Video streaming service using AWS Elemental Media Services, S3, and CloudFront

1. Preparation
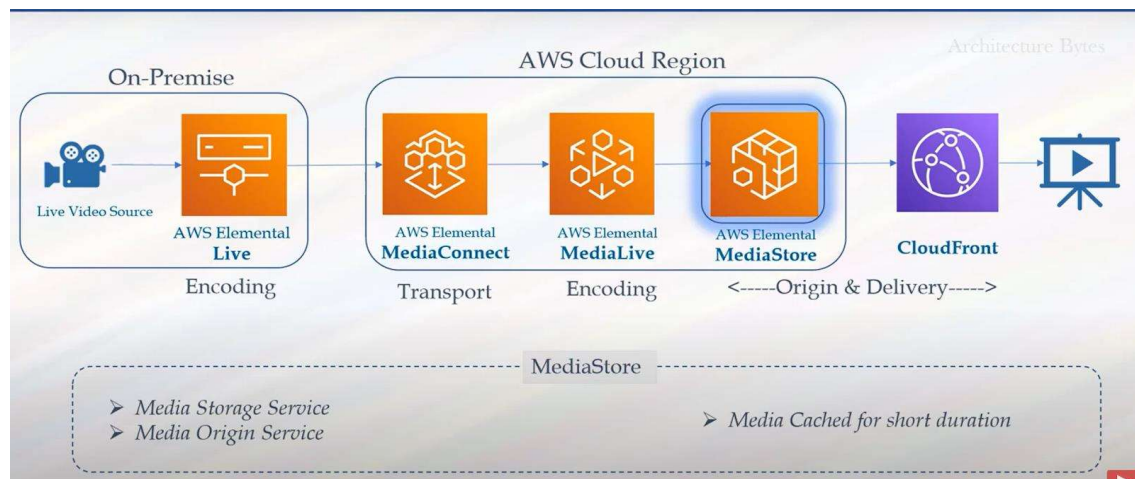
Tools and Software

- **AWS CLI**: Installed AWS CLI following the AWS CLI Installation Guide.

2. Project Setup

Project Planning

- **Objectives**: Set up a video streaming service that delivers high-quality, low-latency video content.
- **Requirements**: Defined the need for live and on-demand streaming capabilities, efficient content delivery, and user-friendly access.

AWS Services Identification

- **AWS Elemental MediaLive**: For encoding live video streams in real-time.
- **AWS Elemental MediaPackage**: For packaging content into formats suitable for playback on various devices.
- **Amazon S3**: For storing video content for on-demand playback.
- **Amazon CloudFront**: For delivering video content with low latency and high availability.
- **AWS IAM**: For managing secure access to AWS resources.

3. Environment Configuration

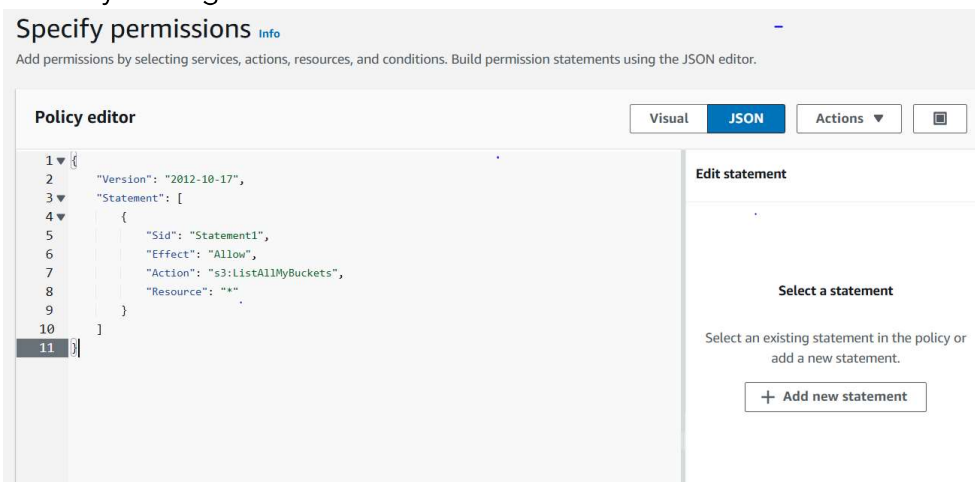- **AWS Management Console**: Familiarized with the AWS Management Console for resource management.

