Automatic Virtual Machine Creation Report

Name: Ryan Sheppard **Student Number**: 1091670

AWS

Ease of programming
It's very easy to program an AWS EC2 instance (virtual machine) via the [AWS' Boto3 SDK](#). Based on [AWS' documentation,](#) all you need to create an instance is an Image ID, the type of instance and a special Boto3 KeyPair or KeyPairInfo that represents the key pair used to secure connections to the instance. The Boto3 SDK has incredibly good documentation compared to the SDK's for other cloud platforms. One caveat is that the Boto3 SDK has some more tedious authentication. The easiest way to authenticate the Boto3 client is to provide it with an AWS access key for an account that has the appropriate rights, but this is not recommended by AWS.

Features
Taking a look at the [Boto3 SDK EC2 API](#), EC2 has a plethora of features. They provide all the features included in making virtual machines in other cloud platforms such as creating a virtual machine from a template or custom image and creating a virtual network. AWS has [99 availability zones across 31 geographic regions](#).

Cost
Like other cloud platforms, AWS provides a pay as you go and reserved model for EC2 virtual machines where you can pay as you use resources (the former) or purchase capacity ahead of time at a discount (the latter) for a predictable workload. Unlike other cloud platforms, AWS also has a [savings plan](#), where you can commit to a certain amount of usage for a one to three year period.

GCP

Ease of programming
[Google Cloud's compute SDK](#) makes it relatively easy to create virtual machines in the cloud. One caveat is that, unlike other cloud platforms, there is a requirement to instantiate virtual machine components as objects. For example, if you want to create a drive for your virtual machine, you'll need to create or get one via the SDK, and use this object to create the virtual machine.

Features
GCP has [73 total availability zones](#) making it the second most available cloud platform. Like all other cloud platforms, it has the ability to create virtual machines from templates, existing images or custom images and allows for control over size and types of disks as well as a network for your virtual machine. An interesting feature that I can't seem to find on other platforms is deploying a container image without the need to get into the VM and run a script or start a container automatically.

Cost

Like all other cloud platforms, Google Cloud has a pay as you go modell for its compute instances. Similar to AWS, Google Cloud has a sustained use program, where you can commit to a certain amount of usage. The only difference is that you do not need to commit to a one to three year period.

Azure

Ease of programming
Azure requires more onboarding than AWS, but less than GCP. In Azure, you must create or get some components for your virtual machine like a network and a disk, but you don't have to deal with the hassle of managing these components in memory. You can simply specify their ID or name (depending on what you're specifying) in the virtual machine configuration, and Azure will connect everything for you.

Features
Azure has [41 availability zones across 19 regions](#) making it the third most available cloud platform of the three major cloud platforms. Azure has extensive management for it's Microsoft Windows virtual machines making it the best choice if you are going to be creating many Windows virtual machines. Other than that, Azure has the same general features every other cloud provider has when it comes to creating virtual machines like customised disks, networking and monitoring.

Cost
Azure supports both the pay as you go and the reserved model where you can pay for virtual machine capacity upfront at a discount (the latter) or pay for capacity as you use it (the former). Out of the three cloud platforms, Azure is the least flexible when it comes to payment methods. They do not offer some sort of commitment plan for sustained use like the other platforms.

Which platform would you select for a major deployment?

For a major deployment, I would most-likely choose AWS. AWS seems to be the easiest to program with their Boto3 SDK. Furthermore, it has the best documentation for programming automatic VM creation. In addition, it is the most available and it has flexible cost plans.