

AWS EC2

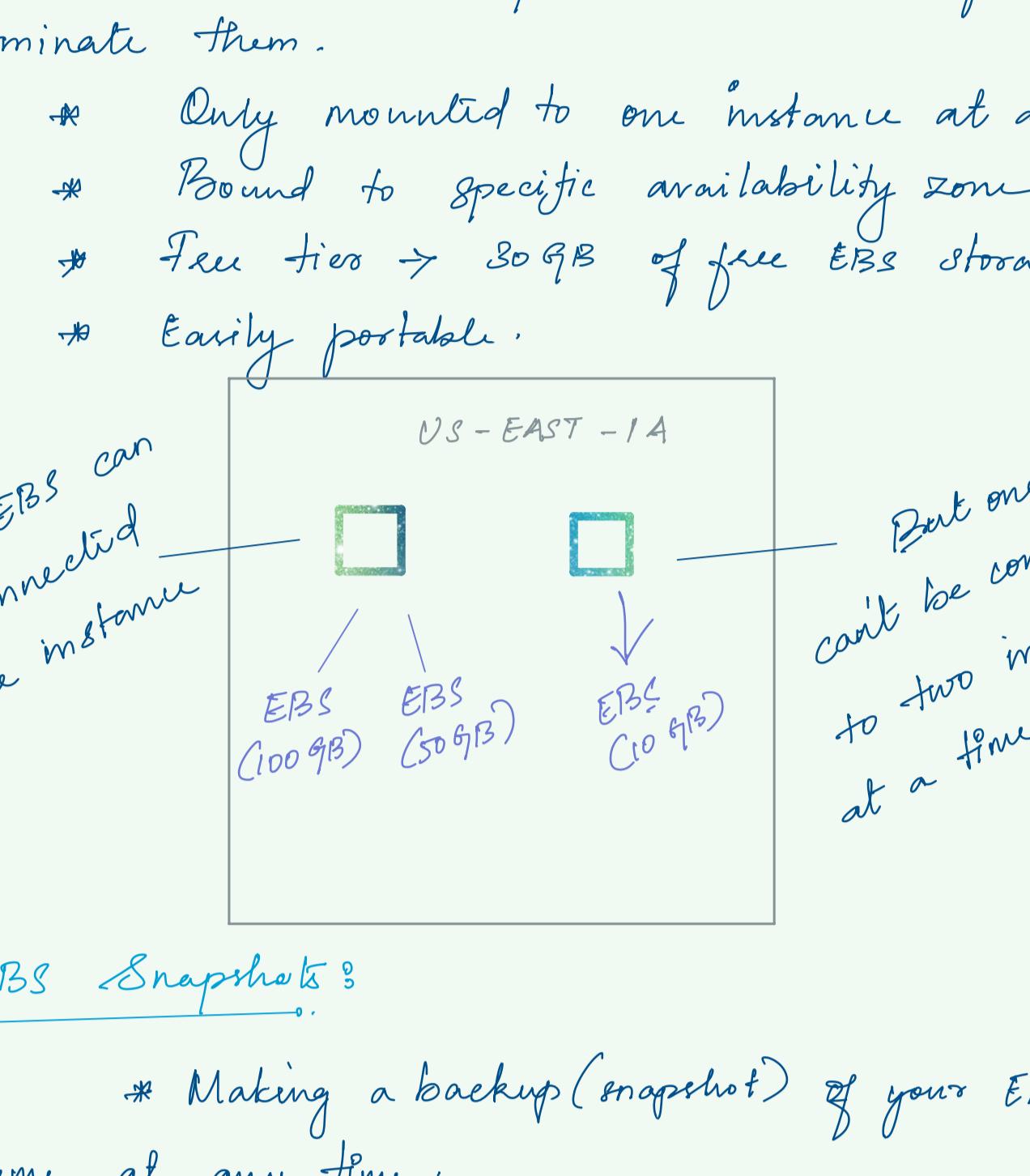
Sunday, February 4, 2024 9:32 AM

EC2 Configuration & Sizing:

- * OS
- * CPU & RAM
- * Storage Space - Network attached (EBS & EFS)
 - Hardware (EC2 Instance Store)
- * Network Card
- * Security Rules - Firewall
- * Bootstrap Script.

