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Content Provider



Reference

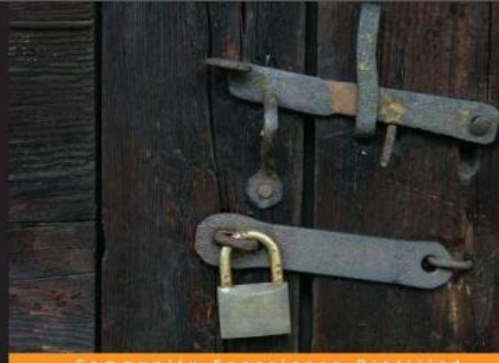


Learning Android Forensics

A hands-on guide to Android forensics, from setting up the forensic workstation to analyzing key forensic artifacts

Rohit Tamma Donnie Tindall

PACKT open source★



Learning Pentesting for Android Devices

A practical guide to learning penetration testing for Android devices and applications

Foreword by Eliad Shapira, Mobile Security Researcher

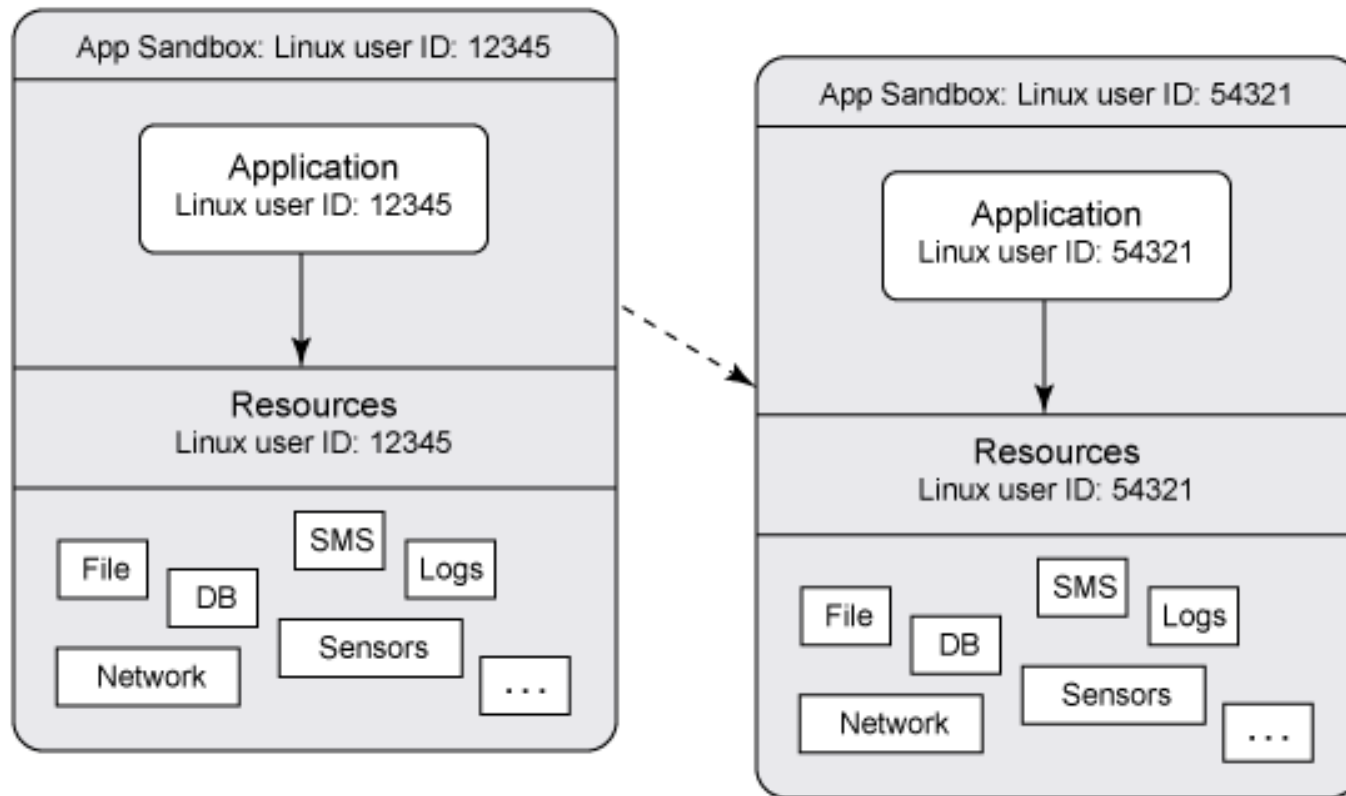
Aditya Gupta

PACKT open source★

www.developer.google.com

Content Provider

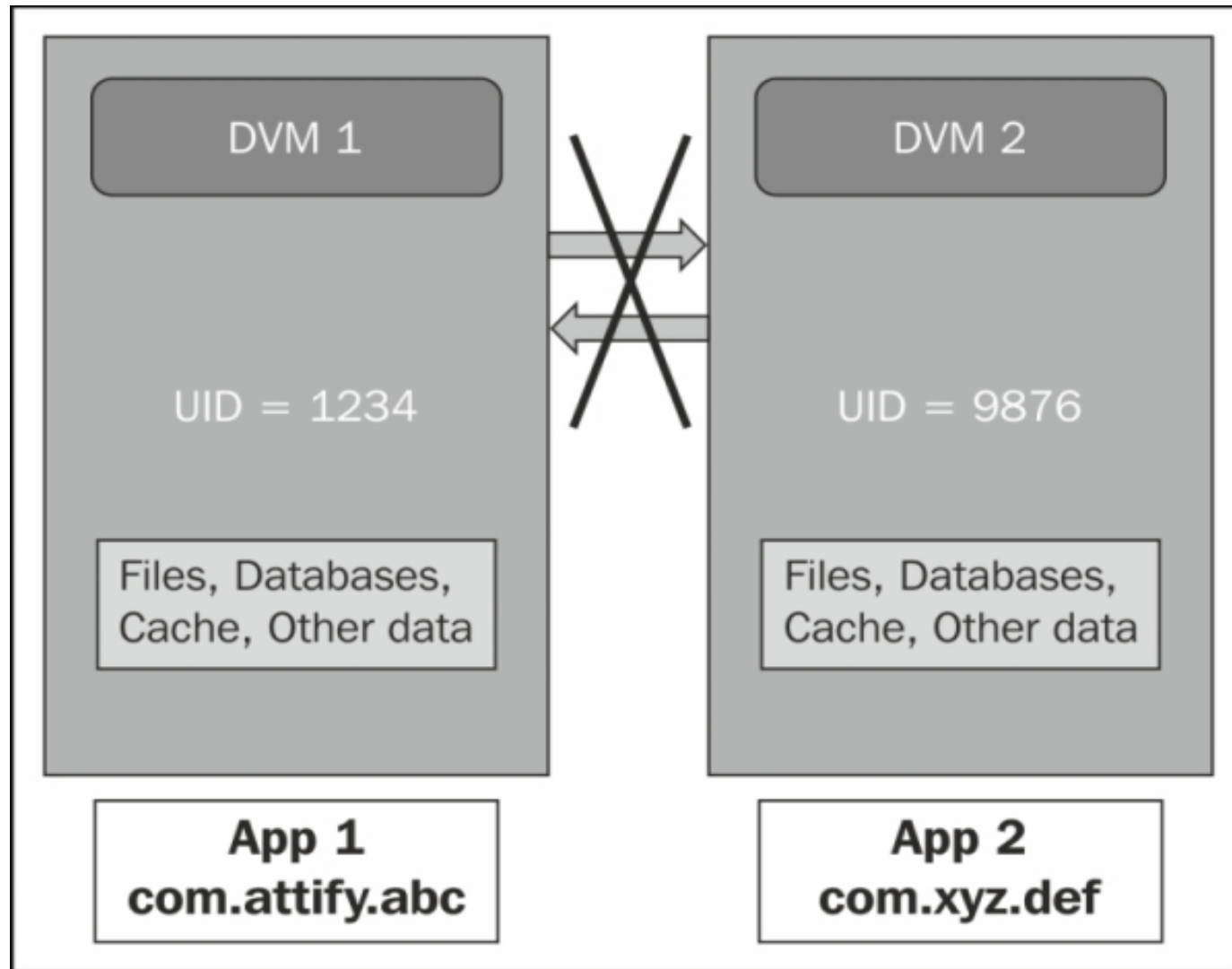
Android application/process space



Two applications on different processes (with different user-ids)