- **IAM Roles and Policies**: Created and configured IAM roles and policies to securely manage access to AWS resources.

Add permissions

Add user to an existing group or create a new one. Using groups is a best-practice way to manage user's permissions by job functions. Learn more [↗]

Permissions options

○ Add user to group	○ Copy permissions	● Attach policies directly
Add user to an existing group, or create a new group. We recommend using groups to manage user permissions by job function.	Copy all group memberships, attached managed policies, inline policies, and any existing permissions boundaries from an existing user.	Attach a managed policy directly to a user. As a best practice, we recommend attaching policies to a group instead. Then, add the user to the appropriate group.

Permissions policies (1/1223)

Filter by Type

| 🔍 list ✕ | All types ▼ | 4 matches | ‹ 1 › ⚙ |

	Policy name [↗] ▲	Type ▽	Attached entities ▽
☐	⊞ 🟧 AWSIAMIdentityCenterAllowListF...	AWS managed	0
☐	⊞ 🟧 AWSPriceListServiceFullAccess	AWS managed	0
☐	⊞ 🟧 AWSQuickSightListIAM	AWS managed	0
☑	⊞ ListS3BucketsPolicy	Customer managed	0

Activate Windows
Go to Settings to activate Windows

Cancel   Next

Specify permissions Info

Add permissions by selecting services, actions, resources, and conditions. Build permission statements using the JSON editor.

Policy editor

Visual   **JSON**   Actions ▼   ▣

```
1 ▼ {
2     "Version": "2012-10-17",
3 ▼   "Statement": [
4 ▼     {
5         "Effect": "Allow",
6 ▼       "Action": [
7           "s3:CreateBucket",
8           "s3:ListBucket",
9           "s3:DeleteBucket"
10        ],
11 ▼     "Resource": [
12          "arn:aws:s3:::*"
13        ]
14      }
15    ]
16 }
17 |
```

Edit statement

Select a statement

Select an existing statement in the policy or add a new statement.

