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CC Assignment 2

1. Explain briefly the role of Automated Scaling listener and Load Balancer in cloud mechanism

Ans : The automated scaling listener mechanism is a service agent that monitors and tracks communications between cloud service consumers and cloud services for dynamic scaling purposes. Automated scaling listeners are deployed within the cloud, typically near the firewall, from where they automatically track workload status information.

Workloads can be determined by the volume of cloud consumer-generated requests or via back-end processing demands triggered by certain types of requests. For example, a small amount of incoming data can result in a large amount of processing.

Automated scaling listeners can provide different types of responses to workload fluctuation conditions, such as:

* Automatically scaling IT resources out or in based on parameters previously defined by the cloud consumer (commonly referred to as auto-scaling).
* Automatic notification of the cloud consumer when workloads exceed current thresholds or fall below allocated resources. This way, the cloud consumer can choose to adjust its current IT resource allocation.

A load balancer may be:

* A physical device, a virtualized instance running on specialized hardware or a software process.
* Incorporated into application delivery controllers (ADCs) designed to more broadly improve the performance and security of three-tier web and microservices-based applications, regardless of where they’re hosted.
* Able to leverage many possible load balancing algorithms, including round robin, server response time and the least connection method to distribute traffic in line with current requirements.

Regardless of whether it’s hardware or software, or what algorithm(s) it uses, a load balancer disburses traffic to different web servers in the resource pool to ensure that no single server becomes overworked and subsequently unreliable. Load balancers effectively minimize server response time and maximize throughput.

2. Discuss briefly on Resource Management System on cloud Management

Ans : Resource management is the process of allocating computing, storage, networking and indirectly energy resources to a set of applications, in the context that looks to jointly meet the performance objectives of the infrastructure providers, users of the cloud resources and applications. The objectives of the cloud users tend to focus on application performance. The conceptual framework provides a high level view of the functional component of cloud resource management systems and all their interactions. This field is classified into eight functional areas or we can say that resource management activities which are as follow: Global planning of virtualized resources, Resource demand profiling, Resource exercise estimation, Resource pricing and profit maximization, Local scheduling of cloud resources, Application scaling and provisioning, Workload management, Cloud management systems

3. Explain in brief about Amazon Web Services (AWS) cloud. Elaborate on the various services offered by this cloud provider

Ans :Amazon Web Services, Inc. (AWS) is a subsidiary of Amazon providing on demand cloud computing platforms and API to individuals, companies, and governments, on a metered pay-as-you-go basis. These cloud computing web services provide a variety of basic abstract technical infrastructure and distributed computing building blocks and tools. One of these services is Amazon Elastic Compute Cloud (EC2), which allows users to have at their disposal a virtual clusters available all the time, through the Internet. AWS's virtual computers emulate most of the attributes of a real computer, including (CPUs) and (GPUs) for processing; local/RAM memory; hard-disk/ ssd Storage; a choice of operating systems; networking; and pre-loaded application software such as web servers, database and (CRM).

The AWS technology is implemented at server farms throughout the world, and maintained by the Amazon subsidiary. Fees are based on a combination of usage (known as a "Pay-as-you-go" model), hardware, operating system, software, or networking features chosen by the subscriber required availability, redundancy, security and service options. Subscribers can pay for a single virtual AWS computer, a dedicated physical computer, or clusters of either. As part of the subscription agreement, Amazon provides security for subscribers' systems. AWS operates from many global geographical regions including 6 in North America.

LIST OF SERVICES OFFERED BY AWS

Analytics : Analytics has been a primary source of growth for businesses. Data is always valued as it gives valuable information. Customers need a fast and scalable system to handle a big amount of data and provide useful insights. It offers a variety of applications for this purpose. Amazon EMR provides the Hadoop framework big data. Amazon Kinesis helps in analyzing real-time streaming data. AWS Data pipeline. Glue provide pipeline structures schedule data load and processing. AWS provides many more applications for almost every operation.

Storage : The data need to be stored somewhere to process it. It offers storage in three broad categories: object, block, and file storage. Amazon Simple Storage Service (S3) provides scalable data storage with backup and replication. Amazon Glacier offers storage for archived data and affordable retrieval. AWS backup service manages the backup of data. It automates the backup process. Apart from these applications AWS storage offers other services also.

