Mobile Application Development

Produced by

David Drohan (ddrohan@wit.ie)

Department of Computing & Mathematics
Waterford Institute of Technology
http://www.wit.ie

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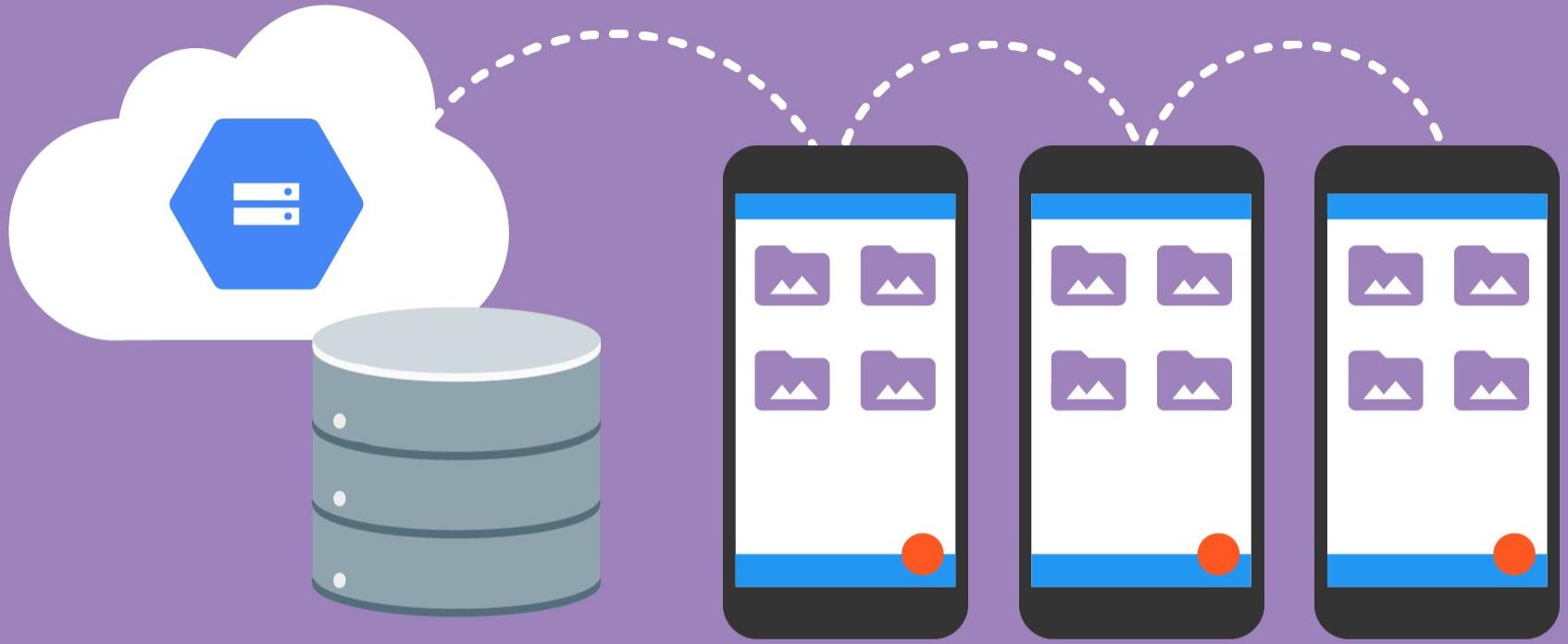


Storage

Overview (Official)

- Cloud Storage for Firebase lets you upload and share user generated content, such as images and video, which allows you to build rich media content into your apps.
- Your data is stored in a Google Cloud Storage bucket, an exabyte scale object storage solution with high availability and global redundancy.
- Cloud Storage lets you securely upload these files directly from mobile devices and web browsers, handling spotty networks with ease.

