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| --- | --- | --- | --- | --- | --- |
|  | | Amazon AWS | Google App Engine | Microsoft Azure | IBM Smart Business Dev. |
| focus | | Public sectors,  Government agenesis ,educational institutes | * Build and deploy. No worrying about DBAs, servers, sharding, and load balancers | Cloud Services:  Deploy highly-available, infinitely-scalable applications and APIs | Private cloud , Hybrid cloud |
| Infrastructure and virtualization architecture | | EC2uses [Xen](http://en.wikipedia.org/wiki/Xen" \o "Xen) virtualization Each virtual machine, called an "instance", functions as a [virtual private server](http://en.wikipedia.org/wiki/Virtual_private_server) | Uses search engine infrastructure with redundancy, global network and products like spanner ,Flume | Azure ExpressRoute enables you to create private connections between Azure datacenters and infrastructure. | IBM WebSphere application infrastructure. Flexibility to have public private or hybrid clouds depending on business needs. |
| Platforms | | IAAS | PAAS | IAAS, PAAS | IAAS |
| Persistent Storage | | EC2 Cloud Storage , Dynamo DB | 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 | Google cloud uses the monitoring API in the developer’s console | Azure management portal. 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. | 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. | IBM WebSphere Message Queueing |
| 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, Enterprise Integrator for Domino |
| Integration with other services | | Amazon Cloud front is content delivery web service which integrates with other AWS services. Dynamo DB is also integrated with other AWS services. | Easy to integrate. Google cloud services and APIs eg: Maps, Places search etc. | Supports building cloud applications to integrate with SaaS or existing cloud based applications.  Eg: Microsoft’s BizTalk service | Supports integration with other services. |
| Web APIs | | Available | Available | Available | Available |
| Programming Framework | | Java, PHP, Python  Ruby, Windows and .Net | Java, PHP, Python, Go | Java, Node.js, PHP, Python, .NET, and Ruby | Java, PHP, Node.js |
| Pricing | Machine CPU | 0.14$/hour | 0.1$/hour | 0.12$/hour | 0.10$/hour |
| Storage | 0.25$/ GB/Month | 0.16$/GB/Month | 0.15$/GB/Month | 0.15$/GB/Month |
| I/O | 0.1$/1000 | 0.1$/1000 | 0.1$/1000 | 0.15$/1000 |
| Bandwidth | 0.1/GB | 0.1$/GB | 0.1$/GB | 0.1$/GB |

Cloud Computing Platforms Comparison