

# COMP41610 – Practical 1 – Neil Grogan - 13204052

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*Q1. Cloud Deployment Models by Provider*

<b>Cloud Provider</b>	<b>Cloud Deployment Model Used</b>
Amazon EC2	Public, Private, Hybrid and Other (IaaS) (Dzone)
Rackspace	Public, Private by provider, private on-premise, and hybrid (IaaS) (Dzone)
Windows Azure	Public, Private, Private on- premise, hybrid (IaaS) (Dzone) (Microsoft, 2014)
Google App Engine	Public (PaaS) (Google, 2014)
HP Cloud	Public, Private by provider, private on-premise, and hybrid (IaaS) (Dzone)
Salesforce Cloud	Public (SaaS) (Salesforce.com)

*Figure 1 - Cloud Deployment Models listed by provider**Q2. Cloud Delivery Models by Provider*

<b>Cloud Provider</b>	<b>Cloud Delivery Model Used</b>
Amazon EC2	Infrastructure-as-a-Service (IaaS) (Dzone)
Rackspace	Infrastructure-as-a-Service (IaaS) (Dzone)
Windows Azure	Infrastructure-as-a-Service (IaaS & PaaS) (Dzone) (Microsoft, 2014)
Google App Engine	Platform-as-a-Service (PaaS) (Google, 2014)
HP Cloud	Infrastructure-as-a-Service (IaaS) (Dzone)
Salesforce Cloud	Software-as-a-Service (SaaS) (Salesforce.com)

*Figure 2 - Cloud Delivery Models per provider*

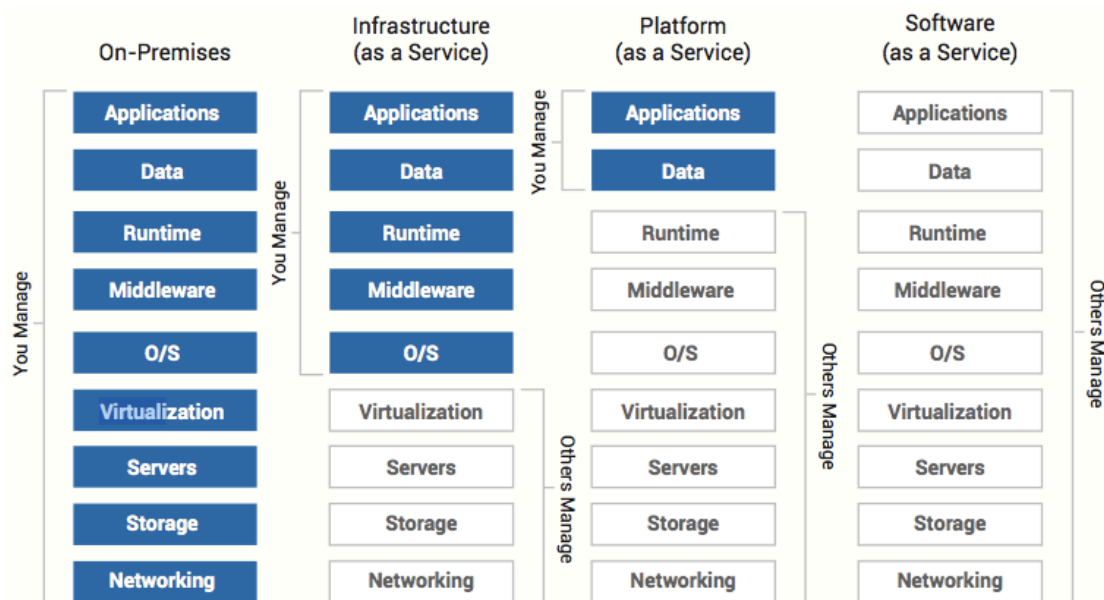
*Q3. Considerations in virtualizing a data centre*

Figure 3 – credit (Dzone)

In considering to virtualize a data centre, you have to first consider how much control you wish (or can afford) to relinquish. In Figure 3, we can see what we start off with that we manage in a pre-existing data centre:

- Applications
- Data
- Runtime
- Middleware
- OS
- Virtualization
- Servers
- Storage
- Networking

Each of these areas needs an employee with familiarity of that area – which can be both an advantage and a disadvantage. First the business case must be made for which cloud deployment suits – can we have our infrastructure hosted elsewhere or under another company's direct control?