Key Features (Official)

- Integrate storage into your apps with a single unified API
- Optimize price/performance across three storage classes with Object Lifecycle Management
- Access data instantly from any storage class
- Designed for secure and durable storage
- Reduce data storage carbon emissions to zero

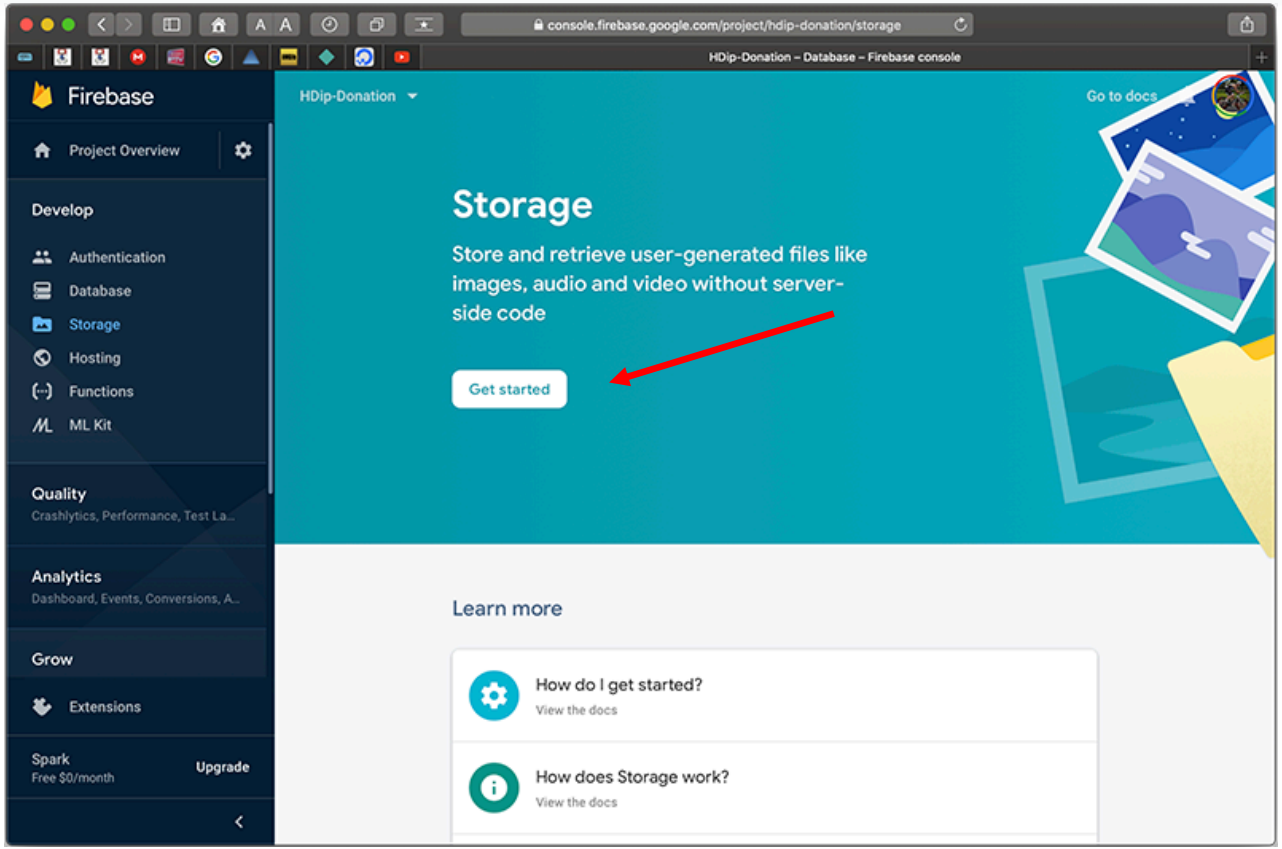
Get Started with Cloud Storage on Android

