|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | Amazon AWS | Google AppEngin | Microsoft Azure | IBM Smart Business Dev. |
| focus | | Infrastructure | platform | Infrastructure | Infrastructure |
| Infrastructure and virtualization architecture | | Amazon Elastic Compute Cloud (EC2) is a central part of [Amazon.com](http://en.wikipedia.org/wiki/Amazon.com" \o "Amazon.com)'s [cloud computing](http://en.wikipedia.org/wiki/Cloud_computing) platform  EC2 [scalable](http://en.wikipedia.org/wiki/Scalable) deployment of applications by providing a [Web service](http://en.wikipedia.org/wiki/Web_service) through which a user can boot an [Amazon Machine Image](http://en.wikipedia.org/wiki/Amazon_Machine_Image) to create a [virtual machine](http://en.wikipedia.org/wiki/Virtual_Machine), | for developing and hosting [web applications](http://en.wikipedia.org/wiki/Web_application) in Google-managed data centers  - App Engine allows you to deploy your applications to Google's highly scalable infrastructure | Servers at back end runs in virtual machines on Windows Azure while front end is in net. Servers can be customized according to your specifications | Virtual Machine Instances-multiple sizes for 32 &64 bit architecture |
| Platforms | | [Sun Microsystems](http://en.wikipedia.org/wiki/Sun_Microsystems)' [OpenSolaris](http://en.wikipedia.org/wiki/OpenSolaris" \o "OpenSolaris)  Linux  [Windows Server 2003](http://en.wikipedia.org/wiki/Windows_Server_2003)  [Windows Server 200](http://en.wikipedia.org/wiki/Windows_Server_2003)8  [Solaris Express Community Edition](http://en.wikipedia.org/wiki/Solaris_(operating_system)) | Not available | Microsoft Sever 2008 | SUSE and Windows |
| Persistent Storage | | Amazon Elastic Block Store (Amazon EBS) provides persistent block level storage volumes for use with Amazon EC2 instances in the AWS Cloud.  Amazon’s [Simple Storage Service](http://aws.amazon.com/s3/) (S3) file storage system not only as a temporary but also as a potentially permanent file storage solution | Gdisk-bulk storage | Standard application storage | Bulk Storage |
| Monitoring | | Amazon CloudWatch is a monitoring service for AWS cloud resources and the applications you run on AWS. | [*HawkEye*](https://portal.appscale.com/tour)brings platform monitoring to Google App Engine applications .  - The System Status Dashboard makes it easier for developers to evaluate and monitor the entire App Engine | The Management Pack for Windows Azure enables you to monitor the availability and performance of resources that are running on Windows Azure. | IBM Tivoli monitors the health and performance of a private cloud infrastructure, including environments containing both physical and virtualized components |
| Load Balancing | | Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances in [the cloud](http://aws.amazon.com/what-is-cloud-computing/). It enables you to achieve greater levels of fault tolerance in your applications, seamlessly providing the required amount of load balancing capacity needed to distribute application traffic. | Google Compute Engine offers server-side load balancing so you can distribute incoming network traffic across multiple virtual machine instances. | traffic Manager load balancing for cloud services and websites - Azure load balancing for virtual machines | Available |
| Message Queues | | Amazon Simple Queue Service (Amazon SQS) offers reliable and scalable hosted queues for storing messages as they travel between computers. By using Amazon SQS, you can move data between distributed components of your applications that perform different tasks without losing messages or requiring each component to be always available. | Not available | **Service Bus queues** | Not available |
| Development Tools | | SDK’s for Java, PHP, and Python as well as several Eclipse plugins. Web Console, Command Line API’s for all services. | Java plugin for Eclipse and Python software development | Visual Studio and SDK for .NET | Java plugin for Eclipse |
| Integration with other services | | AWS Storage Gateway is a service connecting an on-premises software appliance with cloud-based storage to provide  seamless and secure integration between an organization’s on-premises IT environment and AWS’s storage  Infrastructure. | APIs available | Not Available | Not Available |
| Web APIs | | yes | yes | unknown | Yes |
| Programming Framework | | .NET, PHP, Python, Ruby, Java | Python Java  PHP GO | .NET Python  Java Ruby  Node  PHP | Java  Node  Ruby |
| Pricing | Machine CPU | $0.140 to $0.154 per hour depends on location | - $0.10 per hour of CPU usage for processing requests  - 6.5 hours of CPU time is free  - do not pay for CPU idle time | $0.12 per hour of CPU usage for processing requests | $0.1 per hour (for 1.5 GHz Intel Processor) |
| Storage | $0.15 per GB per month | - $0.15 per GB per month – the size includes overhead, metadata  and storage required for indexes  -t includes data stored in the datastore, memcache, blobstore  - pay for CPU usages for data I/O at $0.10 per hour  -60 hours of CPU time for data I/O is free  - Up to 1 GB of storage is free – FAQ page says that it is 500 MB  - charged every day at $0.005 GB per day after subtracting your  free quota | - $0.15 per GB per month  -Storage transactions are charged separately at $0.01 per 10,000  transactions | $0.15 per GB per month |
| I/O | $0.01 for 1,000 write and $0.001 for 1,000 read | $0.01 for 1,000 write and $0.001 for 1,000 read | $0.01 for 1,000 write and $0.001 for 1,000 read | $0.01 for 1,000 write and $0.001 for 1,000 read |
| Bandwidth | $0.1 per GB for incoming traffic and $0.15 per GB for outgoing traffic | -$0.10 per GB for incoming traffic  - pay $0.12 per GB for outgoing traffic  -1 GB of incoming traffic and 1 GB of outgoing traffic is free | - $0.10 per GB for incoming traffic – rates for Asia are different  $0.30 per GB  - $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 |