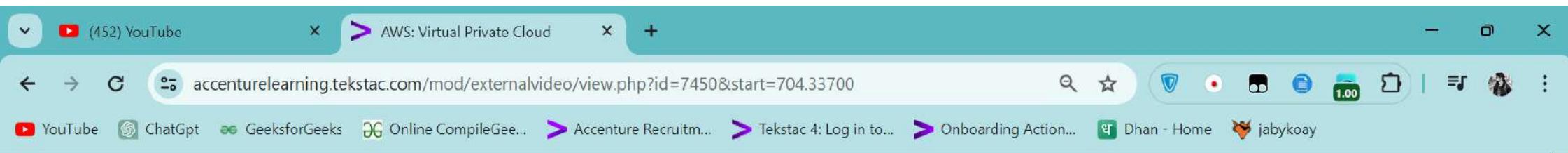


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16-04-2024





TEKNOTURF

Amazon VPC Definitizes

1

A VPC is a virtual network dedicated to an AWS account

2

Requires IPv4 address space (IPv6 address range optional)

3

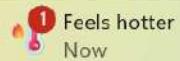
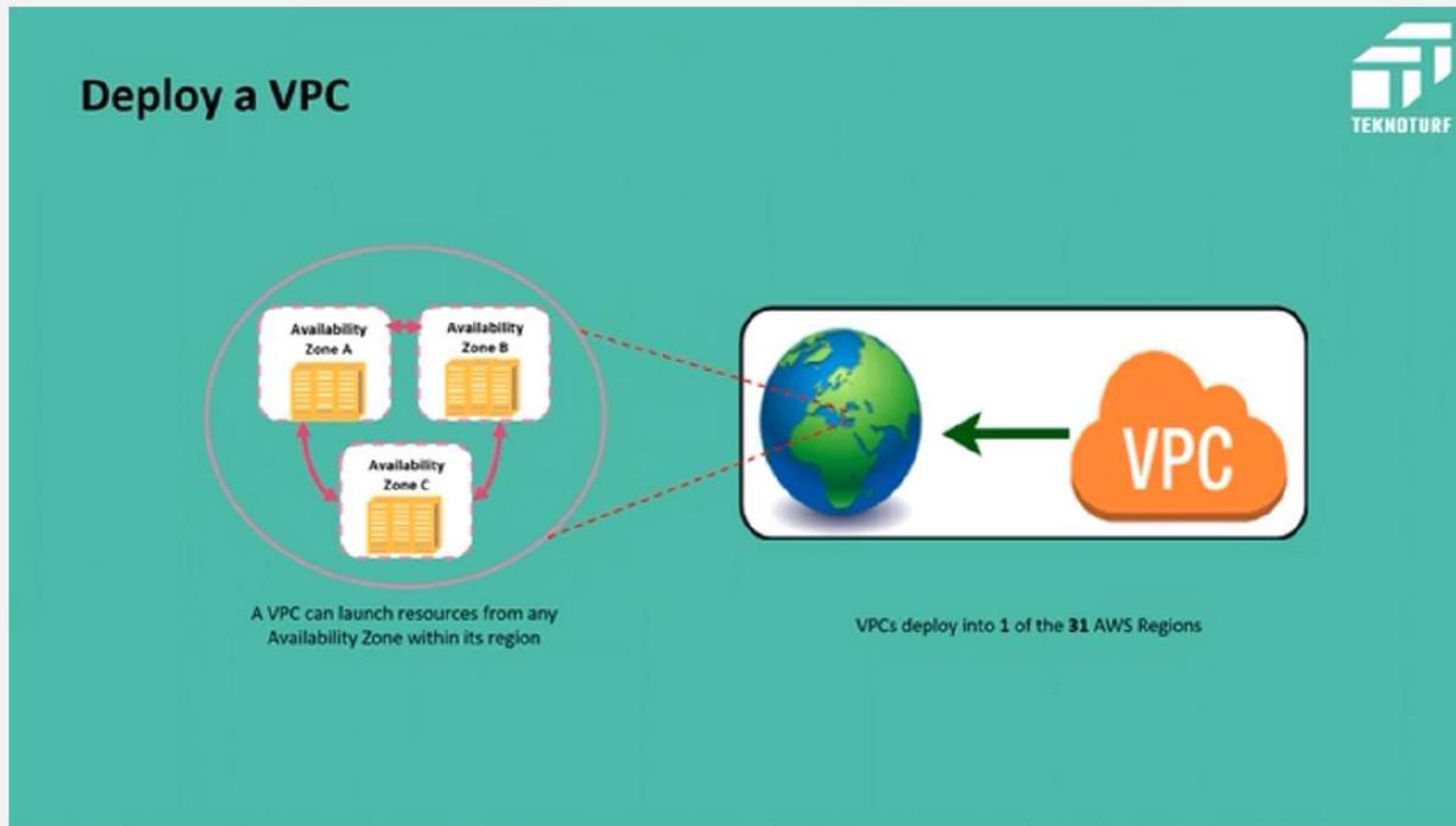
Creates specific CIDR range for your resources

4

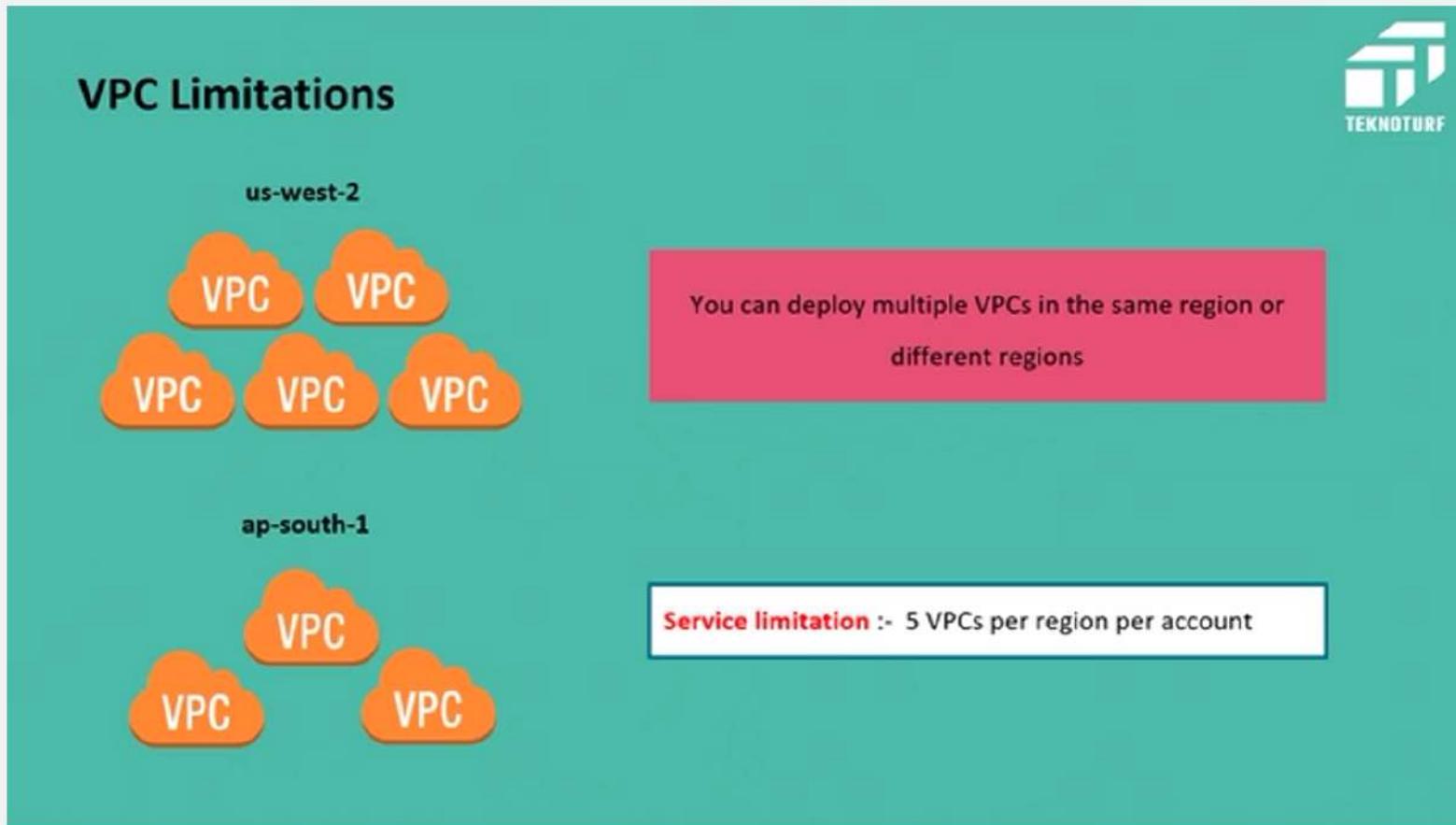
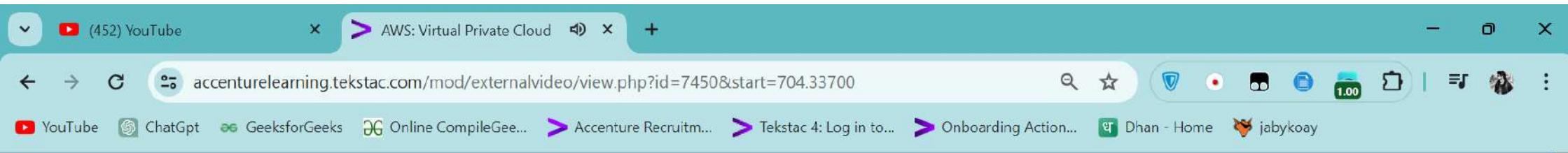
Strict access rules for inbound and outbound traffic

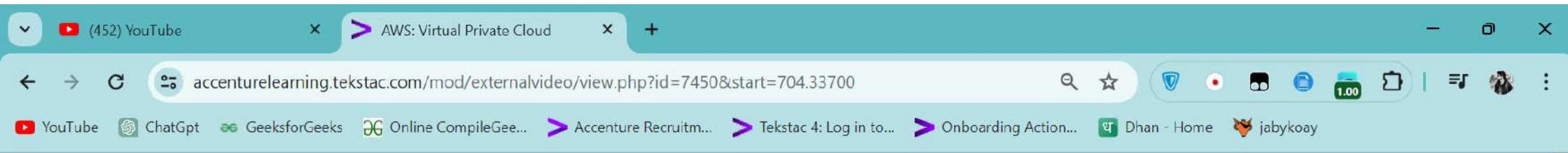






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16-04-2024





VPC Limitations

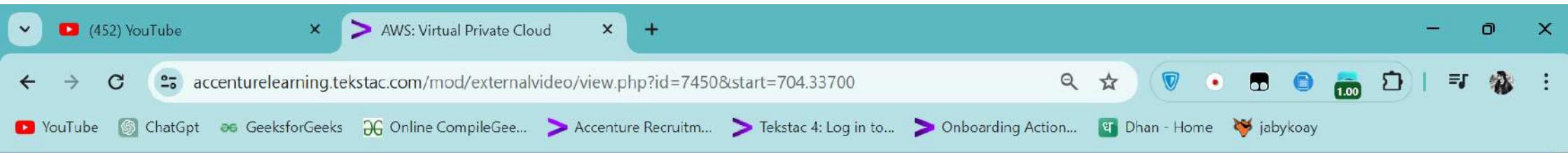


1 Each VPC is created with an IPv4 CIDR block (a range of private IPv4 addresses)

2 The private address can be used by the resources deployed into the VPC

3 Amazon VPC support Bring Your Own IP(BYOIP) prefixes





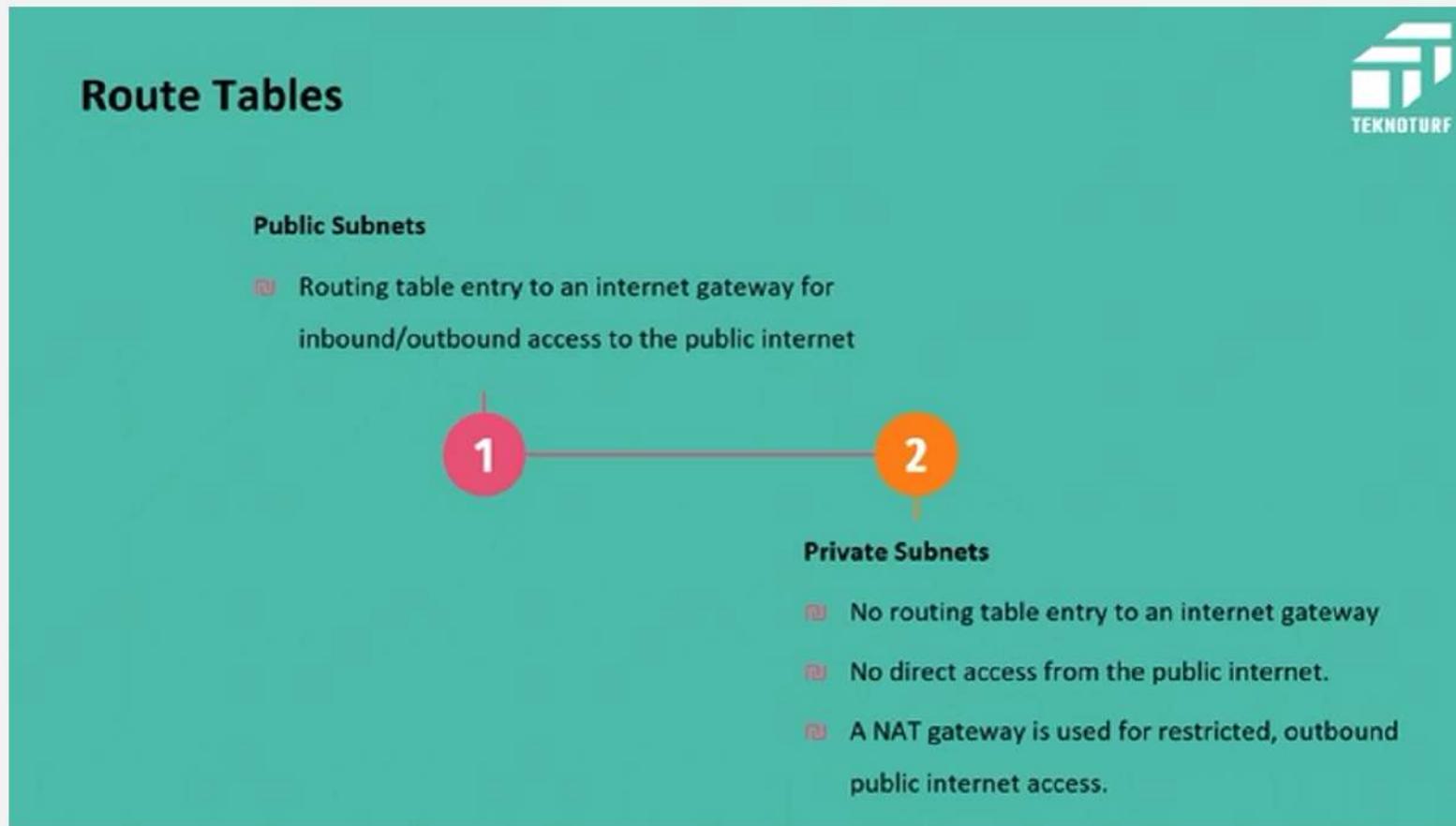
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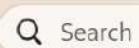
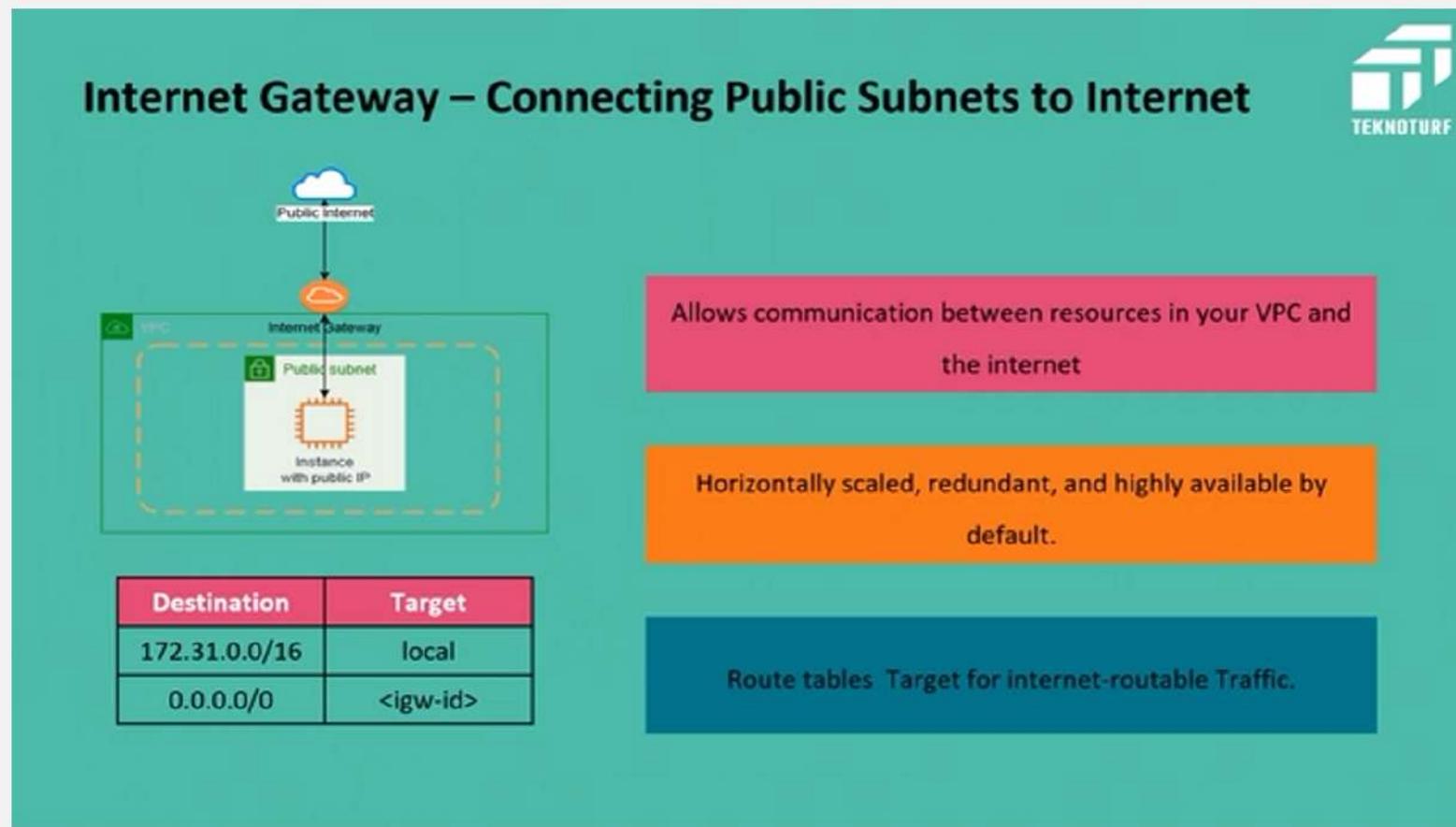
II