Security Groups:

- * Controls how the traffic is allowed inside & outside EC2 instance.
- * They only contain allow rules.



- * Can be attached to multiple instances

- * It's good to maintain one separate Security group for **SSH access**
- * By default, all inbound traffic is blocked.

Classic Ports to know:

- 22 → SSH → Secure Shell
- 21 → FTP → File Transfer Protocol
- 22 → SFTP → Secured File Transfer Protocol
- 80 → HTTP → Access Unsecured websites
- 443 → HTTPS → Access Secured websites
- 3389 → RDP → Remote Desktop protocol.

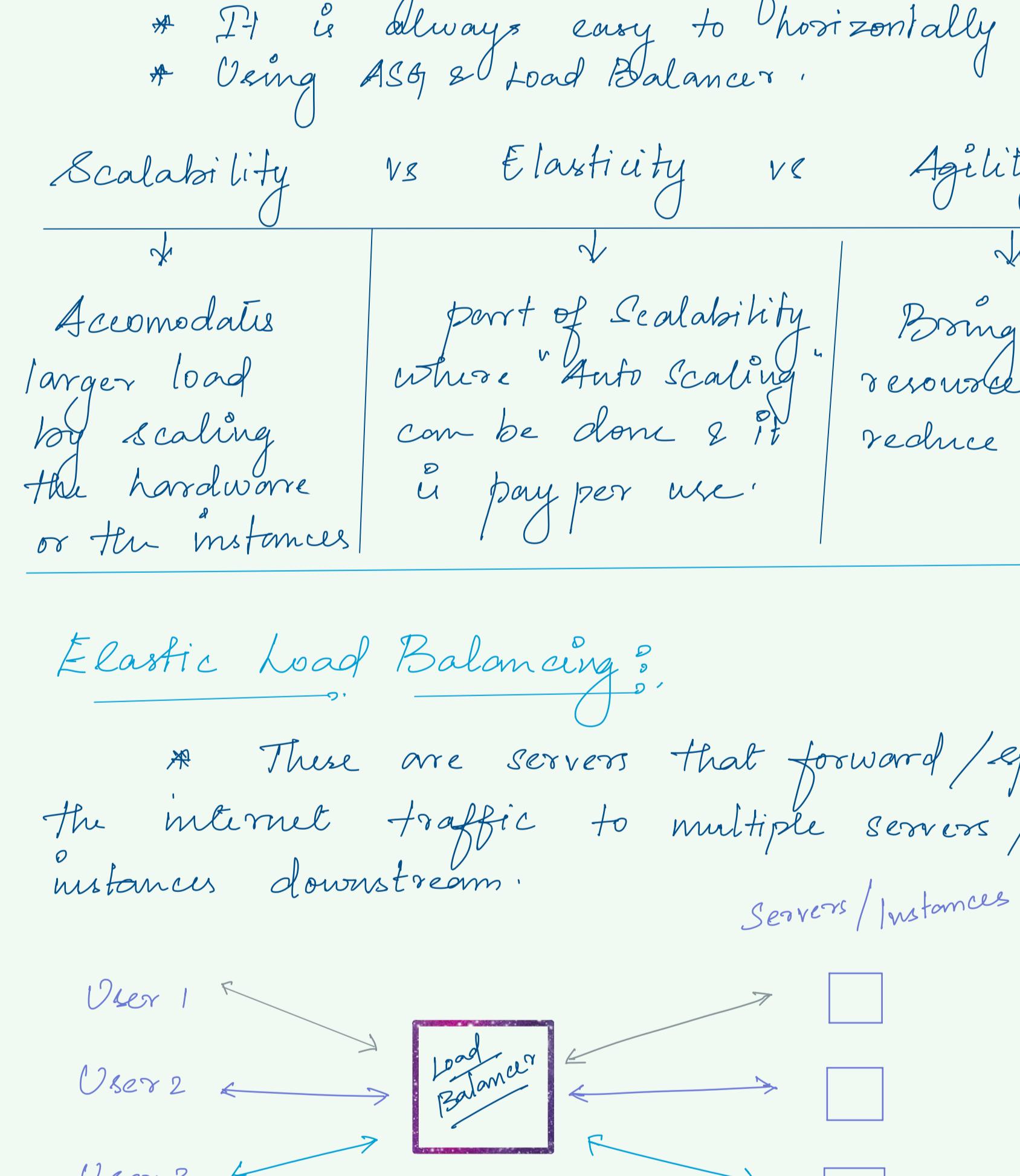
EC2 Instance Purchasing Options:

