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# OpenStack: Is this the Future of Cloud Computing?

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## Introduction

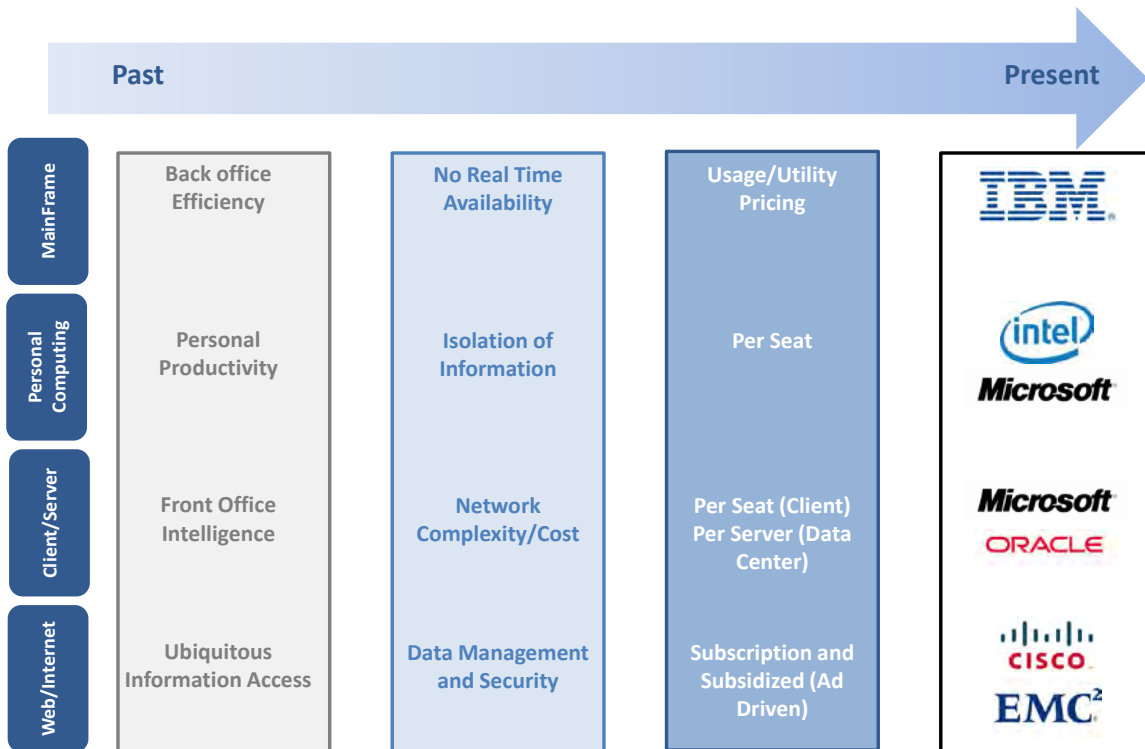
We are at the beginning stages of a complete revolution in enterprise computing. The availability of robust cloud platforms and applications have begun to enable businesses to shift budget dollars from capital expense to operating expense (Capex to Opex). It's possible to choose the best-of-breed solutions to deploy technology to solve business problems free of the constraints imposed by an IT department and existing legacy infrastructure. Salesforce.com's rapid ramp to over \$5 billion in revenue along with Amazon AWS's equally impressive ramp to \$5 billion demonstrate that enterprises are looking to adopt cloud solutions wherever possible.

The challenge this brings is two-fold. First, how does the enterprise ensure that these new applications are able to access the data stored in corporate systems and how do they enable all of these cloud systems to interoperate? We believe that OpenStack will provide the foundation to enable interoperability and drive adoption of the next stage of cloud computing – the hybrid cloud.

OpenStack is essentially an operating system for the hybrid cloud. It both augments and replaces existing proprietary infrastructure software, providing a standard mechanism for systems to operate across computing, network and storage. We believe that OpenStack will emerge as the winning approach primarily due to its open source heritage. Its concept leverages the ideas of hundreds of thousands of developers globally and prevents vendors from locking customers onto a single high-cost platform. Before we discuss the specifics of the OpenStack platform, we believe it's important to understand why we believe the timing is optimal for this shift in computing to accelerate.

## The Evolution of Enterprise Computing – How did we get here?

An underlying trend driving investments for the next several years will focus on the continued development and rollout of cloud computing infrastructure and applications. Cloud computing has become the next, logical evolution in computing – combining the critical elements of each architecture that came before it. We view OpenStack as the core foundation upon which cloud computing must sit. Each tectonic shift in computing architecture added a new benefit to an enterprise organization and we see the cloud model as the amalgamation of all that came before.



While each of these evolutionary architectures brought benefits, they also introduced new challenges and risks to the organization as customers pushed the technology to its limits.

In addition to pushing enterprises to rethink their data center architectures, each shift forced vendors to rethink business models, as well, since the usage for each approach is so radically different.

Additionally, each shift has seen a new leading vendor (or two) emerge that has set the proprietary architectural platform for the shift.

Importantly, none of these architectures has gone away as all continue to add material benefit. However, the complexity of making them work together, along with the cost of maintenance, has been a significant drain on IT budgets. Some estimates range as high as 75% of IT spending is focused on these requirements, rather

than on innovation or launching new applications. The last decade has seen the introduction of several new innovations that begin to open up the possibilities of either freeing up enterprise IT dollars or minimizing the impact on budgets from all of the billions of dollars of legacy investment. Among the most important innovations are:

- Commercialization of standard Open Source Software
- Commoditization of standard Computing Hardware
- Emergence of Offsite Data Centers
- Maturation of Software as a Service

All of these variables drive similar benefits for IT management – lowering costs, simplifying infrastructure and speeding up delivery time for new functionality and features. Rather than being bogged down in issues such as power management, cooling, CPU upgrades and operating system maintenance, IT can instead focus on adding value to the business, rather than just keeping the operation running. These four variables provide the foundation for today’s emerging Cloud Computing model.

Over the past seven years, the launch of the smart phone, combined with the wide availability of easily accessible high bandwidth broadband, has changed computing yet again. Not only have we seen an explosion in the volume of data created – emails, pictures, texts, audio, etc. – but also new user expectations that running corporate applications should be no different than the apps users run every day to manage their lives. Said another way, the user expectation now is “everything at my fingertips, at all times.”

The final major shift stems from the view that open sourced technologies are ready for production use within the enterprise. The wide-scale adoption of Linux over the past five years has significantly changed IT executive attitudes toward community-based development. This has enabled a new type of vendor, exemplified by RedHat, which supports and packages open technologies. We are now seeing early momentum in a similar movement in hardware (built on the foundation of the OCF) where enterprises are exploring replacing proprietary hardware (servers, networking, storage) with off the shelf “white box” computers running open source software that can perform the same functions.

So, the challenge for today’s IT managers is to take current infrastructure and applications and bring them to this modern world, and simultaneously reallocate new development to take advantage of all that this new age brings. This melding of old and new is fundamentally what cloud computing is all about – and OpenStack is the key platform on which it is being built.

## What is Cloud Computing?

NIST (National Institute of Standards and Technology) offers the following definition of cloud computing:

*“Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.”*

The Five essential characteristics cited by NIST are:

- On-demand self-service. A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.
- Broad network access. Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).
- Resource pooling. The provider’s computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, and network bandwidth.
- Rapid elasticity. Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly up and down commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.
- Measured service. Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

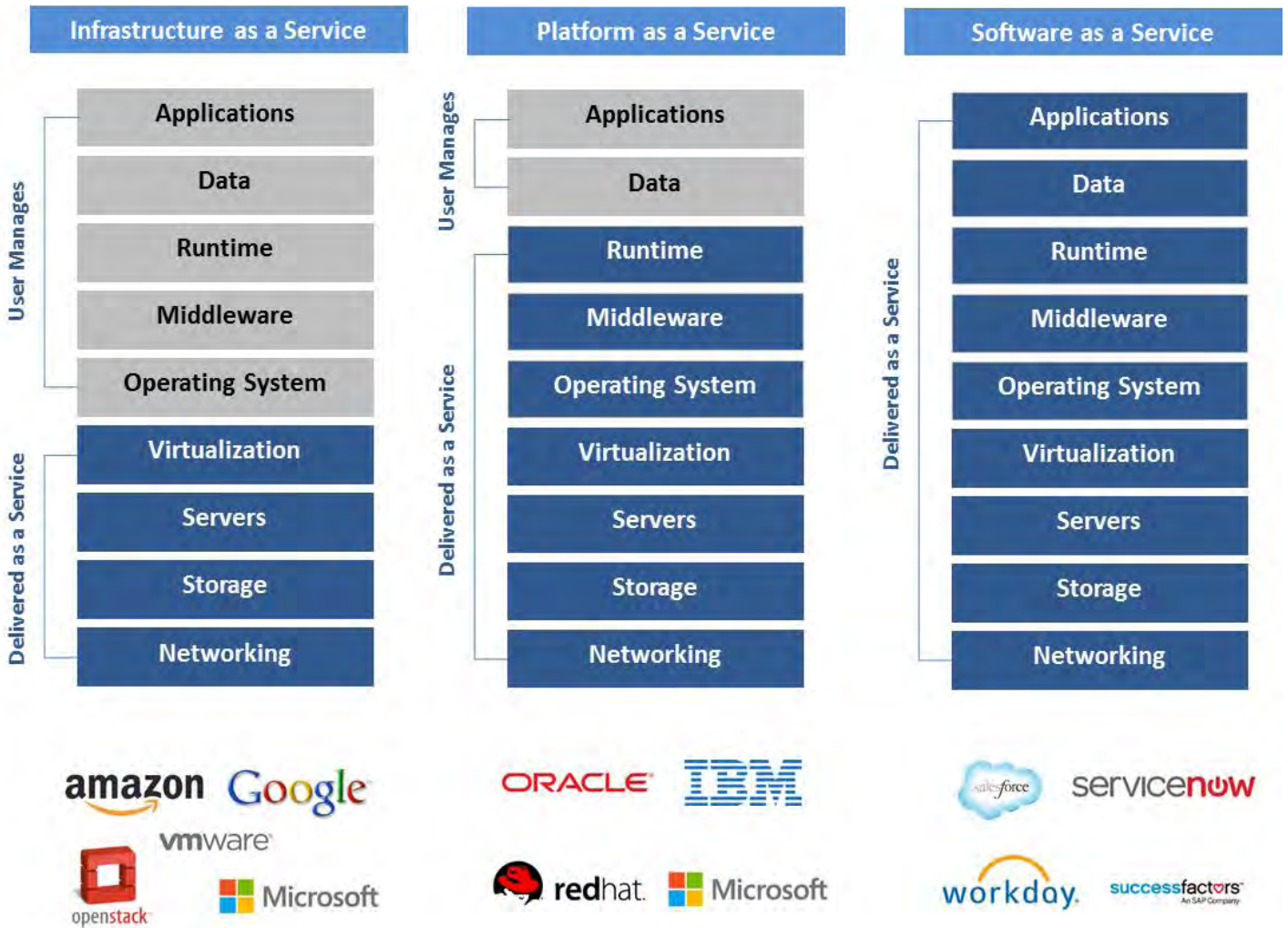
In more plain language, Cloud computing is about the capability to access any information, at any time, regardless of the resources required and the location of the infrastructure, data, application or user i) all the while enforcing necessary business policy and security rules and ii) simultaneously and dynamically allocating the necessary resources in order to minimize cost and maximize performance. These responsibilities typically reside within the IT organization today and require significant compute and personnel resources to implement. By shifting these tasks to the cloud, corporate resources are freed up to solve technology issues that directly impact the business.

## Cloud Delivery

Cloud computing services are typically broken up into three different approaches:

- Infrastructure as a Service
- Platform as a Service
- Software as a Service

The following chart delineates the differences between the three approaches:





## How Does OpenStack Fit in the IT and Cloud Landscapes?

OpenStack is a set of software products for constructing and managing cloud computing environments. Its two primary objectives are to provide interoperability across cloud services and to enable enterprises to develop private clouds in a corporate data center. The OpenStack software is completely open sourced and has been built and extended by a community of thousands of developers just as Linux, Apache and Hadoop have been. Additionally, OpenStack is being supported by the majority of the major enterprise vendors including RedHat, Cisco, IBM, and VMWare, all of whom are not only shipping versions of the software but are also contributing code back to the open source platform. The OpenStack Foundation is responsible for coordinating both the open source development and community building around the platform. The foundation just concluded its annual Global OpenStack Summit which was attended by several thousand developers and partners. We believe that OpenStack will become the primary infrastructure underlying cloud computing efforts over the next decade.

***“OpenStack is a cloud operating system that controls large pools of compute, storage and networking resources throughout a datacenter, all managed through a dashboard that gives administrators control while empowering users to provision resources through a web interface.”***



The primary functional benefit of OpenStack is that it enables the deployment of completely elastic services – across computing, network and storage – as usage demands require. As users come and go across the service over days, hours, minutes or seconds, OpenStack can spin capacity up and down to manage the workload, maximizing compute efficiency and minimizing costs. This utility computing model is one of the key potential benefits of cloud computing.

Another key benefit of OpenStack is that it is completely open source – meaning that a sizable community of programmers build, test, and enhance the software on a daily basis and that anyone is free to download and install the components and contribute back the enhancements they develop. This model not only significantly lowers costs for enterprises that choose to use it but also significantly speeds up the time to market for new features and opens the door for far more creativity – taking the product in new directions that a single vendor might not choose, due to either lack of resources or proprietary strategic concerns. This model has proven to be very successful in the Linux community, where open source Linux has become a dominant operating system over the last seven years.

## Key Growth Statistics of Previous Releases of OpenStack

Developer Growth	<b>1,202 contributors</b> to previous version of Openstack “Icehouse”; a <b>32% increase</b> from the “Havana” release
Total Number of Features	Approximately <b>350 new features</b> , focus on testing, maturity and stability this release cycle
Bugs Fixed	<b>2,902 bugs fixed</b> during Icehouse release cycle
Total Companies Committing Code	Red Hat, IBM, HP, Rackspace, Mirantis, SUSE, OpenStack Foundation, eNovance, Vmware, Intel; users in top 20 include Samsung, Yahoo! and Comcast
Translations	Dashboard now supports <b>16 languages</b> ; internationalization team translated <b>nearly 700,000 words</b> during Icehouse cycle
Testing	<b>53 third-party CI systems</b> registered in Icehouse cycle, starting from less than five

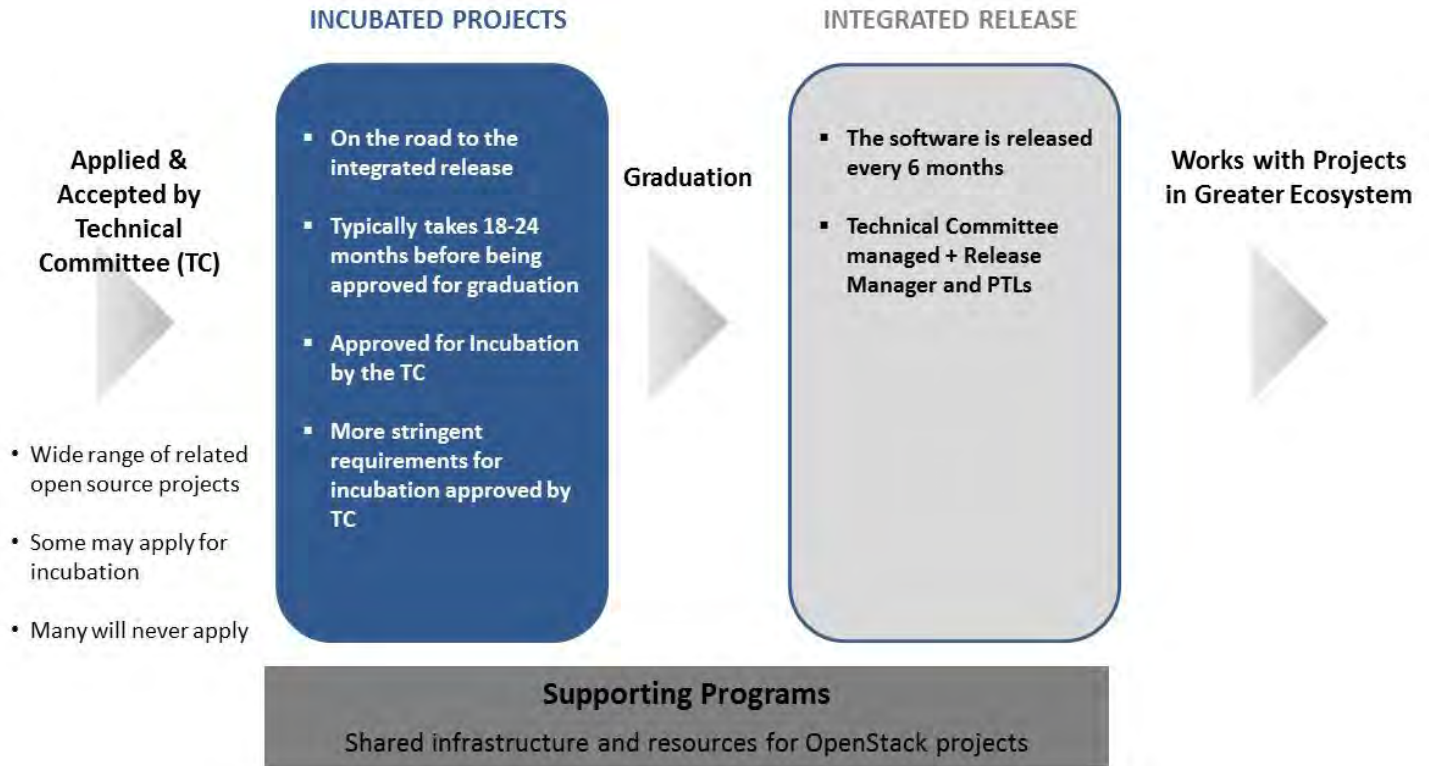
OpenStack is the only open source Infrastructure as a Service (IaaS) in the marketplace today. Customers are very intrigued by IaaS for several reasons including:

- Ability to move infrastructure functionality out of expensive proprietary hardware and into software running on commodity servers
- Ability to spread workloads across multiple servers, services and data centers as demand requires, significantly lowering the investment in hardware infrastructure
- Tie the infrastructure more closely to the application via APIs (application programming interface) to enhance speed and operability
- Speed time to market for new applications and modifications

While there are vendors that today offer IaaS including Amazon AWS, VMWare vCloud and Google Compute, each push the customer to become reliant on proprietary functionality and limit the customer to the pace and direction of innovation that best suits the individual vendor. Our customer research continually emphasizes the point that enterprises are tired of being completely beholden to a handful of vendors who not only limit the ability to adopt new technologies, but also consume a significant portion of an IT budget in product maintenance. This is the primary reason we believe that OpenStack will emerge as the dominant IaaS over

the next decade. In other words, we view the pace of innovation enabled by the open source model as a significant competitive advantage over these proprietary IaaS infrastructures.