Route tables:

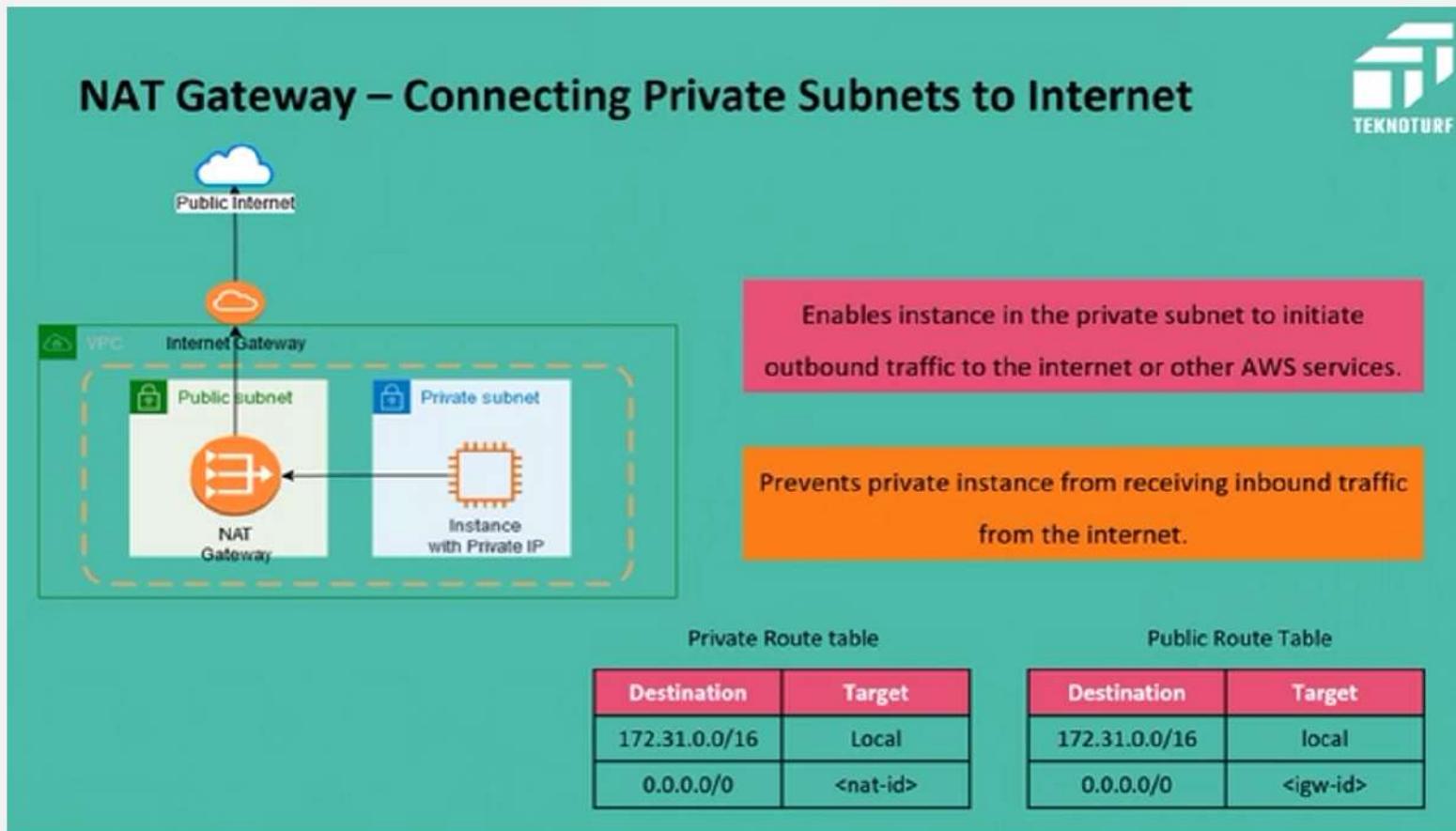
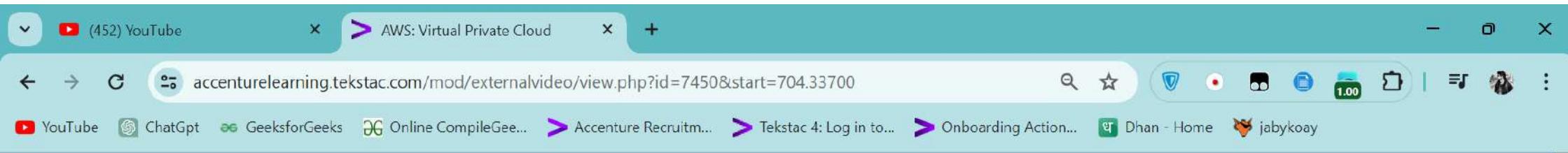
- 1 Redirecting traffics between VPC resources
- 2 Each VPC has a main(default) route table
- 3 You can create a custom route table
- 4 All subnets must have an associate route table

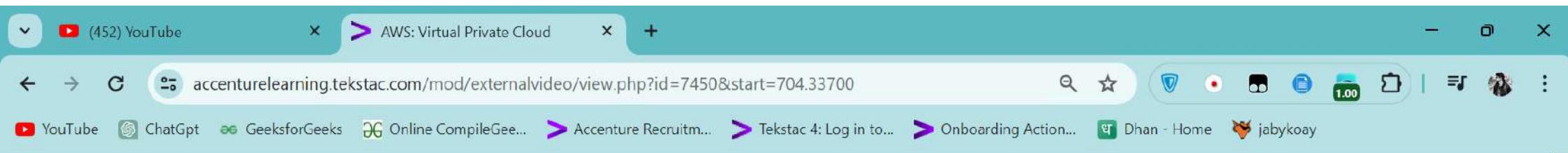
Destination	Target
172.31.0.0/16	local



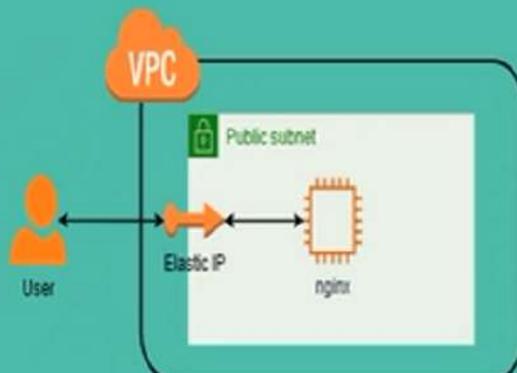


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5-04-2024





Elastic IP Addresses



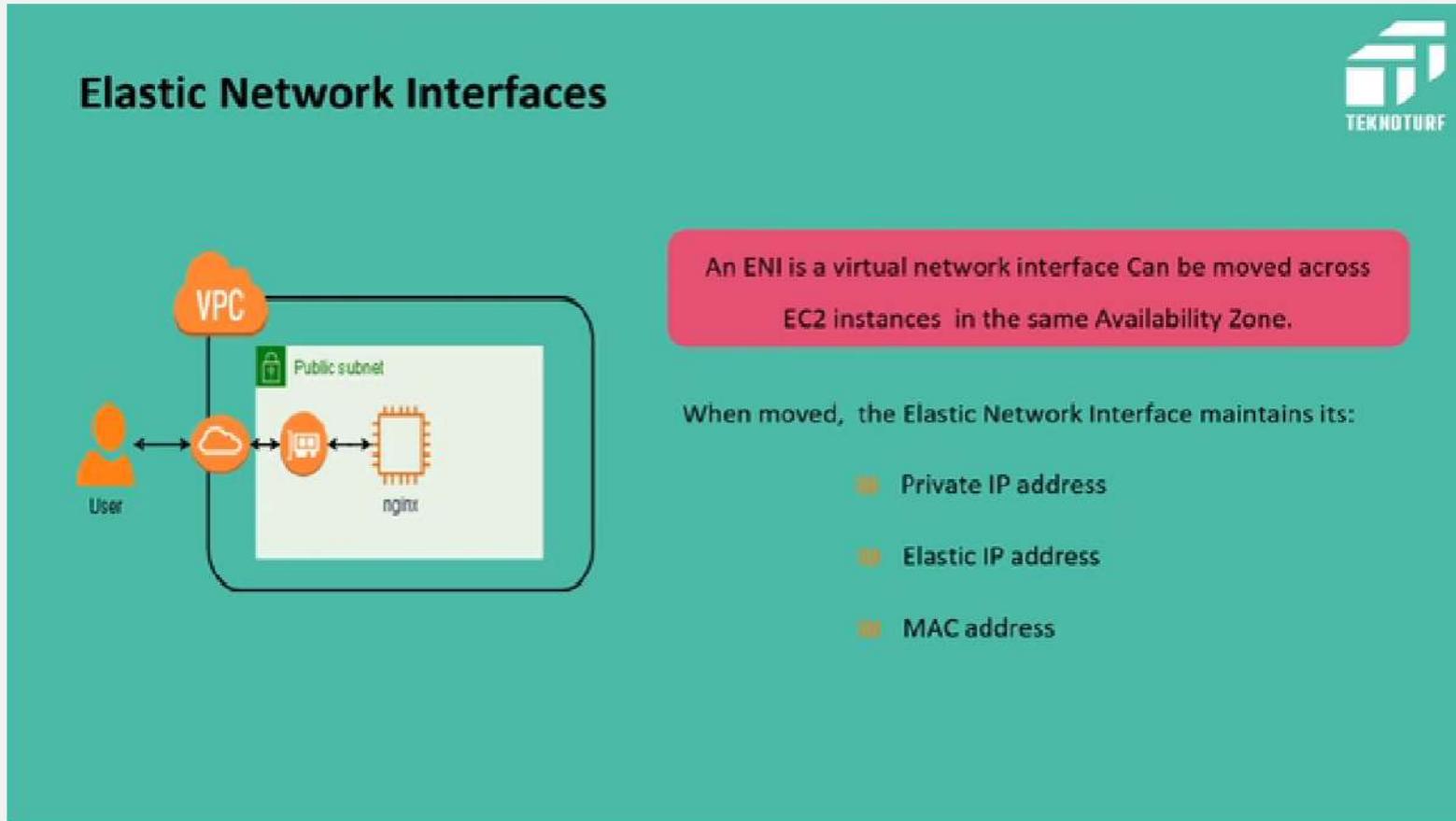
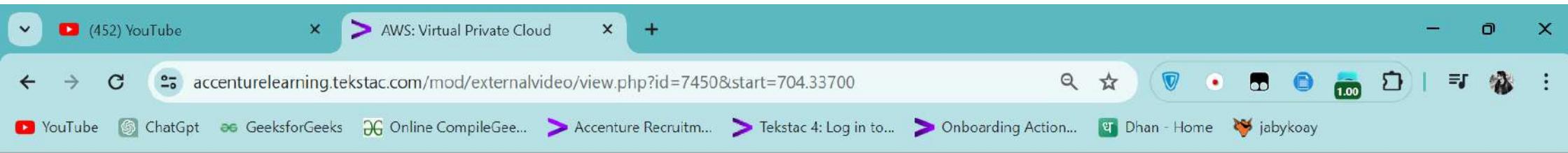
- 1 Public IPv4 address, which is reachable from the internet.
 - 2 Can be associated with an instance or a network interface
 - 3 Re-Associate and direct traffic immediately
 - 4 Limitation: Five allowed per AWS Region.

