TWKSAA SKILLS CENTER

Foundation Day
30-09-2023

त्वक्सा कौशल केंद्र

TWKSAA AWS CLOUD

- आप एक सागर हो बहते नदी का जल नहीं आप एक बदलाव हो भटकाव की कोई राह नहीं
- उस रास्ते पर चलो जिस रास्ते पर भीड़ कम हो (हर काम हो कुछ अलग)
- देश की मिट्टी से करो आप इतना प्यार जहाँ जाओ वहाँ मिले खूब इज्जत और सम्मान
- छह दिन कीजिए अपना काम एक दिन कीजिए त्वक्सा को दान
- त्वक्सा एक चिंगारी हैं हर जगह जलना हम सब की जिमेवारी हैं

Er. Rajesh Prasad • **Motive: - New (RID PMS & TLR)**

"त्वक्सा aws क्लाउड के इस पुस्तक में आप aws क्लाउड के संबंध में सभी बुनियादी अवधारणाएँ सीखेंगे। मुझे आशा है कि इस पुस्तक को पढ़ने के बाद आपके ज्ञान में वृद्धि होगी और आपको कंप्यूटर विज्ञान के बारे में और अधिक जानने में रुचि होगी"

"In this TWKSAA aws cloud book you will learn all basic concept regarding aws cloud. I hope after reading this book your knowledge will be improve and you will get more interest to know more thing about computer Science".

"Skill कौशल एक व्यक्ति के पास उनके ज्ञान, अनुभव, तत्वशास्त्रीय योग्यता, और प्रैक्टिकल अभियांत्रिकी के साथ संचित नौकरी, व्यापार, या अन्य चुनौतीपूर्ण परिस्थितियों में सक्रिय रूप से काम करने की क्षमता को कहते हैं। यह व्यक्ति के द्वारा सीखी जाने वाली कौशलों की प्रतिभा, क्षमता और निपुणता को संक्षेप में व्यक्त करता है"।

TWKSAA RID MISSION

(Research)	(Innovation)	(Discovery)
अनुसंधान करने के महत्वपूर्ण कारण:	**नवीनीकरण करने के महत्वपूर्ण कारण:**	**खोज करने के महत्वपूर्ण कारण:**
1. नई ज्ञान की प्राप्ति	1. प्रगति के लिए	1. नए ज्ञान की प्राप्ति
2. समस्याओं का समाधान	2. परिवर्तन के लिए	2. ज्ञान के विकास में योगदान
3. तकनीकी और व्यापार में उन्नति	3. उत्पादन में सुधार	3. अविष्कारों की खोज
4. विकास को बढ़ावा देना	4. प्रतिस्पर्धा में अग्रणी होने के लिए	4. समस्याओं का समाधान
5. सामाजिक प्रगति	5. समाज को लाभ	5. समाज के उन्नति का माध्यम
6. विज्ञान और प्रौद्योगिकी का विकास	6. विज्ञान और प्रौद्योगिकी के विकास।	6. विज्ञान और तकनीक के विकास

"TWKSAA Skills Center is Learning Earning and Development Based Skill Center."

त्वक्सा कौशल केंद्र सीखने कमाई और विकास आधारित कौशल केंद्र है।

Index

Definition: - A Cloud is an aerosol consisting of a visible mass of miniature liquid droplets from frozen crystal.

Cloud Term: - Origin of the term "cloud" can be found in the old English words clud or cold meaning a hill a mass of stone. 13th century word come to be used as a metaphor for rain clouds.

Computing: - it is any goal-oriented activity requiring benefiting from or crating computing machinery, Computing is indexing the study and experimentation of algorithmic process, and development of both hardware & software, the term "computing" is also synonymous with counting and

Cloud Computing: - Cloud Computing is the on-demand delivery of compute power database, storage, application and other it-Resource through a cloud service provider like (AWS, AZURE, GCP etc.) via internet with pay-as-as-you-go pricing model. The main enabling technology for cloud computing is virtualization.

History: - Cloud term was used to platform for distributed computing as early as 1993.

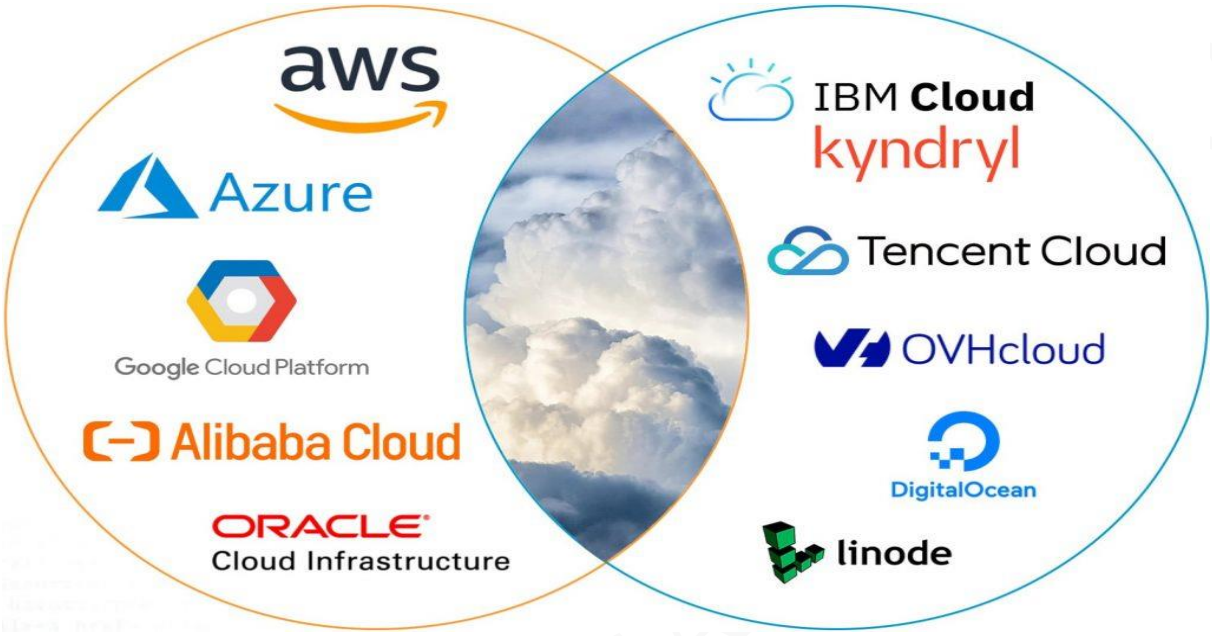
Characteristics: - 1.cost reduction 2. Device and location independence 3. maintained 4. multitenancy 5.performace 6. productivity, Availability scalability & security. According to national institute of standards and technology 1. On-demand self-service 2. broad network access 3.resource pooling 4. Rapid elasticity 5. measure service