https://firebase.google.com/docs/storage/android/start

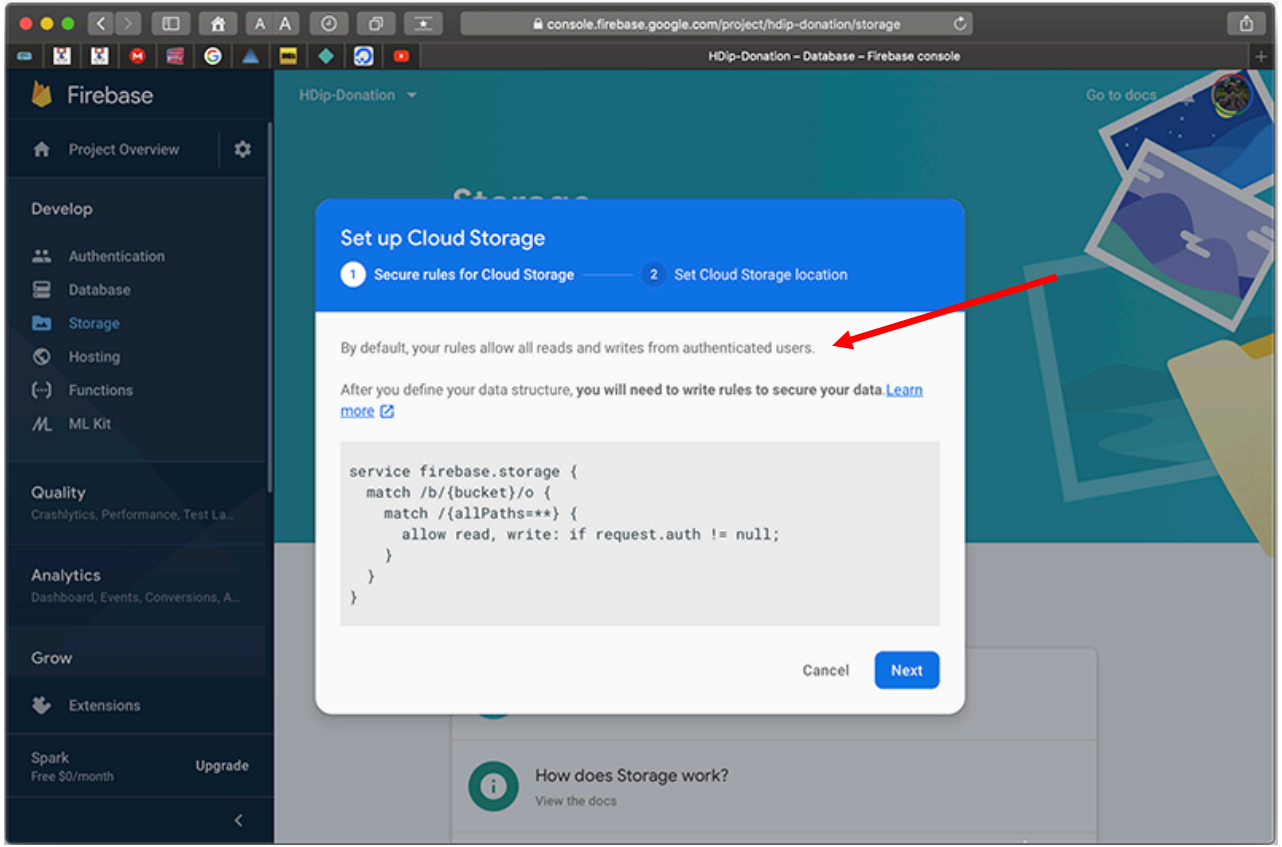
Firebase Cloud Storage

1. Create your Firebase Project (set up in previous labs)

2. Setup your Storage Bucket