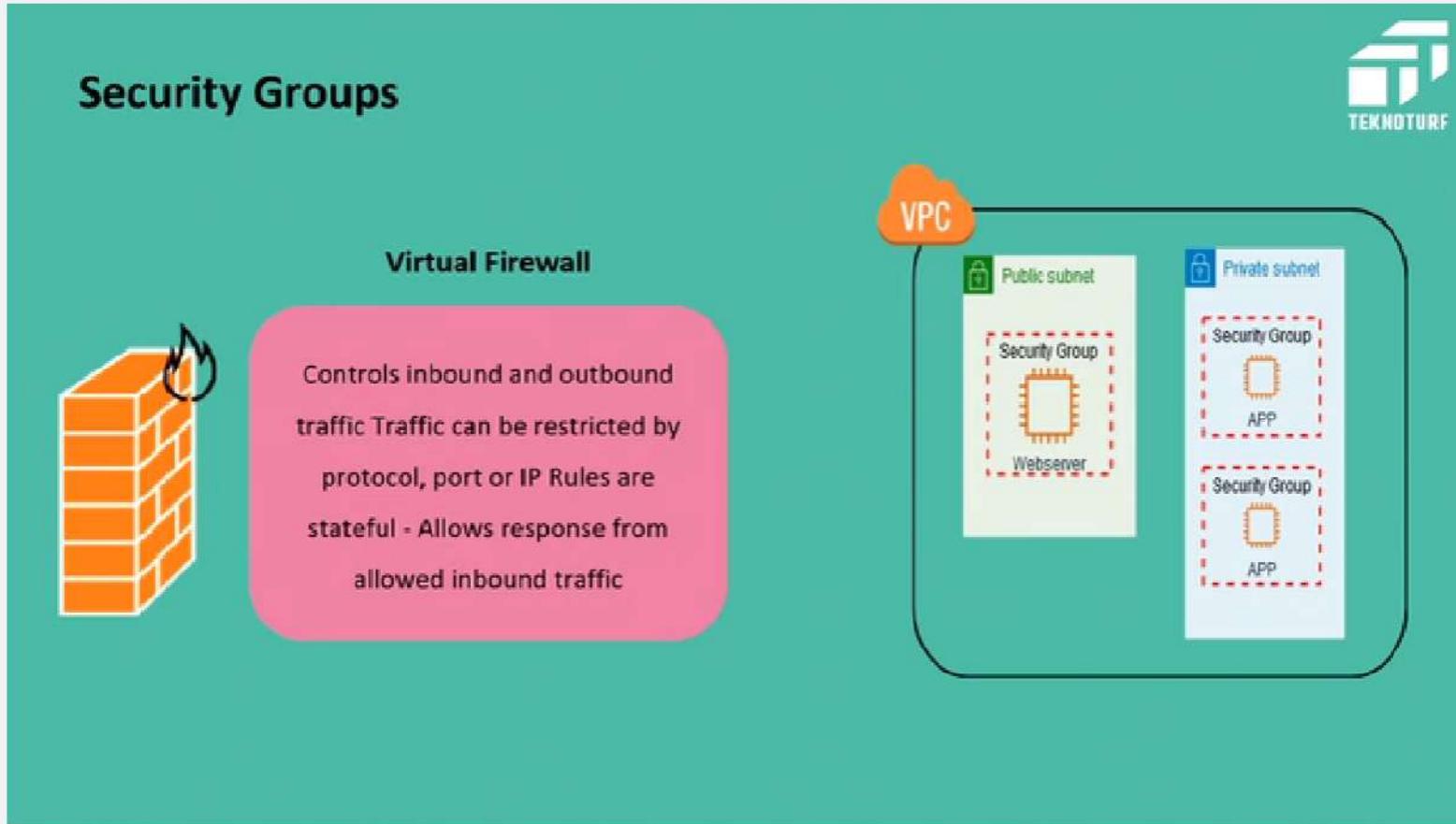
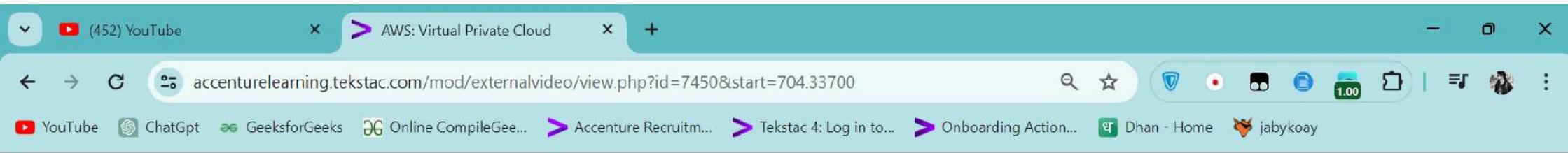


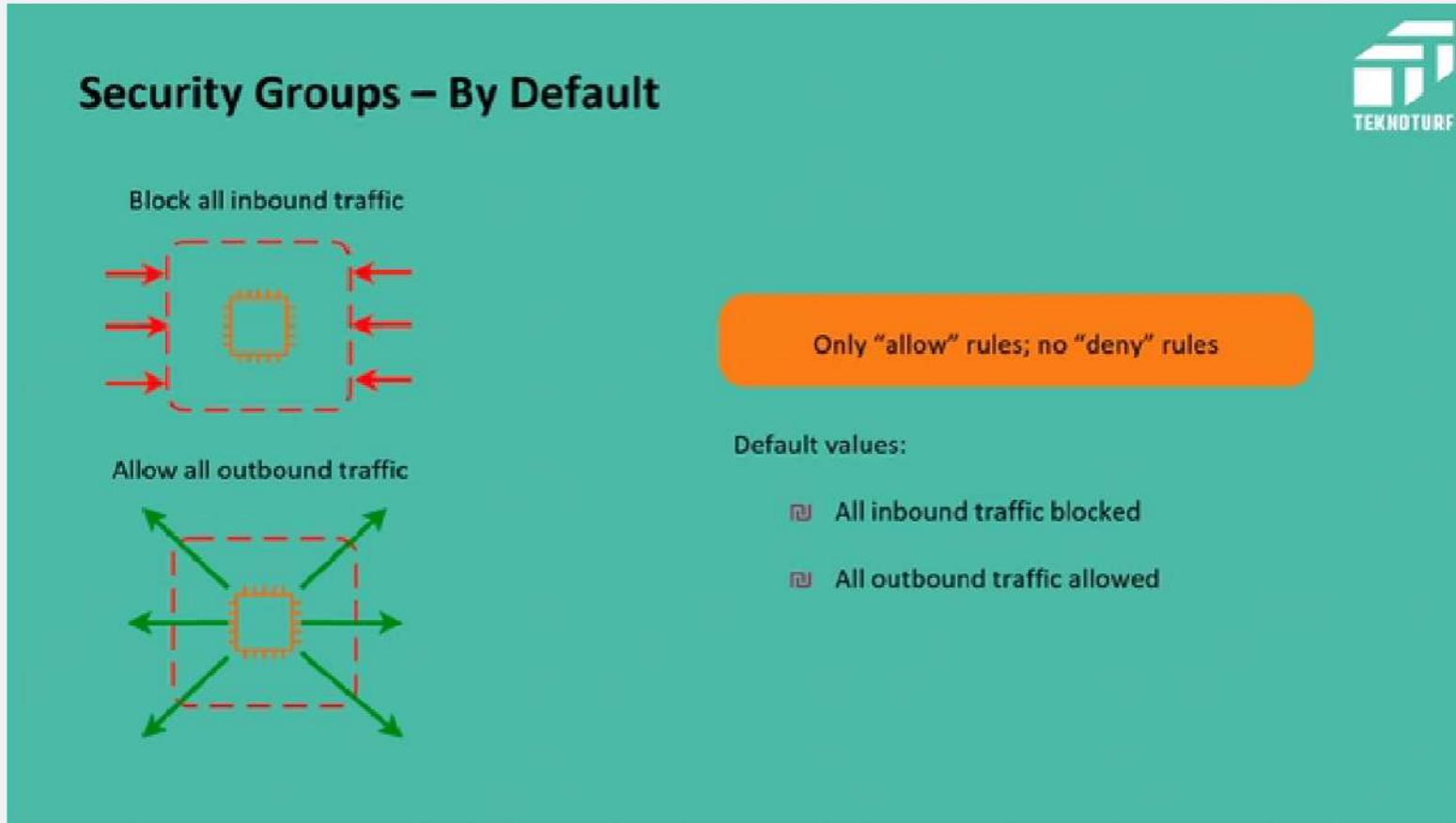
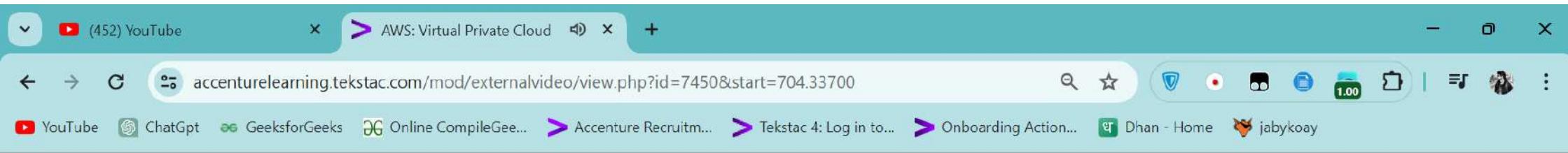
ENG
IN

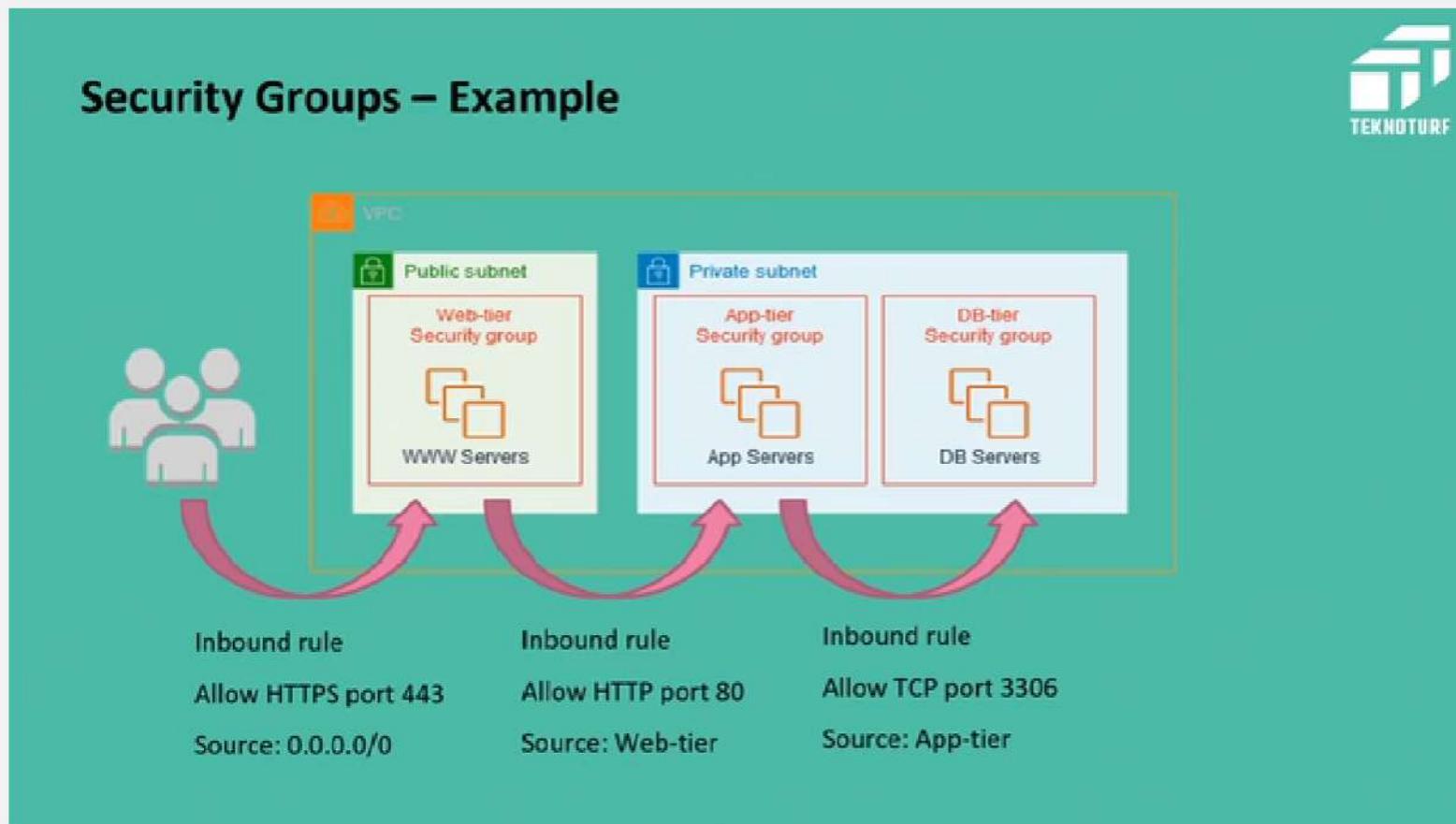


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16-04-2024

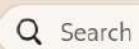








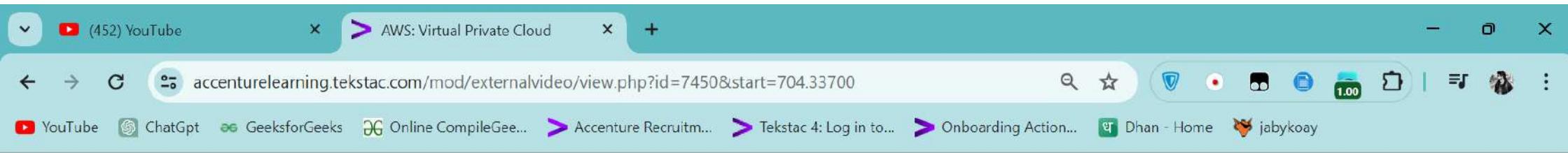
33°C
Haze



ENG
IN



09:35
16-04-2024



Network Access Control Lists (ACLs)

1 Firewalls at the subnet level

2 By default allow all inbound and outbound traffic

3 Rules are **stateless**, requiring explicit rules for both inbound and outbound traffic

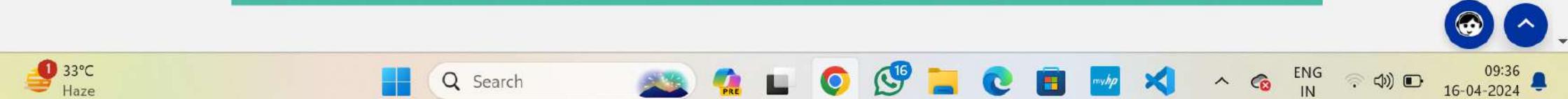
Nacl-2112021

Inbound:

Rules # 100: SSH 172.31.30.244/32 ALLOW
Rules # *: All traffic 0.0.0.0/0 DENY

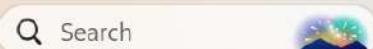
Outbound:

Rules # 100: Custom TCP 172.31.30.244/32 ALLOW
Rules # *: All traffic 0.0.0.0/0 DENY

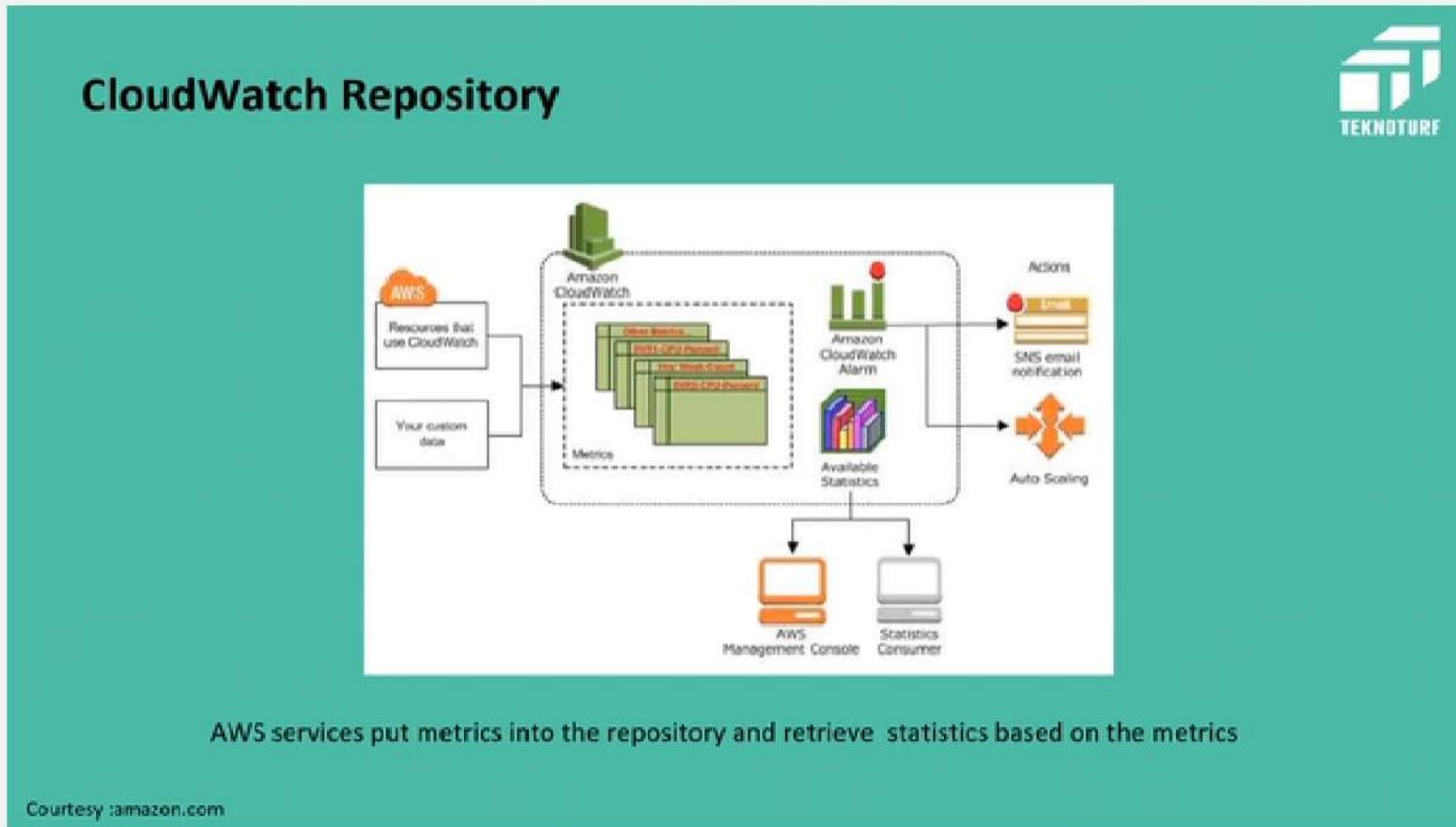
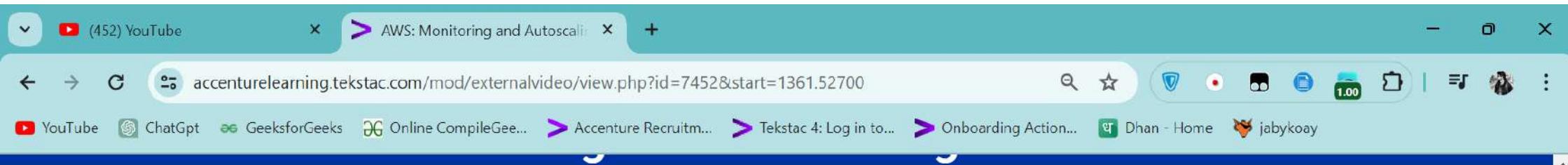