Service model: 1. IAAS 2. PAAS 3. SAAS 4. MBAAS Mobile backend as a service 5. Backend as a service 6.FAAS: -serverless computing function as -a – service

Deployment Models: - 1. Private cloud 2.public Cloud 3.hybrid cloud 4.comunity cloud 5.distributed cloud 6. Multicloud cloud 6.poly cloud 8.big data cloud 9.HPC cloud

Similar concept: - client-server model 2. computer bureau 3.grid computing fog computing utility computing, peer-to peer , cloud sand ox

Cloud Service Provider



AWS: - Amazon web service it is cloud service provider. Provided by amazon company

Cloud Computing: - Cloud Computing is the on-demand delivery of compute power, database, storage, application and other it-Resource through a cloud service provider like AWS, AZURE, GCP etc.) via internet with pay-as-as-you-go pricing model

History: - 2003 1st time Pihan (student) introduce in Research Paper aws official launch in 2006 by amazon company and in 2013 start certification 1). Solution Architect a. Associate professional 2.AWS-Devops (a. Associate & b. professional .3.AWS-sysops (a. Associate b. professional)

AWS service model :- 1.IAAS 2. PAAS 3.SAAS

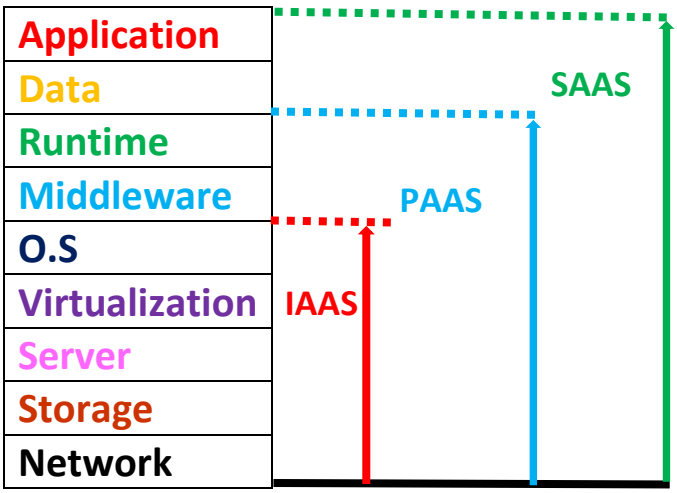
IAAS: - infrastructure as-a service

PAAS:- Platfrom as -a service

SAAS:- Software as-a service

AWS Deployment Model: - 1). Public Cloud
2). Private Cloud
3). Hybrid Cloud

AWS Service: - 1). Computing (EC2)
2). Networking (VPC)
3). Storage 4.DB
5). Application services
6). Deployment
7). Management
8).MI, AI, IOT
9). Developer tools etc.....



AWS service model: - 1. IAAS 2. PAAS 3. SAAS

1. IAAS

- IAAS Stands for infrastructure as a service. The compute instance and network infrastructure required for hosting the applications are provided as part of the IAAS. like

1. Compute instance
2. Network infrastructure
 - Routers
 - Gateways
 - VPN
 - subnets
 - virtual private networks
 - firewalls
3. load balancers
4. DNS registries
5. DNS service
6. IP address
7. cloud storage

2. PAAS

- PAAS stands for platform as a service. For our applications to execute or run on a machine we need the language software or application servers to be available. unless otherwise our applications will not run on the underlying machine. The software's that acts as a base/foundation on which the applications software's run on top of them are called "platform software's" for Ex-

1. all the language software
1.1 java SDK
1.2 python SDK
1.3 PHP SDK etc
2. all the application servers or middleware's on which our applications work
1.1 tomcat/WebLogic/WebSphere servers etc
1.2 wsgi /asgi servers
1.3 lamp / xamp server etc
3. database servers like
3.1 mysql server
3.2 postgres sql
3.2 postgres sql server
3.3 oracle etc.

3. SAAS

- SAAS stands for Software as a Service. How does the business organizations has to use these Enterprise Software Applications that are pre-built and are ready for usage?

For e.g..

1. SAP
2. Oracle EBusiness Suite
3. JDEdwards
4. Peoplesoft
5. Salesforce
6. Sibel CRM
7. Microsoft Dynamics
8. Taleo
9. Oracle Apps

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Characteristic of AWS: -

1). On-Demond self-service
2). Broad Network Access
3). Scalability
4). Resource Pooling
5). Measured Services

Definition: - EC2 (Elastic Cloud Compute) Means Server. Instance Means: - Server or Virtual Machine.

"Compute" Means ऐसी मशीन जो समझने की क्षमता रखता हो जो things को पढ़कर output दे सके |

-EC2 Provides scalable computing capacity in AWS Cloud. It's enables scale-up or scale-down the Instance.

-**Amazon EC2 is having two storage option 1. EBS (Elastic Block Storage) 2. Instance Storage**

EBS (Elastic Block Storage): - "Network attaché" it's attaché with running instance.

Instance Storage: - "Direct attaché" it's physically attaché with host server.

AMI: - "Amazon Machine Image" pre-configured templates are available know as AMI. (Operating System)

Instance Type: - "Combination of CPU & RAM

EC2 Instance = AMI + INSANCE TYPE + EBS VOLUME

EC2 Types: -

EC2 Instance TWKSAA

1) General Purpose -Balanced Memory and CPU
2) Compute Optimized - More CPU than RAM (Processing)
3) Memory Optimized - More RAM (Performance)
4) Storage Optimized - Low Latency
5) Accelerated Computing /GPU - Graphics Optimized
6) High Memory - High RAM, Nitro System Hypervisor
7) Previous Generation

1). General Purpose Ec2 Instance: - General Purpose instance provide balance of compute memory and networking Resource and can be used for a variety of workloads. **Series: -** (A-Series, M-series & T-series) **A-series** { A1} **M-series**{ M4,M5.M5a, M5ad & M5d} **T-series** { T2-micro, T3 , T3a }

2). Compute Optimized Ec2 Instance: - it is ideal for compute-bound application that benefit from high performance processors **Series: -** C-Series {C4,C5 & C5n)

