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| --- | --- | --- | --- | --- | --- |
|  | | Amazon AWS | Google AppEngin | Microsoft Azure | IBM Smart Business Dev. |
| focus | | Mainly on Network Infrastructure | Platform and Infrastructure | Cloud computing platform and Infrastructure | Platform |
| Infrastructure and virtualization architecture | | Ec2 Elastic Compute Cloud upon which you can instantiate 32 or 64 bit Amazon Machine Images or upload your XEN virtual machine images | Specification provided by Google | Servers at back end runs in virtual machines on Windows Azure while front end is in net. | Virtual Machine Instances-multiple sizes for 32 &64 bit architecture |
| Platforms | | IaaS, Linux and Windows | PaaS (Google Cloud Platform) | IaaS, PaaS | PaaS, IBM, [Redhat](http://en.wikipedia.org/wiki/Red_Hat" \o "Red Hat), [Cisco](http://en.wikipedia.org/wiki/Cisco), [Citrix](http://en.wikipedia.org/wiki/Citrix), [EMC](http://en.wikipedia.org/wiki/EMC_Corporation) |
| Persistent Storage | | I/Os, snapshot storage with Amazon Elastic Block Store (EBS). | Google Cloud Storage.  Gdisk – bulk storage. | Standard Application Storage .  Uses Azure SQL database in virtual machines, free to run NoSQL tools such as MongoDB and Casandra. | IBM Persistent Storage, Blue Mix and Web Sphere. |
| Monitoring | | Metrics, Alarms, and API requests with Amazon Cloud-Watch. | Web based Administration console, App Engine System Status Dashboard.  Monitoring API | MP-Management Pack, Azure management portal makes the monitoring done. It can be set to minimal and verbose for each service role. | IBM Tivoli Monitoring |
| Load Balancing | | Elastic Load Balancing and data processing with Amazon Elastic Load Balancing. | Google Compute Engine offers server-side load balancing | Two types:  1) DNS Level – Round Robin Load Balancing Method  2) Network Level – Azure Load Balancer | Randomized Hydrodynamic Load Balancing technique |
| Message Queues | | Amazon Simple Queue Service (SQS). | Using Push Queues in Java, queries, sorting, transactions | Microsoft Azure Service Bus,  Storage Queues | Nastel AutoPilot Web sphere and Soft Layer Message Queues |
| Development Tools | | Primary SDKs, IDE Toolkits, and Command Line Tools for developing and managing your AWS applications. | Datastore SQLite Stub, SDK(software developmet kit) | Visual Studio Online, Azure SDK, Azure tools for Visual studio, Automation | Java plug-in for Eclipse , IBM Domino Designer, Connector for SAP solutions, Expeditor, Workflow, Enterprise Integrator for Domino |
| Integration with other services | | All Services are designed to work together like the pieces a chessboard | A number of APIs available like maps, contractors, calendar etc | Azure Virtual Machines, Azure Biz Talk Services, Azure Service Bus | Sandbox, Open clove ,CRM |
| Web APIs | | Yes | Yes | Yes | Yes |
| Programming Framework | | The AWS Flow Framework is open source, developed and managed by AWS, and available in Java, .Net, Python and Ruby. | Java  PHP  Python  Go | ASP.Net, PHP, Node.js, Python | Java, Node.js, Ruby |
| Pricing | Machine CPU | $0.15 per hour | It is calculated in CPU seconds equivalent to 1.2 GHz  Intel x86 processor  1)You pay $0.10 per hour of CPU usage for processing requests  2) 6.5 hours of CPU time is free  3) You do not pay for CPU idle time | It is calculated in CPU seconds equivalent to 1.2 GHz  Intel x86 processor  1)You pay $0.12 per hour of CPU usage for processing requests | $0.1 per hour (for 1.5 GHz Intel Processor) |
| Storage | Standard Storage: $0.0300 per GB/month  Reduced Redundancy Storage:  $0.0240 per GB/month  Glacier Storage:  $0.0100 per GB/month | Only non-relational storage is available  1)You pay $0.15 per GB per month – the size includes overhead, metadata  and storage required for indexes  2) It includes data stored in the datastore, memcache, blobstore  3) You pay for CPU usages for data I/O at $0.10 per hour  4) 60 hours of CPU time for data I/O is free  5) Up to 1 GB of storage is free – FAQ page says that it is 500 MB  6) You are charged every day at $0.005 GB per day after subtracting your  free quota | Only non-relational storage is available  1) You pay $0.15 per GB per month  2) Storage transactions are charged separately at $0.01 per 10,000  transactions | $0.15 per GB per month |
| I/O | $0.05 per 1 million I/O requests | $0.01 / 1000 Write operations and $0.001 for 1000 Read operations | $0.01 / 1000 Write operations and $0.001 for 1000 Read operations | $0.01 / 1000 Write operations and $0.001 for 1000 Read operations |
| Bandwidth | $0.1 per GB for incoming traffic and $0.15 per GB for outgoing traffic | 1)You pay $0.10 per GB for incoming traffic  2) You pay $0.12 per GB for outgoing traffic  3)1 GB of incoming traffic and 1 GB of outgoing traffic is free | 1)You pay $0.10 per GB for incoming traffic – rates for Asia are different  $0.30 per GB  2) You pay $0.15 per GB for outgoing traffic – rates for Asia are different  $0.45 per GB | $0.1 per GB for incoming traffic and $0.15 per GB for outgoing traffic |

Cloud Computing Platforms Comparison

*Swathi Boyanapalli*

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