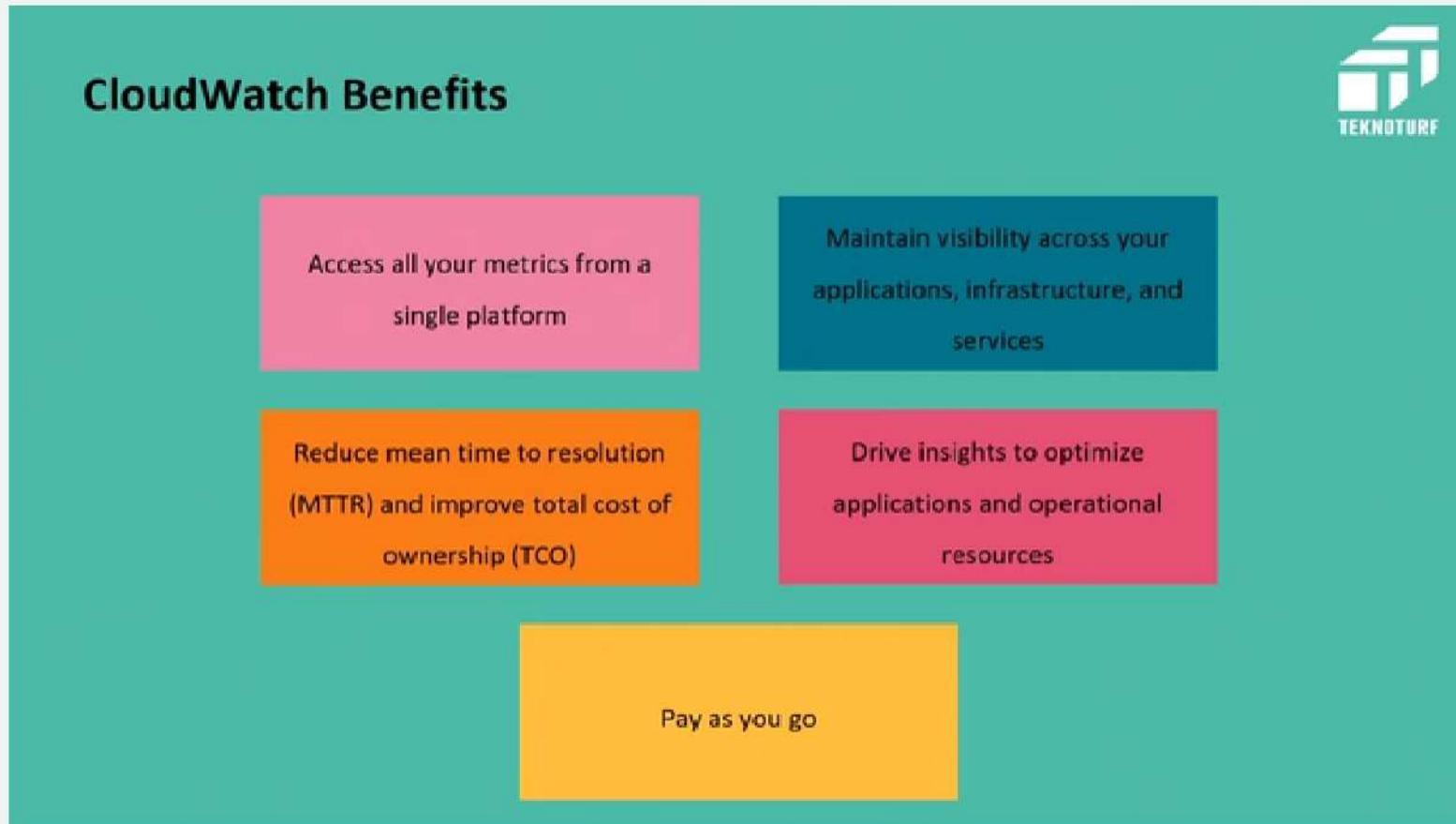


33°C
Haze

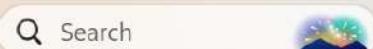


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16-04-2024





33°C
Haze



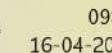
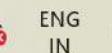
ENG
IN



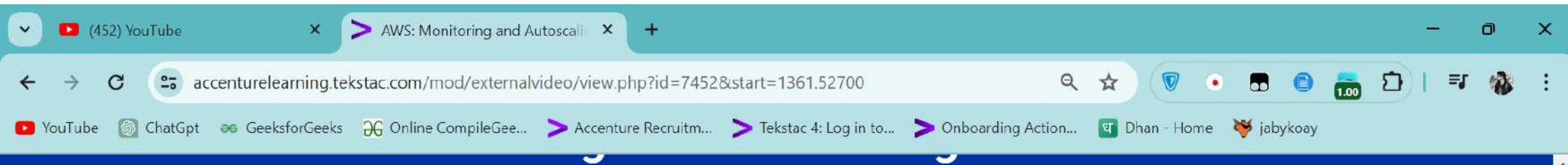
09:38
5-04-2024



33°C
Haze



09:39
16-04-2024



Dynamic Scaling With Amazon EC2 Auto Scaling

Auto Scaling group

Max	4
Min	1
Desired	2

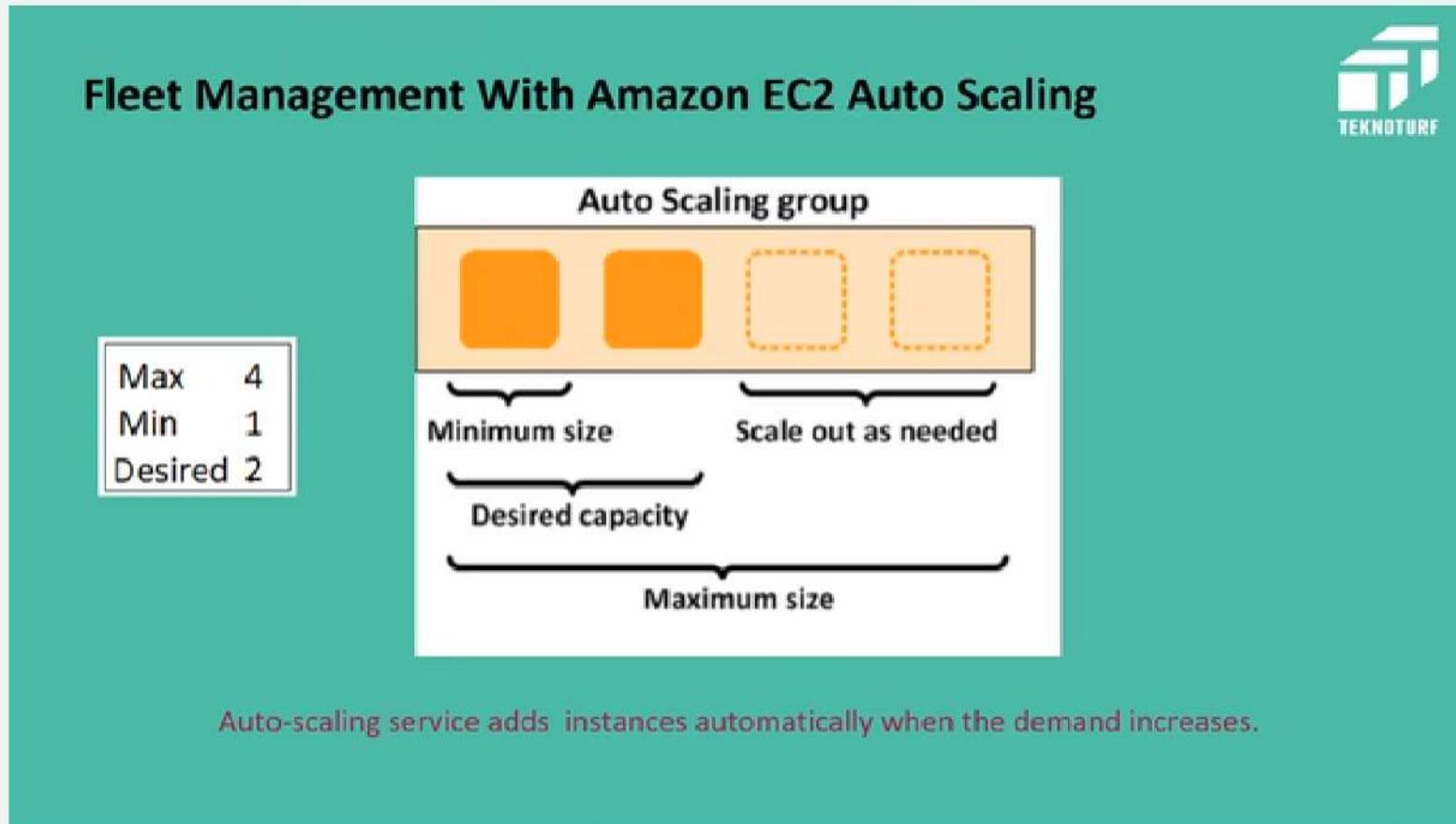
Minimum size Scale out as needed

Desired capacity

Maximum size

Auto-scaling service removes instances automatically when the demand decreases.



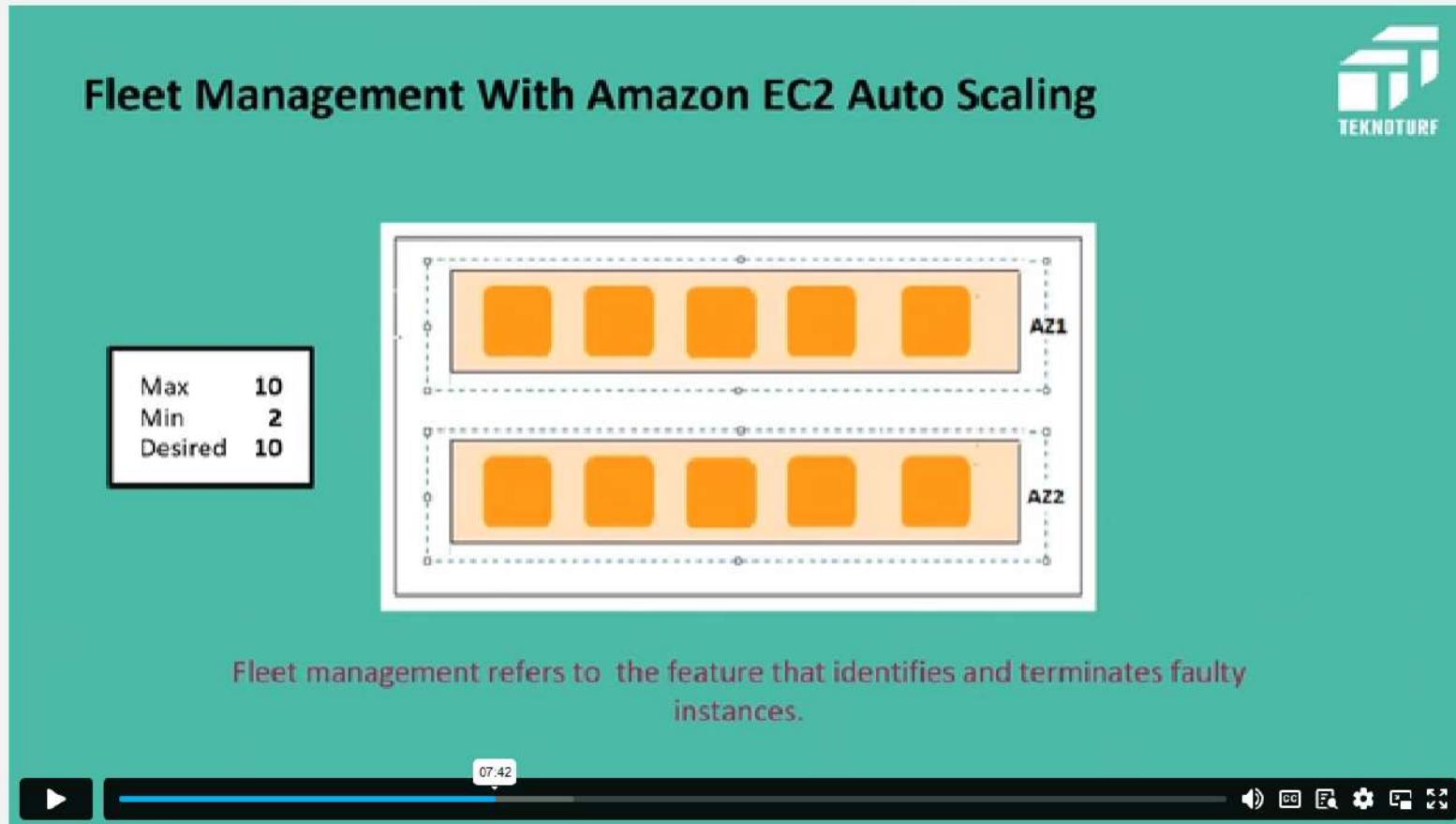


33°C
Haze

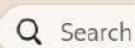


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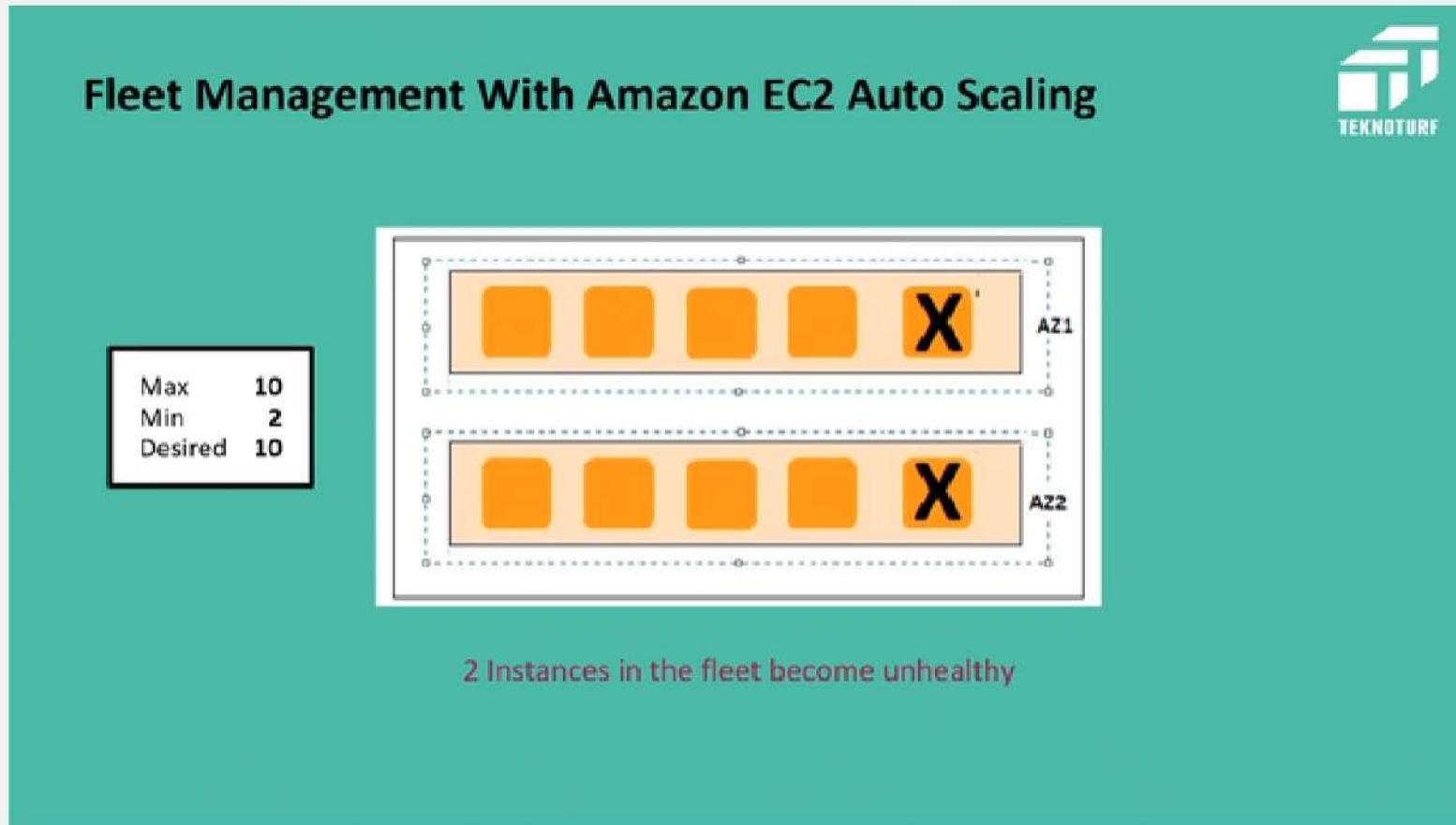
33°C
Haze