<http://CEnriqueOrtiz.com>

Content Provider



- ✓ Content providers provide the content/data to Android applications from an Android system or other Android applications.
- ✓ Let's go through the details of the content provider in Android through this article, but first, let's take a glance of topics that we will discuss:
 - ✓ What are Content Providers
 - ✓ CRUD operations
 - ✓ Examples

- ✓ Let's go through the details of the content provider in Android through this article, but first, let's take a glance of topics that we will discuss:
 - ✓ What are Content Providers
 - ✓ CRUD operations
 - ✓ Examples
 - ✓ Accessing data with Content provider
 - ✓ Implementing Content Provider

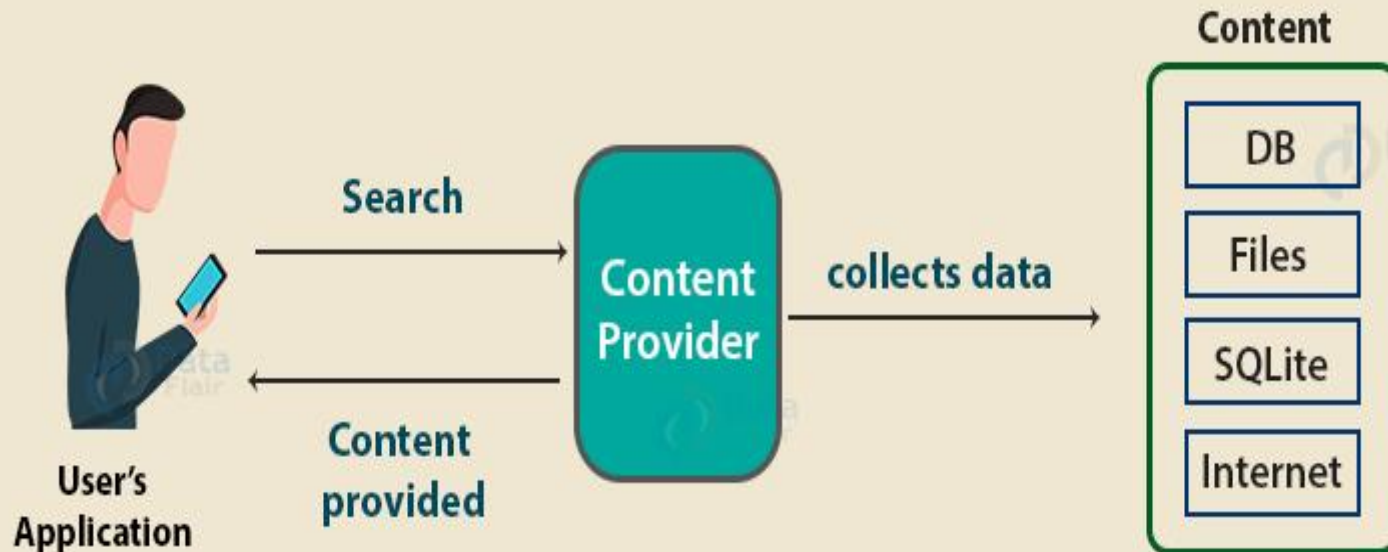
What are Content Providers in Android?

- ✓ Content Providers are an important component of Android. They handle the access to the central repository and supply data from one application to another on request.
- ✓ This task of handling is done by methods of ContentResolver class. So, content providers can store data in various ways such as files, database or over the internet.

- ✓ Many a time we need to share our data with applications and that's where it becomes useful.
- ✓ The following diagram depicts how the content provider helps in sharing data with applications from data stores.