[+ Add new statement]
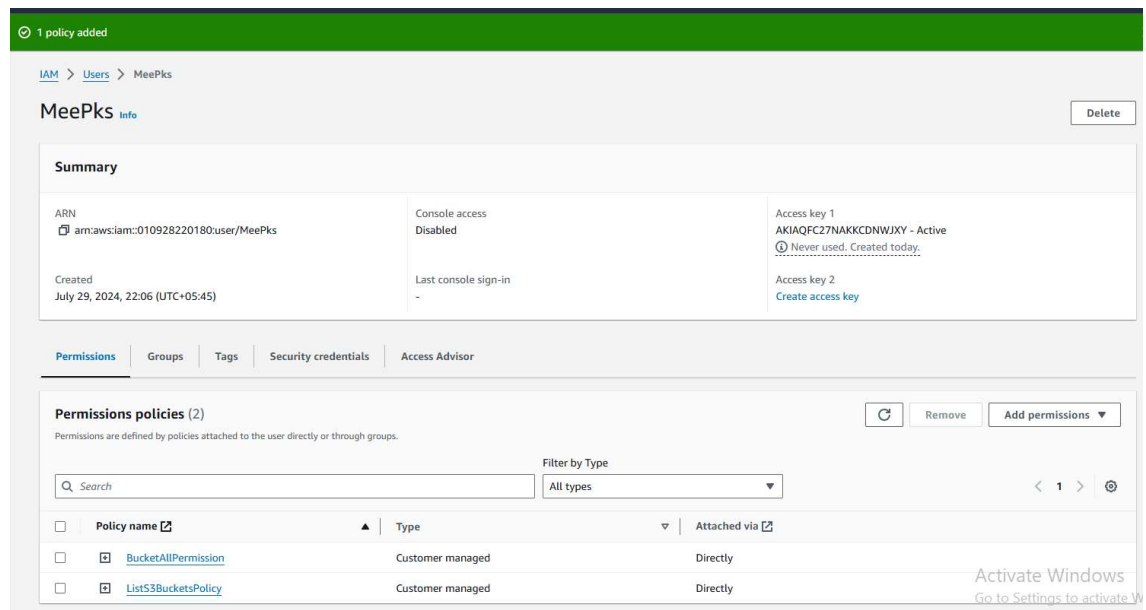
4. Implementation

Resource Provisioning

- **AWS Elemental MediaLive**: Set up a channel for encoding live video streams.
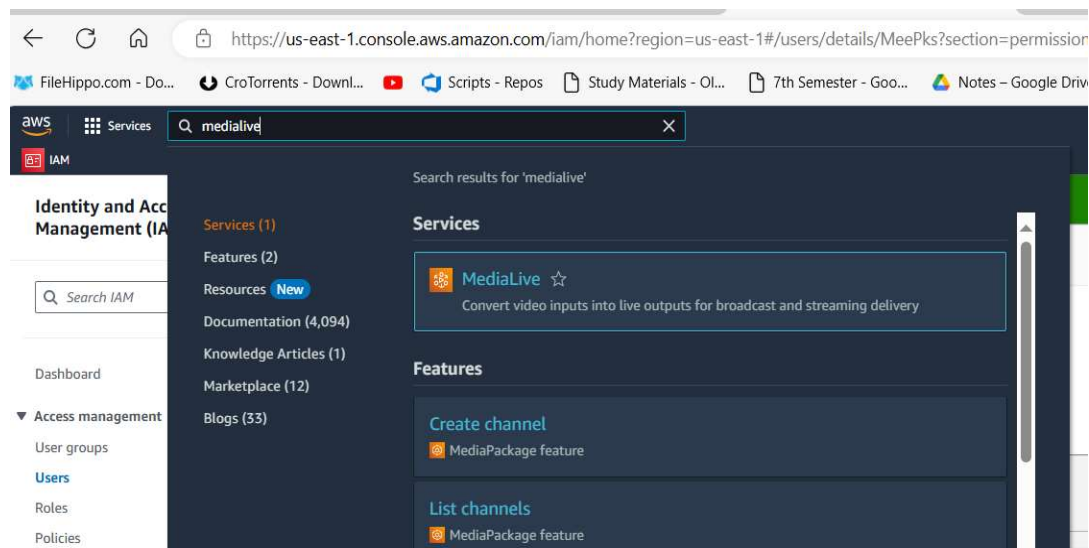
- **AWS Elemental MediaPackage**: Created a channel for packaging and delivering video content.
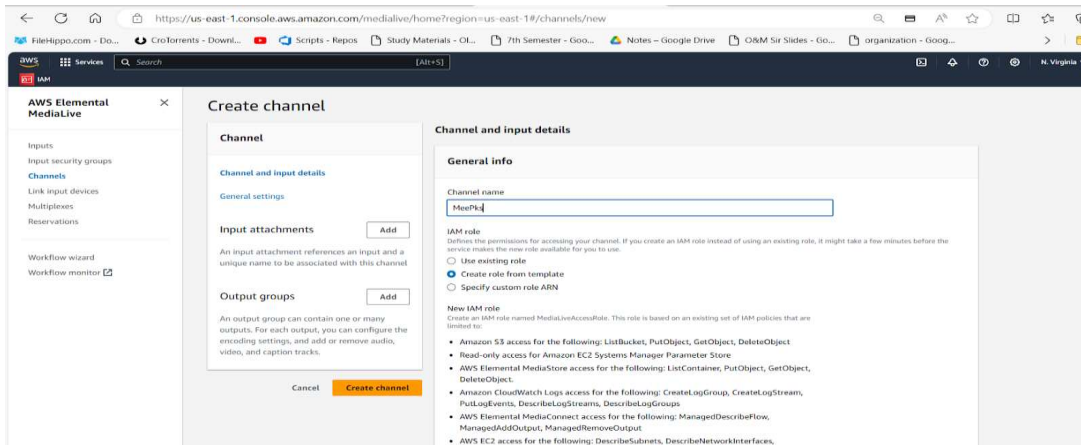
- **Amazon S3**: Created an S3 bucket for storing on-demand video content.