## OpenStack Innovation Model: Greater OpenStack Ecosystem



Customers we have met with, who have either deployed or are testing the platform, highlight four primary reasons why they are confident that the OpenStack initiative will be successful over the long term – both in terms of the shift to cloud computing, and the potential dominance of OpenStack as the winning platform:

- **Controlling your own destiny.** The open source platform significantly lowers the risk of vendor lock-in, and the component architecture of OpenStack means that enterprises can choose those components that work for them and adapt them to meet legacy or business needs
- **Momentum toward being the IaaS industry standard.** Cisco, Intel, IBM, HP, RedHat, Dell, Intel and another 50+ enterprise vendors have already announced and shipped support for OpenStack – either standing up the platform themselves or shipping APIs that make it easier to connect proprietary infrastructure. Additionally there are well over 100 public clouds today that are running OpenStack infrastructure including vendors such as Rackspace and Mirantis.



- Compatibility and flexibility. Via the OpenStack APIs, we are seeing early vendors and enterprises adapt the platform with new functionality to solve their unique business problems. In the telco space, we are seeing the development of new telco specific extensions (traffic management for example) that cannot be done with another vendor's proprietary hardware.
- Future Proofing. We are quickly seeing the mainstream vendors rush to support OpenStack – Microsoft and VMWare being two recent announcements. These integrations will allow enterprises to deploy new cloud applications on OpenStack and tie them back to current systems, enabling broader connectivity.

***“OpenStack has crossed the threshold and will become another defacto IaaS standard before the end of the year, when OpenStack compatibility will be a must, not a nice-to-have.”***

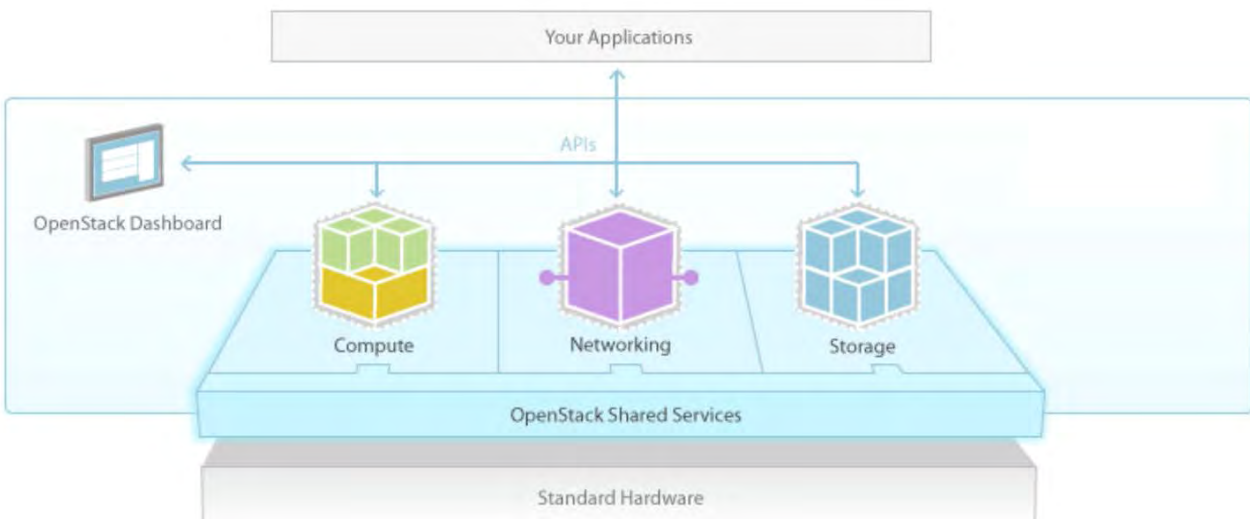
Source: Forrester Research, Inc. State of Cloud Platform Standards: Q1 2014, March 2014

### **The OpenStack Architecture**

OpenStack is a software-only implementation of core data center infrastructure consisting of these key components:

- Compute – manage the deployment and provisioning virtual machines
- Networking – ensure that each OpenStack component can communicate with all others
- Storage – both block and object
- Management/Dashboard – deploy and manage all components
- Shared Services – identity management, telemetry (billing), disk imaging and orchestration

## OpenStack Cloud Platform



The OpenStack Components as of the Juno Release (October 2014)

**Compute:** Also referred to as Nova by developers, the compute engine is responsible for the creation, deployment and management of all the VMs (Vertical Machines) and other instances that are deployed on the infrastructure. Importantly, Nova can support nearly all VM technologies as well as containers, bare metal and high performance computing platforms. All can be intermingled in a single deployment as required. Nova does not require VMs, it can support individual hardware servers as well as offer flexibility of choice. Our research with users indicates the following functions are key benefits of the OpenStack Compute component:

- Ability to virtually manage all compute resources including servers, VMs, memory and network interfaces.
- Distributed, asynchronous architecture for maximum availability.
- VM image management, making it both easier and faster to launch new VMs.
- Projects and quotas, making it easier to track usage and allocate resources accordingly.
- Security groups, including role based access, project based access and resource based access, with great flexibility in controlling and securing servers.

The component contains key functionality in other key areas including caching, API (Application Programming Interface) and networking, among others. Importantly, many customers in vertical markets have used the API to extend Nova to meet their market needs, particularly around HPC (High-performance Computing).

**Storage:** The OpenStack infrastructure has two separate components for storage management. The first, called Swift, deals with object-based storage, while Cinder deals with more traditional block-level storage.

Object storage does not require the application to understand the underlying storage architecture; rather, it just requests resources from Swift based on need and the component complies. Cinder reflects more traditional

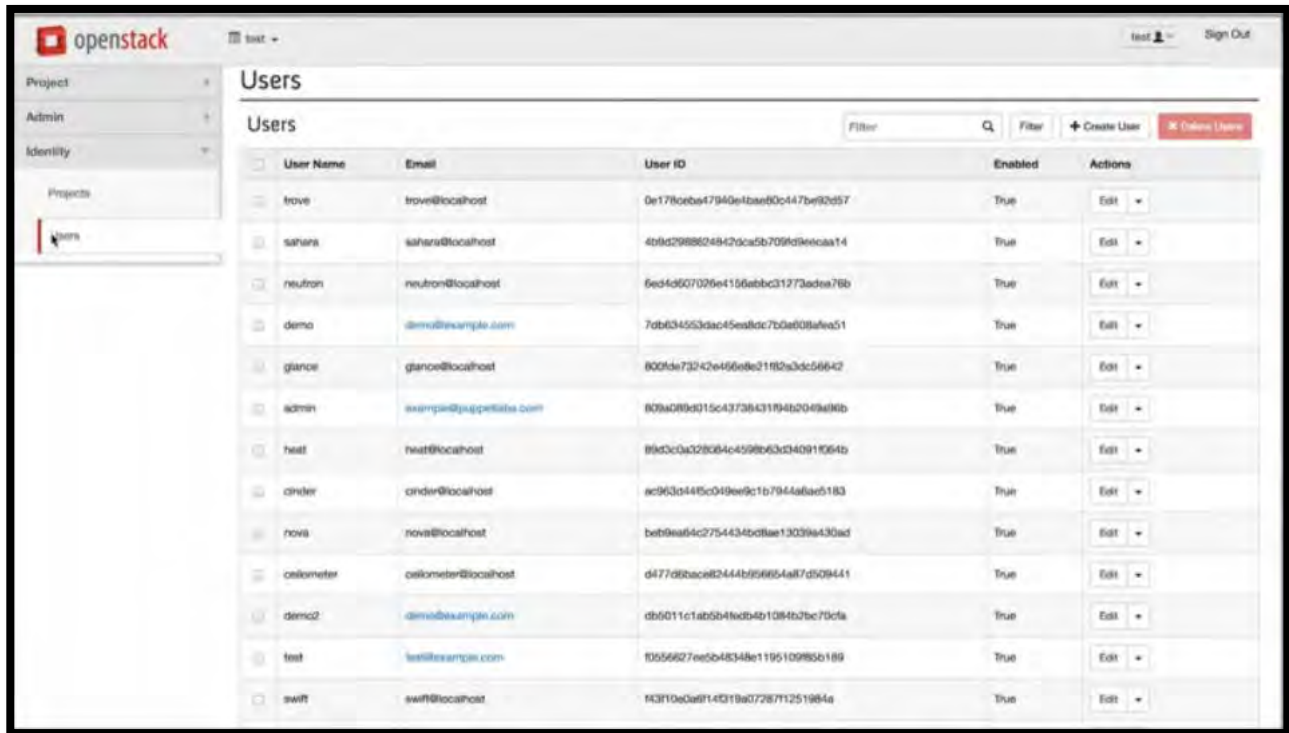
approaches to storage whereby the application is aware of the physical location of data on disk. Typically, block storage is used where read/write performance is paramount.

With Swift or object store the application takes no notice of how or where the information is written, and turns all management responsibility to the infrastructure. This makes it much easier to scale out as there is no need to tie physical disk or flash back to the application in any way. Since OpenStack manages the storage, including replication and availability, the enterprise can rely on low-cost commodity drive arrays, saving significant budget. This architecture is typically used in areas such as big data analytics where large, temporary chunks of storage are required to perform complex calculations.

Since the Cinder block storage requires persistence (data must be in the physical location where the application will look for it) OpenStack must manage not only the physical infrastructure but also be certain that the application is aware of any changes in the underlying physical storage. Several leading storage vendors including EMC and Network Appliance have built interfaces to Cinder via the OpenStack API. Block storage is commonly used in areas that have heavy transaction processing loads such as relational databases.

**Networking:** Neutron is the current name for the networking component of OpenStack. Its primary function is to enable all of the elements linked into the infrastructure to communicate and share data. Since nearly every device in a data center can plug into OpenStack via API, Neutron could end up being the primary mechanism for managing all of the devices on a network. Additionally, Neutron is able to participate in an SDN configuration via the OpenFlow standard to allow both multi-tenancy and scale. (Separately, see WCP's research report on SDN) In addition to managing IP addresses, Neutron could become a replacement for much of the configuration and management functions that exist today in proprietary hardware devices such as switches, firewalls, IPS, load balancers, and ADC. As VMs are spun up and down with great frequency based on need, the scope of the management challenge goes far beyond the capability of today's physical devices driving the broad customer interest in SDN.

**Dashboard:** Horizon is the official OpenStack dashboard, enabling operators to view, manage, and control all the elements of the OpenStack cloud via a graphical web interface. Any operator may choose to build their own dashboard using the APIs associated with each component.



We have seen several customers work to extend Horizon via the API to suit specific requirements tied to individual cloud applications. Unlike traditional management tools, Horizon gives users the ability to have a self-service portal tied to specific elements, with permissions managed and granted by an administrator. This architectural approach helps to lower overall management costs since basic requests do not need to be routed through administrators.

**Shared Services:** The Juno release of OpenStack makes a series of shared services available that are exposed to all of the key components. These include:

- The **identity management** service (named Keystone) keeps a directory of all cloud users and the services that each has permission to use. The API enables IT to map user data stored in other directories against Keystone via the LDAP standard (among other approaches). Importantly, Keystone also allows an administrator to create roles and policies, enabling the grouping of users (or leveraging existing ones created in other products) making ID management a much more efficient process.
- The **image service** (Glance) allows administrators to store and manage server and disk images, significantly reducing the complexity involved in spinning up new servers, either virtual or physical. When users or admins are adding compute resources to the cloud, they are able to query the image service to see if one exists for that particular cloud application.
- The **telemetry service** (Ceilometer) is critical for billing and charge back as it tracks performance and usage on an individual or group basis. This is a critical function for any utility-based cloud model.
- The **orchestration service** (Heat) allows developers to build templates that deploy services in the cloud. Each template details the requirement of a service, automating the rollout process. Templates can specify all three primary service requirements (compute, storage, and networking) as well as application specific needs such as scaling.

- The **database service** (Trove) is designed to reduce the complexity of deploying both relational and non-relational databases in an OpenStack Cloud. Since database implementations have a complex set of requirements around storage, reliability, performance, and synchronization, this service is designed to bring more automation to the database provisioning process.
- The **data processing service** (Sahara) is a specific implementation of cloud database infrastructure that is optimized for complex non-relational systems such as Hadoop.
- There is currently work ongoing in several other areas including **DNS management, queueing, and key management**, due out in future releases and all integrated with the API.

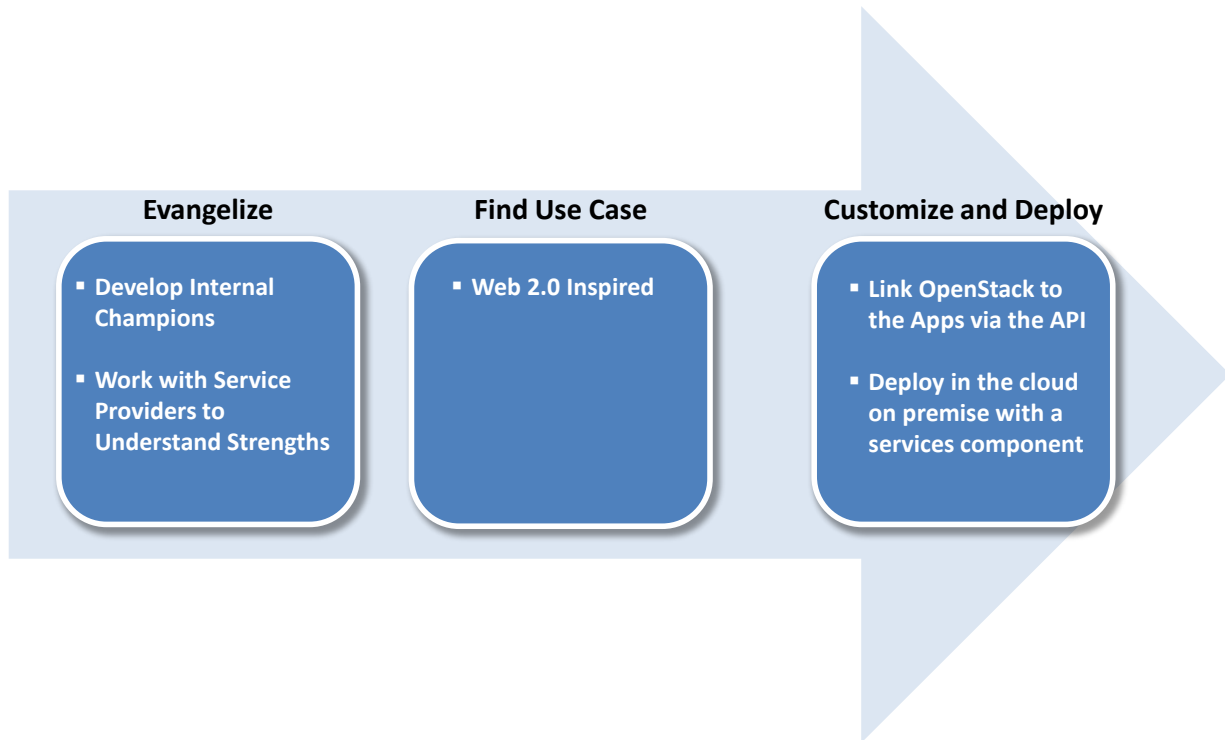
Given its pace of innovation, completeness of vision, industry and community support and ability to offer enterprises protection from vendor lock-in, we believe that OpenStack is well positioned to establish itself as the primary cloud infrastructure. To date, the momentum around Amazon, Google and even VMWare has been stronger, but our research suggests the tide is shifting toward the open approach and that momentum will continue over the next several years.

### **OpenStack Today**

Based on a combination of our research with early adopters, service providers and enterprises looking to understand the implications of OpenStack on their future infrastructure decisions, we believe that there is a limited use case for the software today. However, all categories of users are very motivated to develop broader and more strategic use cases. Most importantly, we believe that the willingness on the part of enterprise IT to adopt Open Source technology, rather than vendor-specific product, is quickly reaching the mainstream. While this movement began with Linux, we believe it is rapidly spreading into other critical areas such as middleware (JBoss) and database technologies (MySQL, Casandra, Hadoop). Open Source is being deployed in production environments not just at Web 2.0 companies but in traditional, larger enterprises. With Linux, corporations can now see the economic benefit of open source and standardization and are looking to extend that savings to other parts of IT.



## OpenStack Sales Cycle Success Model



While the longer term vision for OpenStack (or any other vendor's IaaS or PaaS offering) is to replace existing infrastructure, we believe that market is very small today and have seen very few instances that are ready to move beyond the Proof of Concept stage. We attribute this to several factors. First, cloud computing is still immature. Most enterprises are just getting their feet wet via Amazon and Google, and are not yet ready to fully trust the reliability and security offered by the cloud. Second, OpenStack in particular still has areas that need to be improved upon, including high-availability for virtual machines, backup and recovery. These processes need to be as reliable and automated as they are in proprietary offerings in order for the platform to be trusted in production systems. Finally, with limited dollars and significant demand for new applications (that are being deployed on cloud platforms) budget dollars are not widely available for replacement projects at the infrastructure level.