3). Memory Optimized Ec2 Instance: - it is designed to delivered fast performance for workloads that process large data. **Series: -** (R-series, X-series & Z-series) **R-Series**{ R4,R5, R5A R5ad & R5d} **X-series** { X1 & X1e}

4). Storage Optimized Ec2 Instance: - it is designed for workloads that requires high sequential read & write access to very large data sets on locate storage. **Series: -** (I-series, D2-series & H1-series) **I-Series**{ I3, & I3en}

5). Accelerated Computing /GPU Ec2 Instance: - it is co-processors some function such as floating point number calculation graphics processing or data pattern matching more efficient than is possible in software running on CPU.
Series: - (P(p2 &p3)-series, G(g2 &g3)-series & F (f1)-series)

6). High Memory Instance: - it is used only for dedicated host minimum for 3 Years. Not have in virtualization

Definition: - VPC-virtual private cloud is a virtual network closely resembles a traditional networking that VPC operate in your own data centre with the benefits of using the scalable infrastructure of AWS. Or VPC is a virtual network or data centre inside AWS for one client. VPC is region specific.

Limit: - Maximum 5 VPC and 200 Subnet can be created in AWS in one region.

Once we create VPC DHCP (Dynamic Host Configuration Protocol, NACL(Network Access Control list) and Security Group. Will be automatically created.

Types of VPC: - 1. Default VPC 2. Custom VPC

-**Default VPC: -** Created in each AWS region when an AWS account is created has it's own default CIDR, Security Group, NACL, Subnet Routing Table and internet Gateway.

-**Custom VPC: -** AWS user creating the Custom VPC.

Components of VPC: - 1). CIDR& IP address subnet 2). Implied Router & Routing Table 3). Internet Gateway 4). Security Group 5). NACL 6. Virtual Private Gateway 7). Pairing connection 8). Elastic IP

CIDR (Classless Inter Domain Routing): - It is Method for allocating IP address.

Subnet: - it is Technique to save ip address **Subnetting**: - Network with in network.

- It is Availability Zone Specific. There are two types of Subnets.

-**Private Subnet: -** if a subnet does not have a route to the internet gateway.

-**Public Subnet: -** if a subnet traffic is route to an internet.

Routing Table: - It is a central Routing Function.

-**Work: -** Connects different AZ Together & connects VPC to the internet Gateway.

Internet Gateway: - internet gateway is a virtual router that connects a VPC to the internet

NAT Gateway: - Network Address Translation Gateway is translate Private Ip to Public IP Vice-versa

Used: - NAT Gateway used both Elastic IP & Public IP But used only elastic IP. It is always created inside "Public Subnet" But NAT Gateway worked for Private Subnet.

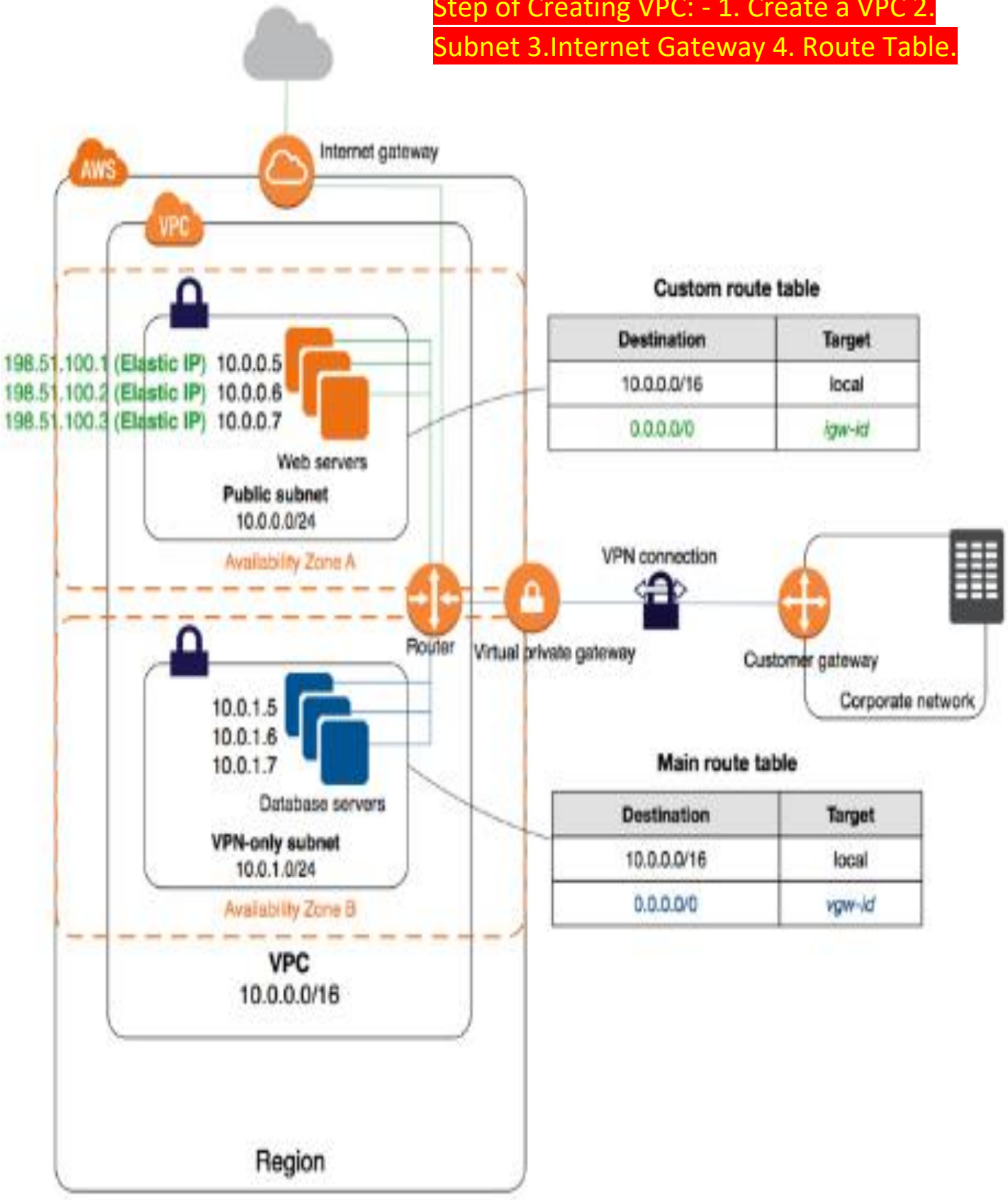
VPC TWKSAA

Security Group: - it is a virtual firewall works at ENI level (Means It's Applied on Instance in Subnet level). It is stateful (Inbound, Outbound) it can only permit rule can not deny rule.

