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***Infrastructure as a Service - Providers***

Using Infrastructure as a Service APIs are essential to modern business. Their ease of use, as well as low cost and high flexibility allow endless possibilities when setting up network services for small or large businesses. In the recent “Exploring Windows Server” assignment, we were asked to create two servers on our IaaS provider of choice; both running Windows Server Datacenter 2019 (GUI). In my case, I decided to do this assignment under the Google Cloud Platform Compute Engine. This allowed me to create multiple VM instances. Creating them both within the same region and zone allowed for an easier network configuration within the VMs. I personally like Google Cloud Services a bit better than Amazon Web Services, simply because I feel that it is set up a bit simpler. AWS has a confusing layout and certain menus are on a different region of the site (VM networking specifically). I liked GCS because it was simply laid out, and I felt that it was easy to get things up and running. Google’s service is also helpful for beginners also because it has extended information on practically every button. If you’re not sure what something means, hover over it with your cursor and it will likely give you an explanation and an example of the selected item to make things easier to understand. Personally, when I was going through my project, I had run into a few issues with zones and virtual network services. Google has an extensive help site that is extremely detailed and helped me solve my issue almost right away. A lot of options in the actual Google Cloud Services pages had direct links to help pages, which also made looking for solutions easier. The Amazon Web Services support center is set-up fine, but I don’t feel that it is as straightforward when compared to Google’s. I also had an error with the Amazon Web Services support center page. I’m unsure if it was because of some sort of server issue, or possibly the AWS account that I was using, but it would not allow me to view the full support center. I was getting a generic “account not authorized” error. This could be related to my account specifically, but it is still not what you would want to see from a service provider that is responsible for business networks.

When doing some research, I discovered several similar additional IaaS solutions. One such solution that I found was a company known as “DigitalOcean”. (<https://www.digitalocean.com/>) This provider was offering very similar products to AWS and GCS, but at substantially lower prices. On the site directly, it mentioned “up to 50% lower monthly cost compared to Amazon Web Services”. The products offered by DigitalOcean include “Droplets”, which are virtual machines; Kubernetes, an app development platform, Databases, and “Spaces”, which is a storage solution. They also offered Virtual Private Clouds, firewalls, DNS, and floating IPs. DigitalOcean’s SLA on their website is simply states: “DigitalOcean provides a 99.99% uptime SLA for both Droplets and block storage. We refund lost time back to your account at the hourly rate incurred.” (<https://docs.digitalocean.com/products/droplets/resources/policies/>) Another IaaS solution that I found was Microsoft’s Azure Cloud services. (<https://azure.microsoft.com/en-us/>) Azure offers many services; very similar to the services that Google and Amazon offer. Azure seems to have a higher price when compared to Amazon and Google services, although this is for good reason. Azure is the only provider of cloud Active Directory services from Microsoft. Although this is a Windows specific service, it is usually very important to most businesses and used very frequently, especially in large scale business operations. Azure offers Service Level Agreements (SLAs) for each specific service they offer. After reviewing both of these options, (comparing pricing, reading online reviews, etc.) I believe that both are great alternatives, but choosing one would be very dependent on the scale of the business in question. For smaller businesses, DigitalOcean is a very good choice. It has a good selection of services while also being at an affordable cost when compared to the large companies such as Amazon Web Services and Google Cloud Services. For larger companies, I think it would be best to choose one of the larger 3 companies, such as Google Cloud Services, Amazon Web Services, or Microsoft Azure Cloud Services. These larger companies offer more services at slightly higher prices, but make up for it with their great support systems, large expandability, and scaling of service as well as price. Google specifically also offers some discounts depending on the size of the business.

Using IaaS services can be extremely helpful to a business, but their can also be some downsides to the solutions. One large benefit to Infrastructure as a service is that it is easily scalable. Any business large or small, can easily sign up for one of these solutions and scale it to their needs. One business may need one or two virtual servers and some cloud storage, while another business may need many servers, unlimited cloud storage, and other services as well. This great scalability allows price to be lower for those businesses who use fewer services. A negative side to this is that you have absolutely no physical access to any hardware. It is all being managed by the company providing the services to you. If a business were to use a smaller company that didn’t have proper backups and something happened to their servers, all of that data would be lost. Another negative relating to scalability would be related to cost. Cost can be low, but costs could raise over time, especially if the business owners are not paying enough attention. If I were in the position of a business leader, I would choose my service provider and services according to the size of my business. I think that if I was managing a larger business, I would have some in-house IT professionals, just for the sake of redundancy (especially if the data is important). Having some in-house services would also reduce latency, as well as being unable to access any of that cloud data if there is a server outage or internet outage at my business. As with any business decisions, it is important to make IaaS related decisions based on the size of the business, and the needs of the employees.