https://s3-vidoes.s3.amazonaws.com/Video+M7.mkv

FileHippo.com - Do...   CroTorrents - Downl...   Scripts - Repos   Study Materials - Ol...   7th Semester - Goo...
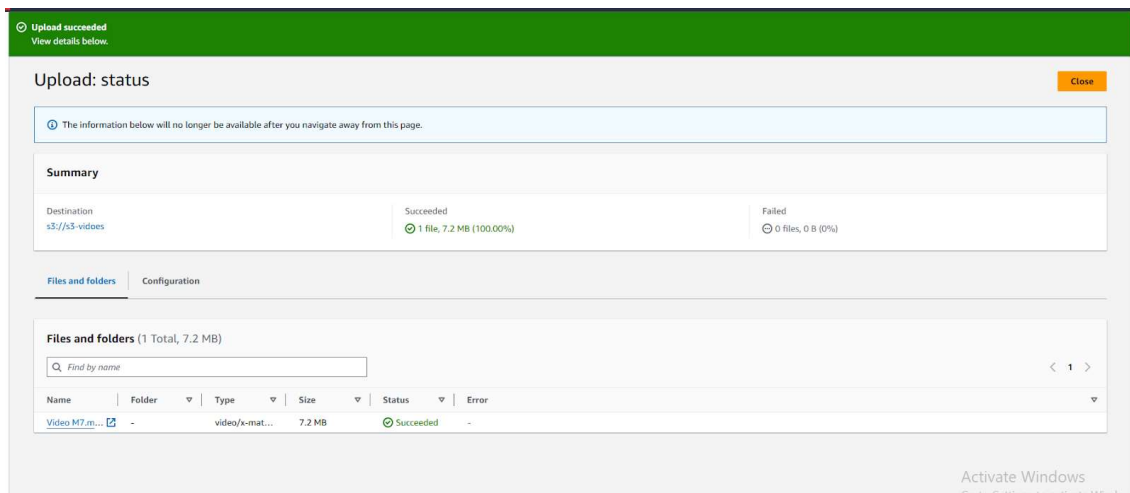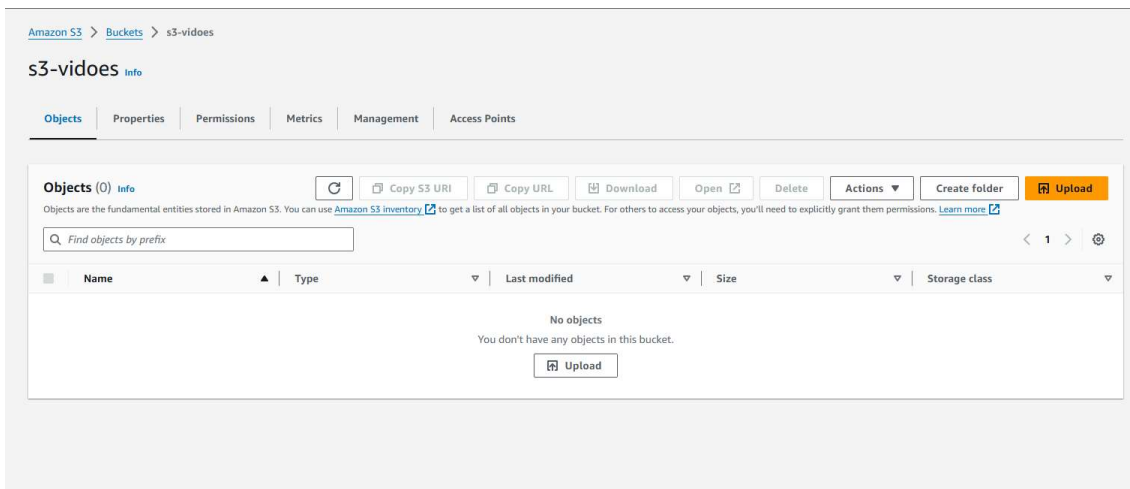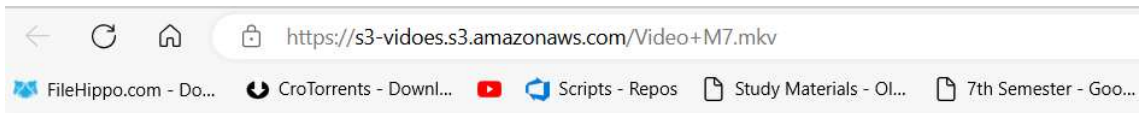
This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
▼<Error>
    <Code>AccessDenied</Code>
    <Message>Access Denied</Message>
    <RequestId>1EQ96PD4TM9Q89WC</RequestId>
    <HostId>m74A5DjLBpFFQbbkaj8wB12A0xXuQBPR7j3B6k6zXU0+sz2JGtndpdqOFveRS8NN7BLUDvpFzAQ=</HostId>
</Error>
```

Amazon S3 > Buckets > s3-vidoes > Video M7.mkv

Video M7.mkv Info

Copy S3 URI   Download   Open   Object actions ▼

Properties   **Permissions**   Versions

Access control list (ACL)

Grant basic read/write permissions to AWS accounts. Learn more

> **This bucket has the bucket owner enforced setting applied for Object Ownership**
> When bucket owner enforced is applied, use bucket policies to control access. Learn more

Grantee	Object	Object ACL
Object owner (your AWS account) Canonical ID: 25bb62f0753e528516e7c815d9cad06e430c03a11434edc4cdd139fd92d3d028	Read	Read, Write
Everyone (public access) Group: http://acs.amazonaws.com/groups/global/AllUsers	-	-
Authenticated users group (anyone with an AWS account) Group: http://acs.amazonaws.com/groups/global/AuthenticatedUsers	-	-

- **Amazon CloudFront**: Set up a CloudFront distribution for content delivery.

Q cloud front   X

Search results for 'cloud front'

Services (59)   **Services**   See all 59 results ▶

Features (91)

Resources New   🌀 **CloudFront** ☆
                           Global Content Delivery Network
Documentation (57,420)

Knowledge Articles (1,027) 🌀 **Nimble Studio** ☆
                            Accelerate building a cloud-based content creation studio or setup your Thinkbox De...
Marketplace (237)

Blogs (8,614)   ⬛ **AWS Cloud Map** ☆
                           Build a dynamic map of your cloud
Events (347)

Tutorials (24)   🔶 **AWS Deadline Cloud** ☆
                           Simplified render management

                         Features   See all 91 results ▶

                         Reserved nodes
                         ⬛ ElastiCache feature

                         Cloud WAN
                         ⬛ VPC feature

                         Synthetics

← C ⌂ 🔒 https://us-east-1.console.aws.amazon.com/cloudfront/v4/home?region=us-east-1#/distributions/create

📄 FileHippo.com - Do... ⬤ CroTorrents - Downl... ▶ Scripts - Repos 📄 Study Materials - Ol... 📄 7th Semester - Goo... ☁ Notes – Google Drive 📄 O&M Sir Slides - Go... 📄

aws ⚏ Services Q Search   [Alt+S]

🔲 IAM

☰   **Add item**

        ⓘ To add a list of alternative domain names, use the bulk editor.

        Custom SSL certificate - optional
        Associate a certificate from AWS Certificate Manager. The certificate must be in the US East (N. Virginia) Region (us-east-1).

        Choose certificate   ▼   🔄

        Request certificate 🔗

        Supported HTTP versions
        Add support for additional HTTP versions. HTTP/1.0 and HTTP/1.1 are supported by default.
        ☑ HTTP/2
        ☐ HTTP/3

        Default root object - optional
        The object (file name) to return when a viewer requests the root URL (/) instead of a specific object.

        [   ]

        Standard logging
        Get logs of viewer requests delivered to an Amazon S3 bucket.
        ⦿ Off
        ○ On

        IPv6
        ○ Off
        ⦿ On

        Description - optional

        [   ]

                              Cancel   **Create distribution**