NACL: - It is also a kind of security. it's work on VPC level. It is a function performed on the implied Router. It is stateless. It's operated at subnet level.

VPC Peering: - it's mean's two different VCP communication after make PVC peering. Transitive Peering not possible.

Step of Creating VPC: - 1. Create a VPC 2. Subnet 3.Internet Gateway 4. Route Table.



Definition: - storage is a physical or virtual location or space for storing data, files, application etc.

Block Storage: - it is suitable for translational DB, random read/write loads and structured DB storage.

Block storage divides data to be stored in evenly sized Blocks. OS can install, Example: - EBS

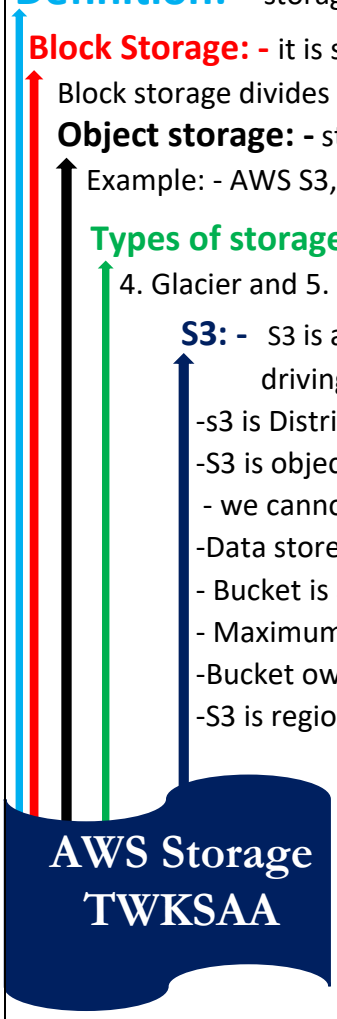
Object storage: - stores the files as a whole and does not divide them, data itself, its metadata, Unique ID

Example: - AWS S3, Dropbox

Types of storage: - 1. S3(simple storage service) 2. EFS (Elastic file system 3. Elastic Block storage (EBS) 4. Glacier and 5. Snowball.

S3: - S3 is a Storage for the internet it has simple Web Services interface for simple storage and driving of any amount of data anytime from anywhere on the internet.

-s3 is Distributed data store architecture where object is redundantly stored in multiple location.
-S3 is object-based storage.
- we cannot install OS on s3.
-Data stored in Bucket.
- Bucket is a flat container of object, we cannot create Nested Bucket.
- Maximum capacity of a Bucket is 5TB. (100 Bucket)
-Bucket ownership can not transfer.
-S3 is region specific not AZ specific. (Global service)



S3 bucket sub-resources: -

1.Life cycle: - to decide an objects lifecycle management.
2.website: - to hold configuration related to static website hosted in s3 buckets
3.verssioning: - it is used to protect against accidented object / data deletion or overwrites
4.Access control: - Bucket Policies

S3 Objects: -

-objects size is an s3 buckets can be 0 bytes to 5 TB.
-Each object is stored and retrieved by a unique key (id or name).
-an object in AWS s3 is uniquely identified and addressed through this following basis
1.service end point (Means region or where keep bucket)
2.bucket name
3.object key(name)
4.object version

S3 Bucket Versioning: -

- it is used to protect against accidented object / data deletion or overwrites
-versioning can also be used for data retention and archive.
-when enabled versioning will protect existing and new objects and maintains their versions as they are updated
-Delete Marker
-incremental versing
-Bucket versioning (only can enable and suspend can't disable)
1. Enabled
2.Suspended
3.Un-versioned (when create bucket)
-Version id Null (Before Versioning)

S3 Buckets versioning - MFA (Multifactor Authentication) Delete

-MFA Delete is a versioning capacity that adds another level of security in case your account is compromised
-this adds another layer of security for the following
1.changing bucket versioning state
2.permanently deleting or objects version
-**MFA Delete Requires** (when it is enabled)
1.security credentials
2.the code displayed on an approved physical or software-based authentication device

S3 Multiport upload: - ("इसका purpose है जल्दी डाटा को store करना यहाँ पर Parallel Processing होता हैं ")

-it is used to upload an object in parts
- parts are upload independently and in parallel in any order
-it is recommended for objects sizes of 100 mb or large
-you must use it for objects larger than 5GB
-This is done through s3 Multipart upload API

Copying S3 Objects: -

-the copy operation creates a copy of an object that is already stored in Amazon S3.
- you can create a copy of your object up to 5GB in size in a single "atomic operation" (not break)

Use the copy operation when: -

1.General additional copies of the subject
2.Renaming object
3.chaging the copy's storage class or encrypt it at rest
4.move object across AWS location/region
5.change object metadate (user meta data, system meta data)

Storage classes of Amazon s3: -

1. Amazon S3-Standard
2. Amazon S3 Intelligent tiering
3. Amazon s3 one-Zone -IA
4. Amazon s3 Standard infrequent access (Standard-IA)
5. Amazon Glacier (long term storage)
6. Amazon S3 Glacier Deep Archive (Cheapest)

1.Amazon s3-Standard: -

-S3 standard offers high durability availability and performance object storage for frequently accessed data
- Durability=99.9999999999
- Availability=99.99 %
-support SSL for data in-transit and encryption of data at rest
-the storage cost for the object is fairly high, but there is very less charge for accessing the objects

2.Amazon S3 Intelligent tiering -

-it is designed to optimize cost by automatically moving data to the most cost-effective access-tier.
(if not access in30 days data automatically class will change)
-it works by storing objects in two access tiers
-no retrieval fee
-same low latency and high performance of s3-standard

3.Amazon One-Zone IA -

-it is for data is accessed less frequently, but requires rapid access when needed
-data store in single AZ
-Ideal for those who want lower cost option of IA-data
-It is good choice for storing secondary backup copies on-premise data or easily re-creatable data
-Durability=99.9999999999
- Availability=99.5 %
-support SSL for data in-transit and encryption of data at rest
-the storage cost for the object is fairly high, but there is very less charge for accessing the objects.