Once the cloud deployment type is chosen (and sometimes this is very obvious based on industry, say healthcare vs. the local fast food outlet) – we can move on

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to choosing the cloud delivery model. The cloud delivery model is arguably as important if not more so than the cloud deployment model chosen. As clearly shown in Figure 3, the cloud delivery model dictates how much of your infrastructure you make the responsibility of others.

IaaS is more suited to a company with pure software experts and very few hardware gurus (as all the hardware is abstracted). IaaS still offers the flexibility down to the operating system level, so if you need to run legacy applications on a certain operating system for instance, IaaS is a good choice. PaaS takes this even further and you only ever worry about the direct applications you develop (say an accounting package) and deploy to a common middleware (say JEE Server Software). Auto-loading balancing and scaling (as provided through development by JEE Server) and the PaaS provider then worries about making this happen via the middleware.

Provider	Applications	Data	Runtime	Middleware	OS
<b>Amazon</b>	Bring your own	Bring your own	OS or Middle-ware	Beanstalk	Linux/Windows
<b>Google</b>	Bring your own	Bring your own	App Engine	App Engine	Linux
<b>Salesforce</b>	Provided	n/a	n/a	n/a	n/a
<b>Rackspace</b>	Bring your own	Bring your own	Middle-ware or OS	Project Solum	Linux
<b>HP Cloud</b>	Bring your own	Bring your own	OS or Middle-ware	HP Cloud Application Platform	Linux
<b>Windows</b>	Bring your own	Bring your own	OS or Middle-ware	App Services	Linux/Windows

Figure 4 - Comparison of Offerings of Cloud Providers at Each Level of the Stack (Part1)

Provider	Virtualization	Servers	Storage	Networking
<b>Amazon</b>	EC2	EC2	S3/Glacier	n/a
<b>Google</b>	Instances	Instances	Big Table	
<b>Salesforce</b>	n/a	n/a	n/a	n/a
<b>Rackspace</b>	Cloud Server	Cloud Server	Cloud Files	Cloud Networks /DNS
<b>HP Cloud</b>	HP Cloud Compute	HP Cloud Compute	HP Cloud Storage	HP Cloud DNS
<b>Windows</b>	Yes		Windows	Virtual

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	Azure Drive	Network
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Figure 5 - Comparison of Offerings of Cloud Providers at Each Level of the Stack (Part2)

*Q4. Comparing cost of Google, Amazon and Windows Azure*

I took the smallest instances available for each provider and compared the cost of each. It is not possible to do a very direct comparison as the specifications for the servers offered differ per provider.

**System Specs:**

Provider	CPU	RAM	Disk
Amazon	0.182	615 MB	Adding 20GB
Google	0.502	1.7 GB	Adding 20GB
Windows Azure	1	1.75 GB	20GB

Figure 6 - System Specs as used for cost calculation

Provider	Server Cost	Storage Cost	Total Yearly Cost
Amazon	\$24.29 /mo (+\$54.00 upfront) (Amazon)	\$58.24/mo	\$241.48 (Server) + \$698.88 (Storage) = \$990.36
Google	\$39.45/mo	0.13/GB/month = \$2.16/mo	\$473.4 (Server) + \$31.20 (Storage) = \$504.60
Windows Azure	\$43.83	included	\$525.96

Figure 7 - Comparison of Costs of Smallest Cloud Instances for the Top 3 most well known providers

*Q5. Which cloud provider to choose?*

I would generally feel more comfortable in choosing a PaaS provider, purely due to peace of mind. I know the whole stack can be covered by an uptime guarantee and contractual obligations. Having said that, I would strictly choose a PaaS provider that is open source (or one where a migration plan is feasible due to standard components, such as a major database and middleware).

The thing that I have to worry about then becomes just the applications I develop and the services I provide – not the underlying details. This means – hopefully – I

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can spend much more time spending my focus on the value I can deliver to my customers. For this reason the frontrunner for me would be an OpenStack solution from Red Hat (with HP also offering OpenStack). There's a lot of Java developers available and familiar with JEE technologies.

As a counter-point I would rule out Google's PaaS offering due to the lock in brought by specific Google technology (such as the Big Table database). I would in future consider Amazon Elastic Beanstalk then as a competitor (also allows scaling, replication, and all the features a JEE ecosystem can give you).

### Bibliography

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