Rackspace
The Open Cloud Company

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Introduction

Founded in 1996 as a local ISP in a San Antonio garage, Rackspace has risen from its humble roots to a billion dollar company. Rackspace now has offices in Australia, the UK, the United Kingdom, Switzerland, The Netherlands, and Hong Kong. Additionally, they also operate data centers in Texas, Illinois, Virginia, The UK, Hong Kong and Australia. They also happen to host upwards of 40% of the Fortune 100 companies in the United States[1]. Rackspace was also voted as 34th best place to work in 2013, with a job growth of 22% over 2012 [2]. After a brief stint as an ISP and web development company, Rackspace turned itself to the hosting business. In 2006, Rackspace purchased a company called Mosso Inc. that worked on cloud computing software. This acquisition would serve as the jumping off point for Rackspaces cloud offerings.

Services

As a large IT hosting provider targeting enterprise, Rackspace has many services available to clients. In terms of cloud computing, Rackspace offers everything from IaaS (Infrastructure as a Service), PaaS (Platform as a Service) to SaaS (Software as a Service). Any kind of service offered can be integrated with existing services, dependent on the needs of the organization. Additionally, Rackspace offers dedicated hosting, as well as cloud storage and a monitoring service. Anything that an enterprise might need in terms of hosting, Rackspace can provide it to you.

Cloud Servers

Cloud Servers are the crux of Rackspace's open cloud involvement. These servers are OpenStack virtual machines running on a

cluster in a Rackspace data center. They can be spun-up or spun-down dynamically via the Rackspace website, or via the API (which will be covered later). There are nine flavors of Linux to choose from, including free distributions like Ubuntu and CentOS and commercial distributions like Red Hat, as well as multiple variants of Windows Server 2008 and 2012. Each individual virtual server can have a varying level of computational resources allocated to it. CPU resources extend from four to eight virtual cores dependent on the particular performance flavor you choose. RAM capacity ranges from 512MB to 30GB and storage capacity of the instance varies from 20GB to 1.2TB.

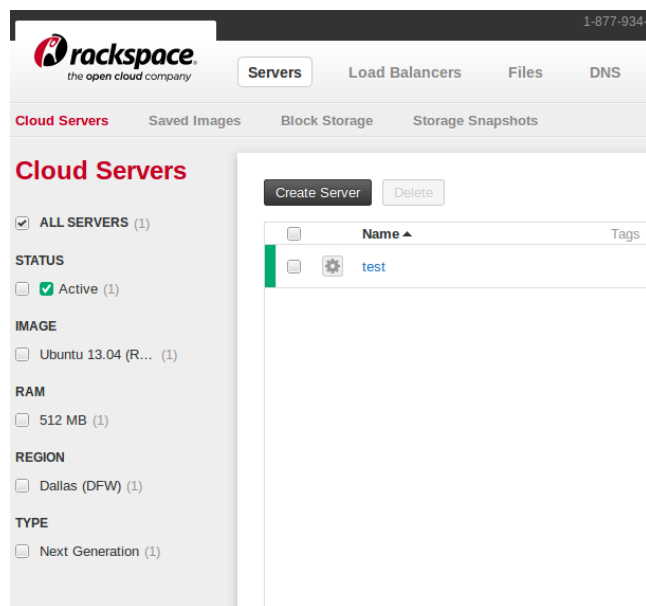A screenshot of the web-based cloud management tool is shown below in Figure 1.

Figure 1: Rackspace web-based cloud server management tool.

Cloud Sites

Cloud sites offers a less technical and more problem specific solution for customers. For customers that simply want to host a website that scales well based on traffic demands,
they might need nothing more than this. Cloud Sites offers support for PHP and .NET environments, as well as Joomla, Drupal, DotNetNuke, and MySQL. For clients that only require a scalable Wordpress site, the service offers a one-click setup for creating a ready-to-go Wordpress environment. As mentioned previously, the service uses Rackspace cloud instances to handle connections, and will spawn and destroy instances when either the load becomes too large or too small respectively. They also offer an uptime guarantee of 99.9%.