4. Amazon S3 Standard -IA

-S3 -IA is for data is accessed less frequently, but requires rapid access when need.
-the storage cost is much cheaper than s3-standard, almost half the price. But charged more heavily for accessing
- Durability=99.9999999999
- Availability=99.99 %
-support SSL for data in-transit and encryption of data at rest
-the storage cost for the object is fairly high, but there is very less charge for accessing the objects.

5. Amazon S3 Glacier -

-s3 Glacier is a secure, durable, low-cost storage class for data archiving
-to keep cost low yet suitable for varying needs s3 glacier provides three retrieval options that range from a few minutes to hours
-can upload object directly to glacier or use lifecycle polies
-Durability=99.9999999999

6.Amazon S3 Glacier Deep Archive -

-s3 Glacier deep Archive is Amazon s3 cheapest storage
-design to retain data for long period ex:- 6year
-store across at least three Geographically-dispersed AZ.
-Retrieval time within 12hr.
-Durability=99.9999999999
Availability=99.9 %
-support SSL for data in-transit and encryption of data at rest

Types of block storage: -

1. EBS (Elastic Block Store)
   - Network attached virtual drive
   - Persistent
2. Instance store: - backed Ec2 basically virtual hard drive on the host allocated to the Ec2 instance.
   - Limited to 10 GB per drive
   - Ephemeral storage (non-persistent storage)
   - Ec2 instance can't be stopped (only can be rebooted or terminated will delete data

EBS types: -

1. **SSD (Solid State drive) Backed EBS Volume: -** a). General purpose SSD (GP2) b). Provisioned IOPS SSD
2. **HDD Backed EBS volume a).** through put optimised HDD (Non-bootable) b). Cold HDD
3. **Magnetic standard: -** it is bootable

Autoscaling it is a condition that is used according to requirement. It means automatic server can increase decease. (Scale out/up & Scale in/down,), it is region specific service.

Scalability, Fault tolerance and High Availability are possible cause of autoscaling

Autoscaling Component's: - 1. Lunch Configuration 2. Autoscaling Group 3. Scaling Policy.

1.Lunch Configuration: - like instance type, AMI, Keypair & security group.

2. Autoscaling Group: - group name, group size (3-20), VPC, Subnet, Health check policy (300sec)

3.Scaling Policy: - metric type, Target Volume.

Based on health check and CPU utilization server scale-up and scale-in.

Auto scaling policies: - 1. manually 2. dynamic (a. Target tracking b. simple scaling policy c. step scaling policy.

"Autoscaling" In AWS TWKSAA

Elastic Load Balancing (ELB) automatically distributes incoming application traffic across multiple targets and virtual appliances in one or more Availability Zones (AZs).

Types: - 1. Application Load Balancer 2. Network LB 3. Classic LB

1.Application Load Balancer: - it is work on 7th Layer.

2.Network LB: - it is work on 4th layer (Transport layer TCP/UDP) it is used for good Latency.

3.Classic LB: - 4TH and 7th OSI model

ELB Listener: - it is process that checks connection request used for ping ICMP

Target: - collection of Ec2 instance AWS API use ping TCP (port-80) for health check.

Target Group: - combination of Target

Unhealthy Threshold: - No of consecutive failed health check that should occur before the Instances are unhealthy.

healthy Threshold: - No of consecutive sequential health checks that must occurred before that not considered unhealthy.

"Load Balancer" In AWS TWKSAA

IAM: - "Identify and access management" is a framework or policies and technologies for ensuring that proper people in an organization have the appropriate access to technology set user's permission and role.

Features: - 1. Centralised control of as AWS account 2.shared access to AWS account 3. Granular permission 4.identity Federation 5. permission based on organization group 6. multifactor authentication 7. Network control 8. provide temporary access 9. integrates with many different AWS services 10. support PCI (payment card industry) DSS (data security standard) compliance 11.eventually consistent 12.free to use

Way to create a new IAM. 1. JSON 2. Visual Editor 3. Import.

Terms or elements: - 1. Principal 2. Request 3. Authentication 4. Authorization 5. Action/operation6.Resource

IAM Identity: - 1. user's 2. Groups 3. Role

Permission and policies

- identity Based by Authorization
- IAM Multiple policies
- Federated user's and Role's
- Resource Based Polices

Identify and access management "IAM"

Data: - Data can be facts related to any objects.

Data Base: - DB is a systematic collection of data. DB support storage and Manipulation of data.

DBMS: - It is a collection of programs which enable its users to access Database manipulate data, representation of data.

Types Of DBMS: - 1. Hierarchical 2. Network 3. Relational 4. Object-oriented

Relational Data Base (RDB)/SQL: - A RDB is a Data structure that allows to link information from different tables or different types of data bucket.in these types of DB all fields must be filled

-Best suited for OLTP (online transaction processing)

- Example: -MYSQL, Oracle, IBM DB2 etc.

Name	age	Branch	Roll No	Phone No
X	16	cs	Abcd	.....
y	18	cs	Abcd	.....
z	20	cs	Abcd	.....

Attribute

Tuple/row

-A Row of a table is also called record.

-A schema is used to strictly defines table Colum indexes and relation between tables

-Relational DB are usually used in enterprises application exception in MySQL which is used for web application common application for MYSQL include PHP and java.

-can not scale-out Horizontally

-virtually all Relational DB are SQL

AWS Database

Relational Database

No RDB: - **No Relational Database** store data without a structured mechanism to link data from different Tables to one another.

-It is much faster read write compare to RDB.

-Horizontal scaling is possible(autoscaling possible in NO SQL but not in SQL.

-best suited for online analytical processing.

Example: - 1. Mango DB, Cassandra, Dynamo DB, Postegre, Roven, Redis etc.

Types Of No RDB: - 1. Columnar DB 2. Document DB 3. Key Value DB 4. Graph Based DB

1. **Columnar DB: -** A Columnar DB is DBMS that stores data in columns instead of rows. In Columnar DB all the column1 value are physically together followed by all the column2 value.
   - Easy to operation minimum, maximum & average mathematical operation is fast.
   - It is self-indexing and less disk space.

   Example: - Cassandra, HBase etc.
2. **Document DB: -**Document DB make it easier for (developers) to store and query data in a DB by using the same document model format they use in their application code.
   - Document DB are efficient for storing catalogue
   - Store semi-structure data as document typically in JSON or XML format
   - A document DB is a great choice for contain management application such as blogs and video platform

   Example: - JSON (Java script-oriented notation), XML (Extensible Markup Language)
3. **Key-Value DB: -** A Key-Value DB is a sample DB that uses an associated array as a fundamental model where each key is associated with one and only one value in a collection.
   - It allows Horizontal scaling
   - Used cases: - shopping cart, and session store in application like Fb & twitter
   - They improve application performance by storing critical pieces of data in memory for low latency access.