Instead, we are seeing adoption in particular use cases that look a lot like Web 2.0 apps – cases where there are large numbers of users, significantly large volumes of data, ubiquitous connectivity or a high volume of transactions – in other words businesses that are furiously active in building a significant web presence. Not surprisingly, our research suggests strong interest from the financial services, media and retail industries as those organizations struggle with how to adapt their models to become internet companies. In our discussions with these users, they see OpenStack as the underlying fabric to get them to this world. In particular, they are excited about the ability, via the API to tie the infrastructure to the application of going from a model with disparate, proprietary hardware toward one that delivers a data center that can be both virtual and completely programmable depending on requirements.

We believe that these early success stories, as they become more mainstream over the next year, will help to drive broader adoption and make it easier for the large scale vendors (HP, IBM, etc.) to make more mainstream customers comfortable that OpenStack can be the right IaaS for them. We continue to hear from those that are watching and waiting is that the key factor will be the ability to deploy OpenStack in the data center and then subscribe to the service via third parties for remote data center usage. This vision of a consistent, open infrastructure appears to be emerging as a key driver of growth in the future.

### **Implications for Technology Vendors**

Just as Linux and virtualization have disrupted the compute space, we believe that OpenStack has the potential to disrupt the entire data center market, including compute, storage and networking. We believe that all of the enterprise vendors today will face significant challenges driven by this shift and that survivors and successful companies will need to completely adapt their business models to compete effectively in this new world where strategic value shifts from hardware to software and innovation moves from proprietary development to shared. We believe the most significant challenges will be the following:

- Hardware becomes commoditized.
- Revenues decline, margins improve
- Open Source forces vendors to find new ways to monetize
- Profits move higher in the stack toward applications
- Required capital significantly declines for start-ups

We already seen the impact of commoditization in the server business as most of the systems vendors have chosen to exit the server market. Those that remain focus instead on higher margin, proprietary boxes such as Oracle's Exadata. We are now seeing that impact extend to the storage market, reflected clearly in the revenues and profits at EMC and Network Appliance. Over the next 18 to 24 months, we look for the same trend to show itself in the network space. Fundamentally, this move is about key functionality that was traditionally tied to hardware now being deployed inside of virtual machines and replicated as more scale is required. We are already seeing the benefits of this move as key networking functionality such as firewall and load balancing are now running well on commodity hardware.

The good news for vendors in software is that gross margins will rise significantly since software carries essentially zero cost of goods. However, we believe that revenue will decline for many vendors as the decoupling of hardware and software continues, as we have seen at HP and IBM. It would not surprise us at all to see a company like Cisco be 67% of its current size but 50% more profitable if it successfully navigates this transition. We also expect many vendors to aggressively pursue M&A to offset this revenue decline and pursue the higher margin software model.

Vendors will face a key challenge in making this shift happen driven by this rapid enterprise acceptance of open source. When Oracle pioneered the value shift from hardware to software in the mid 1980s, commercial open source was virtually non-existent. In today's world, Oracle would be expected to contribute its proprietary code back to the greater community just as we've seen vendors do in other open source projects such as Linux and Hadoop. Finding that fine line where a company can keep its proprietary edge, while still

maintaining a reputation as a contributor, will be a tough tightrope to walk. The long term value of new software will be significantly shorter, requiring more aggressive monetization quickly in order to sustain pricing. Today's year-long ramp to productivity for enterprise sales staff will have to become a thing of the past.

Additionally, new business models will emerge and vendors will be forced to rapidly adapt to the changing ways customers want to acquire what has been traditionally called software. For example, in the past year we have seen five traditional enterprise software vendors all aggressively launch cloud infrastructure services – IBM, Citrix, Oracle, Cisco and VMWare. Interestingly, while all support OpenStack in some way, only Cisco and IBM have aggressively embraced it. In addition to building out data centers to offer cloud services, we believe vendors will need to find ways to launch new applications on top of open infrastructure in order to generate value. Traditionally the infrastructure market has been challenging for vendors, where success has been driven more by linkage to a proprietary platform (such as Oracle or Windows) than innovation. Fundamentally we believe that Google and Amazon are committed to driving basic cloud service pricing to zero over time. A vendor's ability to innovate on top of that platform in key areas such as API, integration or management will be critical. Additionally, we believe that there will be a coming wave of vertical extensions on top of OpenStack in key markets such as telco, retail and financial services that will have the ability to drive profits due to their complexity and need for subject matter experts.

Finally, we believe that the greatest change in the industry will be the continued significant declines in the cost of starting new-tech enabled companies. With infrastructure development under the auspices of the broader community, start-up capital will be focused on new business applications rather than reinventing core functionality and acquiring hardware. Start-ups will be significantly more nimble and likely more narrowly focused, as the lower-up front capital will allow businesses to attack smaller markets at first and then extend horizontally over time to expand TAM (Total Addressable Market).

### **OpenStack Tomorrow**

For OpenStack to be the long term winner in cloud infrastructure we believe these key things need to happen:

- Industry support for the standard has to continue to grow, with key vendors not only offering the service (either as a software, support, or “as a service”) but also importantly, contributing back to the code base. This will continue to ensure that OpenStack will have the broadest support across any infrastructure.
- Vendors need to watch their “forking.” It is tough to generate profits by taking open source code and supporting it at an enterprise level – thereby contributing back 100% of your innovation. We have seen RedHat build a good margin business doing this, but its margins show no sign of approaching those of established proprietary software vendors like Oracle or SAP. Vendors will need to give back and simultaneously find ways to create proprietary value beyond infrastructure to be viable.
- Reduce the cost of IT and empower enterprise developers to quickly roll out new applications that change the business rather than be infrastructure builders and managers.
- IT organizations need to radically change. Gone will be the days where there are experts in each infrastructure area. Rather, all IT staff will be infrastructure generalists (since everything will be

managed from the same APIs and consoles) and focused on how to leverage IT to get more value for the business. This is a radical shift, eliminating traditional silos, and forcing people to work together.

- Manage to an even greater pace of change. As open source continues on its path to mainstream adoption, IT staff must become comfortable with a more rapid and incremental rate of change, rather than the legacy 24 month cycles imposed by traditional vendors. We are already seeing receptivity to this approach from the adoption of cloud applications such as Workday and Salesforce.com which rollout new functionality every six months.

The good news is we believe that the industry is already traveling down this path and is beginning to adapt to this new world. Whether our legacy vendors will adapt and survive remains to be seen. History suggests they will struggle and many will not make the transition opening the door for new approaches such as the community-driven, foundation managed, open source strategy around OpenStack.

### **Conclusion – Accelerating M&A**

We believe that the growing acceptance of open source software, not just around OpenStack, but in other strategic areas, has the potential to dramatically change the M&A landscape. As vendors conform to industry and customer pressure to contribute code back to the open source community, new product loses its proprietary value (and importantly its price premium) forcing companies to push hard to deliver the next value layer on top of the growing pile of commodity infrastructure. Given this backdrop, we believe that time to market becomes much more critical to sustaining competitive advantage and pricing leverage. Accordingly, we believe that not only will the pace of M&A accelerate, but even large companies will be looking to smaller, early stage companies that are able to more easily look a year or even two ahead from a technology perspective. We also believe that companies will need to quickly develop and extend vertical functionality as we believe those product extensions will be less likely to be absorbed into the community.

In summary, our key M&A takeaways:

- Pressure to contribute core infrastructure back to the community reduces length of time a vendor has competitive advantage
- Vendors will look to extend into vertical and industry specific markets where subject matter expertise can be sustained longer
- The quickest path to market remains M&A, and we look for both the pace to accelerate and for larger companies to look to acquire earlier stage businesses in order to extend competitive advantage.

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## Appendix A: Glossary

**ADC** – An application delivery controller is either a physical or virtual appliance that manages client connections to both web and enterprise applications. The primary purpose of an ADC is to take workloads off of a server in order to improve performance.

**API** – A system's application programming interface is the way other developers access the features of any software application from an operating system to a full business application. All systems that can be extended or need to integrate with another require an API.

**DNS** – Domain Name System is the underlying system to name and computers and services across a network. It is used on all TCP/IP networks.

**Infrastructure as a Service (IaaS)** - is used when a company has an existing application that it wishes to move from its own data center to a cloud operator in order to eliminate the costs associated with hardware and data center operations as well as provide scaling on an as needed basis. One example of this scenario could be a customer moving its existing Peoplesoft HR system from its own data center to a cloud provider. The IaaS vendor provides all the technologies required from the networking up through computing, with the customer providing the operating system, application infrastructure and the application itself.

**IPS** – Intrusion prevention systems monitor both systems and networks for improper activity. An IPS can either run on a dedicated hardware appliance or in a virtual machine.

**LDAP** – The Lightweight Directory Access Protocol is an industry standard for accessing available information about organizations, individuals or even files and devices.

**Multi-Tenant** – Multi-tenancy is a core component of cloud computing. It refers to the ability for a single instance of software to serve several different tenants or organizations simultaneously, while isolating each tenant from the other to preserve privacy and security.

**Platform as a Service (PaaS)** – the customer typically chooses to build a new application specifically for the cloud, taking advantage not only of the benefits of cloud infrastructure but also modern app development platforms that are designed not only for rapid development but also deployment on mobile devices such as phones and tablets.

**Provision** – Provisioning refers to all of the necessary components required to spin up a new system in the cloud including compute, storage, networking, application and security.

**SDN** – Software Defined Networking decouples the physical network from the management of the network, making it far easier for administrators to manage and control traffic without having to deal with the proprietary requirements of the underlying hardware.



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**Software as a Service (SaaS)** – is for the customer that is looking for an out of the box solution to solve a specific business problem – sales automation, finance, expense reporting, human resources – without having to think at all about the underlying technology.

**Appendix B: OpenStack Market Map**

Distributions and Appliances	Public Clouds	Private Cloud as a Service	Integrators	Connectors/Drivers
cloudscaling	ANCHOR	AURO	aptira	AIOnetworks
EASYSTACK	KIO	bluebox	CLOUD ENABLED	ARISTA
eNovance	AURO	IBM	DELL	BROCADE
HP	Cloudwatt	metacloud	EASYSTACK	CITRIX
IBM	elastix	MIRANTIS	eNovance	CISCO
MIRANTIS	HP	MORPH LABS	elasti	cloudbase.io
nebul	NUMERGY	rackspace	hastexo!	CRAY
metacloud	INTERNAP	UnitedStack	MIRANTIS	DELL
MPSTOR	io	DataCentred	nexus	EMC <sup>2</sup>
ONYX	rackspace		NUBELIU	embrane
suse	teuto		pactera	Extreme
rackspace	UnitedStack		rackspace	freescala
SwiftStack	VEXXHOST		Solinea	FUJITSU
redhat	DataCentred			HITACHI
ORACLE				HP
ubuntu				IBM
				juniper
				midokura
				Mellanox
				NEC
				nexenta
				NetApp
				nimble storage
				manageworks
				radware
				SCRILITY
				vARMOUR
				vmware

## Appendix C: Selected M&A Transactions

#	Date	Acquirer	Target	TV (\$M)	TV/ Rev (x)	Business Description
<b>Compute</b>						
1)	10/13/14	EMC Corporation	Cloudscaling	NA	NA	Provides OpenStack infrastructure-as-a-service (IaaS) software to enable private and hybrid cloud for businesses and managed service providers. Cloudscaling offers an OpenStack-powered private cloud.
2)	09/17/14	Cisco Systems Inc.	Metacloud Inc.	NA	NA	Provides OpenStack-based open source cloud hosting and virtualization build and deployment IaaS and managed hosting for businesses globally.
3)	09/11/14	Hewlett-Packard Company	Eucalyptus Systems Inc.	NA	NA	Provides Amazon Web Service-based (AWS) on-premise public and private storage and networking infrastructure as a service (IaaS) for businesses and enterprises. It also provides open-source computer software for building compatible private and hybrid cloud computing environments.
4)	08/07/14	Facebook, Inc.	PrivateCore Inc.	NA	NA	PrivateCore Inc. develops a computing platform that allows individuals or organizations to safely use cloud computing resources without ceding control of their data. The company offers vCage software, which audits platform integrity and protects OpenStack clusters from persistent malware, malicious hardware devices, and insider threats.
5)	06/18/14	Red Hat Inc.	eNovance SaS	\$94.8	7.6x	Provides open source cloud hosting and virtualization build and deployment IaaS and managed hosting for businesses globally. The company offers Openstack Accelerator Pod that saves costs, lowers operational risks, and assures ongoing code maintenance and evolution aspects
6)	05/14/14	Flexiant Ltd.	Besol Soluciones SL [dba Tapp Technology and Business] (assets)	NA	NA	The assets of Besol (dba Tapp), which provides cloud management SaaS for business users to manage multiple IaaS instances from a single control panel. Software enables infrastructure management, cloud configuration, monitoring and migration that is compatible with Amazon Web Services as well as other cloud platforms.
7)	10/30/13	Internap Network Services Corporation	iWeb Group Inc. [Novacap Technologies III]	145.0	4.5	Provides managed and web hosting and server colocation, domain name registration, managed data backup and recovery and security services for businesses globally. The company released a fully-managed Cloud hosting service based on OpenStack(R).
8)	05/06/13	Dell Inc.	enstratius, Inc. [fka Enstratus Networks]	70.0	35.0	enstratius, Inc. develops Enstratius, a cloud infrastructure management solution for organizations worldwide. The company's cloud infrastructure management solution deploys and manages enterprise-class applications in public, private, and hybrid clouds. Its Enstratius solution provides a suite of tools for managing the cloud infrastructure.
9)	12/20/12	Red Hat Inc.	ManagelQ, Inc.	104.0	6.9	ManagelQ, Inc. provides infrastructure management software solutions. It offers management and automation solutions for private clouds, virtual infrastructures, and virtual desktop environments. It also offers solutions for OpenStack.
10)	07/12/11	Citrix Systems Inc.	Cloud.com	164.4	26.5	Provides cloud computing environment deployment and management software and SaaS used to launch both private and public cloud environments for businesses. It offers CloudStack, an open source software solution that accelerates the deployment, management, and configuration of multi-tier and multi-tenant infrastructure cloud services.
11)	12/16/10	Rackspace US, Inc.	Cloudkick	29.9	NA	Provides cloud computing-focused virtual server monitoring and management software as a service (SaaS) for businesses. Cloudkick has been an active member of the OpenStack™ community.

## Appendix C: Selected M&A Transactions (continued)

#	Date	Acquirer	Target	TV (\$M)	TV/ Rev (x)	Business Description
<b>Networking</b>						
1)	10/04/12	Cisco Systems Inc.	vCider	NA	NA	Provides network virtualization software for use in data center and cloud computing environments for businesses. vCider focuses on virtual networking, secure data centers and OpenStack
2)	07/23/12	VMware Inc.	Nicira NVP	1,260.0	NA	Provides network virtualization software for businesses and government agencies globally. NVP is a virtual networking platform powering many OpenStack production environments as the networking engine.

#	Date	Acquirer	Target	TV (\$M)	TV/ Rev (x)	Business Description
<b>Storage</b>						
1)	05/29/14	Unitrends	Yuruware Pty Ltd	NA	NA	Provides Amazon Web Services (AWS) and Openstack disaster recovery and data migration software and services for businesses. Also provides data replication and server monitoring software.
2)	04/30/14	Red Hat Inc.	Inktank Storage, Inc.	175.0	NA	Provides Ceph storage software development services and commercial support services for Ceph, which is an open source, object-based storage software platform.
3)	06/04/13	IBM Corporation	SoftLayer Technologies, Inc.	2,000.0	4.7	SoftLayer Technologies, Inc. operates a cloud infrastructure platform for built for Internet scale. It offers storage solutions, including object and networked storage, mass storage servers, backup, and content delivery network; and networking solutions, such as load balancing solutions, network appliances, and domain services.
4)	02/27/13	Rackspace US, Inc.	ObjectRocket, Inc.	NA	NA	Provides MongoDB database application hosting services for businesses. It offers MongoDB, a data storage service that tackles the deficiency in cloud infrastructure.
5)	02/29/12	Advanced Micro Devices, Inc.	SeaMicro, Inc.	331.0	NA	SeaMicro, Inc. provides microservers. The company offers SeaMicro SM15000 Server, a big data server platform; SeaMicro SM15000 fabric compute systems and freedom fabric storage solutions; and storage enclosure options. It also provides big data solutions and OpenStack solutions; and service and support solutions.

## Appendix D: Selected Private Placement Financings

#	Date	Company	TV (\$M)	Investors	Business Description
<b>Compute</b>					
1)	10/20/14	Mirantis	\$101.0	Sapphire Ventures, Ericsson, West Summit Capital, Intel Capital, August Capital, Insight Venture Partners	Mirantis, an OpenStack systems integrator, operates as a vendor of OpenStack services and technology.
2)	06/19/14	Puppet Labs	40.0	Triangle Peak Partners; VMware; True Ventures Kleiner Perkins Caufield & Byers; Cisco Systems	Puppet Labs provides IT automation software for businesses that help system administrators automate configuration. Its Puppet Enterprise implementation provides various solutions, such as VMware deployment; OpenStack cloud deployment.
3)	05/07/14	Metacloud	15.0	Canaan Partners; Pelion Venture Partners; Storm Ventures UMC Capital; SVB Silicon Valley Bank, Investment Arm; AME Cloud Ventures	Metacloud designs and deploys private clouds software solutions. Metacloud is a cloud solutions company providing OpenStack-based, enterprise-grade cloud platforms for enterprises.
4)	05/01/14	OGSystems	NA	General Catalyst Partners	OGSystems provides systems development and integration for the Intelligence Community, as well as commercial clients. OGSystems hosts OpenStack cloud-ready virtualized software packages on flexible Big-Data compute platforms.
5)	09/10/13	Virtustream	40.0	SAP AG	Virtustream provides enterprise-class cloud software, services and public and private clouds based on OpenStack.
6)	08/16/13	Canonical	10.0	Product Crowdfunding	Canonical Ltd. develops and supplies open-source software solutions for individuals and businesses worldwide. The company offers Ubuntu, a solution to streamline business operations.
7)	06/26/13	eNovance SaS	2.6	Odyssée Venture; Entrepreneur Venture Gestion SA; Entrepreneur Venture	eNovance SaS provides open source cloud solutions to businesses worldwide. The company offers Openstack Accelerator Pod that saves costs, lowers operational risks, and assures ongoing code maintenance and evolution aspects.
8)	06/26/13	Metacloud	10.0	Canaan Partners; Storm Ventures AME Cloud Ventures	Metacloud designs and deploys private clouds software solutions. Metacloud is a cloud solutions company providing OpenStack-based, enterprise-grade cloud platforms for enterprises.
9)	05/22/13	The Cloudscaling Group	10.0	Trinity Ventures; Seagate Technology Juniper Networks, Investment Arm	The Cloudscaling Group provides strategy, execution, and support services for building public, community, and private clouds to telecom operators. Cloudscaling is the leading provider of OpenStack-powered IaaS for private and hybrid cloud solutions.
10)	03/28/13	Tesora	6.7	General Catalyst Partners; CommonAngels; Point Judith Capital; LaunchCapital	Tesora provides an enterprise-class Database-as-a-service platform that allows the client to deliver on-demand database capacity. Its DBaaS platform uses OpenStack Trove as the core platform for various administrative tasks.
11)	01/23/13	Puppet Labs	30.0	VMware	Puppet Labs provides IT automation software for businesses that help system administrators automate configuration. Its Puppet Enterprise implementation provides various solutions, such as VMware deployment; OpenStack cloud deployment.
12)	01/08/13	Piston Cloud Computing	8.0	Cisco Systems; Hummer Winblad Venture Partners; Divergent Ventures, True Ventures; Swisscom Ventures; Data Collective	Piston Cloud Computing provides Enterprise OpenStack, a software for building a private Infrastructure-as-a-Service cloud.
13)	12/31/12	Mirantis	20.0	Red Hat (NYSE:RHT); SAP Ventures; Ericsson (OM:ERIC B); Intel Capital; WestSummit Capital; Dell Corporate Ventures	Mirantis, an OpenStack systems integrator, operates as a vendor of OpenStack services and technology.