Compute : Compute service is necessary for running any organization. The computer is necessary from hosting a complete web app to executing a function in a serverless environment. It offers a comprehensive portfolio for computing services like Amazon Elastic Compute Cloud (EC2) provides virtual servers or instances for computing. It is auto-scalable as per the requirement. Amazon Elastic Container Service is a high-performance container service that supports Docker containers. [AWS Lambda offers](https://www.educba.com/what-is-aws-lambda/) serverless computing to run applications. Lightsail is an easy-to-use service that provides virtual servers, storage, DNS management, etc. It provides all the services required for the development of applications.

Blockchain : [Blockchain is the new technology](https://www.educba.com/what-is-blockchain-technology/) that helps customers work with multiple parties to maintain a verified transaction record. Amazon Managed Blockchain creates and manages a blockchain network. In addition, Amazon Quantum Ledger Database (QLDB) offers a fully managed ledger database to maintain transactions.

Database : A database can be used to store structured data. It provides a broad range of database services to supports relational and non-relational databases. In addition, it offers a service to handle all application-specific use cases. Amazon Relational Database Service provides a fully managed database service that includes Oracle, SQL, MySQL, etc. Amazon Aurora offers a high-performance, fully managed relational database service. Amazon Timestream provides a fully managed time-series database. Amazon DynamoDB provides database services for the [NoSQL database](https://www.educba.com/what-is-nosql-database/). Along with these databases, AWS offers many other database services to support almost every type of requirement.

Developer Tool : Developer tools help a developer to deliver software quickly and safely. It [helps DevOps](https://www.educba.com/what-is-devops/) to automatically build, test and deploy the application in different environments. It also helps in maintaining source code and version control. AWS Codestar helps the user set up a continuous delivery pipeline in minutes. AWS X-Ray helps to debug production applications. With the help of an X-Ray, the user can analyze and identify performance issues and application components. [AWS CodeCommit provides](https://www.educba.com/aws-codecommit/) fully managed private GIT repositories to store code and manage versions. Apart from these services, AWS provides AWS CodePipeline, AWS CodeBuild, AWS CodeDeploy, AWS CLoud9 to support development and deployment.

Networking and Content Delivery : AWS is a [virtual private cloud](https://www.educba.com/virtual-private-cloud/); it offers services over a network. Hence it ensures that AWS can run any workload over the network with security, performance, manageability, and availability. It offers a set of resources over the network by connecting it privately. It gives administrative control to users over a virtual network. It provides an application for load balancing in the networks. It also offers DNS to route end users to the application.

Security, Identity, and Compliance : While offering services over internet security is the utmost priority. With AWS Identity and access management, users can control user access and [manage encryption keys](https://www.educba.com/what-is-encryption/). [AWS Firewall Manager helps](https://www.educba.com/aws-firewall-manager/) manage firewall rules for applications. Amazon Inspector is an automated security scan that helps in improving the security and compliance of applications. Amazon Macie is a machine learning-powered service to identify, classify and protect sensitive data. Apart from these security check services, AWS provides a lot more applications to keep the hosted applications secure and safe.

Machine Learning : Learning from existing data is called [machine learning or artificial intelligence](https://www.educba.com/machine-learning-vs-artificial-intelligence/). AWS offers a wide range of services and pre-defined models for AI. Amazon SageMaker provides services to quickly build, train and deploy models at a big scale. It also supports custom model building. Amazon Recognition is used to analyze images and videos. Along with these, AWS offers ML service for speech recognition, language translation, chatbots, and many other scenarios, with high speed and scalability.

4. Explain in brief about Google App Engine. Elaborate on the various services offered by this cloud provider

Ans :Google App Engine (often referred to as GAE or simply App Engine) is a [cloud computing](https://en.wikipedia.org/wiki/Cloud_computing) [platform as a service](https://en.wikipedia.org/wiki/Platform_as_a_service) for developing and hosting [web applications](https://en.wikipedia.org/wiki/Web_application) in Google-managed [data centers](https://en.wikipedia.org/wiki/Data_center). Applications are [sandboxed](https://en.wikipedia.org/wiki/Sandbox_(computer_security)) and run across multiple servers. App Engine offers automatic scaling for web applications—as the number of requests increases for an application, App Engine automatically allocates more resources for the web application to handle the additional demand.