   Example: - Dynamo DB, Tokyo Redis, Riak etc.
4. **Graphical Based DB: -**A graph DB basically a collection of Nodes and Edges each node represent an entity and each edge represent a connection or relationship between two nodes

   Use: - Research field show data in form of graph, Tabular form, Mathematical Form.

   Example: - Neo4J

AWS Database
No Relational Database
No SQL DB

RDBS: -**Relational Database Service** is fully managed by AWS

AWS is Responsible for

1. Security and patching
2. Automated Backup
3. Software updates for the DB Engine
4. If selected multi-AZ with synchronous Replication between the active and standby DB instances. Automatic failover if multi option was selected copy, stand by or Residence and Replica.

Setting managed by the user's: -

1. Meaning DB settings
2. Creating Relational DB schema
3. DB Performance.

Relational DB Engine Options: -

1. MS SQL SERVER
2. MY SQL
3. Oracle
4. AWS Aurora
5. Postgre SQL
6. Maria DB

RDS Instance Storage: -

1. **General Purpose: -** it is used for DB workloads with moderate I/O Requirement.
2. **Provisional IOPS RDS Storage: -** it is used for high performance OLTP workloads.

Relational Database Service RDBS

Database Types: -1. Structure Database 2. Semi-Structure database 3. Unstructured Database

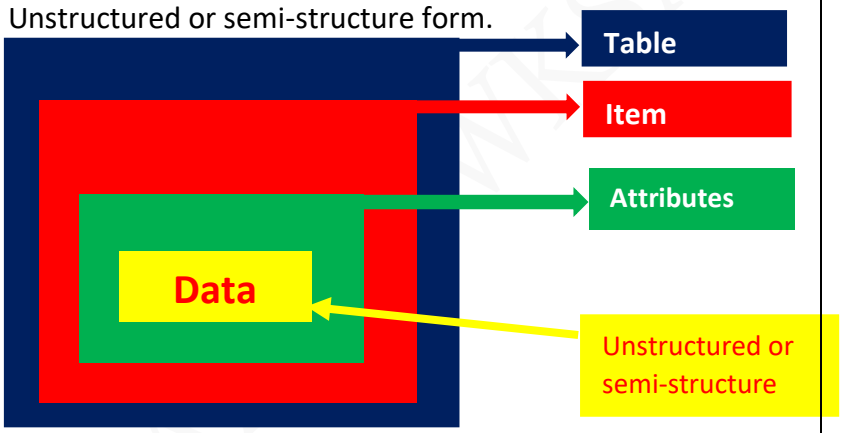
1.Structure Database: - All data which can be stored in database SQL in table with rows and columns. they have relational key and can be easily mapped into pre-defined field.

2. Semi-Structure Database: -it is information that does not reside in a relational database but that does have some organisational that make it easier to analyse eg: - XML JSON

3.Unstructured Data: - it is information that either does not have a pre-defined data model or is not organised in a pre-defined manner. Unstructured information is typically text-heavy but may contain data such as dates numbers and facts as well example email, messages, word processing documents video, photos, audio files presentation webpages etc. **Ex: - Dynamo DB**

Dynamo DB: - it is a DB that store data in Unstructured or semi-structure form.

- **Table: -** it is collection of data names. Dynamo DB stores data in tables.
- **Item: -** items consist of a primary or composite key and aa flexible number of attributes. Item in dynamo DB is similar into Rows records in other DB. It is group attributes, that uniquely identifiable among all of the other's items. Each table contains multiple items.
- **Attribute: -** Each item is composed of one or more attributes. Attributes consist of the attribute name and a value of a set of value.



- Low latency R/W
- Size 1byes -400kb
- Primary key
- Fast
- Schema less

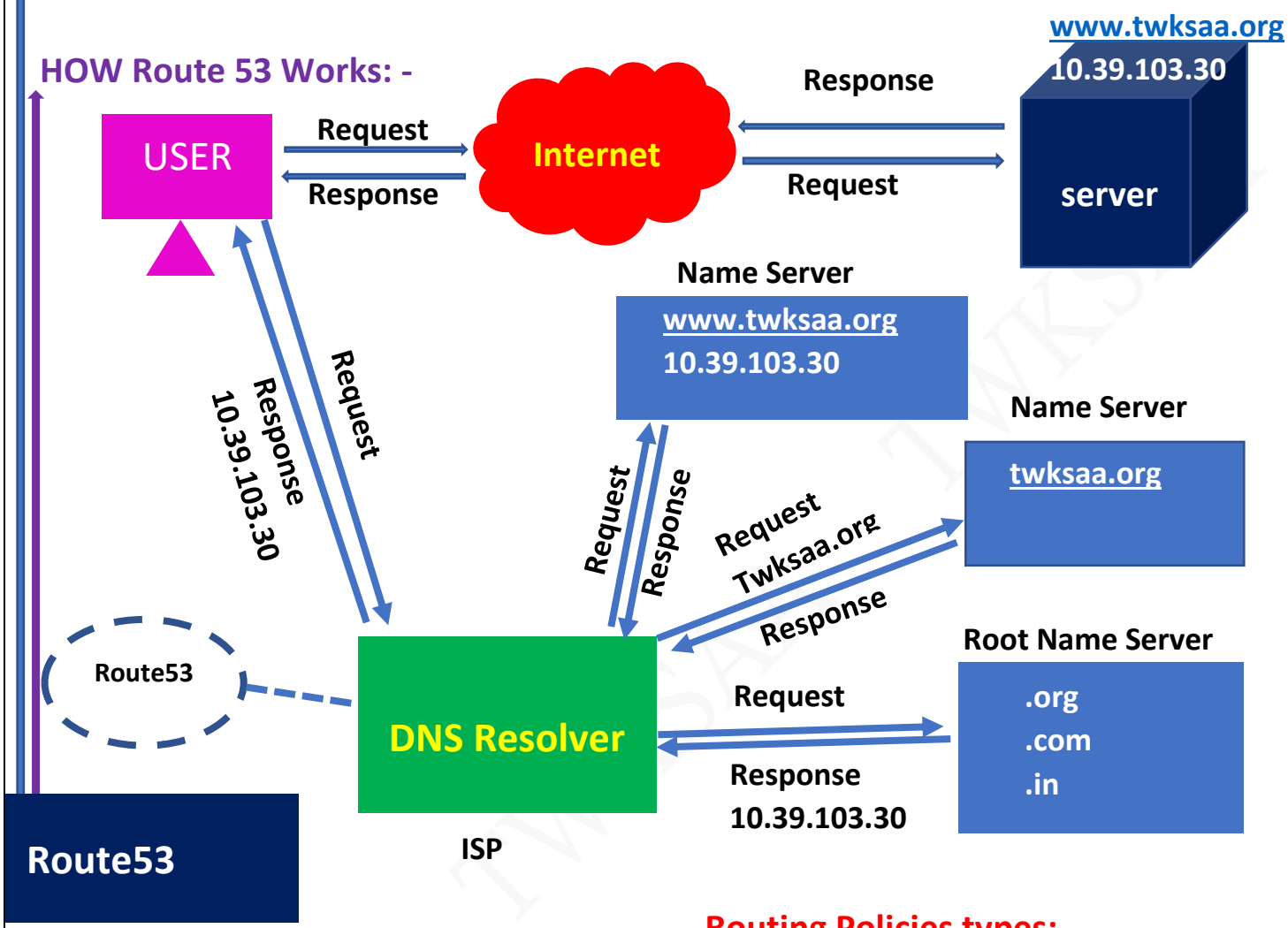
Read capacity Unit (RCU): one RCU represents one strong consistence read per second or two eventually consistent reads per seconds size up to 4 kb in size