- * On-demand instances → short workload
- * Reserved (1 & 3 years) → flexible
- * Savings plan (1 & 3 years) → commit to usage
- * Spot Instances → short workload → less reliable
- * Dedicated Hosts → Book an entire physical server
- * Dedicated Instances → No one will share yours
- * Capacity Reservations

EC2 Instance Storage:

EBS Volume:

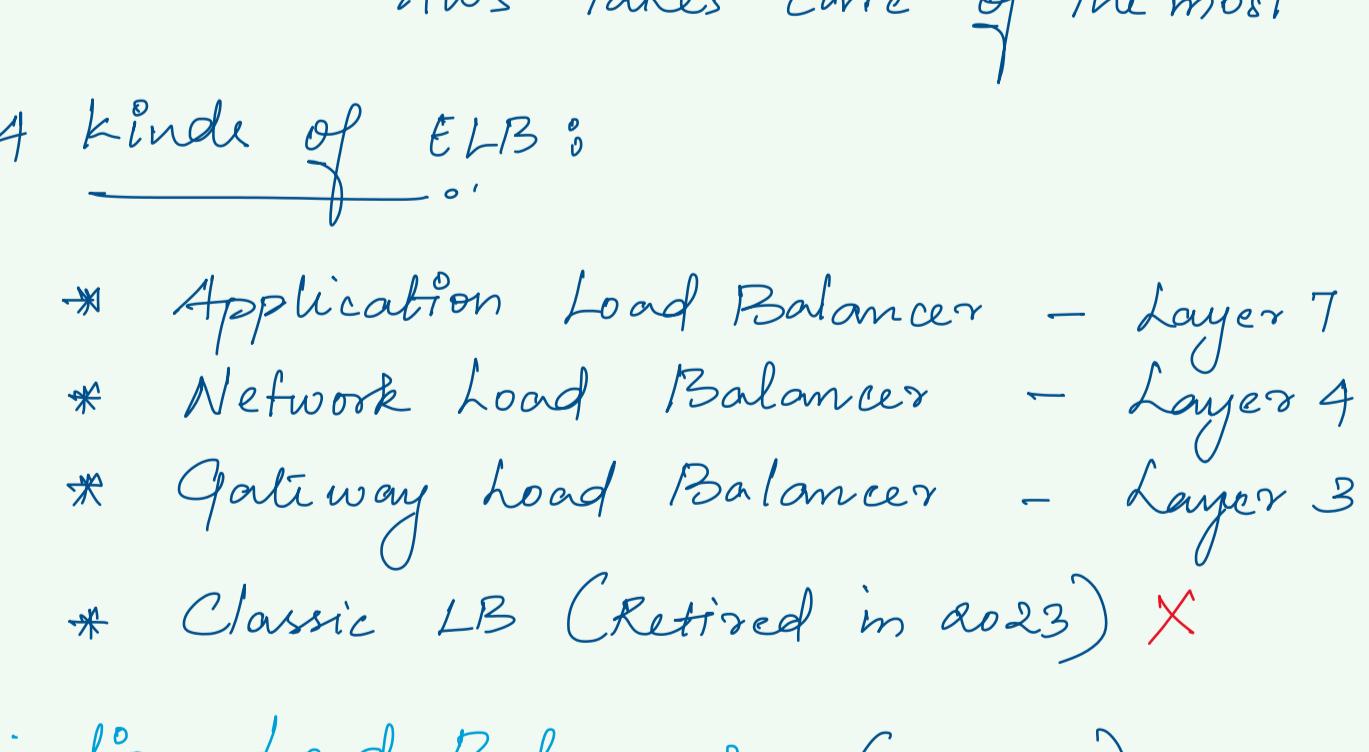
- * EBS - Elastic Block Store Volume
- * It's a network drive, attached to the instances which they own.
- * It allows to persist data, even after you terminate them.
- * Only mounted to one instance at a time.
- * Bound to specific availability zone
- * Fee tiers → 30GB of free EBS storage
- * Easily portable.



