CS551: Cloud Computing Services Comparison
Problem Set 5 (PS-5)

Deadline: April 17 (T), 2017
Submit your report Through Blackboard/ProblemSet

Name/ClassID:

The objective of this work is to compare cloud computing providers in terms of some important aspects.

	Amazon AWS	**Google App Engine**	**Microsoft Azure**	**IBM Smart Business Dev.**
Focus	PaaS	Flexible IaaS	IaaS	IaaS
Infrastructure and virtualization architecture	Elastic Block Store (EBS) and QuickSight	Google Persistent Disk and Google Data Studio (Beta)	Azure Storage Disk and PowerBI, PowerBI Embedded	Block Storage
Platforms	Linux, Windows server 2008	Linux, open Solaris, Windows 2003	Windows server 2003 and 2008	Linux and Windows
Persistent Storage	S3, EBS, EFS, Glaciers	Cloud storage and persistent Disk	Blob, Queue, File, Disk storage	Object, File, Mass, Block storage, and servers
Monitoring	CloudWatch, CloudTrail, AWS X-Ray, AWS Usage and Billing Report, AWS Management Console	Google StackDriver, Monitoring, Logging, Error Reporting, Trace, Debugger	Azure portal, Azure Monitor, Azure Application Insights, Azure Billing API, Log Analytics	-
Load Balancing	Classic Load Balancer, Network Load Balancer, Application Load Balancer	Google Cloud Load Balancing	Load Balancer, Application Gateway	Load Balancer

Compare the major cloud service providers (Amazon, IBM, Microsoft, Google)

Click here for Cloud Computing Active Learning References

		Amazon AWS	Google App Engine	Microsoft Azure	IBM Smart Business Dev.
Message Queues		Simple Queue Service (SQS)	Google Cloud Pub/ Sub	Azure Queue Storage, Service Bus Queues, Topics, Relays	Compose for RabbitMQ
Development Tools		GameLift, Lumberyard	-	Visual Studio	-
Knowledge Service (Machine Learning)		Machine Learning, SageMaker	Google Cloud AI, Google Cloud Datalab, Google Cloud Machine Learning Engine	Azure Machine Learning Studio, Azure Machine Learning Workbench	Watson
Web APIs		API Gateway, Elastic Beanstalk, CodeDeploy, CodeCommit, CodePipeline, AWS Developer Tools	Google Cloud Endpoints	API Management, Web Apps, API Apps, Cloud Services, Visual Studio Team Services, Azure Developer Tools, Power Apps	API Connect
Programming Framework		Command Line Interface	Cloud Shell	Azure Command Line Interface (CLI), Azure PowerShell	-
Pricing	Machine CPU	E2C = 0.0058-0.371	n1 = 0.0475-4.56	B15 = 0.009 F2 = 0.0063	-
	Storage	S3 standard $0.0125/GB	multi regional =0.26, headline storage = 0.01	1-50 TB = 0.0184	0.499.99 = 0.03
	I/O	Based on Number of requests. 0.10 per mill	Varies by server port	Based on request	Based on Usage

	Bandwidth	$90, 1TB/ month	$0-12 per GB	$0.09 per GB	$0.76 per GB