2. Setup your Storage Bucket



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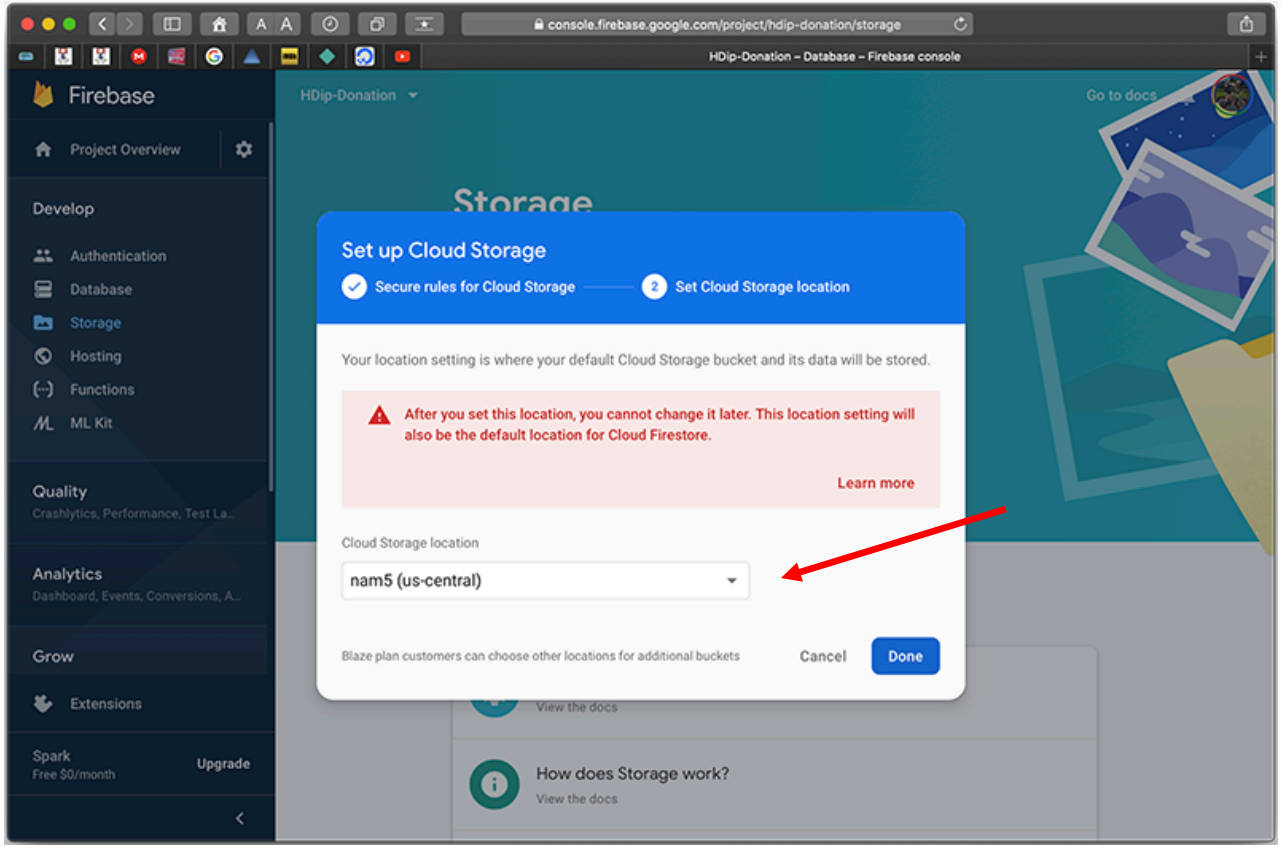

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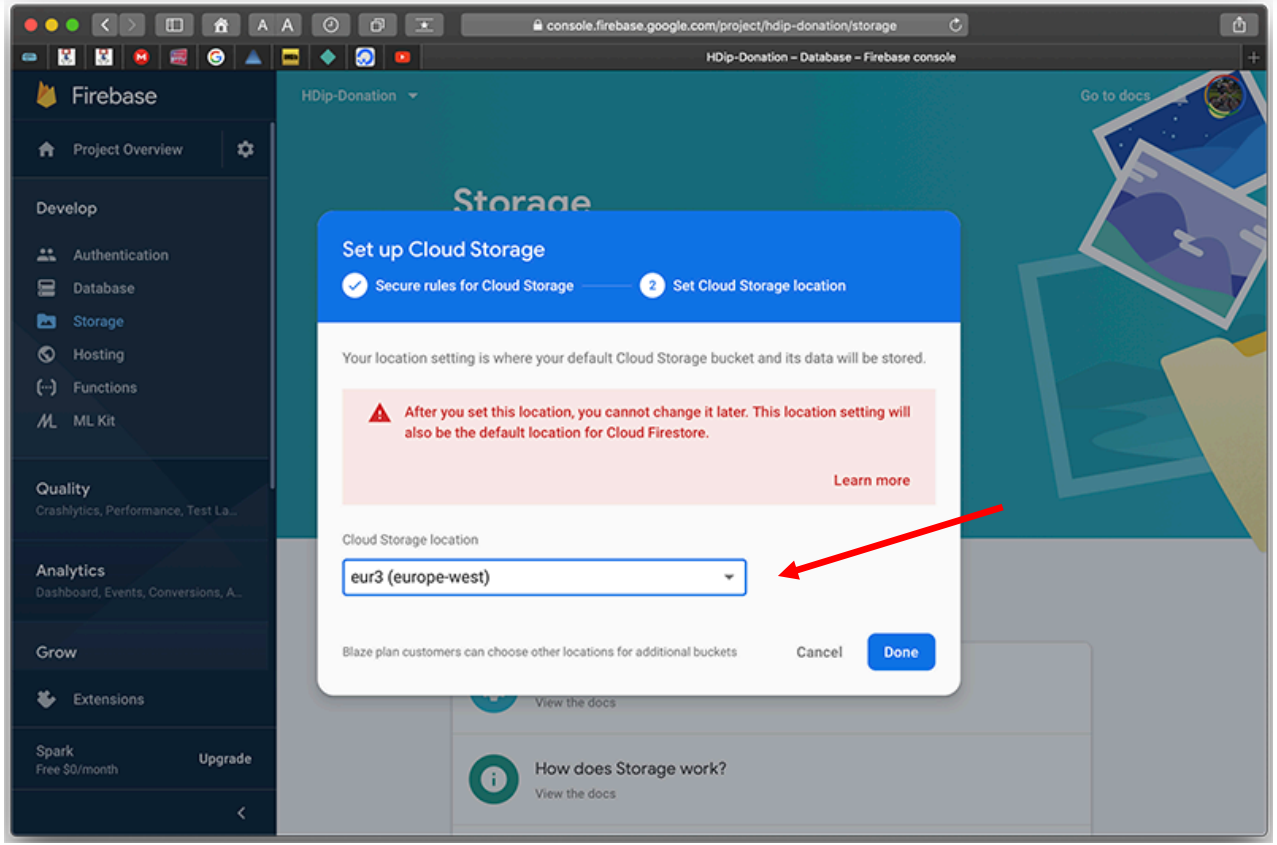