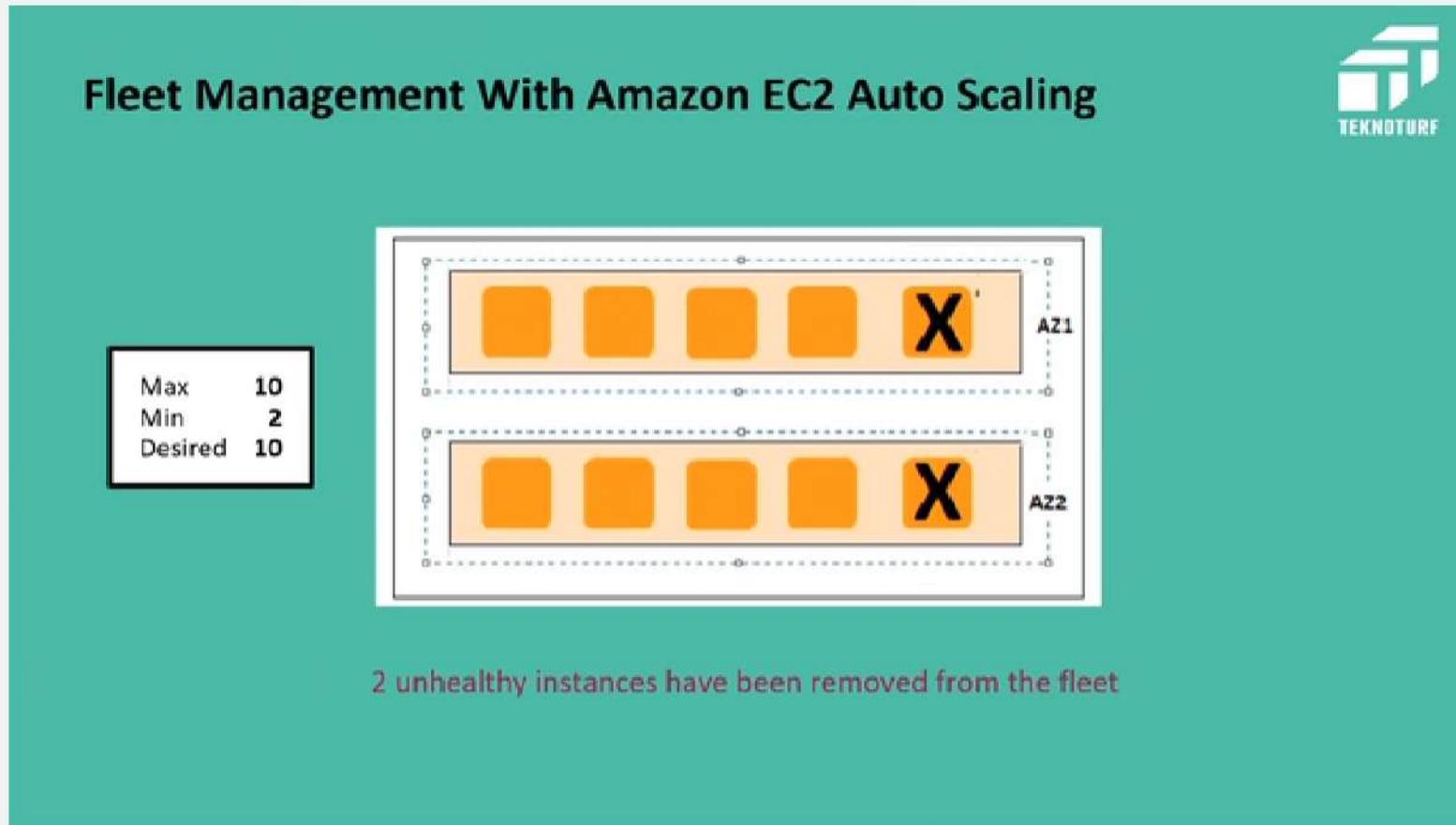


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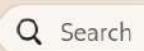


09:40
16-04-2024





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Haze



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accenturelearning.tekstac.com/mod/externalvideo/view.php?id=7452&start=1361.52700

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Fleet Management With Amazon EC2 Auto Scaling

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Max 10
Min 2
Desired 10

2 new instances have been created and added to the fleet

Nifty bank -0.79% 09:42 16-04-2024 ENG IN

(452) YouTube > AWS: Monitoring and Autscal... +

accenturelearning.tekstac.com/mod/externalvideo/view.php?id=7452&start=1361.52700

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Elastic Load Balancer

Distributing incoming traffic across targets like EC2 instances IP address and Containers

Nifty bank -0.79% 09:42 16-04-2024 ENG IN

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Elastic Load Balancer- Features

```
graph TD; 1((1)) --- 2((2)); 4((4)) --- 3((3)); 2 --- 3;
```

High availability

Health checks

Monitoring

SSL termination

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09:47

Play button

Search bar

Nifty bank -0.79%

Windows Start button

Search icon

File Explorer icon

Google Chrome icon

WhatsApp icon

Microsoft Edge icon

File icon

Microsoft Word icon

Microsoft Excel icon

Microsoft PowerPoint icon

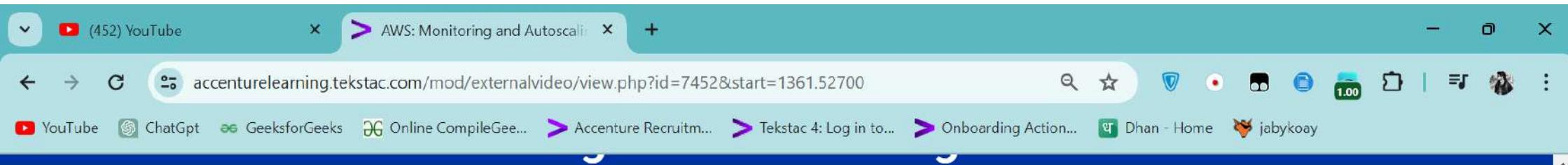
Up arrow

Down arrow

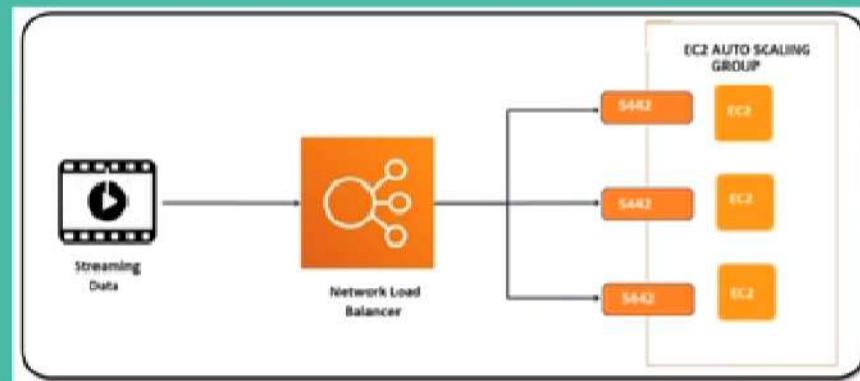
ENG IN

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Network Load Balancer Example



Network Load Balancer can handle millions of requests
per second It operates at Layer 4 of the OSI model

1 Feels hotter
Now



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1.00

DIY vs. AWS Database Services

TEKNOTURF

1

DB on EC2 instance

- Full Control over database
- Commercial Features

2

DB on EC2 instance

- Full Control over database
- Commercial Features
- High availability

12:08

Feels hotter Now

Search

09:43 16-04-2024

DB ON EC2

AWS RDS

12:08

Play

Volume

Settings

Share

Close

Up

Down

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AWS Database Service-Features

```
graph TD; 1((1)) --- 2((2)); 4((4)) --- 3((3)); 2 --- 3;
```

Lower administrative burden

High Availability and durability

Push button scaling

Automated backups

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Amazon RDS



Amazon RDS Engines

- Amazon Aurora
- MySQL
- PostgreSQL
- ORACLE
- MariaDB
- Microsoft SQL Server

AWS relational database service enables us to quickly setup, operate and scale database in the cloud.

Feels hotter Now

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What is Amazon Aurora?

Amazon Aurora is a relational database engine offered by AWS

- MySQL and PostgreSQL compatible
- 3X faster than standard PostgreSQL
- Self-healing storage, scales upto 64T
- 5X faster than standard MySQL
- 1/10 cost of Commercial database.
- Up to 15 low-latency read replicas



14:29

Feels hotter Now

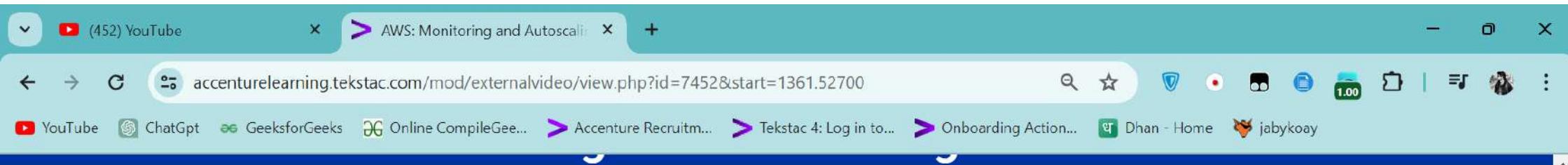
Search

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Amazon Aurora-Features

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Highly secure High availability and durability

1 Fully managed 2 3 Low Cost 4 5 High performance and scalability

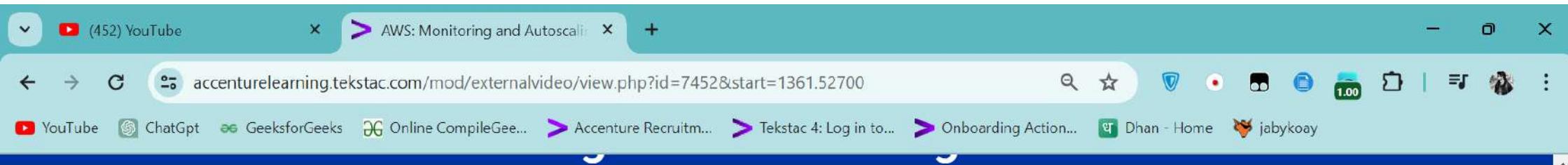
Courtesy :amazon.com



Relational vs. Key-Value Databases



	Relational/SQL	NoSQL
Data Storage	Rows and columns	Key value, documents, and graphs
Schemas	Fixed	Dynamic
Querying	SQL-based querying	Focused on collection of documents
Scalability	Vertical	Horizontal



What is Amazon DynamoDB?



The icon features a blue 3D hexagonal prism with horizontal stripes, representing a database structure. It is enclosed in a white rounded rectangle with a thin blue border.

Amazon
DynamoDB

- Fully managed non-relational
- Single digit millisecond latency
- Scales horizontally

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A slide from a presentation titled "What is Amazon DynamoDB?". It features a large icon of a blue hexagonal prism labeled "Amazon DynamoDB". To the right, three pink, orange, and teal callout boxes list the service's key features: "Fully managed non-relational", "Single digit millisecond latency", and "Scales horizontally". The TEKNOTURF logo is in the top right corner.

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Amazon DynamoDB use cases

```
graph LR; A[Serverless web applications] --> B[Microservices data store]; B --> C[Mobile backends]; C --> D[Internet of Things (IoT)]; D --> E[Ad tech]
```

The diagram illustrates the various use cases for Amazon DynamoDB, represented by colored boxes connected by arrows:

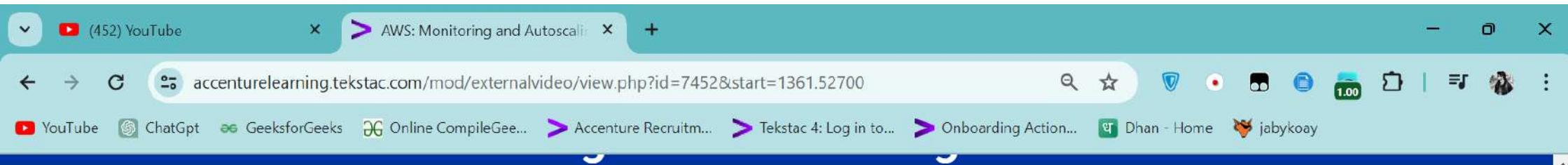
- Serverless web applications
- Microservices data store
- Mobile backends
- Internet of Things (IoT)
- Ad tech

Connections between the boxes indicate the integration points:

- Serverless web applications connects to Microservices data store.
- Microservices data store connects to Mobile backends.
- Mobile backends connects to Internet of Things (IoT).
- Internet of Things (IoT) connects to Ad tech.

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32°C Haze 09:45 16-04-2024 ENG IN



Other Purpose-Built Database Services

Amazon RedShift is a fast and scalable data warehouse

Amazon DocumentDB is a fast and highly available MongoDB compatible database

Amazon Neptune is a high performance graph database

Amazon Redshift

Amazon DocumentDB

Amazon Neptune

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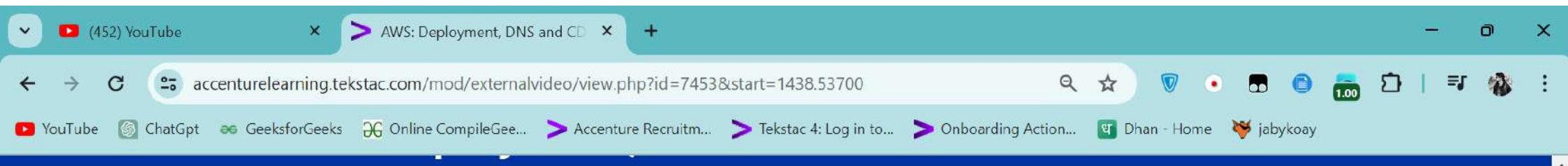
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Other Purpose-Built Database Services



Enterprise Relational Database	Amazon Relation Database Service
NoSQL database service for any scale	Amazon DynamoDB
Application feature is not supported by Amazon Database Service	Database on EC2
Specific case driven requirements (Machine Learning, Data warehouse, graphs)	AWS purpose built database service



AWS CloudFormation

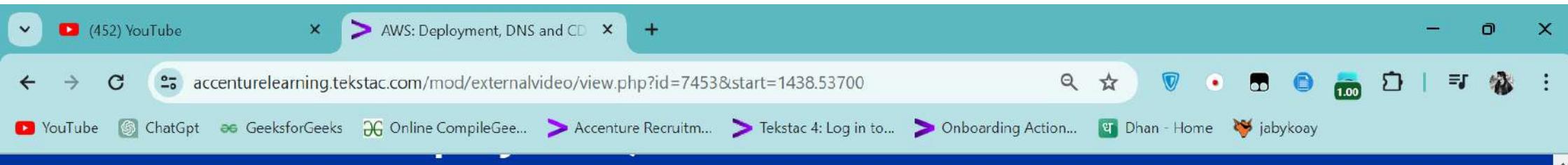
AWS CloudFormation allows you to create a collection of related AWS resources in an orderly fashion.