EBS Snapshots:

- * Making a backup (snapshot) of your EBS volume at any time.

* Snapshots are not region specific & the backup can be used to restore in an other EBS in other region as well.



Features:

- * EBS Snapshot Archive
- * EBS Snapshot Recycle Bin.

Aws AMI:

- * AMI → Amazon Machine Image
- * Customization of an EC2 instance
- * Built for specific region & copied to other.
- * Can launch instances from
 - Public AMI
 - Your own AMI
 - AWS Marketplace AMI

AMI Process:

- * Start an EC2 instance & customize it.
- * Stop the instance (for data integrity)
- * Build an AMI → this will also create EBS SS
- * Launch instances from other AMIs

AMIs can be created from Images & templates option.

EC2 Image Builders:

- * Automates the creation of EC2 instances and stores it as AMI and then distributed.

Free Service



EC2 Instance Store:

- * High performance hardware disk, attached to the instances.

- * Better performance of I/O compared to network drives like EBS

- * But only good for short term usage

- * Risk of data loss if hardware fails.

EFS - Elastic File System:

- * Managed NFS (Network File System)
- * Can be mounted on lots of EC2
- * Works only with Linux EC2 instances or multi AZ
- * Scalable, expensive, pay-per-use, no capacity planning

EBS vs EFS:

- * Can be used in other region by snapshots
- * Used in multi-AZ in many instances using EFS mount target.

So, EFS is a shared file system.

EFS - Infrequent Access:

- * Cost optimized storage class, for rarely accessed files.

- * Up to 92% lower cost compared to EFS-standard.

- * EFS will automatically move your files to EFS-IA based on the last time it was accessed.

- * It also has a life cycle policy which sends the files which are not accessed for a long time to EFS-IA.

Amazon FSS:

- * Launch third party high performance file systems
- * Fully managed service.

3 Types:

- * FSS for Lustre
- * FSS for Windows file Server → windows native.
- * FSS for NetApp ONTAP

Elastic Load Balancing & Auto Scaling Groups:

Scalability:

- * App / System can handle greater loads by adapting.

Two kinds of Scalability:

- * Vertical

- * Horizontal → (Elasticity)

Vertical Scalability:

- * Increasing the size of the instance

- * Eg: changing from t2.micro to t2.large

- * There is always a limit (hardware limit)

Horizontal Scalability:

- * Increasing the number of instances

- * It is always easy to horizontally scale.

- * Using ASG & Load Balancer.

- * ASG can be created from Images & templates option.

Application Load Balancer:

- * Launch third party high performance file systems

- * Fully managed Service.

3 Types:

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Network Load Balancer:

- * TCP / UDP protocols - Layer 4

- * High performance - millions of requests per sec

- * Static IP through Elastic IP.

Gateway Load Balancer:

- * GENEVE protocol on IP packets

- * Route Traffic to firewalls

- * Intrusion detection.

Auto Scaling Groups:

- * It automatically scales in/out of instances by adding/removing instances

Goals of ASG:

- * Scale out to an increased load.

- * Scale in to a minimal load.

- * Automatically registers new instances.

- * Replace unhealthy instances.

Auto Scaling Strategies:

- * Manual Scaling

- * Dynamic Scaling

Step/ Simple:

- * When a cloudwatch alarm is triggered, add/remove units.

- [Eg: CPU > 70%, add 2 units]

Target Tracking:

- * Setting an average CPU at 40%, it adds/removes the units.

Scheduled Scaling:

- * Anticipate the scaling based on usage patterns. Eg: increasing the capacity at weekends.

Predictive Scaling:

- * Using ML algorithms to predict the forecasting and implement scaling.