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A Cloud Comparison: Microsoft Azure, AWS & Google Cloud

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Introduction

- A recruiting software company, whose goal is to help businesses source the best talent available has become wildly popular.
- As a result of the rapid growth, they look to exceed their ability to rely wholly on Excel as it provides multiple versions of the data, making it unreliable.
- They need a solution that would improve both accuracy and efficiency.
- Our target is to make the company a cloud-based recruiting software company by recommending the best cloud for their business based on the requirements.
- A cloud comparison of Microsoft Azure, Amazon Web Services and Google Cloud is thus performed.

An Overview

- User Stories in JIRA
- Identified the requirements of the enterprise
- Prepared a feature comparison matrix of Microsoft Azure, AWS and Google Cloud
- Recommended the most suitable cloud technology

User Stories

- As a team, we want to select a business and gather requirements so that we can analyze the three clouds as per customer's requirements.
- As a team, we want to decide the features so that we can create a feature comparison matrix of the three cloud technologies.
- As a team, we want to track our progress using JIRA software so that we can complete our project on time.
- As a team, we want to analyze Amazon Web Services so that we know the pros and cons of the cloud technology as per the user's requirements.

User Stories

- As a team, we want to recommend the most suitable cloud technology to the company based on our analysis.
- As a team, we want to create a final presentation to present our findings and analysis.
- As a team, we want to select a topic for the project and get it approved so that we can plan our implementation
- As a team, we want to decide on a clear problem statement so that we can finalize the project goals.

User Stories

- As a team, we want to analyze Microsoft Azure so that we know the pros and cons of the cloud technology as per the user's requirements.
- As a team, we want to analyze Google Cloud so that we know the pros and cons of the cloud technology as per the user's requirements.
- As a team, we want to create a feature comparison matrix of the three cloud technologies so that we can analyze which one fits the requirements of the company.

Requirements

Mandatory	Optional
End user and provider access The platform should provide user authentication and system administrator to access restricted information.	**Availability** The platform should be available at all times. As per SLA, the uptime should be more for customers.
Backup & Recoverability The platform should be able to do automatic backups and provide data recovery in case of data loss or data center failure.	**User Interface** The platform should be easy to learn and use.
Reliability The platform should be reliable.	**Scalability** The platform should provide easy procedures to increase or decrease the resources (capacity, CPU) as per the workload requirements.
Logging The platform should provide log of user activity and audit trail in the event of security breach, to help the system manager establish what damage has been done and take measures to prevent future breaches.	**Bulk Transfer** The platform should be able to transfer large volume of data, i.e. be flexible for migration.
Threat Management The platform should provide procedures for evaluating and responding to identified security threats.	**Reporting** The platform should provide reports on usage and performance of the system.
Maintainability The platform should not take too many resources for maintaining it.	

Feature Comparison Matrix

Features	AWS	Microsoft Azure	Google Cloud
Pricing **- Costs related to the installation and maintenance of the cloud.**			
Pricing Model	Pay as you go 12 month Free Tier **$300** Credit	Pay as you go 12 month Free Tier **$200** Credit	Pay as you go 12 month Free Tier **$300** Credit
Licensing Cost	Buy license from AWS or BYOL	Buy license from Microsoft or BYOL	Buy license from Google or BYOL
Total Cost of Ownership (TCO)	TCO Calculator Trusted Advisor	Azure TCO Calculator	No
Education and Training Cost	Certification - **$150** Digital classroom – free	Certification - **$150** Digital classroom – free	Certification - **$200** Digital classroom – free
Support Plans	Around $30 to $15,000	From $30	From $30
Price Protection	No	No	No

Feature Comparison Matrix

Compliance - **Terms and conditions that the customers need to observe**			
Unique Compliance Requirements	Strong relationship with global agencies. Lacks enterprise experience.	Proclaims to have more certifications than “any other provider”.	Still expanding.
Log and Audit Trail	CloudTrail - security analysis, understands AWS API call history AWS Config - provides audit compliance CloudWatch - monitors system, applications and log files	Provides centralized monitoring, logging and analysis, timely alerts and reports.	Cloud Logging Audit - maintains two audit logs: Admin Activity and Data Access
Recovery	DynamoDB - automatic and encrypted backup upto 25 GB. It is scalable (can create as many back ups)	Central monitoring Role based Access Control Instant Restore	Cloud SQL - automatic backups Retains upto 7 automatic backups each instance
Business Continuity & Disaster Recovery	4 level Disaster recovery	Site recovery. Reduces application downtime during IT interruptions	Warm standby, cold standby and hot standby