CloudFormation

- 1 Infrastructure modelled in a text file
- 2 Resource provisioning is done in safe and repeatable manner
- 3 Infrastructure as a Code
- 4 Write template using JSON or YAML





AWS CloudFormation

The diagram illustrates the AWS CloudFormation process:

- Template → S3 Bucket
- S3 Bucket → CloudFormation
- CloudFormation → Stack Creation

Upload your Template S3 bucket

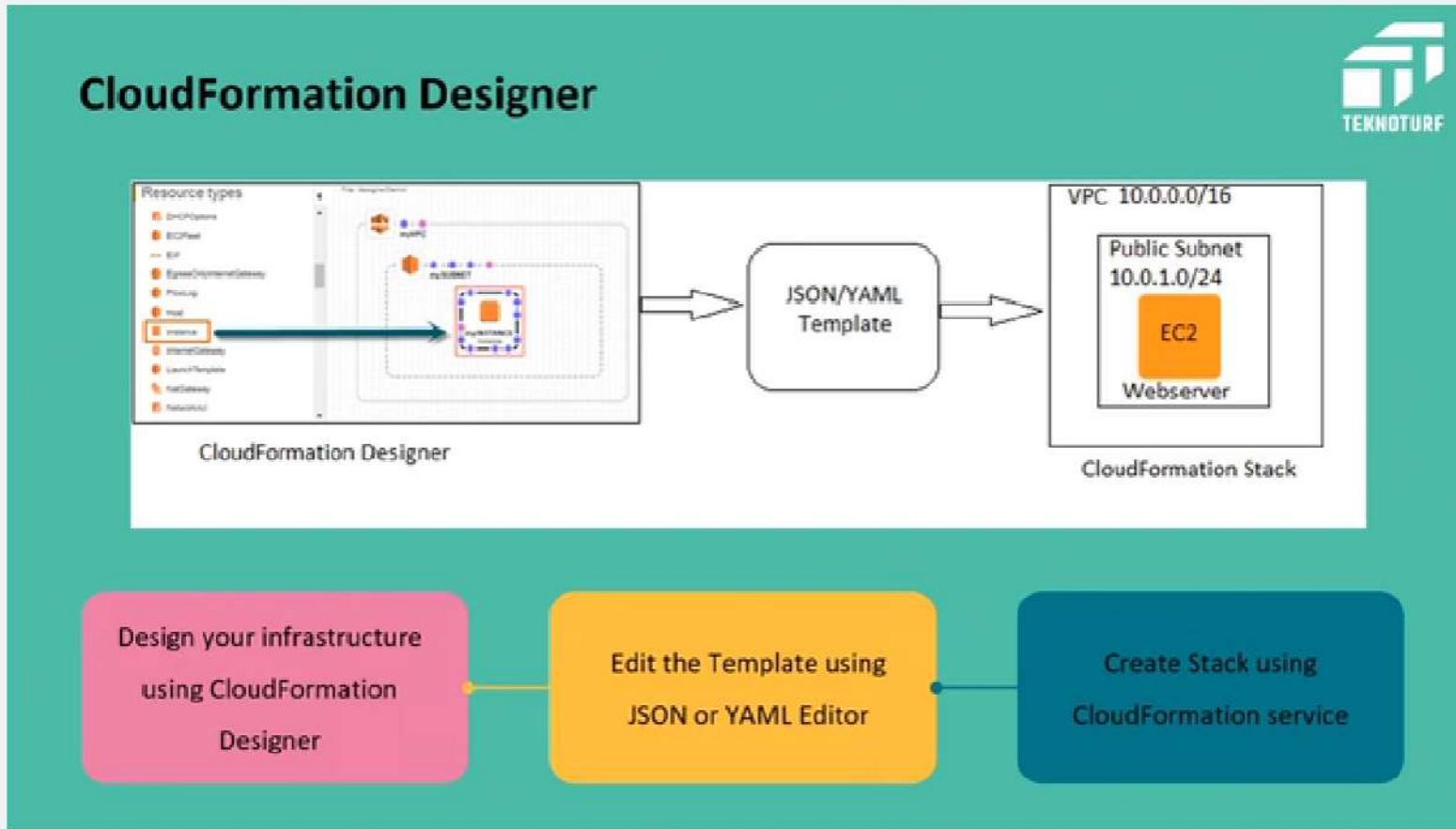
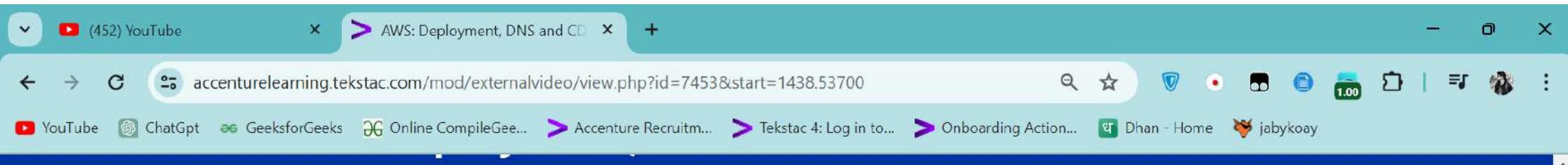
Code your infrastructure in YAML or JSON format

Create Stack using CloudFormation service.

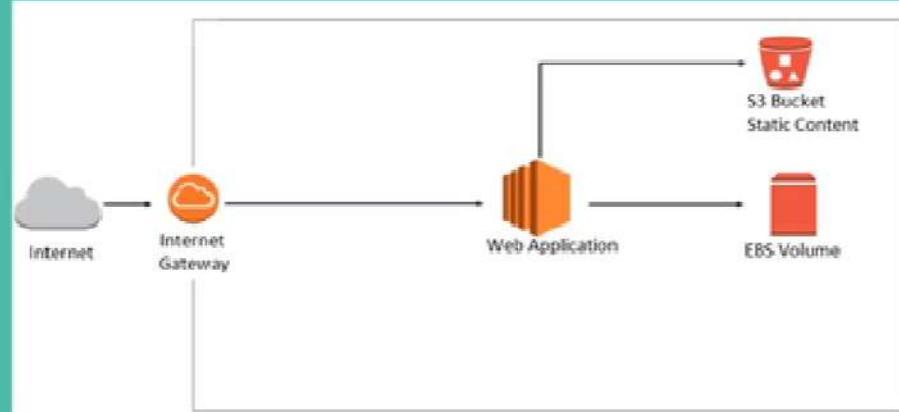
Courtesy :amazon.com

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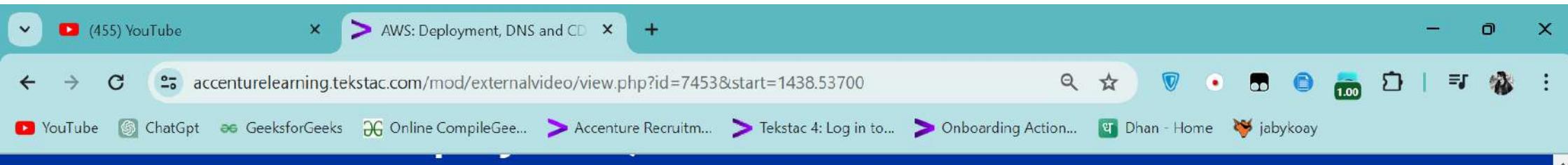




Putting It All Together (1 Of 4)



How to improve performance, scalability and efficiency

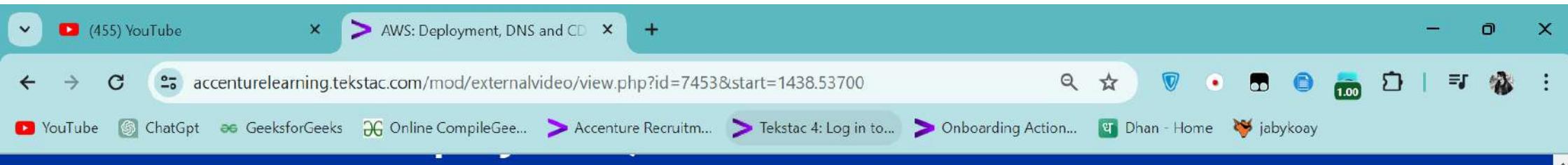


Putting It All Together (2 Of 4)

The diagram illustrates a cloud architecture stack. On the left, a grey cloud icon labeled "Internet" is connected to an orange circle labeled "Internet Gateway". An arrow points from the Internet Gateway to a white rectangular box labeled "Web Application". Inside the Web Application box, there is a central orange cube icon. Two arrows point outwards from the cube: one to the right labeled "EBS Volume" and one upwards labeled "S3 Bucket Static Content".

Application becomes durable, scalable and fast by replacing Legacy Database with Amazon RDS



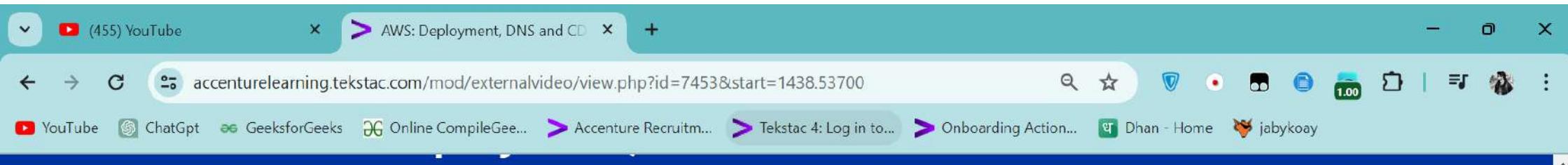


Putting It All Together (3 Of 4)

```
graph LR; Internet[Internet] --> IG[Internet Gateway]; IG --> WA[Web Application]; WA --> S3[S3 Bucket Static Content]; WA --> EBS[EBS Volume]
```

Replacing single EC2 instance with Auto-scaling group of instances to improve utilization and efficiency





Putting It All Together (4 Of 4)

The diagram illustrates a cloud architecture. On the left, a grey cloud icon labeled "Internet" is connected to an orange circle labeled "Internet Gateway". An arrow points from the Internet Gateway to a central orange hexagonal box labeled "Web Application". From the Web Application, two arrows point to the right: one to a red bucket icon labeled "S3 Bucket Static Content" and another to a red cylinder icon labeled "EBS Volume".

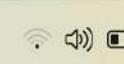
Code your infrastructure using JSON/YAML format and deploy quickly using Amazon CloudFormation service



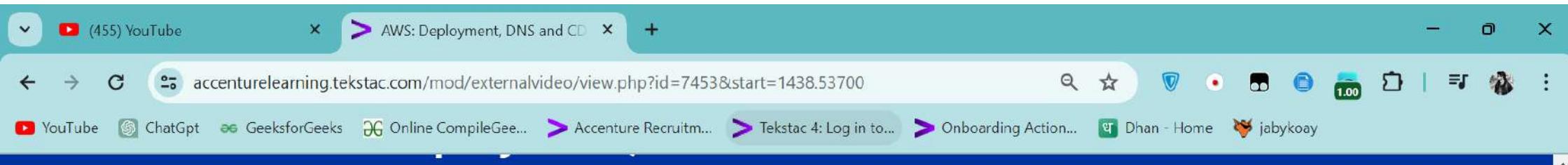
Search



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09:49
16-04-2024



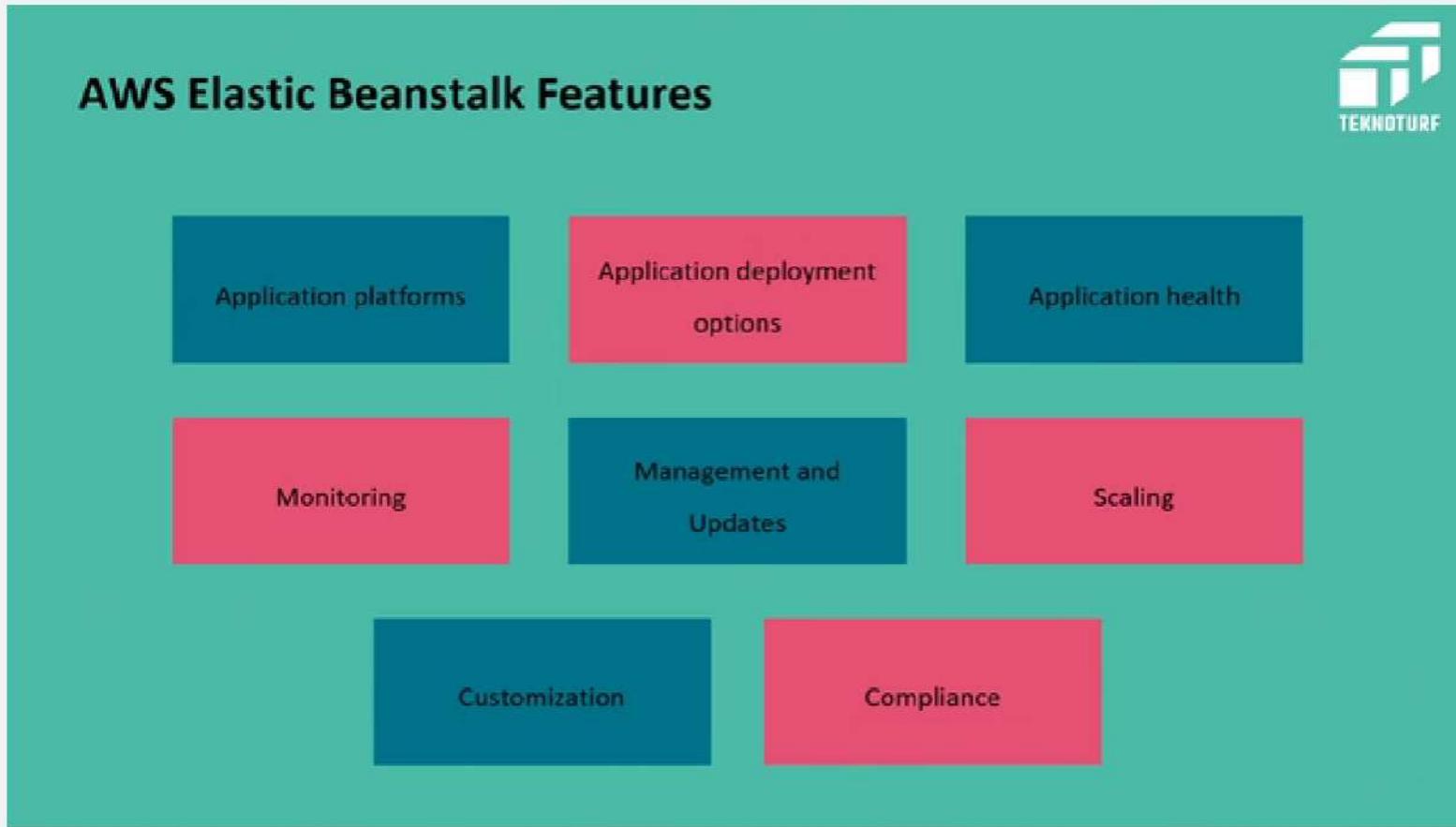
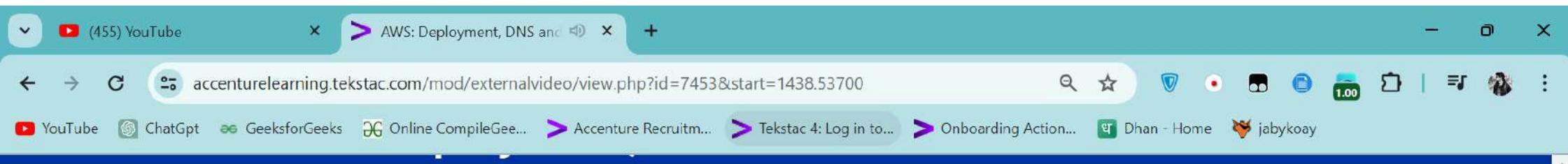
AWS Elastic Beanstalk

AWS Elastic Beanstalk helps us to quickly deploy application without worrying about the hardware provision.

