

## Cloud Computing Platforms Comparison

|  |             | Amazon AWS   | Google App Engine  | Microsoft Azure  | IBM Smart Business Dev.   |
|--|-------------|--|--|--|---|
| focus  |             | Public sectors, Government agencies, educational institutes  | Rapid develop, deploy and iterate application without system administration.,                      | Public cloud   | Hybrid cloud,   |
| Infrastructure and virtualization architecture |             | Flexibility to launch application regardless of use case or industry   | Uses search engine infrastructure with redundancy, global network and products like spanner, Flume | Deploy a full range of open and community driven OS and software solutions.  | Flexibility to have public private or hybrid clouds depending on business needs.  |
| Platforms                                      |             | Infrastructure as a Service  | Platform as a Service  | Platform as a Service , Infrastructure as a Service  | Infrastructure as a Service   |
| Persistent Storage                             |             | Amazon Elastic Block store (EBS) allows user to create storage volumes attachment to Amazon EC2 instances    | MySQL using cloud SQL, object storage using cloud storage  | Uses Azure SQL database in virtual machines, free to run NoSQL tools such as MongoDB and Casandra.   | Provisioned separately from any particular instance, and can be attached to running under the same account in the same data center. |
| Monitoring                                     |             | Amazon cloud watch is the monitoring service.  | Google cloud uses the monitoring API in the developer's console                                    | Azure management portal makes the monitoring done. It can be set to minimal and verbose for each service role.   | IBM smart cloud monitoring tool monitors the health and performance of a private cloud infrastructure.                              |
| Load Balancing                                 |             | Uses ELB (Elastic Load Balancing) that automatically distributes incoming traffic across multiple instances. | Use to make further scale out capabilities in Google compute engine                                | There are two levels of load balances. First DNS level uses round robin and traffic manager methods and Second Network level uses Azure load balancer. | Elastic load balancing is a shared service that provides routing and load balancing to multiple deployed web applications.          |
| Message Queues                                 |             | Amazon simple Queue Service(SQS) which is a fast, reliable service   | Contains Push queues, Task queue and pull queue  | Both Azure queues and service Bus queues are implementations of this.  | SoftLayer message queue helps us to build higher scalability in to applications with cost effective messaging and notification.     |
| Development Tools                              |             | Primary SDKs, IDE Toolkits and command line tools  | Eclipse, IntelliJ, Maven, Git, Jenkins, PyCharm  | Azure SDKs, Azure Powershell and command-line tools for management and deployment.   | IBM Domino Designer, Connector for SAP solutions, Expeditor, Workflow, Enterprise Integrator for Domino                             |
| Integration with other services                |             | DynamoDB is integrated with other AWS services   | Google cloud services and APIs, Memcache   | Microsofts BizTalk service   | CRM, Ariba, sanebox, openclave, teampoint   |
| Web APIs                                       |             | Yes  | Yes  | Yes  | Yes   |
| Programming Framework                          |             | .NET<br>Java<br>PHP<br>Python<br>Ruby  | Python   | .NET<br>Java<br>Node<br>PHP<br>Python<br>Ruby  | Java<br>Node<br>Ruby  |
| Pricing  | Machine CPU | \$0.14 / hour  | \$0.10 / hour  | \$0.12 / hour  | \$0.10 / hour   |
|  | Storage     | \$0.25 / GB / month  | \$0.15 / GB / month  | \$0.15 / GB / month  | \$0.15 / GB / month   |
|  | I/O         | \$0.01 / 1000 requests   | \$0.12 / GB / month  | \$0.01 / 1000 requests   | \$0.01 / 1000 requests  |
|  | Bandwidth   | \$0.10 / GB  | \$0.10 / GB  | \$0.10 / GB  | \$0.10 / GB   |

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