Managed Dedicated Servers

Rackspace still offers dedicated servers to those who are not ready or comfortable to move to a virtualized cloud environment or have special performance or security concerns. A dedicated server, unlike their "cloud" counterparts, is not virtualized, and runs on bare metal. Some companies may wish to keep some services on dedicated hardware to provide a more stable environment for the applications that they are running or for development purposes.

Regardless of the reason, Rackspace will manage the server and ensure that it is running smoothly. They monitor the server for potential problems, apply security patches as they become available, create backups, and are available for 24/7 support year-round.

Private Cloud

A private cloud is a cloud that is running on an infrastructure that is dedicated exclusively to a particular organization. It offers the flexibility of an open cloud, with the added security usually exhibited by dedicated in-house solutions. Rackspace can help you host your own private cloud in your own datacenter, a datacenter of your choosing, or at a Rackspace datacenter with exclusive hardware.

Typically a private cloud is used when the organization wants to have dynamic cloud features like dynamic instancing, but are prevented from hosting an open cloud because of highly sensitive information being stored on the cloud or because of organizational policy. It may also be the case that the cloud has a very high computational demand and cannot afford to waste CPU cycles on other clouds running on the same hardware.

Managed Virtualization

In enterprise environments, virtualization is often a key piece of the IT infrastructure. The leader of enterprise virtualization technology is VMWare, who's market share is greater than 80% [3]. Rackspace provides a managed virtualization service that allows an organization to maintain a virtualized environment on the Rackspace cloud. The environment provides access to many VMWare products, including vSphere, which is a cloud operating system. As with other managed solutions at Rackspace, the environment can be monitored, managed, and designed by Rackspace employees who are experts in the field.

Cloud Files

On the internet today, the amount of information being stored is growing at an exponential rate. Users wanting to get access to this data will want to be able to do so quickly and reliably. Keeping files on a single server at one location is no longer enough. Cloud Files, much like the name implies, allows businesses to store files in the cloud. The files can be replicated on multiple data centers in different geographical locations to reduce latency for users located in regions further away. You also have access to a larger bandwidth than you would hosting the file on your own servers. The content is delivered via the long-standing Akamai

CDN, which has been delivering content reliably since 1998.

Cloud Block Storage

Cloud Files operates at the file-level, which is good for storage of individual files that are accessed by users via the web, or by an application using the API (such as the photos in Instagram). If you need to mount a partition to run an operating system and your applications, or you want to create a drive to store files in, Rackspace has a block-level storage service for thus purpose. Rackspace's file servers implement RAID 10 to provide a performance boost in addition to being fault tolerant. Block storage can be allocated on traditional hard drives or solid state drives (SSD) for dramatic performance increases in disk I/O intensive applications.

Cloud Databases

In many enterprise applications, the size of a relational database can become exceedingly large. As the database grows, its performance will decrease and you may end up spending an equally large amount on upgrading hardware to achieve the performance that you need. By distributing the database across multiple machines using sharding, Rackspace can scale a MySQL database as it grows so you don't need to continue spending money on trying to keep up with an expanding database. Cloud databases are stored redundantly so even in the event of a hardware failure your data still remains intact. Additionally, Rackspace API's can aid you in managing your databases, including patches, configurations, and deployments.

Managed Storage

Sometimes all you might need is a large-scale storage solution in the cloud. Rackspace of-

fers all types of storage solutions to users, including DAS, NAS, and SAN. Performance and capabilities vary based on the type of solution selected. Solid state disks, file-level access, block-level access, fibre channels, replication, snapshots, and storage-tiering are available based on which solution is chosen. The storage is managed by Rackspace, so it can be backed up, monitored and upgraded by storage experts.

Cloud Monitoring

An important aspect of any IT solution is the ability to know when something has gone wrong right away and resolve the issue. The Cloud Monitoring service provided by Rackspace allows you to notify anyone of a problem or potential problem via email or SMS. You can configure alerts to happen individually, or send a report aggregating multiple alerts. There are multiple types of checks that the monitoring service can perform, including HTTP checks, PING tests, and content subjective tests that monitor the response of your application.