Once Application is uploaded, beanstalk service takes care of

- 1 Resource provisioning
- 2 Load Balancing
- 3 Automatic scaling
- 4 Monitoring





(455) Sydney Sweeney hot 100% > AWS: Deployment, DNS and CD +

accenturelearning.tekstac.com/mod/externalvideo/view.php?id=7453&start=1438.53700

YouTube ChatGpt GeeksforGeeks Online CompileGee... Accenture Recruitm... Tekstac 4: Log in to... Onboarding Action... Dhan - Home jabykoay

AWS Direct Connect

AWS Direct Connect is used to create a dedicated private network between on-premise data center and AWS cloud.

Reduces bandwidth cost

Consistent network performance

Easy scalability

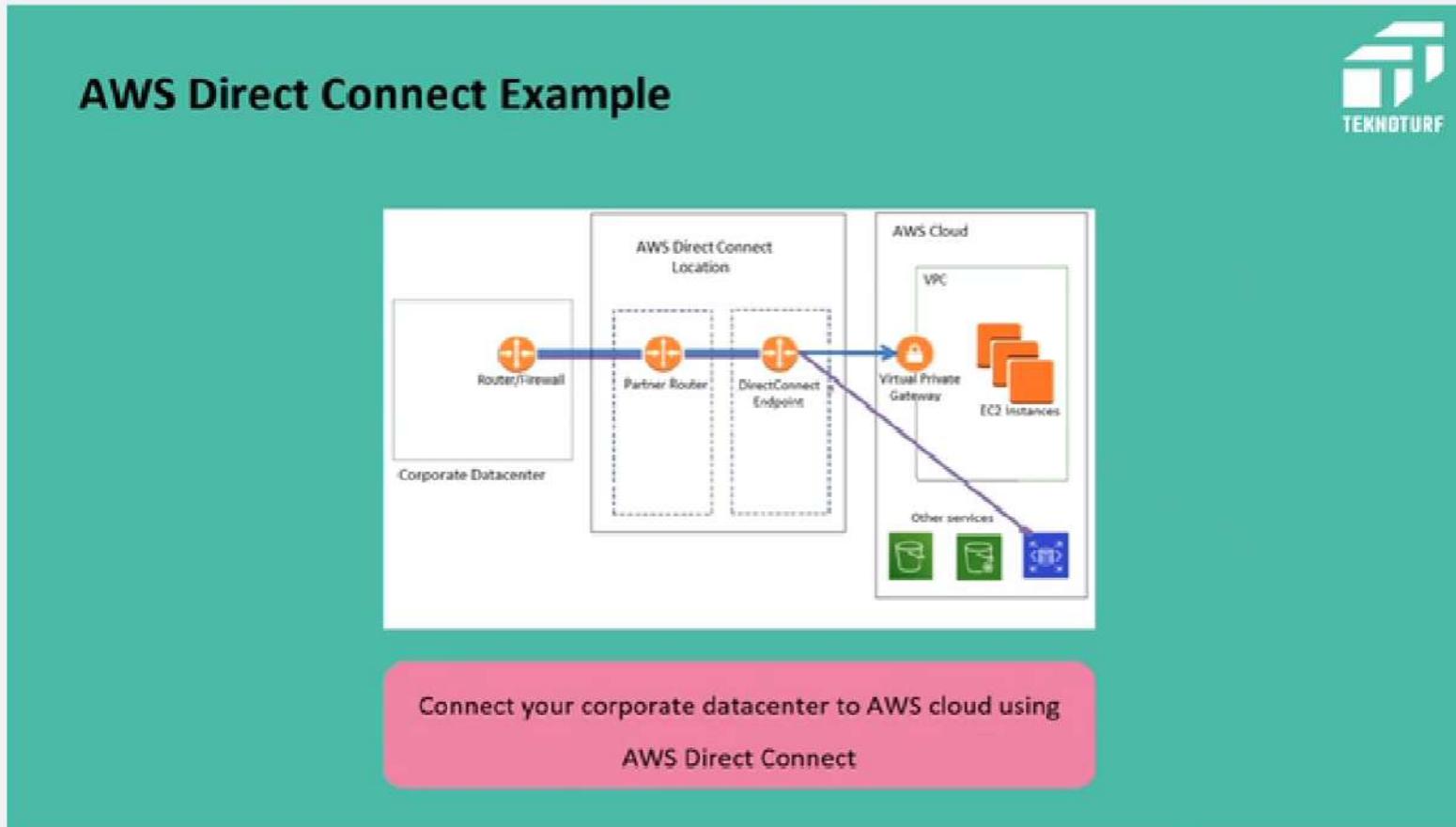
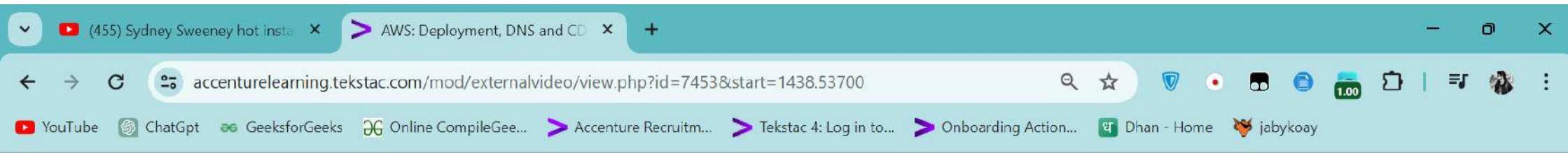
Private connectivity to your Amazon VPC

TEKNOTURF

33°C Haze

Search

10:17 16-04-2024 ENG IN



AWS Direct Connect

Amazon Route 53 is a managed DNS service in AWS. It is highly available and scalable.

1

Route traffic

2

Register domain
names

3

Health check



12:16



Amazon Elastic File System (EFS)

Amazon EFS is a fully managed service providing shared file system storage for Linux workloads.

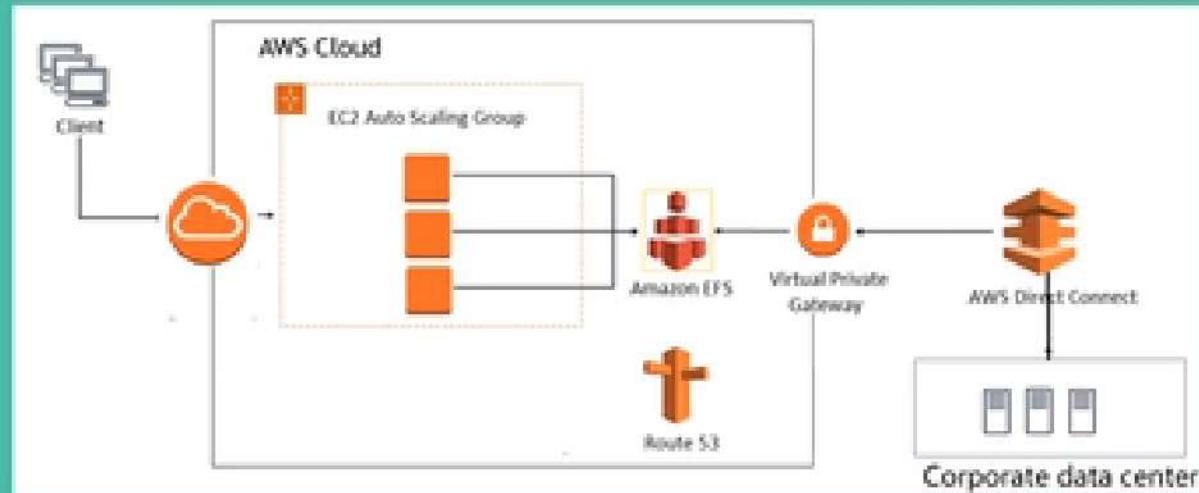


Dynamic elasticity

Shared file storage

Cost-effective

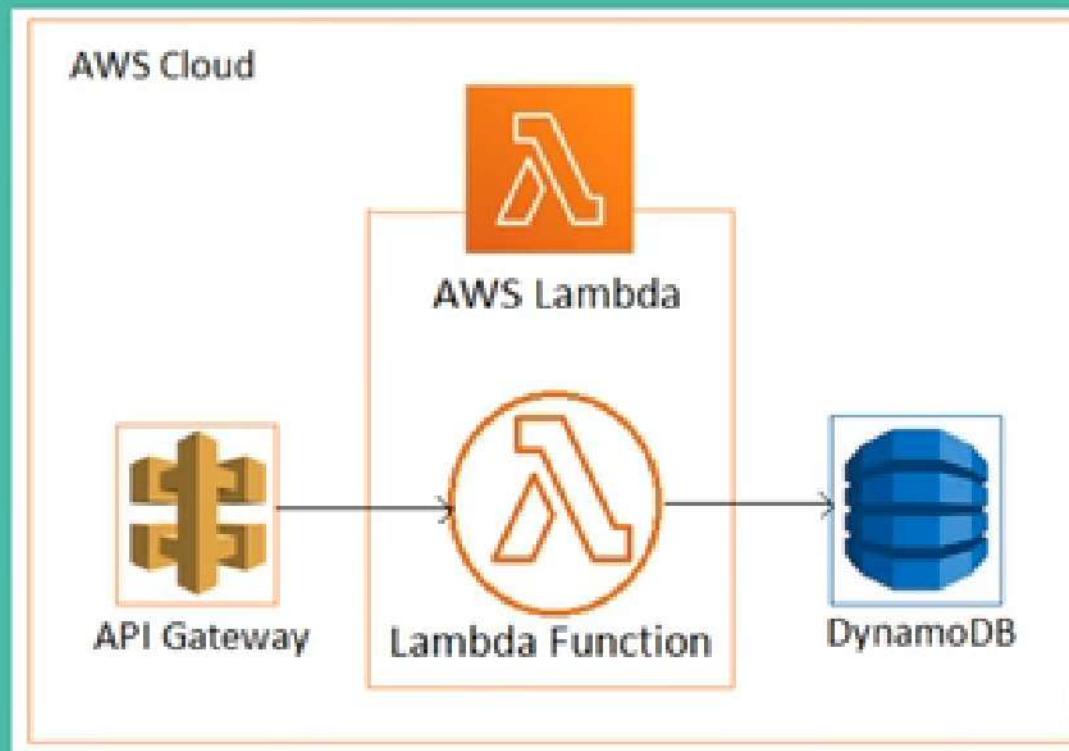
Amazon EFS Example



EC2 instances and On-premise Server sharing EFS to
Application data .

Amazon EFS Example

Run code without provisioning and managing servers.



Benefits of Lambda

Multiple programming languages support



Automated administration

Automatic scaling

Built-in fault tolerance

Orchestrate multiple functions

Pay per use pricing

Amazon Simple Notification Service (SNS)

Fully managed messaging service for distributed application.

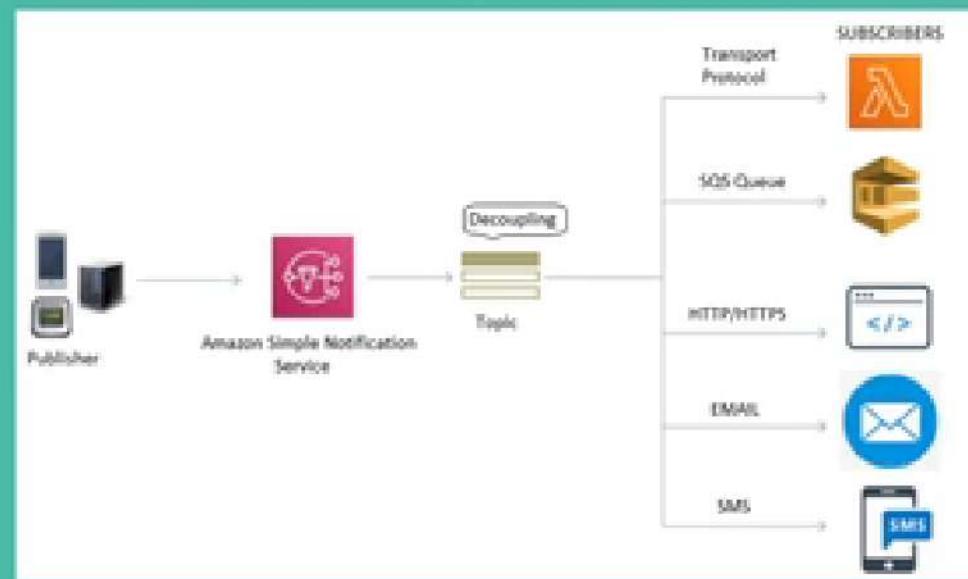


Amazon
SNS

Features

- 1 Reliability and durability
- 2 Scalability
- 3 Message filtering and routing

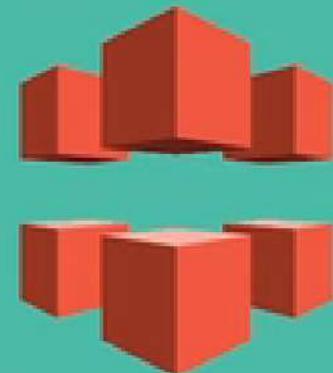
Amazon SNS Overview



Publisher sends messages to the SNS topic , SNS in-turn sends messages to all the subscribers (PubSub model)

Amazon CloudFront

A fast content delivery network (CDN) service that securely delivers data to customers globally.



Advantages

1

Faster performance

2

Secure

3

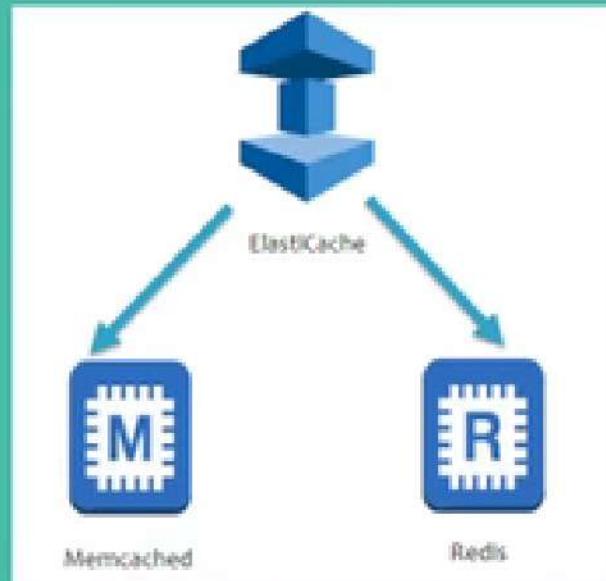
Programmable

4

Cost Effective

Amazon ElastiCache

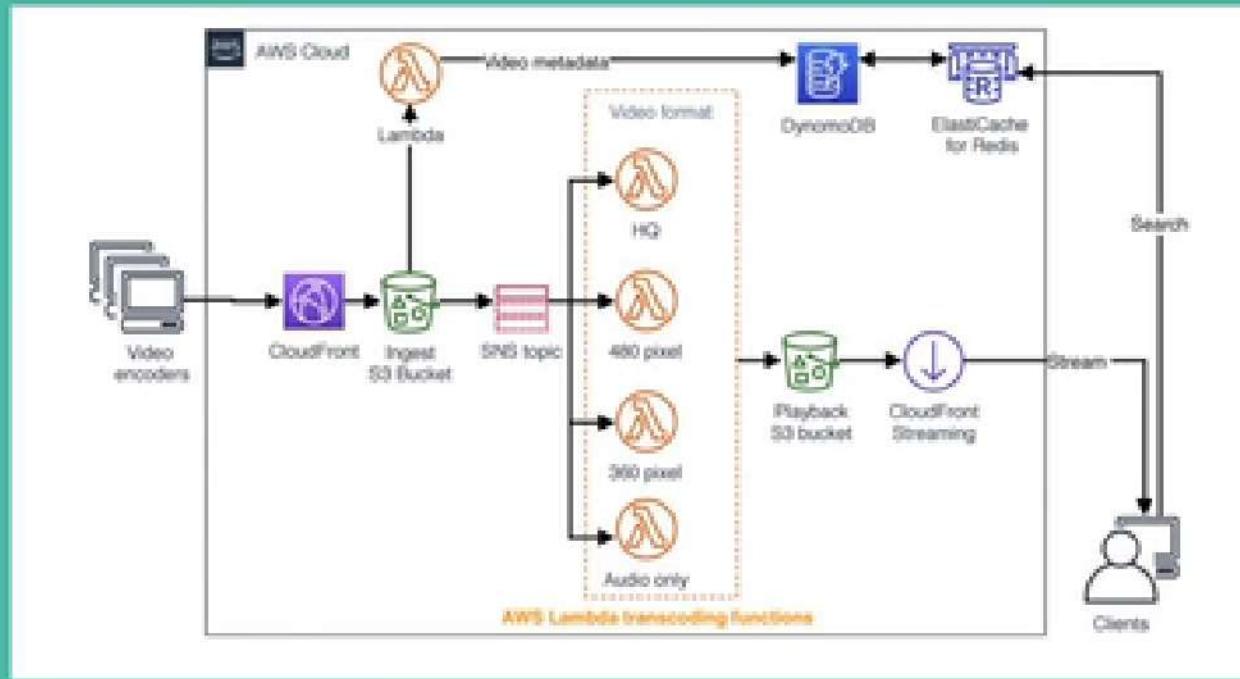
Amazon ElastiCache is an in-memory database service in the cloud



Fully Managed



Use Case: Media Streaming Service



Involves Lambda, SNS, CloudFront and ElastiCache service to transcode Uploaded images

Security is our top priority



The AWS infrastructure has been architected to be one of the most flexible, reliable, scalable and secure cloud computing environments available today.