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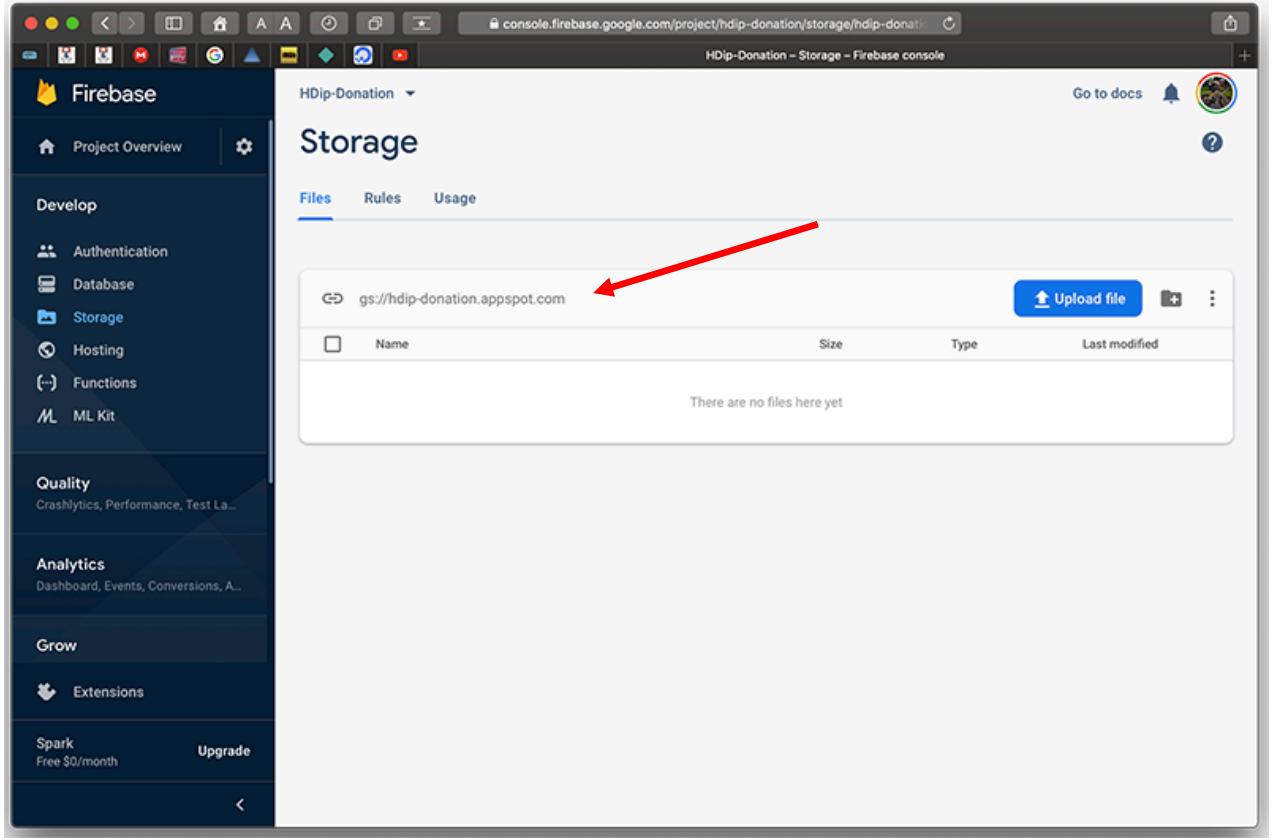
