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| --- | --- | --- | --- | --- | --- |
|  | | Amazon AWS | Google AppEngin | Microsoft Azure | IBM Smart Business Dev. |
| focus | | Webservicesthat make up a cloud computingplatform. | platform as a service(PAAS) cloud computing platform for developing and hosting web applications in Google-managed data centers | For building, deploying and managing applications and services through a global network of Microsoft-managed datacenters | Enhanced capabilities for collaborative cloud development using Rational Software Delivery Services for Cloud Computing. |
| Infrastructure and virtualization architecture | | Flexibilty to launch applications regardless of use case or industry.  C:\Users\Shashi\Desktop\ASE\Increment2\screens\Capture10.PNG | Use search engine infrastructure with redundancy, global network and products like spanner, flume.C:\Users\Shashi\Desktop\ASE\Increment2\screens\Capture11.PNG | Deploy wide range of open and community driven OS and software solutions.  C:\Users\Shashi\Desktop\ASE\Increment2\screens\Capture12.PNG | Flexible to have public, private, hybrid cloud depending on business needs.  C:\Users\Shashi\Desktop\ASE\Increment2\screens\Capture13.PNG |
| Platforms | | IAAS | PAAS | PAAS, IAAS | IAAS |
| Persistent Storage | | Amazon Elastic Block Store (ELB) | MySQL using cloud SQL, object storage using cloud storage. | Azure Storage | MongoDB,MySQLPostGreSQL. |
| Monitoring | | Amazon cloud watch | Use cloud monitoring API’s. Review performance metrics for cloud services, virtual machines, and common open source servers such as MongoDB, Apache, Nginx, Elastic search, and more. | - | Use IBM smart cloud monitoring tools to monitor the health and performance of private cloud infrastructure. |
| Load Balancing | | Elastic load Balancing (ELB). 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:  **DNS Level**: Load balancing for traffic to different cloud services located in different data centres, to different Azure websites located in different data centres, or to external endpoints. This is done with Traffic Manager and the Round Robin load balancing method.  **Network Level**: Load balancing of incoming Internet traffic to different virtual machines of a cloud service, or load balancing of traffic between virtual machines in a cloud service or virtual network. This is done with the Azure load balancer. | Elastic load Balancing. |
| Message Queues | | Amazon Simple Queue Service (SQS) is a fast, reliable, scalable, fully managed message queuing service. SQS makes it simple and cost-effective to decouple the components of a cloud application. | Push Queues | Azure Data Queues  Service Bus Queues | Web sphere and soft layer message queues. |
| Development Tools | | AWS LAMBDA, AMAZON VPC, AMAZON S3, AMAZON GLACIER, AMAZON EBS. | Eclipse, IntellIJ, Maven, Git | Azure SDK’s, Azure power shell | IBM Domino designer, connector foe SAP solution. |
| Integration with other services | | All services are integrated to work with other AWS | Many API’s available like google maps, contacts,etc. | Many .NET services and line services. Microsoft Azure Biz Talk Services | Sandbox, Open clove, CRM |
| Web APIs | | AMAZON EC2 | Yes | Yes | Yes |
| Programming Framework | | PHP.Java,.NET, Node,Ruby,Python | Go,Java.PHP.Python | .NET,Java,PHP,Python,Ruby,Node | JAVA.Node,Ruby |
| Pricing | Machine CPU | $0.14/hour | $0.10/hour | $0.12/hour | $0.10/ hour |
| Storage (GB) | $0.25/month | $0.15/month | $0.15/month | $0.15/month |
| I/O | $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 |

Cloud Computing Platforms Comparison