Google App Engine primarily supports [Go](https://en.wikipedia.org/wiki/Go_(programming_language)), [PHP](https://en.wikipedia.org/wiki/PHP), [Java](https://en.wikipedia.org/wiki/Java_(programming_language)), [Python](https://en.wikipedia.org/wiki/Python_(programming_language)), [Node.js](https://en.wikipedia.org/wiki/Node.js), [.NET](https://en.wikipedia.org/wiki/.NET_Framework), and [Ruby](https://en.wikipedia.org/wiki/Ruby_(programming_language)) applications, although it can also support other languages via "custom runtimes". The service is free up to a certain level of consumed resources and only in standard environment but not in flexible environment. Fees are charged for additional storage, [bandwidth](https://en.wikipedia.org/wiki/Bandwidth_(computing)), or instance hours required by the application. It was first released as a preview version in April 2008 and came out of preview in September 2011.

Google App Engine has following services (or you may call it libraries or APIs):

* App Identity
* Cloud Storage Client Library
* Datastore
* Logging
* Mail
* Memcache
* Multitenancy
* Search
* Task Queue
* URL Fetch
* Users
* Blobstore
* Capabilities
* Channel
* Endpoints
* Images
* Logservice
* OAuth
* Remote
* XMPP

5. Explain in brief about Microsoft Azure. Elaborate on the various services offered by this cloud provider

Ans : Microsoft Azure is a [cloud computing](https://en.wikipedia.org/wiki/Cloud_computing) service operated by [Microsoft](https://en.wikipedia.org/wiki/Microsoft) for application management via Microsoft-managed [data centers](https://en.wikipedia.org/wiki/Data_center). It provides [software as a service (SaaS)](https://en.wikipedia.org/wiki/Software_as_a_service), [platform as a service (PaaS)](https://en.wikipedia.org/wiki/Platform_as_a_service) and [infrastructure as a service (IaaS)](https://en.wikipedia.org/wiki/Infrastructure_as_a_service) and supports many different [programming languages](https://en.wikipedia.org/wiki/Programming_language), tools, and frameworks, including both Microsoft-specific and third-party software and systems.

Azure, announced at Microsoft's Professional Developers Conference (PDC) in October 2008, went by the internal project codename "Project Red Dog",[[5]](https://en.wikipedia.org/wiki/Microsoft_Azure#cite_note-:1-5) and formally released in February 2010, as Windows Azure before being renamed to Microsoft Azure on March 25, 2014

* [Virtual machines](https://en.wikipedia.org/wiki/Virtual_machine), [infrastructure as a service](https://en.wikipedia.org/wiki/Infrastructure_as_a_service) (IaaS) allowing users to launch general-purpose [Microsoft Windows](https://en.wikipedia.org/wiki/Microsoft_Windows) and [Linux](https://en.wikipedia.org/wiki/Linux) virtual machines, as well as preconfigured machine images for popular software packages.

Most users run Linux on Azure, some of the many [Linux distributions](https://en.wikipedia.org/wiki/Linux_distribution) offered, including Microsoft's own [Linux](https://en.wikipedia.org/wiki/Linux_kernel)-based [Azure Sphere](https://en.wikipedia.org/wiki/Azure_Sphere).

* App services, [platform as a service](https://en.wikipedia.org/wiki/Platform_as_a_service) (PaaS) environment letting developers easily publish and manage websites.
* [Websites](https://en.wikipedia.org/wiki/Microsoft_Azure_Web_Sites), Azure Web Sites allows developers to build sites using [ASP.NET](https://en.wikipedia.org/wiki/ASP.NET), [PHP](https://en.wikipedia.org/wiki/PHP), [Node.js](https://en.wikipedia.org/wiki/Node.js), [Java](https://en.wikipedia.org/wiki/Java_(programming_language)), or [Python](https://en.wikipedia.org/wiki/Python_(programming_language)) and can be deployed using [FTP](https://en.wikipedia.org/wiki/File_Transfer_Protocol), [Git](https://en.wikipedia.org/wiki/Git_(software)), [Mercurial](https://en.wikipedia.org/wiki/Mercurial), [Team Foundation Server](https://en.wikipedia.org/wiki/Team_Foundation_Server) or uploaded through the user portal. This feature was announced in preview form in June 2012 at the Meet Microsoft Azure event. Customers can create websites in PHP, ASP.NET, Node.js, or Python, or select from several open source applications from a gallery to deploy. This comprises one aspect of the [platform as a service](https://en.wikipedia.org/wiki/Platform_as_a_service) (PaaS) offerings for the Microsoft Azure Platform. It was renamed to Web Apps in April 2015.
* WebJobs, applications that can be deployed to an App Service environment to implement background processing that can be invoked on a schedule, on demand, or run continuously. The Blob, Table and Queue services can be used to communicate between WebApps and WebJobs and to provide state.