## Appendix D: Selected Private Placement Financings (continued)

#	Date	Company	TV (\$M)	Investors	Business Description
<b>Compute</b>					
14)	08/13/12	Nebula	\$25.0	Highland Capital Partners; Kleiner Perkins Caufield & Byers; Comcast Ventures; NBCUniversal Media, Innovation Endeavors; Webb Investment Network	Nebula develops a hardware appliance that allows businesses to deploy large private cloud computing infrastructures from racks of industry-standard servers. Nebula products are API compatible with with OpenStack & AWS EC2 & S3.
15)	08/02/12	Sonix Co.	NA	Nissay Capital Co.,Ltd; Dentsu Digital Holdings, Investment Arm	Sonix Co. develops applications for iOS, Android, and cloud platforms based on open stack technology. Sonix Co. builds software for Android and cloud platforms, based on OpenStack technology.
16)	07/31/12	The Cloudscaling Group	10.0	Khosla Ventures	The Cloudscaling Group provides strategy, execution, and support services for building public, community, and private clouds to telecom operators. Cloudscaling is the leading provider of OpenStack-powered IaaS for private and hybrid cloud solutions.
17)	07/05/12	Tesora	1.0	General Catalyst Partners; CommonAngels; Point Judith Capital; LaunchCapital	Tesora provides an enterprise-class Database-as-a-service platform that allows the client to deliver on-demand database capacity. Its DBaaS platform uses OpenStack Trove as the core platform for various administrative tasks.
18)	11/29/11	Puppet Labs	8.5	Cisco Systems; VMware; Google Ventures	Puppet Labs provides IT automation software for businesses that help system administrators automate configuration. Its Puppet Enterprise implementation provides various solutions, such as VMware deployment; OpenStack cloud deployment.
19)	09/21/11	The Cloudscaling Group	5.0	Trinity Ventures	The Cloudscaling Group provides strategy, execution, and support services for building public, community, and private clouds to telecom operators. Cloudscaling is the leading provider of OpenStack-powered IaaS for private and hybrid cloud solutions.
20)	07/27/11	Nebula	NA	Highland Capital Partners; Kleiner Perkins Caufield & Byers; Sheralo Ventures	Nebula develops a hardware appliance that allows businesses to deploy large private cloud computing infrastructures from racks of industry-standard servers. Nebula products are API compatible with with OpenStack & AWS EC2 & S3.
21)	06/17/11	Virtustream	10.1	Columbia Capital, Intel Capital; Noro-Moseley Partners; Asset Management; Mutual Funds - Entertainment & Communications Fund Buyer Funds	Virtustream provides enterprise-class cloud software, services and public and private clouds based on OpenStack.
22)	05/26/11	Tesora	2.0	General Catalyst Partners; CommonAngels; Point Judith Capital; LaunchCapital	Tesora provides an enterprise-class Database-as-a-service platform that allows the client to deliver on-demand database capacity. Its DBaaS platform uses OpenStack Trove as the core platform for various administrative tasks.
23)	05/20/11	SeaMicro	20.0	Draper Fisher Jurvetson; CrossLink Capital; Khosla Ventures	SeaMicro provides microservers, big data, OpenStack and service and support solutions.
24)	03/28/11	Piston Cloud Computing	4.5	Hummer Winblad Venture Partners; Divergent Ventures, True Ventures	Piston Cloud Computing provides Enterprise OpenStack, a software for building a private Infrastructure-as-a-Service cloud.
25)	07/19/10	Puppet Labs	5.0	Kleiner Perkins Caufield & Byers; True Ventures; Radar Partners; Emerson Street Partners	Puppet Labs provides IT automation software for businesses that help system administrators automate configuration. Its Puppet Enterprise implementation provides various solutions, such as VMware deployment; OpenStack cloud deployment.

## Appendix D: Selected Private Placement Financings (continued)

#	Date	Company	TV (\$M)	Investors	Business Description
<b>Networking</b>					
1)	12/31/13	Arista Networks	NA	Summit Partners	Arista Networks provides cloud networking solutions for datacenter and cloud computing environments. EOS supports cloud and virtualization solutions, including VMware, Microsoft, OpenStack and other cloud management frameworks.
2)	10/30/12	Big Switch Networks	\$45.0	Goldman Sachs Group, Merchant Banking Division; Redpoint Ventures; Index Ventures; Intel Capital; Khosla Ventures	Big Switch Networks provides data center architecture enabled by bare metal fabrics worldwide. Big Switch Networks also provides SDN vSwitches for OpenStack plug-in integration with various distributions of OpenStack.
3)	05/22/12	PrivateCore	2.3	Foundation Capital	PrivateCore develops a computing platform that allows individuals or organizations to safely use cloud computing resources without ceding control of their data. The company offers vCage software, which audits platform integrity and protects OpenStack from threats.
4)	03/04/11	Big Switch Networks	13.8	Matrix Partners; Index Ventures; Khosla Ventures	Big Switch Networks provides data center architecture enabled by bare metal fabrics worldwide. Big Switch Networks also provides SDN vSwitches for OpenStack plug-in integration with various distributions of OpenStack.

#	Date	Company	TV (\$M)	Investors	Business Description
<b>Storage</b>					
1)	04/17/14	Pure Storage	\$225.0	Redpoint Ventures; Sutter Hill Ventures; Index Ventures; Fidelity Investments; Wellington Management Company; T. Rowe Price Associates; Tiger Global Management; Greylock Partners	Pure Storage provides flash-based storage solutions for enterprises in the United States and internationally. Pure Storage has created an OpenStack CINDER provider to automate FlashArray management in OpenStack environments.
2)	08/22/13	Pure Storage	175.1	Institutional Venture Partners; Redpoint Ventures; Sutter Hill Ventures; Index Ventures; Fidelity Investments; Samsung Venture; T. Rowe Price Associates; Tiger Global Management; Greylock	Pure Storage provides flash-based storage solutions for enterprises in the United States and internationally. Pure Storage has created an OpenStack CINDER provider to automate FlashArray management in OpenStack environments.
3)	07/02/13	SolidFire	31.0	New Enterprise Associates; Novak Biddle Venture Partners; Valhalla Partners; Samsung Venture Investment Corporation	SolidFire provides primary storage systems for cloud service providers worldwide. SolidFire's storage platforms supports Oracle's enterprise grade OpenStack for Oracle Linux.
4)	05/28/13	Scality	22.0	Menlo Ventures; Iris Capital; IDInvest Partners; Omnes Capital S.A.S.; Galileo Partners; Bpifrance Investissement	Scality develops and deploys software storage solutions. Scality RING supports POSIX file systems, REST standards such as CDML, Hadoop and block storage to extend virtual machines within the OpenStack framework.
5)	05/21/13	Pure Storage	NA	In-Q-Tel	Pure Storage provides flash-based storage solutions for enterprises in the United States and internationally. Pure Storage has created an OpenStack CINDER provider to automate FlashArray management in OpenStack environments.
6)	03/12/13	SwiftStack	6.1	Mayfield Fund; Storm Ventures UMC Capital	SwiftStack provides private cloud storage software solutions. The company enables application developers and operations teams to implement and manage private cloud storage platforms based on the openstack object storage system.
7)	08/07/12	Pure Storage	40.0	Redpoint Ventures; Sutter Hill Ventures; Index Ventures; Data Domain; Greylock Partners	Pure Storage provides flash-based storage solutions for enterprises in the United States and internationally. Pure Storage has created an OpenStack CINDER provider to automate FlashArray management in OpenStack environments.
8)	03/14/12	Violin Memory	96.2	Highland Capital Partners; SAP Ventures; Toshiba Corporation; GE Asset Management Incorporated; Juniper Networks; Intuitive Venture Partners, Grouse Ridge Capital	Violin Memory develops and supplies memory-based storage systems worldwide. Violin offers its all flash storage arrays with an iSCSI plug-in option for customers running business applications on the OpenStack platform.

## Appendix D: Selected Private Placement Financings (continued)

#	Date	Company	TV (\$M)	Investors	Business Description
<b>Storage</b>					
9)	09/01/11	SolidFire	\$25.0	New Enterprise Associates; Novak Biddle Venture Partners; Valhalla Partners	SolidFire provides primary storage systems for cloud service providers worldwide. SolidFire's storage platforms supports Oracle's enterprise grade OpenStack for Oracle Linux.
10)	05/26/11	Pure Storage	30.4	Redpoint Ventures; Sutter Hill Ventures; Samsung Venture Investment Corporation; Greylock Partners	Pure Storage provides flash-based storage solutions for enterprises in the United States and internationally. Pure Storage has created an OpenStack CINDER provider to automate FlashArray management in OpenStack environments.
11)	02/25/11	Scality	7.0	IDInvest Partners; Omnes Capital S.A.S.; Galileo Partners	Scality develops and deploys software storage solutions. Scality RING supports POSIX file systems, REST standards such as CDMI, Hadoop and block storage to extend virtual machines within the OpenStack framework.
12)	02/02/11	Violin Memory	35.0	Toshiba America Electronic Components; Juniper Networks, Investment Arm	Violin Memory develops and supplies memory-based storage systems worldwide. Violin offers its all flash storage arrays with an iSCSI plug-in option for customers running business applications on the OpenStack platform.
13)	01/21/11	SolidFire	11.0	New Enterprise Associates; Novak Biddle Venture Partners; Valhalla Partners	SolidFire provides primary storage systems for cloud service providers worldwide. SolidFire's storage platforms supports Oracle's enterprise grade OpenStack for Oracle Linux.
14)	11/26/10	Pure Storage	NA	Greylock Partners	Pure Storage provides flash-based storage solutions for enterprises in the United States and internationally. Pure Storage has created an OpenStack CINDER provider to automate FlashArray management in OpenStack environments.
15)	07/27/10	SolidFire	1.0	Novak Biddle Venture Partners; Valhalla Partners	SolidFire provides primary storage systems for cloud service providers worldwide. SolidFire's storage platforms supports Oracle's enterprise grade OpenStack for Oracle Linux.
16)	05/31/10	Scality	5.0	Omnes Capital S.A.S.; Galileo Partners	Scality develops and deploys software storage solutions. Scality RING supports POSIX file systems, REST standards such as CDMI, Hadoop and block storage to extend virtual machines within the OpenStack framework.

Appendix E: Public Company Summaries











  
the #1 managed cloud company



















**Amazon.com Inc. (NasdaqGS:AMZN)**

Internet Retail

Employees: 117,300 Incorporated: 1994 in Delaware, US

S&P Issuer Credit Rating FC LT: AA-

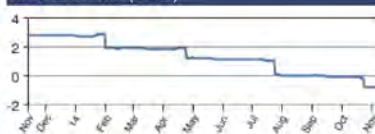
410 Terry Avenue North  
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United States  
Phone: 206-266-1000  
[www.amazon.com](http://www.amazon.com)

Amazon.com, Inc. operates as an online retailer in North America and internationally. The company operates in two segments, North America and International. The company serves consumers through retail Websites, such as amazon.com and amazon.ca, which primarily include merchandise and content purchased for resale from vendors and those offered by third-party sellers. It also offers programs that enable sellers to sell their products on company's Websites, and their own branded Websites; and programs, which allow authors, musicians, filmmakers, app developers, and others to publish and sell content. In addition, the company serves developers and enterprises through Amazon Web Services, which provides access to technology infrastructure that enables...

**Key Statistics**

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	61,093.00	74,452.00	85,246.00	89,448.55	106,238.17
Growth Over Prior Year	27.1%	21.9%	21.5%	20.1%	18.8%
Gross Profit Margin %	24.8%	27.2%	28.6%	-	-
EBITDA Margin %	4.1%	4.8%	4.6%	6.9%	7.4%
EBIT Margin %	1.1%	1.0%	0.1%	-	-
Net Income Margin %	(0.1%)	0.4%	(0.3%)	-	-
Diluted EPS Excl. Extra	(0.09)	0.59	(0.47)	(0.77)	1.10

**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(2.04)
Target Price	346.45921000
LT Growth %	48.97%

**Revenue by Business and Geographic Segments (USD, mm)**



\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	NM	283.79x
TEV/REV	1.57x	1.32x
TEV/EBITDA	22.78x	17.79x
PEG	NM	5.80x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Bezos, Jeffrey P.	83,941,464	18.13	25,611.4
Capital Research and Management	52,540,030	11.35	16,030.5
T. Rowe Price Group, Inc.	23,406,085	5.06	7,141.4
The Vanguard Group, Inc.	18,596,989	4.02	5,674.1
BlackRock, Inc.	17,922,925	3.87	5,468.5

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	312.37	Market Cap (mm)	144,462.5
Open	310.75	Shares Out. (mm)	463.0
Previous Close	312.01	Float %	81.7%
Change on Day	0.36	Shares Sold	7.8
Change % on Day	0.1%	Dividend Yield %	-
Day High/Low	312/308	Diluted EPS Excl....	(0.47)
52 wk High/Low	408/284	P/Diluted EPS	NM
Volume (mm)	1.23	Avg 3M Div Vlm	3.64
Beta 5Y	1.10		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	312.01
Shares Out.	463.01
<b>Market Capitalization</b>	<b>144,462.50</b>
- Cash & Short Term	6,883.00
+ Total Debt	3,099.00
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>140,678.50</b>
Book Value of Common	10,336.00
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	3,099.00
<b>= Total Capital</b>	<b>13,435.00</b>

**Key Executives and Board Members**

Bezos, Jeffrey P.	Founder, Chairman, Chief Executive Officer and
Szkutak, Thomas J.	Chief Financial Officer and Senior Vice President
Reynolds, Shelley L.	Principal Accounting Officer, Vice President and...
Zapolsky, David A.	Senior Vice President, General Counsel and
Berman, Craig	Vice President of Global Communications

**Events**

Date/Time	Event
Dec-01-2014	Company Conference Presentation
Dec-01-2014	Conference
Jan-30-2015	Estimated Earnings Release Date (CIQ Derived)



**Cisco Systems, Inc. (NasdaqGS:CSCO)**

Communications Equipment

Employees: 74,042 Incorporated: 1984 in California, US

S&P Issuer Credit Rating FC LT: AA-

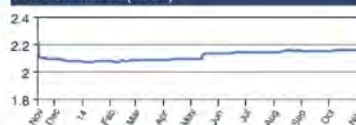
170 West Tasman Drive  
San Jose, California 95134  
United States  
Phone: 408-526-4000  
[www.cisco.com](http://www.cisco.com)

Cisco Systems, Inc. designs, manufactures, and sells Internet Protocol (IP) based networking products and services related to the communications and information technology industry worldwide. It provides switching products, including fixed-configuration and modular switches, and storage products that provide connectivity to end users, workstations, IP phones, wireless access points, and servers; and NGN routing products that interconnect public and private wireline and mobile networks for mobile, data, voice, and video applications. The company also offers service provider video infrastructure, including set-top boxes, cable/telecommunications access products, and cable modems; and video software and solutions. In addition, it provides collaboration...