Load Balancing

In order to scale with the massive amount of traffic and processing required by large-scale applications, the workload must be distributed across multiple machines to maintain acceptable performance. Rackspace provides load balancers that help perform this task. Load balancers take the incoming traffic and distribute amongst a list of nodes that will handle the requests independently of each other. The algorithm used to distribute traffic can be changed to fit the users needs, and includes round robin, weighted round robin, least connections, weighted least connections, and random.

"RackConnect"

Sometimes a company may want to maintain a traditional dedicated server while still having access to the features of a dynamic cloud. This is called a hybrid cloud and it is becoming increasingly common in enterprise scenarios. By using a hybrid cloud, an organization can maintain their existing dedicated infrastructure and still take advantage of dynamic cloud features, including cloud servers, cloud storage, and databases, even when the dedicated servers are in-house at the organization.
Any cloud-based feature available to Rackspace customers can be used by an organization without having to migrate their systems. RackConnect works by creating a VPN between the organization's network and Rackspace. Security policies restrict what/who has access to the cloud features and protects the existing company network from being compromised.

API Access

All the services provided by Rackspace, would be far less effective if they didn't have a way for them to be managed programatically. All non-dedicated cloud services have API calls through various methods (typically JSON or XML) that allow you to control every aspect of your cloud. This is where the real power of the Rackspace cloud comes from. You can spin up instances and destroy them as necessary, create new load balancers on the fly, add files to the Akamai CDN, backup your data, or setup new alerts, all via the API. An example request to the Rackspace API is shown in Listing 1.

```
 1
 2  {
 3      "server": {
 4          "name": "new-server-test",
 5          "min_count": 1,
 6          "max_count": 1,
 7          "imageRef": "5f68715f-201f
                -4600-b5a1-0b97e2b1cb31",
 8          "flavorRef": "2",
 9          "diskConfig": "auto",
10          "metadata": {
11              "My Server Name": "Ubuntu
                    10.04 LTS"
12          }
13      }
14  }
```

Listing 1: A JSON object directing the Rackspace API to create a new Ubuntu server.

Rackspace & Amazon Web Services

When on the topic of publicly hosted clouds, there are generally two companies that come up: Amazon and Rackspace. Both are huge players in the cloud computing arena and offer similar services, but which one should you choose? It really comes down to a matter of preference and what you will be using the cloud for. Amazon Web Services offers a host of higher-level features that make it convenient to quickly accomplish certain tasks. Features like Elastic Beanstalk, which allows users to execute web applications that dynamically scale based on the load, aren't present in Rackspace's service offerings. This can still be done in a Rackspace cloud, however it is not as simple to do. In this regard, Amazon makes more sense for smaller companies and individuals who might just want to get their application up and running quickly and easily rather than developing their own solution to the problem. Configuring instances manually for a web application gives you much more control in large-scale mission-critical systems. That being said, scrappy entrepreneurial pro-

grammers trying to create the next Instagram are probably not Rackspace's target audience.

Rackspace focuses largely on support and their managed hosting solutions, providing so-called "Fanatical Support^{TM}" to its clients: something that enterprises looking to get into the cloud that don't know much about it would be interested in having. It comes as no surprise that Rackspace has garnered the role of hosting over 40% of the Fortune 100 companies[1] by focusing on support and stability rather than convenient features provided by Amazon (not that AWS is unstable).

So when it comes time to make a decision between these providers, its really best to understand your needs as a cloud user. If you are a large business with a hefty IT footprint already and might need some help getting in the door, Rackspace is probably the better choice. However if you are a small company or individual looking to get a fresh start in cloud computing, Amazon might be better suited for your needs.

Conclusion

Rackspace provides a myriad of useful cloud computing services. Almost everything that you might need in an enterprise environment can be provided with a hearty helping of "Fanatical Support^{TM}". As Rackspace continues to grow their userbase and aquire innovative companies like ObjectRocket (acquired in 2013) [4], we will most likely see a wealth of new features and improvements that further the ubiquity and utility of the cloud in the future.

References

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