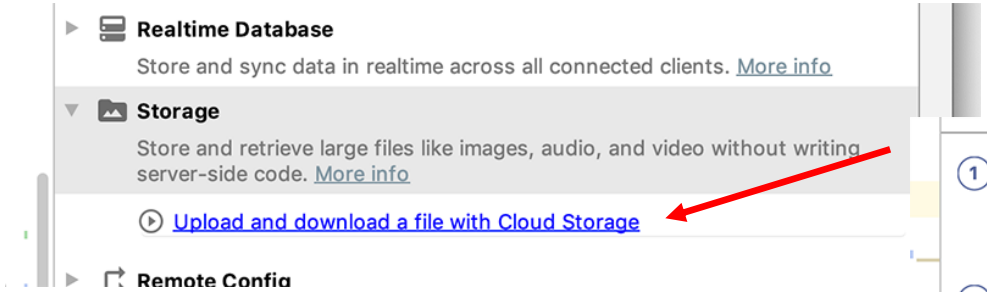
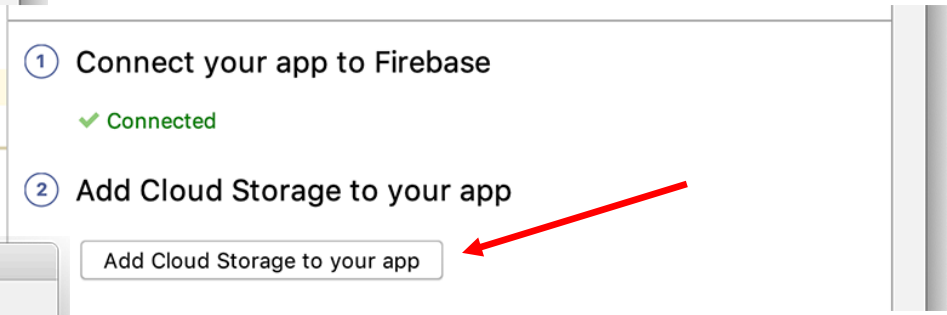
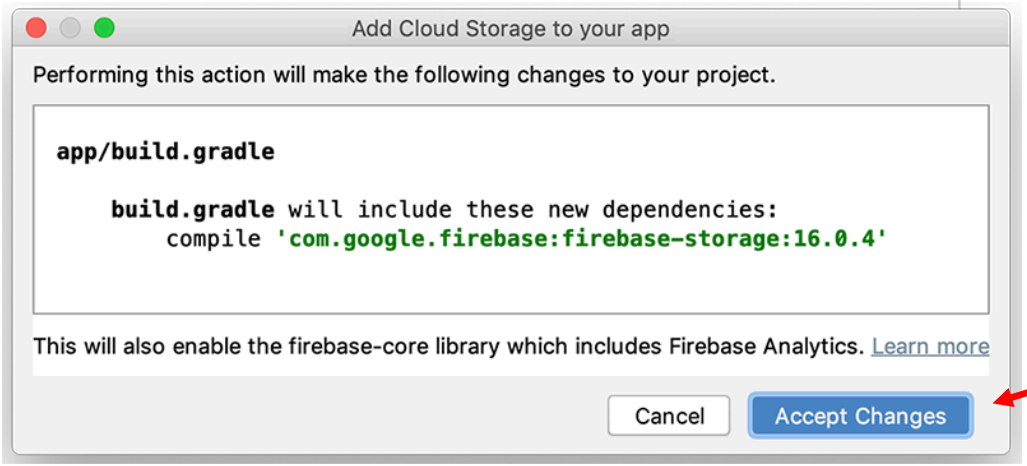