**Key Statistics**

	12 Months Jul-28-2012A	12 Months Jul-27-2013A	12 Months Jul-26-2014A	12 Months Jul-31-2015E	12 Months Jul-31-2016E
Total Revenue	46,061.00	48,607.00	47,142.00	49,226.47	51,328.87
Growth Over Prior Year	6.6%	5.5%	(3.0%)	4.4%	4.3%
Gross Profit Margin %	61.2%	61.0%	60.3%	-	-
EBITDA Margin %	27.6%	28.7%	27.3%	26.9%	26.6%
EBIT Margin %	23.5%	23.7%	22.1%	-	-
Net Income Margin %	17.5%	20.5%	16.7%	-	-
Diluted EPS Excl. Extra	1.49	1.86	1.49	2.16	2.28
Diluted EPS Excl. Extra	27.4%	24.8%	(19.9%)	4.8%	5.4%

**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(2.18)
Target Price	26.75676000
LT Growth %	7.09%

**Revenue by Business and Geographic Segments (USD, mm)**

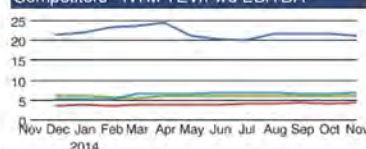


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2015	FY2016
P/E	11.65x	11.05x
TEV/REV	1.98x	1.90x
TEV/EBITDA	7.37x	7.15x
PEG	1.64x	1.56x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

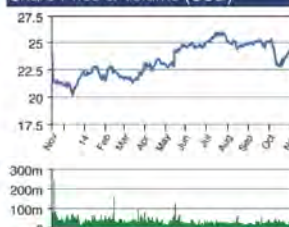
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
BlackRock, Inc.	302,238,545	5.90	7,601.3
The Vanguard Group, Inc.	262,458,561	5.13	6,600.8
State Street Global Advisors, Inc.	217,970,746	4.26	5,482.0
Capital Research and Management	172,174,750	3.36	4,330.2
Fidelity Investments	116,705,880	2.28	2,935.2

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	24.99	Market Cap (mm)	128,771.1
Open	24.91	Shares Out. (mm)	5,120.1
Previous Close	25.15	Float %	99.9%
Change on Day	(0.17)	Shares Sold	72.7
Change % on Day	(0.7%)	Dividend Yield %	3.0%
Day High/Low	25.1/24.8	Diluted EPS Excl....	1.49
52 wk High/Low	26.0/20.2	P/Diluted EPS	16.82x
Volume (mm)	19.87	Avg 3M Dly V/m	26.43
Beta 5Y	1.27		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	25.15
Shares Out.	5,120.12
<b>Market Capitalization</b>	<b>128,771.09</b>
- Cash & Short Term	52,074.00
+ Total Debt	20,909.00
+ Pref. Equity	-
+ Total Minority Interest	7.00
<b>= Total Enterprise Value</b>	<b>97,613.09</b>
Book Value of Common	56,654.00
+ Pref. Equity	-
+ Total Minority Interest	7.00
+ Total Debt	20,909.00
<b>= Total Capital</b>	<b>77,570.00</b>

**Key Executives and Board Members**

Chambers, John T.	Chairman, Chief Executive Officer and Member
Moore, Gary B.	President and Chief Operating Officer
Moragidae, John P.	Chairman Emeritus
Calderoni, Frank A.	Chief Financial Officer and Executive Vice
Bhatt, Prat S.	Chief Accounting Officer, Senior Vice President

**Events**

Date/Time	Event
Nov-12-2014	Earnings Call
Nov-12-2014	Earnings Release Date
Nov-18-2014	Conference



**Citrix Systems, Inc. (NasdaqGS:CTXS)**  
 Application Software      Employees: 8,901      Incorporated: 1989 in Delaware, US      S&P Issuer Credit Rating FC LT: BBB

851 West Cypress Creek Road  
 Fort Lauderdale, Florida 33309  
 United States  
 Phone: 954-267-3000  
[www.citrix.com](http://www.citrix.com)

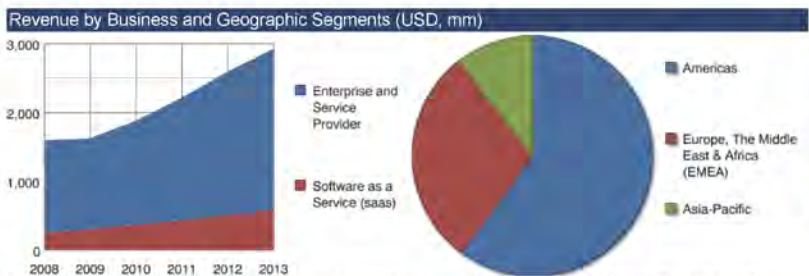
Citrix Systems, Inc. provides virtualization, networking, and cloud infrastructure solutions worldwide. The company operates in two divisions, Enterprise and Service Provider, and SaaS division. The Enterprise division offers Desktop and Application Virtualization solutions, including XenDesktop, an integrated desktop virtualization system; XenApp to manage and mobilize Windows applications; XenClient, a bare-metal hypervisor, and Citrix Receiver for communicating with XenApp and XenDesktop. It also provides mobile solutions, such as XenMobile Enterprise that manages mobile devices, apps, and data; and XenMobile MDM, a mobile device management solution. In addition, this division offers cloud networking solutions comprising NetScaler, a Web...

Key Statistics	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	2,586.12	2,918.43	3,093.79	3,137.98	3,379.75
Growth Over Prior Year	17.2%	12.8%	8.3%	7.5%	7.7%
Gross Profit Margin %	87.5%	86.1%	85.3%	-	-
EBITDA Margin %	23.6%	22.2%	22.3%	29.6%	29.4%
EBIT Margin %	15.5%	13.1%	13.4%	-	-
Net Income Margin %	13.6%	11.6%	9.5%	-	-
Diluted EPS Excl. Extra	1.86	1.80	1.67	3.23	3.69
Diluted EPS Excl. Extra	(0.5%)	(3.2%)	0.4%	7.0%	14.3%

**EPS Estimate (USD)**

**Estimates**

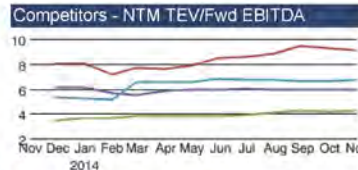
Recommendat	Outperform(2.29)
Target Price	68.75862000
LT Growth %	12.61%



\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	20.63x	18.05x
TEV/REV	3.59x	3.33x
TEV/EBITDA	12.15x	11.33x
PEG	1.64x	1.43x



**Top Holders**

Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Invesco Ltd.	11,332,582	7.04	757.1
ClearBridge Investments, LLC	10,589,312	6.58	707.5
The Vanguard Group, Inc.	10,097,330	6.27	674.6
BlackRock, Inc.	9,182,718	5.70	613.5
State Street Global Advisors, Inc.	7,517,370	4.67	502.2

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	66.61	Market Cap (mm)	10,731.9
Open	66.26	Shares Out. (mm)	161.0
Previous Close	66.67	Float %	99.4%
Change on Day	(0.06)	Shares Sold	7.3
Change % on Day	(0.1%)	Dividend Yield %	-
Day High/Low	66.8/66.2	Diluted EPS Excl...	1.67
52 wk High/Low	72.8/51.1	P/Diluted EPS	39.79x
Volume (mm)	0.57	Avg 3M Div Vlm	2.13
Beta 5Y	1.75		



**Capitalization**

Share Price as of	66.67
Shares Out.	160.97
<b>Market Capitalization</b>	<b>10,731.94</b>
- Cash & Short Term	747.22
+ Total Debt	1,285.09
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>11,269.81</b>
Book Value of Common	2,096.34
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	1,285.09
<b>= Total Capital</b>	<b>3,381.43</b>

**Key Executives and Board Members**

Bojan, Thomas F.	Chairman, Chairman of Nominating &
Templeton, Mark B.	Chief Executive Officer, President and Director
Henshall, David James	Chief Financial Officer, Chief Operating Officer.
Fleites, Eduardo	Director of Investor Relations
Friedman, David R.	Senior Vice President of Human Resources and

**Events**

Date/Time	Event
Nov-18-2014	Conference
Nov-18-2014	Company Conference Presentation
Dec-01-2014	Conference





**EMC Corporation (NYSE:EMC)**

Technology Hardware, Storage and Peripherals

Employees: 63,900 Incorporated: 1979 in Massachusetts, US

S&P Issuer Credit Rating FC LT: A

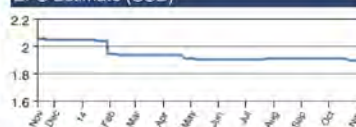
176 South Street  
Hopkinton, Massachusetts  
01748  
United States  
Phone: 508-435-1000  
[www.emc.com](http://www.emc.com)

EMC Corporation develops, delivers, and supports information infrastructure and virtual infrastructure technologies, solutions, and services. It operates in three segments: Information Storage, Information Intelligence Group, and RSA Information Security. The company offers enterprise storage systems and software deployed in storage area networks (SAN), networked attached storage (NAS), unified storage combining NAS and SAN, object storage, and/or direct attached storage environments, as well as provides backup and recovery, disaster recovery, and archiving solutions. It also offers information security solutions that are engineered to combine agile controls for identity assurance, fraud detection, and data protection, as well as security analytics...

**Key Statistics**

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	21,714.00	23,222.00	24,073.00	24,507.74	26,328.53
Growth Over Prior Year	8.5%	6.9%	6.7%	5.5%	7.4%
Gross Profit Margin %	62.7%	62.3%	62.2%	-	-
EBITDA Margin %	23.9%	24.2%	23.0%	30.2%	29.8%
EBIT Margin %	18.7%	18.8%	17.2%	-	-
Net Income Margin %	12.6%	12.4%	10.8%	-	-
Diluted EPS Excl. Extra	1.23	1.33	1.24	1.90	2.13
Diluted EPS Excl. Extra	12.4%	8.1%	(0.5%)	5.6%	12.4%

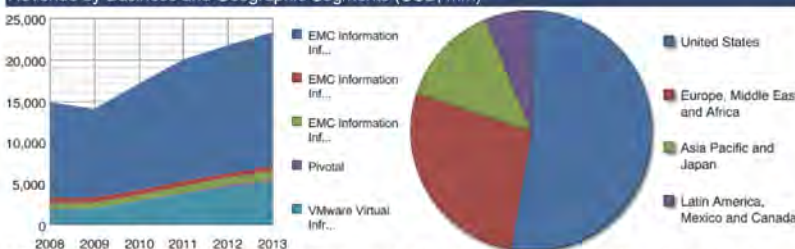
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(1.77)
Target Price	31.65000000
LT Growth %	10.91%

**Revenue by Business and Geographic Segments (USD, mm)**

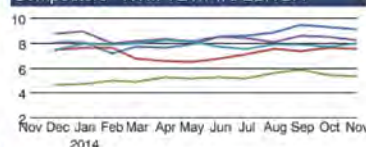


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	15.29x	13.60x
TEV/REV	2.37x	2.20x
TEV/EBITDA	7.84x	7.40x
PEG	1.40x	1.25x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

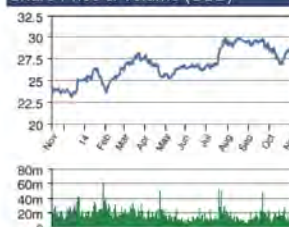
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
BlackRock, Inc.	109,955,651	5.40	3,206.3
The Vanguard Group, Inc.	104,514,760	5.14	3,047.7
State Street Global Advisors, Inc.	81,055,270	3.98	2,363.6
Elliott Management Corporation	40,946,000	2.01	1,194.0
Dodge & Cox	39,519,400	1.94	1,152.4

Holder as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	29.22	Market Cap (mm)	59,053.1
Open	28.91	Shares Out. (mm)	2,034.9
Previous Close	29.02	Float %	99.6%
Change on Day	0.20	Shares Sold	23.0
Change % on Day	0.7%	Dividend Yield %	1.6%
Day High/Low	29.2/28.7	Diluted EPS Excl....	1.24
52 wk High/Low	30.1/23.1	P/Diluted EPS	23.34x
Volume (mm)	4.64	Avg 3M Dly Vlm	15.03
Beta 5Y	1.24		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	29.02
Shares Out.	2,034.91
<b>Market Capitalization</b>	<b>59,053.06</b>
- Cash & Short Term	8,147.00
+ Total Debt	5,494.00
+ Pref. Equity	-
+ Total Minority Interest	1,622.00
<b>= Total Enterprise Value</b>	<b>58,022.06</b>
Book Value of Common	22,669.00
+ Pref. Equity	-
+ Total Minority Interest	1,622.00
+ Total Debt	5,494.00
<b>= Total Capital</b>	<b>29,785.00</b>

**Key Executives and Board Members**

Tucci, Joseph M.	Chairman, Chief Executive Officer, President.
Rowe, Zane C.	Chief Financial Officer and Executive Vice
Cashman, Denis G.	Chief Accounting Officer, Chief Operating Officer
Roese, John Joseph	Chief Technology Officer and Senior Vice
Bhaqat, Vic	Chief Information Officer and Executive Vice

**Events**

Date/Time	Event
Nov-13-2014	Company Conference Presentation
Nov-18-2014	Conference
Nov-19-2014	Company Conference Presentation



**Google Inc. (NasdaqGS:GOOGL)**

Internet Software and Services

Employees: 51,564 Incorporated: 1998 in Delaware, US

S&P Issuer Credit Rating FC LT:  
AA

1600 Amphitheatre Parkway  
Mountain View, California  
94043  
United States  
Phone: 650-253-0000  
[www.google.com](http://www.google.com)

Google Inc., a technology company, builds products and provides services to organize the information. The company offers Google Search, which provides information online; Knowledge Graph that allows to search for things, people, or places, as well as builds systems that recognize speech and understand natural language; Google Now, which provides information to users when they need it; and Product Listing Ads that offer product image, price, and merchant information. It also provides AdWords, an auction-based advertising program; AdSense, which enables Websites that are part of the Google Network to deliver ads; Google Display, a display advertising network; DoubleClick Ad Exchange, a marketplace for the trading display ad space; and YouTube that...

**Key Statistics**

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	50,175.00	59,825.00	67,911.00	66,478.36	77,054.39
Growth Over Prior Year	32.4%	19.2%	25.2%	11.1%	15.9%
Gross Profit Margin %	59.1%	56.8%	58.1%	-	-
EBITDA Margin %	32.6%	30.1%	29.4%	39.1%	40.1%
EBIT Margin %	26.7%	23.6%	23.0%	-	-
Net Income Margin %	21.4%	21.6%	19.2%	-	-
Diluted EPS Excl. Extra	16.18	17.97	18.75	25.91	30.54
Diluted EPS Excl. Extra	9.1%	11.0%	2.4%	18.1%	17.9%

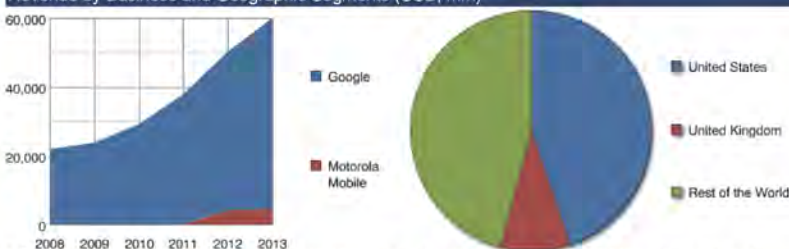
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(1.67)
Target Price	644.86463000
LT Growth %	17.26%

**Revenue by Business and Geographic Segments (USD, mm)**

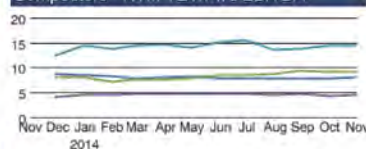


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	21.66x	18.38x
TEV/REV	4.90x	4.23x
TEV/EBITDA	12.54x	10.54x
PEG	1.25x	1.06x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

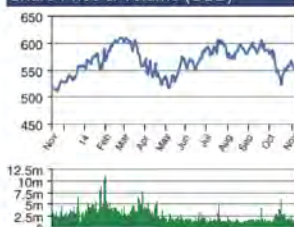
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Page, Lawrence	46,007,152	6.78	25,682.6
Brin, Sergey	45,137,220	6.65	25,197.0
Fidelity Investments	39,970,035	5.89	22,312.5
BlackRock, Inc.	32,594,512	4.80	18,195.2
The Vanguard Group, Inc.	29,140,339	4.30	16,267.0

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	558.35	Market Cap (mm)	377,027.1
Open	561.15	Shares Out. (mm)	678.4
Previous Close	561.29	Float %	84.3%
Change on Day	(2.94)	Shares Sold	2.9
Change % on Day	(0.5%)	Dividend Yield %	-
Day High/Low	561/555	Diluted EPS Excl....	18.75
52 wk High/Low	614/503	P/Diluted EPS	29.82x
Volume (mm)	0.67	Avg 3M Dly V/Im	1.83
Beta 5Y	1.17		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	561.29
Shares Out.	678.37
<b>Market Capitalization</b>	<b>377,027.13</b>
- Cash & Short Term	60,058.00
+ Total Debt	8,641.00
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>325,610.13</b>
Book Value of Common	98,815.00
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	8,641.00
<b>= Total Capital</b>	<b>107,456.00</b>

**Key Executives and Board Members**

Schmidt, Eric E	Executive Chairman, Chairman of Executive
Page, Lawrence	Co-Founder, Chief Executive Officer, Director,
Brin, Sergey	Co-Founder, Director, Member of Acquisition
Pichette, Patrick	Chief Financial Officer, Principal Accounting
Fried, Ben	Chief Information Officer

**Events**

Date/Time	Event
Dec-01-2014	Conference
Dec-02-2014	Company Conference Presentation
Jan-22-2015	Estimated Earnings Release Date (CIQ Derived)



**Hewlett-Packard Company (NYSE:HPQ)**

Technology Hardware, Storage and Peripherals

Employees: 317,500 Incorporated: 1939 in Delaware, US

S&P Issuer Credit Rating FC LT: BBB+

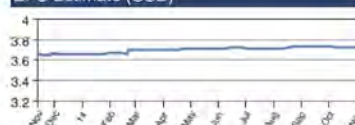
3000 Hanover Street  
Palo Alto, California 94304  
United States  
Phone: 650-857-1501  
[www.hp.com](http://www.hp.com)

Hewlett-Packard Company, together with its subsidiaries, provides products, technologies, software, solutions, and services to individual consumers, small-and medium-sized businesses (SMBs), and large enterprises, including customers in the government, health, and education sectors worldwide. Its Personal Systems segment offers commercial personal computers (PCs), consumer PCs, workstations, thin clients, tablets, retail point-of-sale (POS) systems, calculators and other related accessories, software, support, and services for the commercial and consumer markets. The company's Printing segment offers consumer and commercial printer hardware, supplies, media, software and Web services, and scanning devices, as well as inkjet and printing solutions...

