|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Amazon AWS | Google AppEngin | Microsoft Azure | IBM Smart Business Dev. |
| focus | | Infrastructure | platform | Platform | Platform and Infrastructure |
| Infrastructure and virtualization architecture | | Any application based on our usage and purpose. | As provided by google | OS level through fabric controller. | Either works on external or internal services. |
| Platforms | | IAAS | PAAS | IAAS, PAAS | IAAS |
| Persistent Storage | | Amazon Elastic Block store (EBS). | MySQL using cloud SQL, object storage using cloud storage. | Uses Windows Azure SQL | IBM persistent storage |
| Monitoring | | Amazon cloud watch | Uses Google cloud monitoring API | Azure management portal tool | IBM smart cloud tools. |
| Load Balancing | | Uses ELB (Elastic Load Balancing) | Google compute engine. | Done in two levels. First DNS level uses traffic manager method, Second Network level uses Azure load balancer. | Hadoop load balancing menthod. |
| Message Queues | | Amazon Simple Queue Service(SQS) | Push Queues. | Windows Azure Queues, Service bus Queues | IBM Web Sphere MQ |
| Development Tools | | Primary SDKs, IDE Toolkits and command line tools. | Eclipse, IntellIJ,java,python | Microsoft visual studio | Java plugin for Eclipse |
| Integration with other services | | DynamoDB is integrated with other AWS services | Google services and a large number of APIs | With all .NET services. | CRM, Ariba |
| Web APIs | | Yes | Yes | Yes | Yes |
| Programming Framework | | CustomizableLinux,Amazon Machine Language(AML) | Python,java | .NET,java | Java  Node  Ruby |
| Pricing | Machine CPU | $0.14 / hour | $0.10 / hour | $0.12 / hour | $0.10 / hour |
| Storage | $0.025 / GB / month | $0.15 / GB / month | $0.15 / GB / month | $0.15 / GB / month |
| I/O | $0.01 / 1000 requests | $0.01 / 1000 requests | $0.01 / 1000 requests | $0.01 / 1000 requests |
| Bandwidth | $0.10 / GB | $0.10 / GB | $0.10 / GB | $0.10 / GB |

**CS551: Cloud Computing Platforms Comparison**