Security of the cloud



1

Protecting Global Infrastructure
Regions, Availability Zones and
Edge Locations.

2

Provides third party reports
on Security Compliance

Security in the cloud



Security requirements that the customer needs to consider includesContent they store, AWS service they use, Country in which they host data, and who has access to the content

AWS shared responsibility model



Security and compliance are shared between AWS and the customer

Managed and Unmanaged Services

Managed Services

- Amazon S3
- Amazon RDS
- Amazon DynamoDB

Unmanaged Services

- Amazon EC2
- Amazon EBS

Security and compliance products



■ AWS Artifact

■ AWS Firewall Manager

■ AWS Organizations

■ AWS Certificate Manager

■ Amazon Guard Duty

■ AWS Shield

■ Amazon Cloud Directory

■ AWS IAM

■ AWS Secrets Manager

■ AWS CloudHSM

■ Amazon Inspector

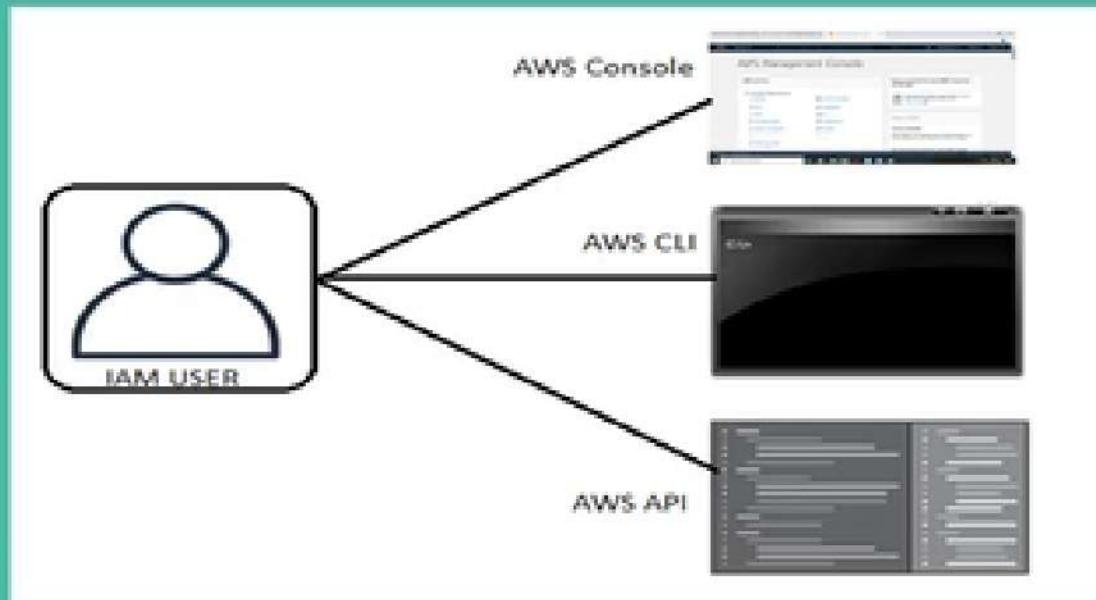
■ AWS Single Sign-On

■ Amazon Cognito

■ AWS KMS

■ AWS WAF

Authentication



Authentication is the method of checking that a user and host is who they claim to be.

IAM role



- 1 IAM Roles are assumed by the Users or application
- 2 IAM Role is attached with the IAM policy for permission
- 3 Temporary credentials are provided for Users/Application for assuming the Role.

Best practices

Delete access keys of AWS account root user

Enable multi-factor authentication (MFA)

Grant least privilege

Use roles for applications

Rotate credentials regularly

Remove unnecessary users and credentials

Monitor activity in your AWS account

Amazon Inspector findings

Amazon Inspector - Findings

Findings are potential security issues discovered after Amazon Inspector runs an assessment against a specified assessment target.

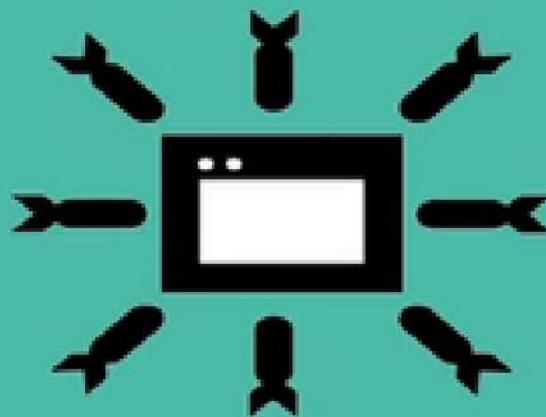
Add/Edit attributes

T Filter

	Severity	Finding	Target	Template
<input type="checkbox"/>	High	Instance is vulnerable to CVE-2016-0636	Web Servers	Web Servers
<input type="checkbox"/>	High	Instance is vulnerable to CVE-2016-0636	Web Servers	Web Servers
<input type="checkbox"/>	Medium	Instance is configured to allow users to...	Web Servers	Web Servers
<input type="checkbox"/>	Medium	Instance is vulnerable to CVE-2016-0787	Web Servers	Web Servers
<input type="checkbox"/>	Medium	Instance is vulnerable to CVE-2016-0787	Web Servers	Web Servers
<input type="checkbox"/>	Medium	Instance is configured to allow users to...	Web Servers	Web Servers
<input type="checkbox"/>	Informational	Unsupported Operating System or Version	Web Servers	Web Servers
<input type="checkbox"/>	Informational	No potential security issues found	Web Servers	Web Servers
<input type="checkbox"/>	Informational	Unsupported Operating System or Version	Web Servers	Web Servers

Amazon Inspector findings shows security issues such as vulnerabilities in a webserver with different severity level

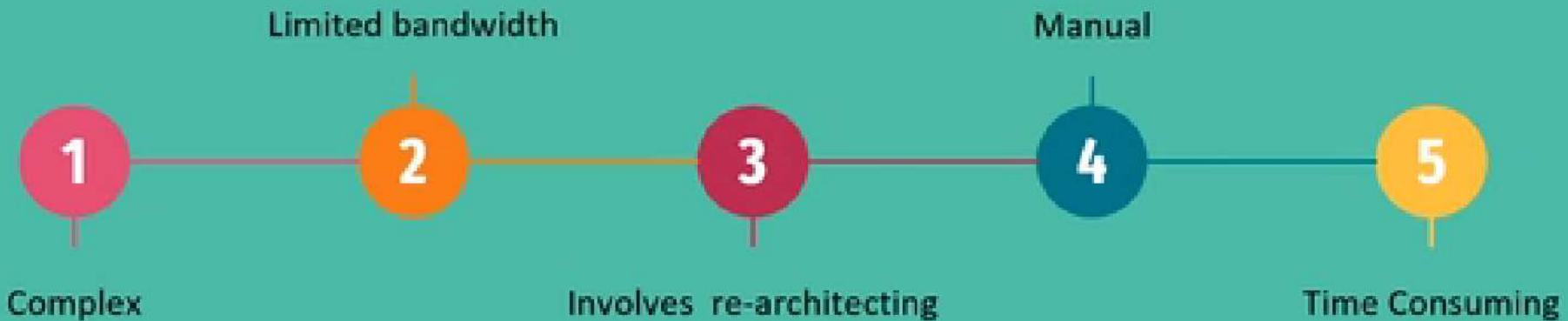
DDoS



Cybercriminals use several sources to attack against a target to make the application un-available.

DDoS mitigation challenges

AWS Shield is a managed service that safeguards applications running on AWS from
DDoS attack



AWS SHIELD

18:40

DDoS mitigation challenges

AWS Shield Standard



- 1 Quick detection
- 2 Inline attack mitigation
- 3 No cost

AWS Shield Advanced



- 1 Enhanced detection
- 2 Advanced attack mitigation
- 3 Visibility and attack notification
- 4 DDoS cost protection
- 5 Specialized support

21:35

How AWS helps customers achieve compliance

Sharing information

- Industry certifications
- Security and control practices
- Compliance reports directly under NDA

Assurance program

- Certifications/attestations
- Laws, regulations, and privacy
- Alignments/frameworks

Press Esc to exit full screen

AWS- Well Architected Framework



Five pillars of the WAF



Security

Implement a strong identity foundation

Automate security best practices

Enable traceability

Protect data in transit and at rest

Apply security at all layers

Prepare for security events



Performance efficiency

1

Democratize advanced technologies

2

Go global in minutes

3

Use serverless architectures

4

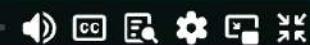
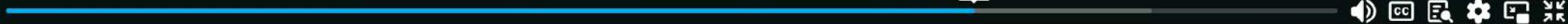
Experiment more often

5

Apply mechanical sympathy



08:31



Cost optimization

1

Adopt a consumption model

2

Measure overall efficiency

3

Stop spending money on data center operations

4

Analyze and attribute expenditure

5

Use managed services to reduce cost of ownership

AWS Well-Architected Tool



You can assess the state of your workloads and compare them to the most recent AWS architectural best practices.

Help cloud architects in creating secure, high-performing, robust, and efficient application architecture.

Provides recommendations for making your workloads more secure, reliable, efficient, and cost-effective.

Press Esc to exit full screen

Pricing models and application support



How do you pay for AWS?

1

Pay as you go



2

Save when you reserve



3

Pay less by using more



Pay as you go

Only pay for what you use



upfront capital costs for data center



Pay as you consume resources

Use more, pay less

Automatic volume-based discounts



Pricing concepts

Compute

- Charged per hour/second
- Varies by instance type
- Linux only

Storage

- Charged typically per GB

Data transfer

- Outbound is aggregated and charged
- Inbound has no charge (with some exceptions)
- Charged typically per GB

EC2 Pricing Models

On-Demand Instances

- Charged per hour/second*
- Short-term
- Without any up-front payment or long-term commitment

Savings Plan

- Commitment based discounts 1 to 3 years
- Applications with steady state usage

Dedicated Hosts

- Dedicated physical servers
- Applications with specific compliance requirements

Spot Instances

- Spare AWS capacity for up to 90% discount
- Applications with flexible start and end times
- Urgent computing needs for large amounts of capacity

EC2 Pricing Models

Volumes

- ⦿ Charged by GB provisioned/month
- ⦿ Varies by volume type

Snapshots

- ⦿ Charged by space consumed in Amazon S3
- ⦿ Charged for volume copied across regions

Data transfer

- ⦿ Inbound data transfer is free
- ⦿ Outbound data transfer charges are tiered

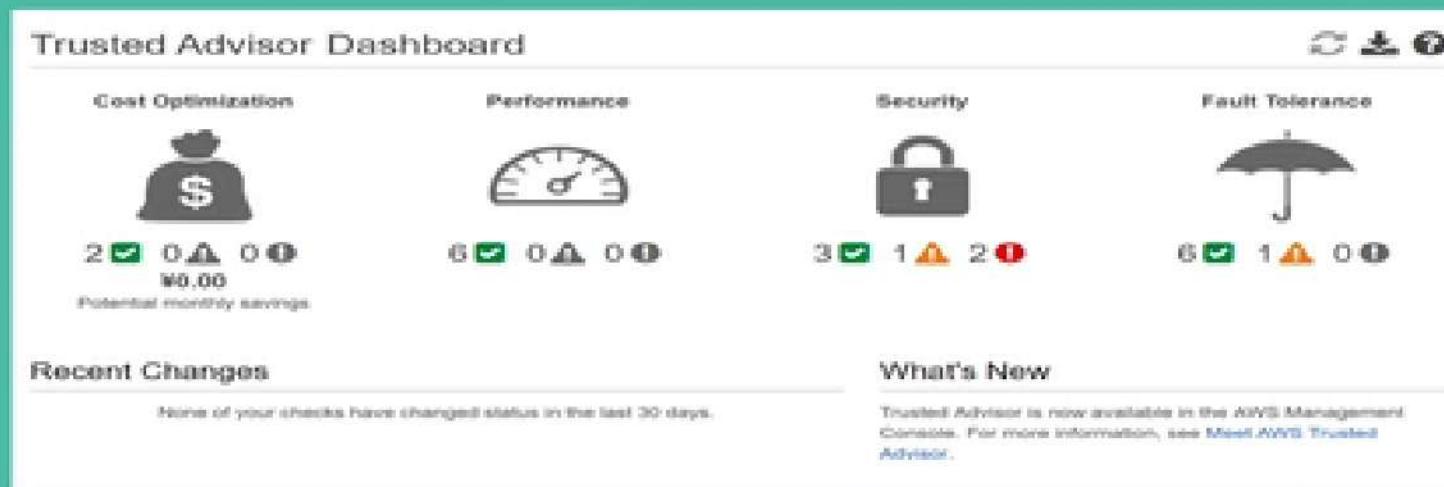
EC2 Pricing Models



What Is Trusted Advisor?

A service providing guidance to help you reduce cost,
increase performance, and improve security

Trusted Advisor Dashboard



Category	Count	Green	Yellow	Red	Total
Cost Optimization	2	✓	0	0	2
Performance	6	✓	0	0	6
Security	3	✓	1	2	6
Fault Tolerance	6	✓	1	0	7

Potential monthly savings: \$0.00

Recent Changes

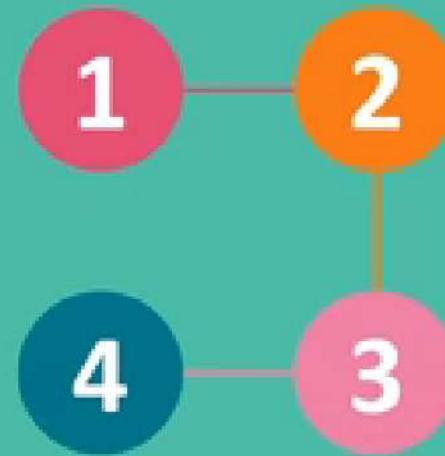
No changes found.

What's New

Trusted Advisor is now available in the AWS Management Console. For more information, see [About AWS Trusted Advisor](#).

Support documentation

Knowledge Center (FAQs and common requests)



AWS Support Center

AWS Documentation

AWS Discussion Forums