**Key Statistics**

	12 Months Oct-31-2012A	12 Months Oct-31-2013A	12 Months Jul-31-2014A	12 Months Oct-31-2014E	12 Months Oct-31-2015E
Total Revenue	120,357.00	112,298.00	112,179.00	111,769.23	110,467.35
Growth Over Prior Year	(5.4%)	(6.7%)	(0.8%)	(0.5%)	(1.2%)
Gross Profit Margin %	23.5%	23.3%	23.7%	-	-
EBITDA Margin %	12.2%	11.6%	11.8%	11.9%	12.3%
EBIT Margin %	7.9%	7.5%	7.9%	-	-
Net Income Margin %	(10.5%)	4.6%	4.5%	-	-
Diluted EPS Excl. Extra	(6.41)	2.62	2.66	3.73	3.95

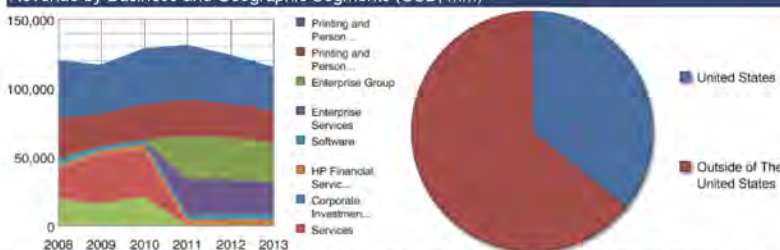
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(2.26)
Target Price	39.88200000
LT Growth %	2.07%

**Revenue by Business and Geographic Segments (USD, mm)**

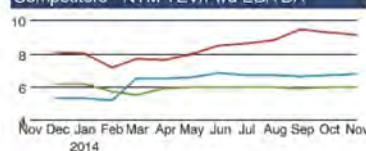


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	9.86x	9.30x
TEV/REV	0.67x	0.67x
TEV/EBITDA	5.57x	5.49x
PEG	4.77x	4.50x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

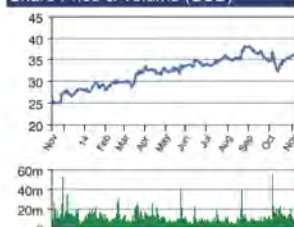
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Dodge & Cox	168,738,420	9.04	6,226.4
BlackRock, Inc.	101,329,554	5.43	3,739.1
State Street Global Advisors, Inc.	94,531,819	5.07	3,488.2
The Vanguard Group, Inc.	93,972,854	5.04	3,467.6
Fidelity Investments	43,904,995	2.35	1,620.1

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	36.63	Market Cap (mm)	68,604.3
Open	36.66	Shares Out. (mm)	1,866.3
Previous Close	36.76	Float %	99.9%
Change on Day	(0.14)	Shares Sold	26.8
Change % on Day	(0.4%)	Dividend Yield %	1.7%
Day High/Low	36.8/36.5	Diluted EPS Excl...	2.66
52 wk High/Low	38.2/24.7	P/Diluted EPS	13.82x
Volume (mm)	2.67	Avg 3M Dly Vlm	12.09
Beta 5Y	1.50		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	36.76
Shares Out.	1,866.28
<b>Market Capitalization</b>	<b>68,604.27</b>
- Cash & Short Term	14,474.00
+ Total Debt	19,833.00
+ Pref. Equity	-
+ Total Minority Interest	393.00
<b>= Total Enterprise Value</b>	<b>74,356.27</b>
Book Value of Common	28,509.00
+ Pref. Equity	-
+ Total Minority Interest	393.00
+ Total Debt	19,833.00
<b>= Total Capital</b>	<b>48,735.00</b>

**Key Executives and Board Members**

Whitman, Margaret C.	Chairman, Chief Executive Officer and President
Lesjak, Catherine A.	Chief Financial Officer and Executive Vice
Ricci, Jeff T.	Principal Accounting Officer, Senior Vice
Fink, Martin	Chief Technology Officer and Director of HP Labs
Baez, Ramon F.	Global Chief Information Officer and Senior Vice

**Events**

Date/Time	Event
Nov-20-2014	Estimated Earnings Release Date (CIQ Derived)
Nov-25-2014	Earnings Call
Dec-01-2014	Company Conference Presentation



**International Business Machines Corporation (NYSE:IBM)**

IT Consulting and Other Services

Employees: 431,212 Incorporated: 1910 in New York, US

S&P Issuer Credit Rating FC LT:  
AA-

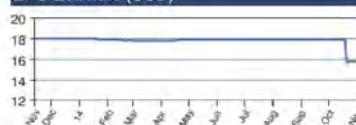
1 New Orchard Road  
Armonk, New York 10504  
United States  
Phone: 914-499-1900  
[www.ibm.com](http://www.ibm.com)

International Business Machines Corporation provides information technology (IT) products and services worldwide. The company's Global Technology Services segment provides IT infrastructure and business process services, including outsourcing, process, integrated technology, cloud, and technology support. Its Global Business Services segment offers consulting solutions for strategy and transformation, application innovation, enterprise applications, and smarter analytics; and application management, maintenance, and support services. International Business Machines Corporation's Software segment offers middleware and operating systems software, such as WebSphere software to integrate and manage business processes; and information management software...

**Key Statistics**

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	104,507.00	99,751.00	97,449.00	93,971.56	90,347.06
Growth Over Prior Year	(2.3%)	(4.6%)	(2.8%)	(5.8%)	(3.9%)
Gross Profit Margin %	48.1%	48.6%	49.0%	-	-
EBITDA Margin %	25.7%	25.1%	25.2%	25.4%	27.4%
EBIT Margin %	21.2%	20.4%	20.4%	-	-
Net Income Margin %	15.9%	16.5%	13.1%	-	-
Diluted EPS Excl. Extra	14.37	14.94	15.57	15.76	17.02
Diluted EPS Excl. Extra	10.0%	4.0%	5.5%	(7.2%)	8.0%

**EPS Estimate (USD)**



**Estimates**

Recommendat	Hold(2.93)
Target Price	170.91667000
LT Growth %	7.86%

**Revenue by Business and Geographic Segments (USD, mm)**

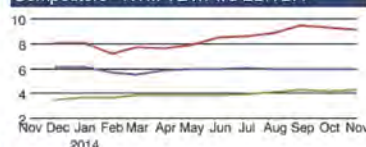


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	10.37x	9.58x
TEV/REV	2.11x	2.19x
TEV/EBITDA	8.30x	7.99x
PEG	1.32x	1.22x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

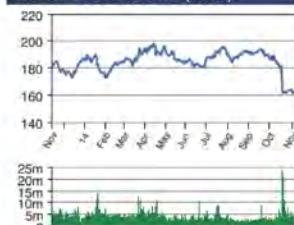
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Berkshire Hathaway Inc.	70,173,978	7.09	11,472.7
The Vanguard Group, Inc.	53,757,918	5.43	8,788.9
State Street Global Advisors, Inc.	52,885,820	5.34	8,646.3
BlackRock, Inc.	49,475,764	5.00	8,088.8
State Farm Insurance Companies,	16,651,892	1.68	2,722.4

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	162.28	Market Cap (mm)	161,611.5
Open	162.28	Shares Out. (mm)	989.7
Previous Close	163.30	Float %	99.8%
Change on Day	(1.02)	Shares Sold	21.4
Change % on Day	(0.6%)	Dividend Yield %	2.7%
Day High/Low	163/161	Diluted EPS Excl....	15.57
52 wk High/Low	199/160	P/Diluted EPS	10.43x
Volume (mm)	1.85	Avq 3M Dly Vlm	4.06
Beta 5Y	0.64		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	163.30
Shares Out.	989.66
<b>Market Capitalization</b>	<b>161,611.48</b>
- Cash & Short Term	9,570.00
+ Total Debt	45,704.00
+ Pref. Equity	-
+ Total Minority Interest	140.00
<b>= Total Enterprise Value</b>	<b>197,885.48</b>
Book Value of Common	14,255.00
+ Pref. Equity	-
+ Total Minority Interest	140.00
+ Total Debt	45,704.00
<b>= Total Capital</b>	<b>60,099.00</b>

**Key Executives and Board Members**

Rometty, Virginia M.	Chairman, Chief Executive Officer, President
Schroeter, Martin J.	Chief Financial Officer of Finance & Enterprise...
Kavanaugh, James J.	Chief Accounting Officer, Vice President and
Murphy, Patricia	Vice President of Investor Relations
Weber, Robert C.	Senior Vice President of Legal & Regulatory

**Events**

Date/Time	Event
Nov-13-2014	Company Conference Presentation
Nov-18-2014	Conference
Nov-18-2014	Company Conference Presentation



**Intel Corporation (NasdaqGS:INTC)**

Semiconductors

Employees: 107,600 Incorporated: 1968 in Delaware, US

S&P Issuer Credit Rating FC LT: A+

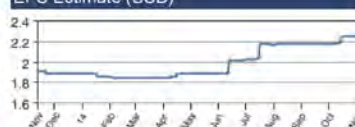
2200 Mission College  
Boulevard  
Santa Clara, California 95054  
United States  
Phone: 408-765-8080  
[www.intel.com](http://www.intel.com)

Intel Corporation designs, manufactures, and sells integrated digital technology platforms worldwide. It operates through PC Client Group, Data Center Group, Other Intel Architecture, Software and Services, and All Other segments. The company's platforms are used in various computing applications comprising notebooks, desktops, servers, tablets, smartphones, automobile infotainment systems, automated factory systems, and medical devices. It offers microprocessors that process system data and control other devices in the system; and chipsets, which send data between the microprocessor and input, display, and storage devices, such as keyboard, mouse, monitor, hard drive or solid-state drive, and optical disc drives; system-on-chip products that...

**Key Statistics**

	12 Months Dec-29-2012A	12 Months Dec-28-2013A	12 Months Sep-27-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	53,341.00	52,708.00	54,983.00	55,889.19	57,551.40
Growth Over Prior Year	(1.2%)	(1.2%)	5.0%	6.0%	3.0%
Gross Profit Margin %	62.1%	59.8%	62.9%	-	-
EBITDA Margin %	41.5%	39.0%	42.1%	42.4%	42.4%
EBIT Margin %	27.4%	23.8%	26.9%	-	-
Net Income Margin %	20.6%	18.3%	19.4%	-	-
Diluted EPS Excl. Extra	2.13	1.89	2.10	2.25	2.37
Diluted EPS Excl. Extra	(10.9%)	(11.3%)	13.6%	19.1%	5.5%

**EPS Estimate (USD)**



**Estimates**

Recommendat	Hold(2.61)
Target Price	34.07750000
LT Growth %	9.76%

**Revenue by Business and Geographic Segments (USD, mm)**

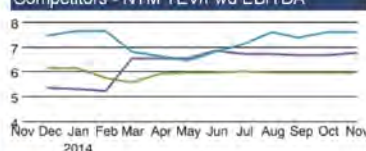


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	14.80x	14.03x
TEV/REV	2.84x	2.76x
TEV/EBITDA	6.69x	6.49x
PEG	1.52x	1.44x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

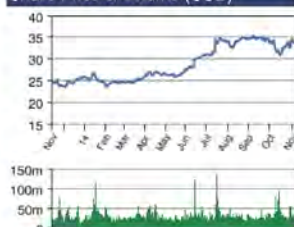
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
BlackRock, Inc.	287,368,411	5.94	9,557.9
The Vanguard Group, Inc.	256,238,401	5.30	8,522.5
State Street Global Advisors, Inc.	210,254,391	4.35	6,993.1
Wellington Management Company, LLP	85,493,697	1.77	2,843.5
Invesco Ltd.	74,762,504	1.55	2,486.6

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	33.37	Market Cap (mm)	161,053.9
Open	33.23	Shares Out. (mm)	4,835.0
Previous Close	33.31	Float %	99.9%
Change on Day	0.06	Shares Sold	204.4
Change % on Day	0.2%	Dividend Yield %	2.7%
Day High/Low	33.4/33.0	Diluted EPS Excl....	2.10
52 wk High/Low	35.5/23.4	P/Diluted EPS	15.78x
Volume (mm)	12.58	Avg 3M Div Vlm	31.46
Beta 5Y	0.94		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	33.31
Shares Out.	4,835.00
<b>Market Capitalization</b>	<b>161,053.85</b>
- Cash & Short Term	15,762.00
+ Total Debt	13,327.00
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>158,618.85</b>
Book Value of Common	56,073.00
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	13,327.00
<b>= Total Capital</b>	<b>69,400.00</b>

**Key Executives and Board Members**

Bryant, Andy D.	Executive Chairman and Member of Executive
Krzanich, Brian M.	Chief Executive Officer, Director, Member of
James, Renée J.	President
Smith, Stacy J.	Chief Financial Officer, Principal Accounting
Stevenson, Kimberly S.	Chief Information Officer and Vice President of...

**Events**

Date/Time	Event
Nov-20-2014	Analyst/Investor Day
Dec-01-2014	Conference
Dec-02-2014	Conference



**Microsoft Corporation (NasdaqGS:MSFT)**

Systems Software

Employees: 128,000 Incorporated: 1975 in Washington, US

S&P Issuer Credit Rating FC LT:  
AAA

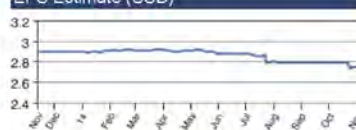
One Microsoft Way  
Redmond, Washington 98052  
United States  
Phone: 425-882-8080  
[www.microsoft.com](http://www.microsoft.com)

Microsoft Corporation develops, licenses, markets, and supports software, services, and devices worldwide. The company's Devices and Consumer (D&C) Licensing segment licenses Windows operating system and related software; Microsoft Office for consumers; and Windows Phone operating system. Its Computing and Gaming Hardware segment provides Xbox gaming and entertainment consoles and accessories, second-party and third-party video games, and Xbox Live subscriptions; surface devices and accessories; and Microsoft PC accessories. The company's Phone Hardware segment offers Lumia Smartphones and other non-Lumia phones. Its D&C Other segment provides Windows Store, Xbox Live transactions, and Windows Phone Store; search advertising; display advertising...

**Key Statistics**

	12 Months Jun-30-2013A	12 Months Jun-30-2014A	12 Months Sep-30-2014A	12 Months Jun-30-2015E	12 Months Jun-30-2016E
Total Revenue	77,849.00	86,833.00	91,505.00	98,210.55	104,153.70
Growth Over Prior Year	5.6%	11.5%	13.9%	13.1%	6.1%
Gross Profit Margin %	74.0%	69.0%	67.1%	-	-
EBITDA Margin %	39.6%	37.0%	36.3%	34.6%	35.6%
EBIT Margin %	35.3%	32.1%	31.2%	-	-
Net Income Margin %	28.1%	25.4%	23.4%	-	-
Diluted EPS Excl. Extra	2.58	2.63	2.55	2.77	3.14
Diluted EPS Excl. Extra	29.0%	1.9%	(4.5%)	5.3%	13.5%

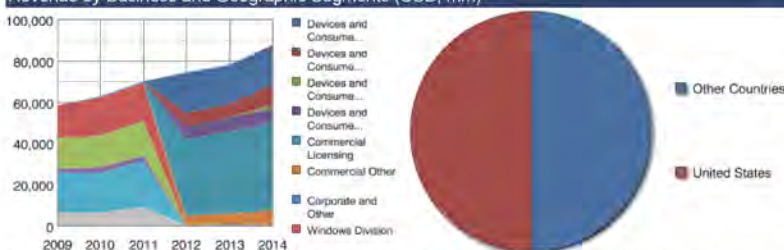
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(2.36)
Target Price	48.66000000
LT Growth %	8.36%

**Revenue by Business and Geographic Segments (USD, mm)**

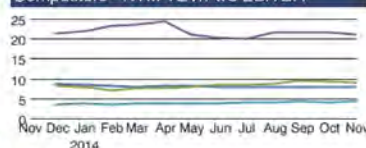


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2015	FY2016
P/E	17.65x	15.54x
TEV/REV	3.44x	3.25x
TEV/EBITDA	9.96x	9.13x
PEG	2.11x	1.86x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
BlackRock, Inc.	459,345,843	5.57	22,457.4
Capital Research and Management	410,791,438	4.98	20,083.6
The Vanguard Group, Inc.	386,749,214	4.69	18,908.2
State Street Global Advisors, Inc.	336,509,026	4.08	16,451.9
Ballmer, Steven A.	333,254,734	4.04	16,292.8

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	48.86	Market Cap (mm)	402,828.2
Open	48.56	Shares Out. (mm)	8,242.9
Previous Close	48.87	Float %	92.2%
Change on Day	(0.01)	Shares Sold	84.5
Change % on Day	(0.0%)	Dividend Yield %	2.5%
Day High/Low	48.9/48.5	Diluted EPS Excl....	2.55
52 wk High/Low	49.1/34.6	P/Diluted EPS	19.14x
Volume (mm)	12.04	Avg 3M Dly Vlm	33.96
Beta 5Y	1.00		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	48.87
Shares Out.	8,242.85
<b>Market Capitalization</b>	<b>402,828.23</b>
- Cash & Short Term	88,542.00
+ Total Debt	23,919.00
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>338,205.23</b>
Book Value of Common	90,170.00
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	23,919.00
<b>= Total Capital</b>	<b>114,089.00</b>

**Key Executives and Board Members**

Thompson, John W.	Independent Chairman, Chairman of Governance
Nadella, Satya	Chief Executive Officer and Director
Gates, William Henry	Co-Founder, Technology Advisor and Director
Hood, Amy E.	Chief Financial Officer and Executive Vice

**Events**

Date/Time	Event
Nov-12-2014	Company Conference Presentation
Nov-12-2014	Company Conference Presentation
Nov-18-2014	Ex-Div Date (Regular)



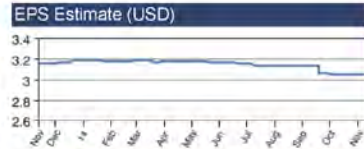


**Oracle Corporation (NYSE:ORCL)**  
 Systems Software Employees: 122,000 Incorporated: 1977 in Delaware, US S&P Issuer Credit Rating FC LT: A+

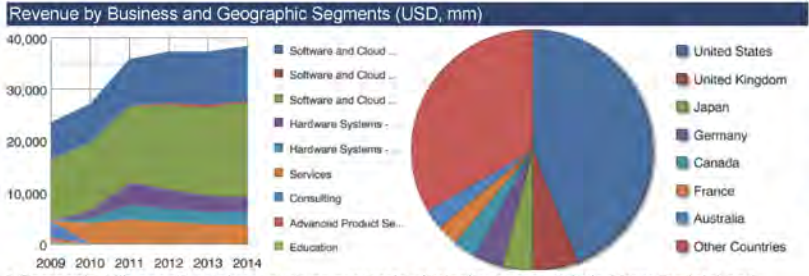
500 Oracle Parkway  
 Redwood City, California 94065  
 United States  
 Phone: 650-506-7000  
[www.oracle.com](http://www.oracle.com)

Oracle Corporation develops, manufactures, markets, hosts, and supports database and middleware software, application software, cloud infrastructure, hardware systems, and related services worldwide. It provides software and hardware systems, and related services to manage their cloud-based or on-premise IT environments, as well as to deploy cloud software-as-a-service, platform-as-a-service, and infrastructure-as-a-service. The company offers software for mobile computing; database and middleware software that runs and manages business applications for midsize businesses and large enterprises; and Java, a software development language. It also provides applications software, such as human capital and talent management, customer experience and...

