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| **Course Code: CT2364** | **Course Name: Lab: Internet of Things** | **Lab:** **Introduction to Internet of Things** |

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**Practical No - 10**

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| **Aim:** To perform upload of files from the board to Amazon S3 and download of files from  Amazon S3 to the board. |
| **Requirement:** Amazon S3. |
| **Theory:**  Amazon S3 or Amazon Simple Storage Service is a service offered by Amazon Web Services (AWS) that provides [object storage](https://en.wikipedia.org/wiki/Object_storage) through a [web service](https://en.wikipedia.org/wiki/Web_service) interface. Amazon S3 uses the same scalable storage infrastructure that [Amazon.com](https://en.wikipedia.org/wiki/Amazon_(company)) uses to run its global e-commerce network. Amazon S3 can be employed to store any type of object, which allows for uses like storage for Internet applications, backup and recovery, disaster recovery, data archives, [data lakes](https://en.wikipedia.org/wiki/Data_lake) for analytics, and [hybrid cloud storage](https://en.wikipedia.org/wiki/Cloud_computing#Hybrid_cloud).  AWS launched Amazon S3 in the United States on March 14, 2006, then in Europe in November 2007.  Features of AWS-S3:   1. Durability 2. Availability 3. Cost effective 4. Scalability 5. Security 6. Bucket stores objects 7. Data encryption   **STEPS:**   1. **Create Identity pool.** 2. **Create Policy** 3. **Set up permissions.** 4. **Create Bucket** 5. **Update the Android code** 6. **Build and Run the Android code.**   **1.Create Identity Pool**   * 1. Go to [Amazon Cognito Console](https://console.aws.amazon.com/cognito/) and choose Manage Federated Identities.   2. Click Create new Identity pool button on the top left of the console.   3. Give a name for the Identity pool and check Enable access to unauthenticated identities under the Unauthenticated Identities section, click Create pool button on the bottom right.   4. To enable Cognito Identities to access your resources, expand the View Details section to see the two roles that are to be created. Make a note of the unauth role whose name is of the form Cognito\_<IdentityPoolName>Unauth\_Role. Now click Allow button in the bottom right of the console.   5. Under Get AWSCredentials section, in the code snippet to create CognitoCachingCredentialsProvider, find the Identity pool ID and the AWS region and make note of them.  1. **Create Policy**    1. Go to Amazon IAM Console.    2. Go to policies and create policy.    3. Add following code to policy.   {  "Version": "2012-10-17",  "Statement": [  {  "Sid": "VisualEditor0", "Effect": "Allow", "Action": [  "s3:ListAllMyBuckets", "s3:\*",  "s3:HeadBucket", "s3:ListObjects"  ],  "Resource": "\*"  },  {  "Sid": "VisualEditor1", "Effect": "Allow",  "Action": "s3:\*", "Resource": [  "arn:aws:s3:::\*/\*", "arn:aws:s3:::s3transfer1-bucket"  ]  }  ]  }   * 1. the name of bucket: s3transfer1-bucket  1. **Setup permissions**    1. Select the unauth role you created in above, which is of the form   Cognito\_<IdentityPoolName>Unauth\_Role.   1. **Create a bucket**    1. Go to [Amazon S3 Console](https://console.aws.amazon.com/s3/home) and click Create bucket.    2. Enter a name for the bucket that is DNS-compliant.    3. Choose the region that you want the bucket to be created.    4. Click Create. Note the name and the region of the bucket that was created. 2. **Update the Android code.**   Update COGNITO\_POOL\_ID with the ID of the Cognito Identity Pool created in Step-1.  Update COGNITO\_POOL\_REGION with the region of the Cognito Identity Pool created from Step-1. For example,  us-east-1.  Update BUCKET\_NAME with the name of the S3 Bucket created in Step-3.  Update BUCKET\_REGION with the region of the S3 Bucket created from Step-3. For example, us-east-1.  These values are to be updated in:   * MainActivity.java for AmazonS3Tutorial project * constansts.java in S3transferutility project  1. **Build and run the Android code**   Ensure file with the specific file name (example “ic\_next.png“) exists at following path  *“/storage/sdcard0/Pictures/ic\_next.png”* for MainActivity.java of AmazonS3Tutorial project.  Also, ensure file with the specific file name (example “ic\_next.png“) exists at S3 bucket of AmazonS3Tutorial project.  Select upload option if you want to upload a file to S3 Check the S3 for upload  Select download download option if you want to download the file from S3 Check the local file system for download.  **Screenshots-**     1. Identity pool ID should look similar to: `us-east-1:xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx".      1. Create policy as shown:     After creating Policy will be shown as:   1. Attach policy, you created in earlier step. 2. Create bucket.     **Conclusion:** Thus, Practical to perform upload of files from the board to Amazon S3 and download of files from amazon S3 to the board is performed successfully. |