Write Capacity Unit (WCU): - one writes capacity unit represent one write per second for an item Up to 1kb in size

Dynamo DB

Route53: -You can use Amazon Route53 to register new domains transfer existing domains route traffic route for Your domains to your AWS and external resource and monitor the health of your resource.

HOW Route 53 Works: -



Route 53 Functions: -

1. DNS management
2. Traffic Management
3. Availability monitoring
4. Domain registration

Routing Policies types: -

1. Simple Routing (default)
2. Failover Routing
3. Geolocation Routing
4. Multi Value Routing
5. Latency Based Routing
6. Geo-Proximity

DNS Record Types by Route 53

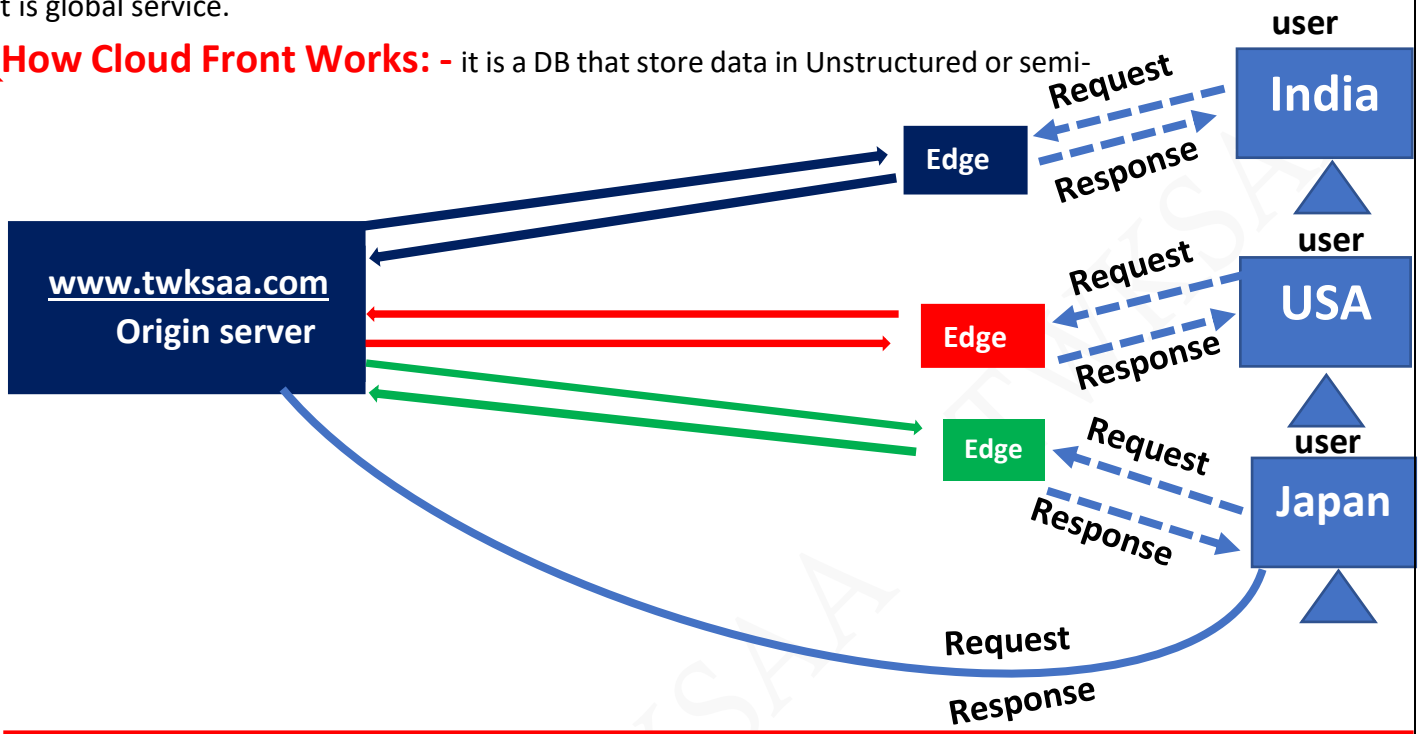
1. A Record: - Address Record-Maps Domain Name to IP address.
2. AAAA Record: - IPV6 address record-Maps Domain name to an IPV6 address.
3. C Name Record: - maps on alias to a hostname web in C Name www.twksaa.com
4. NS Record: - Name server record-used for delegating zone to a name server.
5. SOA Record: - start of authority Record
6. MX Record: - mail exchange defines where to deliver mail for user @ Domain Name

AWS Cloud Front: -it is a web service that gives business and web application developer an easy and cost effective way to distribute content with low latency and high data transfer speed.

-we can reduce load through Autoscaling and Load Balancer but we can not reduce latency through this. For solve this problem we are using Content delivery network (CDN) this process is know as cloud front in AWS.

-it is global service.