Key Statistics	12 Months May-31-2013A	12 Months May-31-2014A	12 Months Aug-31-2014A	12 Months May-31-2015E	12 Months May-31-2016E
Total Revenue	37,180.00	38,275.00	38,499.00	39,597.03	41,267.52
Growth Over Prior Year	0.2%	2.9%	3.0%	3.4%	4.2%
Gross Profit Margin %	61.2%	61.3%	61.4%	-	-
EBITDA Margin %	43.3%	43.7%	43.7%	49.9%	50.6%
EBIT Margin %	38.8%	39.1%	39.2%	-	-
Net Income Margin %	29.4%	28.6%	28.4%	-	-
Diluted EPS Excl. Extra	2.26	2.38	2.39	3.05	3.28
Diluted EPS Excl. Extra	15.3%	5.3%	2.8%	6.2%	7.5%

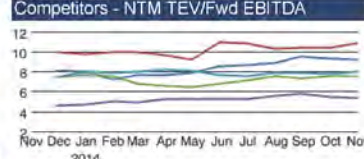


Estimates	
Recommendat	Outperform(2.19)
Target Price	43.85588000
LT Growth %	8.85%



\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

Forward Multiples		
	FY2015	FY2016
P/E	13.27x	12.35x
TEV/REV	4.06x	3.90x
TEV/EBITDA	8.13x	7.71x
PEG	1.50x	1.39x



Top Holders			
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Ellison, Lawrence J.	1,113,634,580	25.13	45,046.5
BlackRock, Inc.	186,814,045	4.22	7,556.6
The Vanguard Group, Inc.	174,195,941	3.93	7,046.2
Capital Research and Management	171,371,384	3.87	6,932.0
State Street Global Advisors, Inc.	134,514,790	3.04	5,441.1

Holders as of Wednesday, November 12, 2014

Market Data			
Last (Delayed)	40.17	Market Cap (mm)	179,334.9
Open	40.59	Shares Out. (mm)	4,431.3
Previous Close	40.47	Float %	74.7%
Change on Day	(0.30)	Shares Sold	31.2
Change % on Day	(0.7%)	Dividend Yield %	1.2%
Day High/Low	40.5/40.0	Diluted EPS Excl....	2.39
52 wk High/Low	43.1/33.2	P/Diluted EPS	16.93x
Volume (mm)	5.98	Avg 3M Dly Vlm	14.89
Beta 5Y	1.41		



Capitalization	
Share Price as of	40.47
Shares Out.	4,431.30
<b>Market Capitalization</b>	<b>179,334.87</b>
- Cash & Short Term	51,616.00
+ Total Debt	32,570.00
+ Pref. Equity	-
+ Total Minority Interest	577.00
<b>= Total Enterprise Value</b>	<b>160,865.87</b>
Book Value of Common	47,354.00
+ Pref. Equity	-
+ Total Minority Interest	577.00
+ Total Debt	32,570.00
<b>= Total Capital</b>	<b>80,501.00</b>

Key Executives and Board Members	
Ellison, Lawrence J.	Co-Founder, Executive Chairman and Chief
Catz, Safra Ada	Chief Executive Officer and Director
Hurd, Mark Vincent	Chief Executive Officer and Director
Henley, Jeffrey O.	Executive Vice Chairman
West, William Corey	Chief Accounting Officer, Senior Vice President

Events	
Date/Time	Event
Nov-12-2014	Company Conference Presentation
Dec-18-2014	Estimated Earnings Release Date (CIQ Derived)
Jun-18-2015	Estimated Earnings Release Date (CIQ Derived)



**Rackspace Hosting, Inc. (NYSE:RAX)**

Internet Software and Services

Employees: 5,939

Incorporated: 1998 in Delaware, US

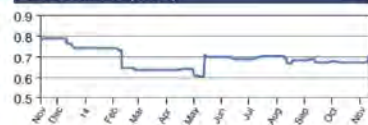
1 Fanatical Place  
City of Windcrest  
San Antonio, Texas 78218  
United States  
Phone: 210-312-4000  
www.rackspace.com

Rackspace Hosting, Inc., through its subsidiaries, provides cloud computing services and managing Web-based IT systems for small and medium-sized businesses and large enterprises worldwide. The company's service offering combines hosting on dedicated hardware and on multi-tenant pools of virtualized hardware in a way that suits each customer's requirements. Its public cloud services refer to pooled computing resources delivered on-demand over the Internet. The company offers cloud servers for computing; cloud sites for Website hosting; cloud block storage and cloud files for storage; cloud databases for hosting; cloud backup for file protection; cloud load balancers for traffic management; cloud monitoring for infrastructure control; cloud DNS for...

**Key Statistics**

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	1,309.24	1,534.79	1,730.04	1,795.97	2,083.21
Growth Over Prior Year	27.7%	17.2%	16.9%	17.0%	16.0%
Gross Profit Margin %	68.0%	67.9%	67.5%	-	-
EBITDA Margin %	29.5%	25.8%	26.3%	33.4%	33.9%
EBIT Margin %	13.2%	8.7%	8.4%	-	-
Net Income Margin %	8.1%	5.7%	5.5%	-	-
Diluted EPS Excl. Extra	0.75	0.61	0.66	0.70	0.93
Diluted EPS Excl. Extra	36.4%	(18.7%)	(1.4%)	14.5%	33.1%

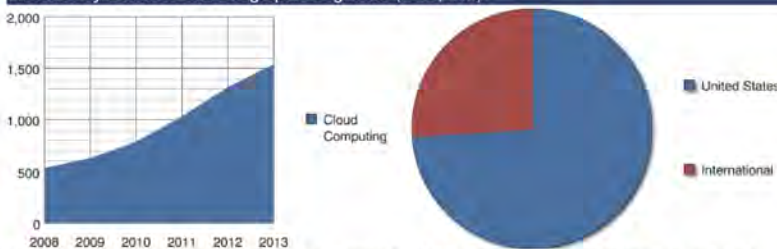
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(2.35)
Target Price	43.94737000
LT Growth %	20.25%

**Revenue by Business and Geographic Segments (USD, mm)**

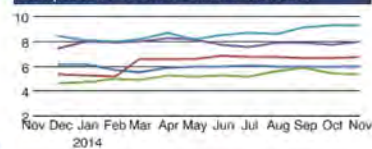


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	60.48x	45.43x
TEV/REV	3.24x	2.79x
TEV/EBITDA	9.70x	8.23x
PEG	2.99x	2.24x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

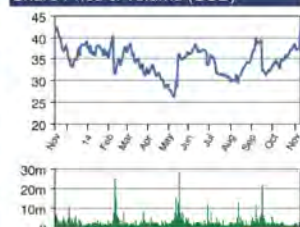
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Fidelity Investments	21,320,461	14.85	795.7
Weston, Graham M.	18,954,544	13.20	707.4
T. Rowe Price Group, Inc.	9,772,073	6.81	364.7
Blue Harbour Group, L.P.	9,098,087	6.34	339.5
Capital Research and Management	8,354,208	5.82	311.8

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	42.60	Market Cap (mm)	6,065.2
Open	41.88	Shares Out. (mm)	143.6
Previous Close	42.25	Float %	71.2%
Change on Day	0.35	Shares Sold	11.3
Change % on Day	0.8%	Dividend Yield %	-
Day High/Low	42.7/41.5	Diluted EPS Excl...	0.66
52 wk High/Low	42.9/26.1	P/Diluted EPS	63.69x
Volume (mm)	2.19	Avg 3M Dly Vlm	3.10
Beta 5Y	1.28		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	42.25
Shares Out.	143.55
<b>Market Capitalization</b>	<b>6,065.16</b>
- Cash & Short Term	349.48
+ Total Debt	98.52
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>5,814.19</b>
Book Value of Common	1,223.77
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	98.52
<b>= Total Capital</b>	<b>1,322.29</b>

**Key Executives and Board Members**

Weston, Graham M.	Co-Founder, Executive Chairman, Member of Rhodes, William Taylor Chief Executive Officer, President and Director
Condon, Patrick R.	Co-Founder
Elmendorf, Dirk J.	Co-Founder
Pichler, Karl	Chief Financial Officer, Senior Vice President

**Events**

Date/Time	Event
Nov-18-2014	Company Conference Presentation
Nov-18-2014	Conference
Dec-01-2014	Conference



Red Hat, Inc. (NYSE:RHT)  
Systems Software Employees: 6,300 Incorporated: 1993 in Delaware, US S&P Issuer Credit Rating FC LT: BBB

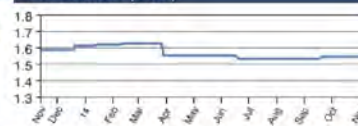
100 East Davie Street  
Raleigh, North Carolina 27601  
United States  
Phone: 919-754-3700  
[www.redhat.com](http://www.redhat.com)

Red Hat, Inc. provides open source software solutions to enterprise customers worldwide. It develops and offers operating system, virtualization, middleware, storage, and cloud technologies. The company's products include Red Hat Enterprise Linux, an operating system designed for enterprise computing that runs on a range of hardware, such as mainframes, servers, and work stations; Red Hat Enterprise Virtualization, which comprise standalone virtualization functionality and management tools for server and desktop deployments; and Red Hat JBoss Middleware that offers a range of middleware offerings for developing, deploying, and managing applications, which are accessible via the Internet, enterprise Intranets, extranets, clouds, and virtual private...

**Key Statistics**

	12 Months Feb-28-2013A	12 Months Feb-28-2014A	12 Months Aug-31-2014A	12 Months Feb-28-2015E	12 Months Feb-29-2016E
Total Revenue	1,328.82	1,534.62	1,666.59	1,781.29	2,031.10
Growth Over Prior Year	17.3%	15.5%	16.6%	16.1%	14.0%
Gross Profit Margin %	84.9%	84.8%	84.8%	-	-
EBITDA Margin %	20.4%	20.1%	18.9%	27.3%	26.8%
EBIT Margin %	15.7%	15.3%	14.3%	-	-
Net Income Margin %	11.3%	11.6%	10.9%	-	-
Diluted EPS Excl. Extra	0.77	0.93	0.95	1.55	1.84
Diluted EPS Excl. Extra	2.7%	20.8%	15.9%	4.0%	18.6%

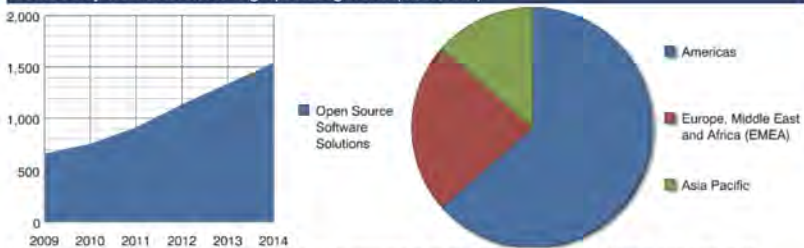
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(1.81)
Target Price	66.42857000
LT Growth %	15.39%

**Revenue by Business and Geographic Segments (USD, mm)**

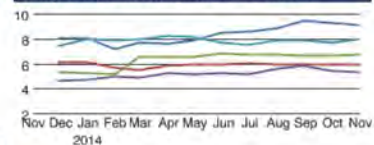


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2015	FY2016
P/E	39.56x	33.37x
TEV/REV	6.01x	5.27x
TEV/EBITDA	22.04x	19.68x
PEG	2.57x	2.17x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
T. Rowe Price Group, Inc.	32,711,223	17.42	2,008.8
Jennison Associates LLC	20,267,573	10.79	1,244.6
The Vanguard Group, Inc.	13,371,526	7.12	821.1
Fidelity Investments	12,522,593	6.67	769.0
BlackRock, Inc.	10,341,587	5.51	635.1

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	61.59	Market Cap (mm)	11,513.5
Open	61.32	Shares Out. (mm)	187.8
Previous Close	61.30	Float %	99.2%
Change on Day	0.29	Shares Sold	10.1
Change % on Day	0.5%	Dividend Yield %	-
Day High/Low	61.6/61.0	Diluted EPS Excl...	0.95
52 wk High/Low	62.6/45.4	P/Diluted EPS	64.59x
Volume (mm)	0.62	Avg 3M Dly Vlm	1.66
Beta 5Y	1.04		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	61.30
Shares Out.	187.82
<b>Market Capitalization</b>	<b>11,513.49</b>
- Cash & Short Term	803.04
+ Total Debt	-
+ Pref. Equity	-
+ Total Minority Interest	-
<b>= Total Enterprise Value</b>	<b>10,710.45</b>
Book Value of Common	1,514.66
+ Pref. Equity	-
+ Total Minority Interest	-
+ Total Debt	-
<b>= Total Capital</b>	<b>1,514.66</b>

**Key Executives and Board Members**

Shelton, Henry Hugh	Chairman and Member of Compensation
Whitehurst, James M.	Chief Executive Officer, President and Director
Young, Robert F.	Co-Founder
Peters, Charles E.	Chief Financial Officer and Executive Vice
Cook, Mark E.	Principal Accounting Officer, Vice President of

**Events**

Date/Time	Event
Dec-19-2014	Estimated Earnings Release Date (CIQ Derived)
Mar-27-2015	Estimated Earnings Release Date (CIQ Derived)



SAP SE (DB:SAP)

Application Software

Employees: 68,835 Incorporated: 1972 in GE

S&P Issuer Credit Rating FC LT:  
A

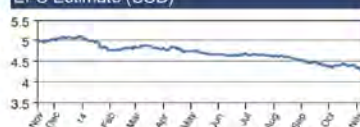
Dietmar-Hopp-Allee 16  
Waldorf, Baden-Württemberg  
69190  
Germany  
Phone: +49 6227 747474  
www.sap.com

SAP AG provides enterprise application software and software-related services worldwide. The company offers solutions covering various lines of businesses, including asset management; corporate strategy and sustainability; finance; human resources; information technology; manufacturing; marketing; procurement; research and development, and engineering; sales; service; and supply chain management on premise or through the cloud as software-as-a-service offerings. It also supports enterprises in various industries in consumer, discrete manufacturing, energy and natural resources, financial services, public services, and services industry sectors. In addition, the company provides SAP Business All-in-One solution, the SAP Business One application, and...

Key Statistics

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	21,389.68	23,156.37	21,718.94	21,774.34	23,268.65
Growth Over Prior Year	14.0%	3.6%	2.9%	3.3%	6.9%
Gross Profit Margin %	71.2%	72.6%	72.5%	-	-
EBITDA Margin %	32.1%	34.2%	35.1%	34.6%	35.5%
EBIT Margin %	28.3%	30.4%	31.2%	-	-
Net Income Margin %	17.3%	19.8%	19.1%	-	-
Diluted EPS Excl. Extra	3.10	3.83	3.47	4.32	4.63
Diluted EPS Excl. Extra	(18.7%)	18.3%	6.6%	2.7%	7.2%

EPS Estimate (USD)



Estimates

Recommendat	Outperform(2.12)
Target Price	78.84572021
LT Growth %	9.20%

Revenue by Business and Geographic Segments (USD, mm)

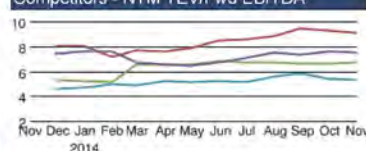


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

Forward Multiples

	FY2014	FY2015
P/E	15.62x	14.56x
TEV/REV	3.76x	3.52x
TEV/EBITDA	10.88x	9.90x
PEG	1.70x	1.58x

Competitors - NTM TEV/Fwd EBITDA



Top Holders

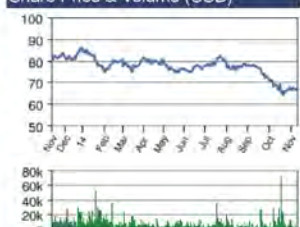
Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
Hasso Plattner GmbH & Co. Beteiligungs-	107,695,054	9.02	7,241.7
Tschira, Klaus	92,079,595	7.71	6,191.7
Dietmar Hopp Stiftung GmbH	61,869,200	5.18	4,160.3
BlackRock, Inc.	54,790,847	4.59	3,684.3
Credit Suisse, Investment Banking and...	21,410,326	1.79	1,439.7

Holders as of Wednesday, November 12, 2014

Market Data

Last (Delayed)	66.52	Market Cap (mm)	79,457.9
Open	67.33	Shares Out. (mm)	1,194.5
Previous Close	67.43	Float %	77.8%
Change on Day	(0.91)	Shares Sold	-
Change % on Day	(1.3%)	Dividend Yield %	1.8%
Day High/Low	67.6/66.3	Diluted EPS Excl....	3.43
52 wk High/Low	78.5/62.5	P/Diluted EPS	19.42x
Volume (mm)	0.00	Avg 3M Dly Vlm	0.01
Beta 5Y	0.57		

Share Price & Volume (USD)



Capitalization

Share Price as of	68.25
Shares Out.	1,194.50
<b>Market Capitalization</b>	<b>81,528.10</b>
- Cash & Short Term	4,278.41
+ Total Debt	5,574.56
+ Pref. Equity	-
+ Total Minority Interest	10.10
<b>= Total Enterprise Value</b>	<b>82,834.34</b>
Book Value of Common	22,365.12
+ Pref. Equity	-
+ Total Minority Interest	10.10
+ Total Debt	5,574.56
<b>= Total Capital</b>	<b>27,949.77</b>

Key Executives and Board Members

Plattner, Hasso C.	Co-Founder, Chairman of the Supervisory
McDermott, William R.	Chief Executive Officer, Member of the Executive
Kuntz-Mayr, Christiane	Deputy Chairman of Supervisory Board, Member
Mucic, Luka	Chief Operating Officer, Chief Financial Officer,
Enslin, Robert	President of Global Customer Operations.