```
Amazon S3 > Buckets > s3-vidoes > Edit bucket policy

Edit bucket policy   Info

Bucket policy

The bucket policy, written in JSON, provides access to the objects stored in the bucket. Bucket policies don't apply to objects owned by other accounts. Learn more

Bucket ARN

  arn:aws:s3:::s3-vidoes

Policy

1 ▼ {
2        "Version": "2008-10-17",
3        "Id": "PolicyForCloudFrontPrivateContent",
4 ▼      "Statement": [
5 ▼          {
6                "Sid": "AllowCloudFrontServicePrincipal",
7                "Effect": "Allow",
8 ▼              "Principal": {
9                    "Service": "cloudfront.amazonaws.com"
10               },
11               "Action": "s3:GetObject",
12               "Resource": "arn:aws:s3:::s3-vidoes/*",
13 ▼             "Condition": {
14 ▼                "StringEquals": {
15                     "AWS:SourceArn": "arn:aws:cloudfront::010928220180:distribution/E2UNSMWK382WY3"
16                  }
17               }
18           }
19       ]
20 }
```

Service Configuration

- Configured MediaLive input sources and encoding settings.
- Integrated MediaLive with MediaPackage.
- Uploaded video files to the S3 bucket.
- Configured CloudFront to use MediaPackage for live streaming and S3 for on-demand content.

5. Integration

Service Integration

- Integrated Medialive with MediaPackage to stream live video.
- Set up CloudFront to deliver both live and on-demand content efficiently.

Networking and Security

- Configured security groups, VPC settings, and IAM policies to ensure secure and efficient networking

6. Testing

- Tested on-demand video playback from S3 through CloudFront.