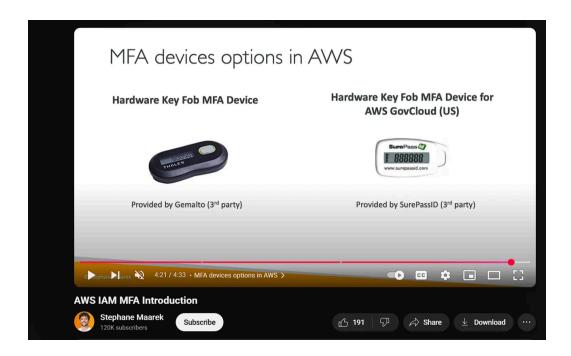
1. AWS IAM Preparation

Key Learnings:

 Watched Stephane Maarek's AWS IAM Masterclass (YouTube) and reviewed AWS IAM documentation.



- Understood core IAM concepts:
 - Users, Groups, Roles, Policies (Identity vs. Resource-based policies).
 - Principle of Least Privilege (PoLP) Granting minimal required permissions.
 - Multi-Factor Authentication (MFA) for enhanced security.
 - IAM Access Analyzer to detect unintended resource exposure.

Hands-on Exploration:

- Created an IAM user with programmatic & console access.
- Attached AmazonS3ReadOnlyAccess policy to a group.

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• Tested **IAM policy simulator** to verify permissions.

2. AWS SLAs Research

Service Level Agreements (SLAs) for Key AWS Services:

AWS Service	SLA Uptime %	Allowed Downtime per Year
Amazon EC2	99.99%	~52.56 minutes
Amazon S3	99.9%	~8.76 hours
AWS Lambda	99.95%	~4.38 hours
RDS (Multi-AZ)	99.95%	~4.38 hours

Observations:

- Higher SLA (e.g., 99.99%) means stricter uptime guarantees.
- EC2 vs. S3:
 - EC2 (99.99%) allows ~52 mins downtime/year.
 - S3 (99.9%) allows ~8.76 hours/year.
- Impact of Downtime:
 - Financial penalties (service credits) apply if SLA is breached.

3. AWS Basics & Free Tier Exploration

Key Takeaways:

- AWS Global Infrastructure:
 - Regions → Availability Zones (AZs) → Edge Locations.
 - Free Tier offers 12-month free usage (e.g., 750 EC2 hours/month).
- Core Services:
 - EC2 (Virtual Servers), S3 (Object Storage), VPC (Networking).

Hands-on Activity:

- Created an S3 bucket and uploaded a test file.
- Checked AWS Free Tier limits in the Billing Dashboard.

4. CDN & Edge Locations Study

Comparison: CloudFront vs. Akamai vs. Fastly

Feature	AWS CloudFront	Akamai	Fastly
Global Edge Network	600+ Locations	4,100+ Locations	100+ Locations
Integration	Native AWS services	Third-party	API-driven
Pricing	Pay-as-you-go	Enterprise contracts	Usage-based
DDoS Protection	AWS Shield	Prolexic	Built-in

Experiment: Testing CloudFront with S3

- 1. Deployed a static website on S3.
- 2. Enabled CloudFront distribution.
- 3. Compared latency:
 - Without CDN: ~300ms (Direct S3 access from India).
 - With CloudFront: ~50ms (via Mumbai Edge Location).

India's Edge Locations:

- 33 CloudFront Edge Locations (Mumbai, Delhi, Chennai, etc.).
- Reduced latency for Indian users.

5. Command Line Network Testing

Traceroute to AWS Domains:

bash

tracert aws.amazon.com

Findings:

- Multiple hops observed (ISP \rightarrow AWS Edge \rightarrow Origin).
- Ping Test: Lower latency when accessing via CDN.

6. AWS Global Infrastructure Diagram



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