Events

Date/Time	Event
Nov-19-2014	Conference
Nov-19-2014	Company Conference Presentation
Jan-20-2015	Earnings Release Date



**VMware, Inc. (NYSE:VMW)**  
Systems Software

Employees: 13,585

Incorporated: 1998 in Delaware, US

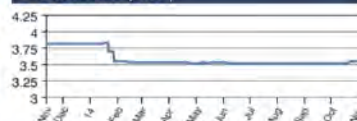
3401 Hillview Avenue  
Palo Alto, California 94304  
United States  
Phone: 650-427-5000  
[www.vmware.com](http://www.vmware.com)

VMware, Inc. provides virtualization infrastructure solutions in the United States and internationally. The company's virtualization infrastructure solutions include a suite of products designed to deliver a software-defined data center, run on industry-standard desktop computers and servers and support a range of operating system and application environments, as well as networking and storage infrastructures. Its solutions enable organizations to aggregate multiple servers, storage infrastructure, and networks together into shared pools of capacity that can be allocated to applications as needed. It offers VMware vSphere, a software-defined data center platform, which enables users to deploy hypervisor, a layer of software that resides between the...

**Key Statistics**

	12 Months Dec-31-2012A	12 Months Dec-31-2013A	12 Months Sep-30-2014A	12 Months Dec-31-2014E	12 Months Dec-31-2015E
Total Revenue	4,605.00	5,207.00	5,816.00	6,025.97	6,883.40
Growth Over Prior Year	22.2%	13.1%	15.9%	15.7%	14.2%
Gross Profit Margin %	84.3%	86.0%	85.3%	-	-
EBITDA Margin %	25.1%	28.1%	25.2%	35.9%	35.9%
EBIT Margin %	18.9%	22.3%	20.0%	-	-
Net Income Margin %	16.2%	19.5%	15.4%	-	-
Diluted EPS Excl. Extra	1.72	2.34	2.06	3.54	4.10
Diluted EPS Excl. Extra	2.4%	36.0%	0.5%	5.1%	15.8%

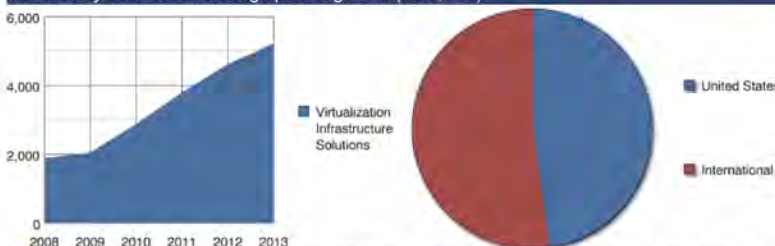
**EPS Estimate (USD)**



**Estimates**

Recommendat	Outperform(2.13)
Target Price	102.08333000
LT Growth %	17.47%

**Revenue by Business and Geographic Segments (USD, mm)**

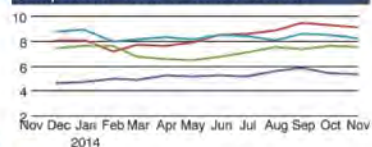


\* Segments with negative values, such as corporate eliminations, are excluded from the total and percentage calculations and do not appear on the charts

**Forward Multiples**

	FY2014	FY2015
P/E	23.80x	20.55x
TEV/REV	5.10x	4.46x
TEV/EBITDA	14.20x	12.44x
PEG	1.36x	1.18x

**Competitors - NTM TEV/Fwd EBITDA**



**Top Holders**

Holder	Common Stock Equivalent Held	% of Total Shares Outstanding	Market Value (USD in mm)
EMC Corporation	343,025,308	79.68	28,927.3
Jennison Associates LLC	7,630,546	1.77	643.5
T. Rowe Price Group, Inc.	6,500,932	1.51	548.2
Cisco Systems, Inc.	6,500,000	1.51	548.1
BlackRock, Inc.	6,302,074	1.46	531.5

Holders as of Wednesday, November 12, 2014

**Market Data**

Last (Delayed)	86.27	Market Cap (mm)	36,302.8
Open	84.25	Shares Out. (mm)	430.5
Previous Close	84.33	Float %	18.6%
Change on Day	1.94	Shares Sold	12.7
Change % on Day	2.3%	Dividend Yield %	-
Day High/Low	87.0/84.0	Diluted EPS Excl....	2.06
52 wk High/Low	12.8/76.5	P/Diluted EPS	41.33x
Volume (mm)	1.22	Avg 3M Dly Vlm	1.82
Beta 5Y	1.09		

**Share Price & Volume (USD)**



**Capitalization**

Share Price as of	84.33
Shares Out.	430.48
<b>Market Capitalization</b>	<b>36,302.77</b>
- Cash & Short Term	7,094.00
+ Total Debt	1,500.00
+ Pref. Equity	-
+ Total Minority Interest	6.00
<b>= Total Enterprise Value</b>	<b>30,714.77</b>
Book Value of Common	7,430.00
+ Pref. Equity	-
+ Total Minority Interest	6.00
+ Total Debt	1,500.00
<b>= Total Capital</b>	<b>8,936.00</b>

**Key Executives and Board Members**

Tucci, Joseph M.	Chairman, Member of Mergers & Acquisitions...
Gelsinger, Patrick P.	Chief Executive Officer, Director and Member of
Eschenbach, Carl M.	President and Chief Operating Officer
Devine, Scott	Principal Engineer
Chadwick, Jonathan C.	Chief Operating Officer, Chief Financial Officer

**Events**

Date/Time	Event
Nov-18-2014	Conference
Nov-18-2014	Company Conference Presentation
Dec-01-2014	Conference



Appendix F: Hot Private Companies



## Company Overview

Ansible is the company behind Ansible, the radically simple IT orchestration solution. Ansible simplifies the way IT departments manage systems, applications, and cloud infrastructure.

Address:	1482 East Valley Road Suite 888 Santa Barbara, California	Website:	www.ansible.com
Capital Raised:	\$6.0M	Founded:	2013
Investors:	Menlo Ventures, e.ventures		

## Selected Senior Management

Professional	Professional Title
Ziouani, Said	Co-founder and Chief Executive Officer
Dehaan, Michael	Co-founder and Chief Technology Officer
Barr, Todd	Senior Vice President of Sales and Marketing
Gerla, Tim	Co-founder and Vice President of Services

### Company Overview

Big Switch Networks provides data center architecture enabled by bare metal fabrics worldwide. The company offers SDN products, including Big Tap Monitoring Fabric, a network monitoring solution that enables tapping traffic everywhere in the network and delivers it to any troubleshooting, network monitoring, or security tools.

Address:	430 Cowper Street Suite 250 Palo Alto, California	Website:	www.bigswitch.com
		Founded:	2010
		Employees:	76
Capital Raise:	\$44.7M		
Investors:	Goldman Sachs Group, In-Q-Tel, Index Ventures, Intel Capital, Khosla Ventures, Matrix Partners, Morgenthaler, Redpoint Ventures		

### Selected Senior Management

Professional	Professional Title
Murray, Douglas	Chief Executive Officer
Kyle Forster	Vice President of Marketing / Co-Founder
Rob Sherwood	Chief Technical Officer
Jeffrey Wang	Vice President of Engineering

## Company Overview

Canonical develops and supplies open-source software solutions for individuals and businesses worldwide. The company offers Ubuntu, a solution to streamline business operations; Ubuntu One, a personal cloud service to automatically sync contacts, documents, music, notes, and bookmarks online and across multiple machines; and solutions for the education sector.

Address:	27th Floor Millbank Tower London, United Kingdom	Website:	www.canonical.com
Capital Raise:	\$10.0M	Founded:	2004
Investors:	Crowd Funding	Employees:	614

## Selected Senior Management

Professional	Professional Title
Silber, Jane	Chief Executive Officer
Shuttleworth, Mark	Founder and Founder of Ubuntu
Spencer, Rick	Vice President of Ubuntu Engineering
Williamson, Robbie	Vice President of Cloud Development and Operations

### Company Overview

Docker provides dotCloud multi-language Platform-as-a-Service solutions. The company's platform simplifies application development by allowing programmers to focus on the code for their service while the platform handles code building, scaling, deployment, and load-balancing. Its platform enables developers to build application stacks by combining cloud services.

Address:	180 Sansome Street San Francisco, California	Website:	www.dotcloud.com
		Founded:	2008
		Employees:	42
Capital Raised:	\$55.0M		
Investors:	AME Cloud Ventures, Benchmark Capital, Greylock Partners, Insight Venture Partners, Lowercase Capital, Sequoia Capital, Trinity Ventures		

### Selected Senior Management

Professional	Professional Title
Golub, Ben	Chief Executive Officer
Messina, David	Vice President Enterprise Marketing
Bardin, Eric	Chief Financial Officer
Stinemates, Nick	Head of Business Development

## Company Overview

Mirantis, an OpenStack systems integrator, operates as a vendor of OpenStack services and technology. Its services include do-it-yourself assist services, including assessment, reference architecture, training, and deployment support services. The company also provides openstack cloud infrastructure deployment and integration services.

Address:	615 National Avenue Suite 100 Mountain View, California	Website:	www.mirantis.com
		Founded:	1993
		Employees:	444
Capital Raise:	\$120.0M		
Investors:	August Capital, Dell Ventures, Ericsson, Insight Venture Partners, Intel Capital, Red Hat, Sapphire Ventures, WestSummit Capital		

## Selected Senior Management

Professional	Professional Title
Adrian Ionel	President and Chief Executive Officer
Alex Freedland	Co-Founder and Chairman
Boris Renski	Co-Founder and Chief Marketing Officer
Oleg Goldman	Vice President of Operations



## Company Overview

MPSTOR is the provider of Orkestra – a unique modular open-platform storage software that solves the problem of building flexible, scalable and customised datacenter services by reducing OpEx, increasing asset utilization and assisting in the scale-up of cloud computing services. Orkestra is an automated software defined scale out storage solution for Block, File and Object storage for OpenStack and VMWARE. MPSTOR's OpenStack turnkey distribution delivers up to 270,000 8K IOPs and 5GB of block storage bandwidth per node on standard hardware platforms. The scale out solution scales to hundreds of nodes.

Address:	Rubicon Centre Bishtown Cork Ireland	Website:	www.mpstor.com
Capital Raised:	\$7.0M	Founded:	2006
Investors:	Kernel Capital, Infinity Capital, Enterprise Ireland		

## Selected Senior Management

Professional	Professional Title
O'Hara, Jim	Chairman
Oppermann, William	Founder and Chief Executive Officer
Hassine, Mohammad	Director of Product and Marketing

### Company Overview

Nebula develops a hardware appliance that allows businesses to deploy large private cloud computing infrastructures from racks of industry-standard servers. The company offers Nebula One, a cloud computer and integrated hardware and software appliance that provides distributed compute, storage, and network services in a unified system.

Address:	215 Castro Street 3rd Floor Mountain View, California	Website:	www.nebula.com
		Founded:	2011
		Employees:	64
Capital Raise:	\$38.5M		
Investors:	Comcast Ventures, Highland Capital Partners, Innovation Endeavors, KPCB, NBCUniversal Media, Sheralo Ventures, Webb Investment Network		

### Selected Senior Management

Professional	Professional Title
Stitt, Gordon	Chief Executive Office
Kemp, Chris C.	Founder and Chief Strategy Officer
Carlen, Devin	Founder and Chief Architect
Ishaya, Vish	Chief Technology Officer

## Company Overview

Nexenta Systems provides software defined storage solutions. The company provides cloud- and virtualization-optimized storage software solutions for various hardware platforms. It offers NexentaStor, a software defined storage (SDS) platform, which provides file and block storage services for enterprise applications, and allows clients to transform their storage infrastructure.

Address:	455 El Camino Real	Website:	www.nexenta.com
	Santa Clara,	Founded:	2005
	California	Employees:	230

Capital Raised: \$49.9M

Investors: Dell Corporate Ventures, Javelin Venture Partners, Menlo Ventures, Presidio STX, Razor's Edge Ventures, SanDisk Ventures, Sierra Ventures, The Four Rivers Group, TransLink Capital, UMC Capital Corporation, United Microelectronics Corporation, Western Technology Investment, WestSummit Capital

## Selected Senior Management

Professional	Professional Title
Maner, Tarkan	Chairman and Chief Executive Officer
Aizman, Alex	Founder and Chief Technology Officer
Antuna, Ricardo	Vice President of Business and Corporate Development
Fuller, Bill	Vice President of Engineering

## Company Overview

Puppet Labs provides IT automation software for businesses that help system administrators automate configuration and management of machines and the software running on them. It offers Puppet Enterprise, an IT automation software that helps to automate repetitive tasks, deploy critical applications, and manage infrastructure, on-premise or in the cloud.

Address:	926 NW 13th Avenue Portland, Oregon	Website:	www.puppetlabs.com
		Founded:	2005
		Employees:	95
Capital Raised:	\$85.0M		
Investors:	Cisco Systems, Emerson Street Partners, Google Ventures, KPCB, Radar Partners, Triangle Peak Partners, Triangle Venture Capital Group Management, True Ventures, VMware		

## Selected Senior Management

Professional	Professional Title
Kanies, Luke	Founder and Chief Executive Officer
Kersten, Nigel	Chief Information Officer
Koefoed, Bill	Chief Financial Officer
Campbell, Scott	Senior Vice President of Global Sales

### Company Overview

Scality develops and deploys software storage solutions. It offers RING software that enables large enterprises and service providers to build a storage infrastructure using off-the-shelf x86 servers; Scality Scale-Out File System, a storage system that delivers a solution for file access, sharing, and distribution; and a file synchronization and sharing tool, as well as various customized APIs to facilitate integration with applications and environments.

Address:	50 California Street San Francisco, California	Website:	www.scality.com
		Founded:	2009
		Employees:	26
Capital Raised:	\$34.0M		
Investors:	Bpifrance Investissement, Galileo Partners, IDInvest Partners , Iris Capital, Menlo Ventures, Omnes Capital		

### Selected Senior Management

Professional	Professional Title
Lecat, Jerome	Chief Executive Officer
Regni, Giorgio	Chief Technology Officer
Menard, Erwan	Chief Operating Officer
Mechanick, Philippe	Chief Financial Officer

## Company Overview

SolidFire develops and provides primary storage systems for cloud service providers worldwide. It offers SF3010, a storage node that matches on-demand deployment and scalability needs of the cloud; SolidFire Element operating system that combines a scale-out all-solid-state architecture with various technologies and enables cloud service providers to guarantee sustained performance to various servers within a single storage system.

Address:	1620 Pearl Street Boulder, Colorado	Website:	www.solidfire.com
		Founded:	2009
		Employees:	275
Capital Raised:	\$150.4M		
Investors:	Greenspring Associates, New Enterprise Associates, Novak Biddle Venture Partners, Samsung Venture Investment Corporation, Silicon Valley Bank, Investment Arm, Valhalla Partners		

## Selected Senior Management

Professional	Professional Title
Wright, Dave	Founder and Chief Executive Officer
Weigel, RJ	President
Hillyard, John	Chief Financial Officer
Berg, Daniel	Chief Product Officer



## Company Overview

SwiftStack provides private cloud storage software solutions. The company enables application developers and operations teams to implement and manage private cloud storage platforms based on the openstack object storage system. Its solutions include SwiftStack Controller, a solution for configuration, deployment, management, scaling, and monitoring of the SwiftStack distribution, drives, and nodes.

Address:	425 2nd Street San Francisco, California	Website:	www.swiftstack.com
		Founded:	2011
		Employees:	30
Capital Raised:	\$26.6M		
Investors:	Icon Venture Partners, Mayfield Fund, OpenView Venture Partners, Storm Ventures, UMC Capital		

## Selected Senior Management

Professional	Professional Title
Arnold, Joe	Chief Executive Officer
Tjernlund, Anders	Chief Operating Officer and Co-founder
Dickinson, John	Director of Technology
Bishop, Darrell	Architect and Co-founder

## Company Overview

Tesora provides an enterprise-class Database-as-a-service (DBaaS) platform that allows the client to deliver on-demand database capacity when it is delivered by public cloud providers, such as Amazon. The company offers Database Virtualization Engine that brings a collection of MySQL database servers together to act in unison and appear to the application as a single MySQL database server.

Address:	125 Cambridge Park Drive Cambridge, Massachusetts	Website:	www.tesora.com
		Founded:	2010
		Employees:	15
Capital Raised:	\$9.7M		
Investors:	Bantam Group, Investment Arm, CommonAngels, General Catalyst Partners, LaunchCapital, Point Judith Capital, Walnut Venture Associates		

## Selected Senior Management

Professional	Professional Title
Rugg, Ken	Founder, Chief Executive Officer and Board Member
Amrith Kumar	Founder, Chief Technology Officer and Board Member
Days, Frank	Vice President of Marketing
Shelley, Doug	Vice President, Product Development

## Company Overview

Virtustream provides enterprise-class cloud software and services worldwide. It offers xStream, a cloud management platform software and Infrastructure-as-a-Service (IaaS) for private, public, and hybrid clouds, which enables customers to move existing production applications to the cloud. The company also provides enterprise risk, cyber-security, and compliance solutions for government and enterprise customers.

Address:	4800 Montgomery Lane Bethesda, Maryland	Website:	www.virtustream.com
		Founded:	2008
		Employees:	200
Capital Raised:	\$129.6M		
Investors:	Blue Lagoon Capital, Columbia Capital, Escalate Capital Partners, Intel Capital, Noro-Moseley Partners, QuestMark Partners, SAP, TD Asset Management, TDF Ventures, Top Tier Capital Partners		

## Selected Senior Management

Professional	Professional Title
Rogers, Rodney	Chairman and Chief Executive Officer
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