How Cloud Front Works: - it is a DB that store data in Unstructured or semi-



Origin sever ------Edge Location---------Reginal Edge Cache---------user

We can access amazon Cloud Front in this following away: -

1. AWS management console
2. AWS SDKS
3. AWS command line interface
4. Cloud Front API

Aws Cloud Front

Lambda: -**AWS lambda** is a compute service that lets you run code without provisioning or managing server With AWS lambda

-Work: - you can run code for virtually any type of application or backend service all with zero.

-Administration: - AWS lambda manages all the administration it manages

1.Provisioning & capacity of compute fleet that after a balance of memory, CPU, Network and other Resource
2.Server and OS Maintenance
3.High Availability and Automatic scaling
4.Monitoring Fleet Health
5.Applying security patches
6.Deploying code
7.Monitoring and logging lambda Functions

Language accepts: - Node JS, JAVA, Power shell, C#, Ruby, Python, GO etc.

How Lambda Works: -

1. First upload code to lambda in one or more Lambda Function.
2. AWS Lambda execute the code
3. After Code of Provisioning and manging the required server

Important Terms used in Lambda: -

1. **Function: -**A function is a resource that you can invoke to run your code in AWS Lambda. A function has code that passes Request and Response between Lambda and the function code.
2. **Runtime: -** Lambda Runtimes allows function in different language to run in the some base execution environment the runtime sits in between the lambda service and your function code relaying invocation events, context information and response between the two.
3. **Event: -**in a JSON formatted document that contains data for a function to process.
4. **Event Source/Trigger: -** An AWS service such as Amazon SNS or a Custom service that Trigger your function and execute its logic
5. **Down stream Resource: -** An AWS service such as Dynamo DB tables or S3 bucket that your lambda function calls one it is trigger
6. **Concurrency: -** No of Request …

AWS LAMBDA

❖ Research(अनुसंधान):

- अनुसंधान एक प्रणालीकरण कार्य होता है जिसमें विशेष विषय या विषय की नई ज्ञान एवं समझ को प्राप्त करने के लिए सिद्धांतिक जांच और अध्ययन किया जाता है। इसकी प्रक्रिया में डेटा का संग्रह और विश्लेषण, निष्कर्ष निकालना और विशेष क्षेत्र में मौजूदा ज्ञान में योगदान किया जाता है। अनुसंधान के माध्यम से विज्ञान, प्रोधोगिकी, चिकित्सा, सामाजिक विज्ञान, मानविकी, और अन्य क्षेत्रों में विकास किया जाता है। अनुसंधान की प्रक्रिया में अनुसंधान प्रश्न या कल्पनाएँ तैयार की जाती हैं, एक अनुसंधान योजना डिज़ाइन की जाती है, डेटा का संग्रह किया जाता है, विश्लेषण किया जाता है, निष्कर्ष निकाला जाता है और परिणामों को उचित दर्शाने के लिए समाप्ति तक पहुंचाया जाता है।

❖ Innovation(नवीनीकरण): -

- Innovation (इनोवेशन) एक विशेषता या नई विचारधारा की उत्पत्ति या नवीनीकरण है। यह नए और आधुनिक विचारों, तकनीकों, उत्पादों, प्रक्रियाओं, सेवाओं या संगठनात्मक ढंगों का सृजन करने की प्रक्रिया है जिससे समस्याओं का समाधान, प्रतिस्पर्धा में अग्रणी होने, और उपयोगकर्ताओं के अनुकूलता में सुधार किया जा सकता है।

❖ Discovery (आविष्कार):

- Discovery का अर्थ होता है "खोज" या "आविष्कार"। यह एक विशेषता है जो किसी नए ज्ञान, अविष्कार, या तत्व की खोज करने की प्रक्रिया को संदर्भित करता है। खोज विज्ञान, इतिहास, भूगोल, तकनीक, या किसी अन्य क्षेत्र में हो सकती है। इस प्रक्रिया में, व्यक्ति या समूह नए और अज्ञात ज्ञान को खोजकर समझने का प्रयास करते हैं और इससे मानव सभ्यता और विज्ञान-तकनीकी के विकास में योगदान देते हैं।

Note: अनुसंधान विशेषता या विषय पर नई ज्ञान के प्राप्ति के लिए सिस्टमैटिक अध्ययन है, जबकि आविष्कार नए और अज्ञात ज्ञान की खोज है।

TWKSAA RID MISSION

(Research)	(Innovation)	(Discovery)
अनुसंधान करने के महत्वपूर्ण कारण:	**नवीनीकरण करने के महत्वपूर्ण कारण:**	**खोज करने के महत्वपूर्ण कारण:**
1. नई ज्ञान की प्राप्ति	1. प्रगति के लिए	1. नए ज्ञान की प्राप्ति
2. समस्याओं का समाधान	2. परिवर्तन के लिए	2. ज्ञान के विकास में योगदान
3. तकनीकी और व्यापार में उन्नति	3. उत्पादन में सुधार	3. अविष्कारों की खोज
4. विकास को बढ़ावा देना	4. प्रतिस्पर्धा में अग्रणी होने के लिए	4. समस्याओं का समाधान
5. सामाजिक प्रगति	5. समाज को लाभ	5. समाज के उन्नति का माध्यम
6. देश विज्ञान और प्रौद्योगिकी का विकास	6. देश विज्ञान और प्रौद्योगिकी के विकास।	6. देश विज्ञान और तकनीक के विकास

➢ जो लोग रिसर्च, इनोवेशन और डिस्कवरी करते हैं उन लोगों को ही हमें अपना नायक, प्रतीक एवं आदर्श मानना चाहिए क्योंकि ये लोग हमारे समाज, देश एवं विज्ञान के क्षेत्र में प्रगति, विकास और समस्याओं के समाधान में महत्वपूर्ण भूमिका निभाते हैं।

मैं राजेश प्रसाद एक वीणा उठाया हूँ Research, Innovation and Discovery का जिसका मुख्य उदेश्य हैं आने वाले समय में सबसे पहले New(RID, PMS & TLR) की खोज, प्रकाशन एवं उपयोग भारत की इस पावन धरती से ही हो |

"अगर आप भी Research, Innovation and Discovery के क्षेत्र में रूचि रखतें हैं एवं अपनी प्रतिभा से दुनियां को कुछ नया देना चाहतें तो हमारे इस त्वक्सा रीड मिशन (TWKSAA RID MISSION) से जरुर जुड़ें" |

- **राजेश प्रसाद**