3. Configure Your App








```
implementation
'com.google.firebase:firebase-
storage:19.1.0'
```

3. Configure Your App – IMPORTANT!

```
implementation
'com.google.firebase:firebase-storage:19.1.0'
```

4. Start Uploading/Downloading your Files

https://github.com/firebase/quickstart-android

Implementation Path (Official)

1	Integrate the Firebase SDKs for Cloud Storage.	Quickly include clients via Gradle, CocoaPods, or a script include.
2	Create a Reference	Reference the path to a file, such as "images/mountains.png", to upload, download, or delete it.
3	Upload or Download	Upload or download to native types in memory or on disk.
4	Secure your Files	Use Firebase Security Rules for Cloud Storage to secure your files.

4. Get a Reference to your Bucket

The first step in accessing your storage bucket is to create an instance of `FirebaseStorage`:

Java Android | Kotlin Android

```
storage = FirebaseStorage.getInstance()
```

You're ready to start using Cloud Storage!

4. Get a Reference to your Bucket

If you want to use a storage bucket other than the default provided above, or use multiple storage buckets in a single app, you can create an instance of `FirebaseStorage` that references your custom bucket:

Java Android | Kotlin Android

```kotlin
// Get a non-default Storage bucket
val storage = FirebaseStorage.getInstance("gs://my-custom-bucket")
```

StorageActivity.kt

4. Uploading Files

To upload a file to Cloud Storage, you first create a reference to the full path of the file, including the file name.

```
// Create a storage reference from our app
val storageRef = storage.reference

// Create a reference to "mountains.jpg"
val mountainsRef = storageRef.child("mountains.jpg")

// Create a reference to 'images/mountains.jpg'
val mountainImagesRef = storageRef.child("images/mountains.jpg")

// While the file names are the same, the references point to different files
mountainsRef.name == mountainImagesRef.name // true
mountainsRef.path == mountainImagesRef.path // false
```

Once you've created an appropriate reference, you then call the `putBytes()`, `putFile()`, or `putStream()` method to upload the file to Cloud Storage.

4. Uploading Files (data in memory)

The `putBytes()` method is the simplest way to upload a file to Cloud Storage. `putBytes()` takes a `byte[]` and returns an `UploadTask` that you can use to manage and monitor the status of the upload.

```
// Get the data from an ImageView as bytes
imageView.isDrawingCacheEnabled = true
imageView.buildDrawingCache()
val bitmap = (imageView.drawable as BitmapDrawable).bitmap
val baos = ByteArrayOutputStream()
bitmap.compress(Bitmap.CompressFormat.JPEG, 100, baos)
val data = baos.toByteArray()

var uploadTask = mountainsRef.putBytes(data)
uploadTask.addOnFailureListener {
    // Handle unsuccessful uploads
}.addOnSuccessListener {
    // taskSnapshot.metadata contains file metadata such as size, content-type, etc.
    // ...
}
```

Because `putBytes()` accepts a `byte[]`, it requires your app to hold the entire contents of a file in memory at once. Consider using `putStream()` or `putFile()` to use less memory.

4. Uploading Files (from a stream)

The `putStream()` method is the most versatile way to upload a file to Cloud Storage. `putStream()` takes an `InputStream` and returns an `UploadTask` that you can use to manage and monitor the status of the upload.

Java Android | Kotlin Android

```
val stream = FileInputStream(File("path/to/images/rivers.jpg"))

uploadTask = mountainsRef.putStream(stream)
uploadTask.addOnFailureListener {
    // Handle unsuccessful uploads
}.addOnSuccessListener {
    // taskSnapshot.metadata contains file metadata such as size, content-type, etc.
    // ...
}
```

4. Uploading Files (from a local file)

You can upload local files on the device, such as photos and videos from the camera, with the `putFile()` method. `putFile()` takes a `File` and returns an `UploadTask` which you can use to manage and monitor the status of the upload.

```
var file = Uri.fromFile(File("path/to/images/rivers.jpg"))
val riversRef = storageRef.child("images/${file.lastPathSegment}")
uploadTask = riversRef.putFile(file)

// Register observers to listen for when the download is done or if it fails
uploadTask.addOnFailureListener {
    // Handle unsuccessful uploads
}.addOnSuccessListener {
    // taskSnapshot.metadata contains file metadata such as size, content-type, etc.
    // ...
}
```