Feature Comparison Matrix

Security - **how secure is your data**			
Transparency	AWS Identity and Access Management allows user to monitor his data	Provides a clear explanation where your data is stored	GCP publishes all there data centers which are highly available and secure
Confidentiality	Multi-factor Authentication	The data is protected inside a Trusted Execution Environment(TEE)	Rejects invalid requests
Integrity	Log file integrity validation	Backup & Restore integrity checks Automatic page repair	Detects security breach
Access Controllability	AWS Identity and Access Management(IAM) controls user's access to AWS	Azure Active Directory(AD), multi tenant, cloud based directory & IAM service.	Allows access to data whenever you want
Loss of Data Protection	DLP policies Encrypting AWS S3 policies Monitoring AWS S3.	Azure Info Protection:protects sensitive info continuously DLP policies.	Cloud DLP API

Feature Comparison Matrix

Storage - **How well is the storage capability provided by cloud service to its customer**			
Compute	**Elastic Compute Cloud:** 750 hours/mo of t2.micro instances for upto 12 months. **Container services:** Offers virtual private cloud option for running and scaling web applications.	**Virtual Machines:** 750 hours/mo of Windows /Linux B1S VM for a year. **Additional services:** Cloud services for scalable web apps similar to AWS in addition to service specially designed for apps with microservices architecture.	**List of compute services shorter than both.** **Compute Engine** 1 f1-micro instance/mo upto 12 mpnths. **Focus on Kubernetes** Since less services, extra expertise in this area.
Key Tools	Pagemaker to Serverless	Supporting MSFT Software	IoT to serverless
Type of Storage	AWS S3	Blob Storage Queue Storage	Cloud Storage Persistent Disk

Feature Comparison Matrix

Customer Support - **How well the vendor supports its customers**			
Availability of online training, documents and tutorials	AWS Certification and Training Partner Training AWS Academy AWS Educate	Azure Certification Azure Documentation	Google Cloud Certification . Google Cloud Documentation Technical Support
Learning effort	Depending on the course chosen, 6hr - 3 days	1 - 3 days	Depending on the track chosen, 1 day - 4 days
Free trainings/ learning tools	Digital Training Documentation	Free online courses Microsoft Azure Documentation	Community groups Documentation
External faculty requirement	Professionals and experts for AWS Academy and AWS Educate	Professionals and experts for Microsoft Learning	Rackspace Managed Services for GCP
Ease of learning/ self-explanatory tools	Available	Available	Available

Feature Comparison Matrix

Others - **Some additional features which we will be considering**			
Analytics	**Elastic MapReduce** Friendly to a variety of analytics software. Facilitates running third-party frameworks.	**HDInsight**, basically Hadoop on Azure supports variety of Apache offerings.	**Analytics Engine** contains various products like MapReduce, BigQuery and Cloud Dataflow.
Resources	Manage,tag,move,lock and monitor resource groups	Manage,tag,move,lock and monitor resource groups.	Two fold resource hierarchy, resources managed using Resource Manager
Configuring Solutions to meet needs	Deployment architecture as per the scenario	Deployment architecture as per the scenario	Deployment architecture as per the scenario
Robust Integration	iaaS(AWS Integration as a service)	iPaaS (Microsoft Azure Integration platform as a service)	Google Cloud Functions, GCP's functions as a service (FaaS)
SLA	99.9% SLA.	99.5% SLA.	99.5% SLA
Deployment	AWS offers multiple	Enterprise can be	GCP offers multiple

Our Recommendation

Microsoft Azure!

Why?

- Azure has been designed based on Security Development Lifecycle (SDL)
- Azure is more enterprise oriented
- Azure provides stronger PaaS capabilities.
- Enterprise Agreement Advantage
- Unique Compliance Requirement
- Gentle Learning Curve

References

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