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| --- | --- | --- | --- | --- | --- |
|  | | Amazon AWS | Google AppEngin | Microsoft Azure | IBM Smart Business Dev. |
| focus | | Public Cloud | Public Cloud | Public Cloud | Hybrid Cloud and Private Cloud |
| Infrastructure and virtualization architecture | | The *AWS* cloud *infrastructure* has been architected to be one of the most flexible and secure cloud computing environments. It provides scalable virtual private servers using Xen Virtualization | It allows you to build and run applications on Google’s infrastructure and Virtualization architecture. | Microsoft Azure Hypervisor provides the Virtualization support. | Based on a reference architecture approach, IBM SmartCloud Desktop Infrastructure solutions powered by IBM PureFlex™ System, IBM Flex System™ or IBM System x® servers support a wide range of hardware, software and hypervisor platforms. |
| Platforms | | Infrastructure as a Service (IaaS) | Platform as a Service (PaaS) | Infrastructure as a Service (IaaS)  Platform as a Service (PaaS) | Infrastructure as a Service (IaaS) |
| Persistent Storage | | Amazon Elastic Block Store (Amazon EBS) provides persistent block level storage volumes for use with Amazon EC2 instances in the AWS Cloud. | Google Cloud SQL is a MySQL database that lives in Google's cloud. | Azure drives provides the persistent storage. Without persistent storage, we can also use Azure’s in-memory caching. | *Persistent storage* is provisioned separately from any particular instance, and can be attached to any instance running under the same account in the same datacenter. It can be likened to an ex-ternal USB drive in the physical world. |
| Monitoring | | Amazon CloudWatch is a monitoring service for AWS cloud resources and the applications you run on AWS. | Google Cloud Monitoring provides dashboards and alerts for your cloud-powered applications. | You can monitor key performance metrics for your cloud services in the Azure Management Portal. | IBM® SmartCloud Monitoring tool provides holistic cloud availability, performance and capacity monitoring, broad health dashboards etc. |
| Load Balancing | | Elastic Load Balancing automatically distributes incoming application traffic across multiple Amazon EC2 instances in the cloud. | Google Compute Engine offers server-side load balancing so you can distribute incoming network traffic across multiple virtual machine instances. | There are two levels of load balancing available for Azure infrastructure services:   1. DNS Level 2. Network Level | Load Balancing is provided by Elastic load balancer. It is a shared service that provides routing and load balancing to multiple deployed web applications. It supports both HTTP and HTTPS requests. |
| Message Queues | | Amazon Simple Queue Service(SQS) provides a hosted message queue for web applications. | App Engine provides two different queue configurations:  Push Queues Pull Queues | Microsoft Azure supports two types of queue mechanisms: **Azure Queues** and **Service Bus Queues**. | Soft layer message queue and IBM WebSphere message queue |
| Development Tools | | AWS Management Console, AWS Toolkit for Eclipse, AWS Toolkit for Microsoft Visual Studio | Netbeans, Eclipse,  IntellIJ, Maven, Git, Jenkins, PyCharm  Google Web Toolkit | SDK’s : .NET,JAVA,Node.js,PHP,Python,Ruby,Mobile,Media Command Line Tools:  Windows Powershell,Azure command-line interface,AzCopy command-line tool for azure storage Migration tools:  Virtual Machine Assessment tools, Azure Websites Migration Assistant. | IBM Bluemix, IBM Domino Designer, Connector for SAP solutions, Integrator for Domino |
| Integration with other services | | S3 (Simple Storage Service) and EC2 (Elastic Compute Cloud) integration, are provided to developers and web service providers. | We can integrate the Google App Engine with all other google cloud services and API’s. | Integration with Microsoft BizTalk server and can also integrate with SaaS applications | CRM, open clove,Sanebox, Ariba,intelecom etc.. |
| Web APIs | | Yes | Yes | Yes | Yes |
| Programming Framework | | .NET  Java  PHP  Python  Ruby | Go  Java  PHP  Python | .NET  Java  Node  PHP  Python  Ruby | Java  Node  Ruby |
| Pricing | Machine CPU | $0.14 / hour | $0.10 / hour | $0.12 / hour | $0.10 / hour |
| Storage | $0.30 / GB / month | $0.15 / GB / month | $0.15 / GB / month | $0.15 / GB / month |
| I/O | $0.01 / 1000 requests | $0.02 / 1000 requests | $0.01 / 1000 requests | $0.01 / 1000 requests |
| Bandwidth | $0.10 / GB | $0.10 / GB | $0.10 / GB | $0.10 / GB |

Cloud Computing Platforms Comparison