4. Uploading Files (get your download URL)

After uploading a file, you can get a URL to download the file by calling the `getDownloadUrl()` method on the `StorageReference`:

```
val ref = storageRef.child("images/mountains.jpg")
uploadTask = ref.putFile(file)

val urlTask = uploadTask.continueWithTask { task ->
    if (!task.isSuccessful) {
        task.exception?.let {
            throw it
        }
    }
    ref.downloadUrl
}.addOnCompleteListener { task ->
    if (task.isSuccessful) {
        val downloadUri = task.result
    } else {
        // Handle failures
        // ...
    }
}
```

4. Uploading Files (monitoring progress)

You can add listeners to handle success, failure, progress, or pauses in your upload task:

Listener Type	Typical Usage
`OnProgressListener`	This listener is called periodically as data is transferred and can be used to populate an upload/download indicator.
`OnPausedListener`	This listener is called any time the task is paused.
`OnSuccessListener`	This listener is called when the task has successfully completed.
`OnFailureListener`	This listener is called any time the upload has failed. This can happen due to network timeouts, authorization failures, or if you cancel the task.

`OnFailureListener` is called with an `Exception` instance. Other listeners are called with an `UploadTask.TaskSnapshot` object. This object is an immutable view of the task at the time the event occurred. An `UploadTask.TaskSnapshot` contains the following properties:

4. Downloading Files (get a reference)

You can create a reference by appending child paths to the storage root, or you can create a reference from an existing `gs://` or `https://` URL referencing an object in Cloud Storage.

```
// Create a storage reference from our app
val storageRef = storage.reference

// Create a reference with an initial file path and name
val pathReference = storageRef.child("images/stars.jpg")

// Create a reference to a file from a Google Cloud Storage URI
val gsReference = storage.getReferenceFromUrl("gs://bucket/images/stars.jpg")

// Create a reference from an HTTPS URL
// Note that in the URL, characters are URL escaped!
val httpsReference = storage.getReferenceFromUrl(
        "https://firebasestorage.googleapis.com/b/bucket/o/images%20stars.jpg")
```

4. Downloading Files (into memory)

Download the file to a `byte[]` with the `getBytes()` method. This is the easiest way to download a file, but it must load the entire contents of your file into memory. If you request a file larger than your app's available memory, your app will crash. To protect against memory issues, `getBytes()` takes a maximum amount of bytes to download. Set the maximum size to something you know your app can handle, or use another download method.

```
var islandRef = storageRef.child("images/island.jpg")

val ONE_MEGABYTE: Long = 1024 * 1024
islandRef.getBytes(ONE_MEGABYTE).addOnSuccessListener {
    // Data for "images/island.jpg" is returned, use this as needed
}.addOnFailureListener {
    // Handle any errors
}
```

4. Downloading Files (to a local file)

The `getFile()` method downloads a file directly to a local device. Use this if your users want to have access to the file while offline or to share the file in a different app. `getFile()` returns a `DownloadTask` which you can use to manage your download and monitor the status of the download.

```
islandRef = storageRef.child("images/island.jpg")

val localFile = File.createTempFile("images", "jpg")

islandRef.getFile(localFile).addOnSuccessListener {
    // Local temp file has been created
}.addOnFailureListener {
    // Handle any errors
}
```

4. Downloading Files (via URL)

If you already have download infrastructure based around URLs, or just want a URL to share, you can get the download URL for a file by calling the `getDownloadUrl()` method on a storage reference.

```
storageRef.child("users/me/profile.png").downloadUrl.addOnSuccessListener {
    // Got the download URL for 'users/me/profile.png'
}.addOnFailureListener {
    // Handle any errors
}
```

We'll look at how we work with files (Images) saved to Cloud Storage in the Code walkthrough and the Lab

References

https://console.firebase.google.com/
https://firebase.google.com/
https://github.com/firebase/quickstart-android
https://firebase.google.com/docs/storage/android/start
https://firebase.google.com/docs/storage/android/upload-files


Thanks.