Content Provider in Android



Data - Contact List, Images, Videos, Local Searches

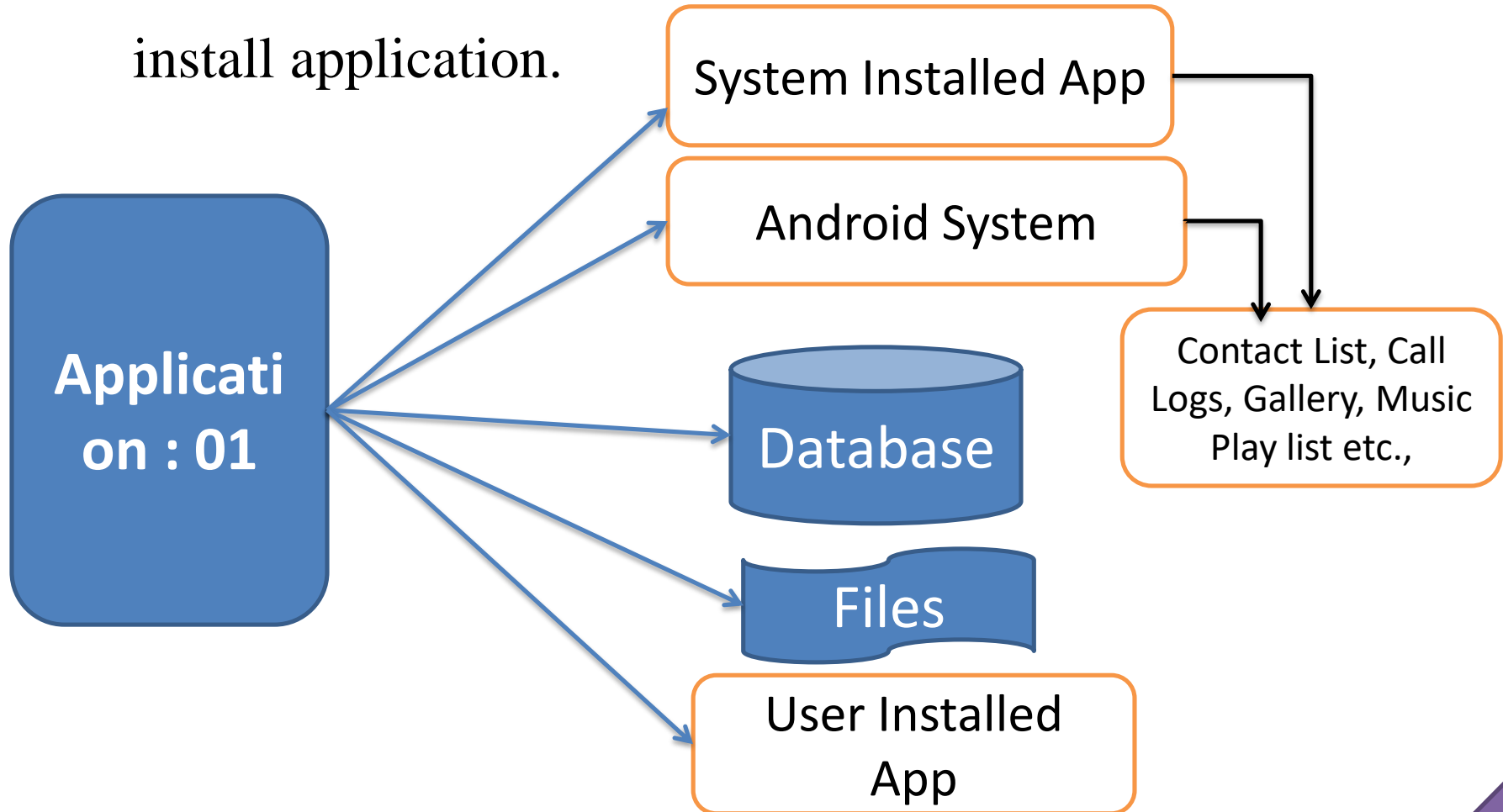
Content Provider

- ✓ As can be seen, the content provider lets us collect the data centrally and provide them to applications as shown in the above diagram.
- ✓ Content providers act the same as database and also we can query it to add, delete, insert or update the data.

Content Provider

- ✓ It can be understood that a content provider hides the database details and also, it lets an application share data among other applications.
- ✓ Content providers are not limited to texts, but also contains images and videos as well.

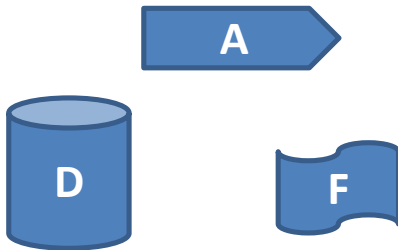
- ✓ But there is a business need when one application needs to share or access data with or from system or user installed application.



Content Provider

How Does
App:01 expose
Data to App:02
securely ?

Application : 01



Data Request

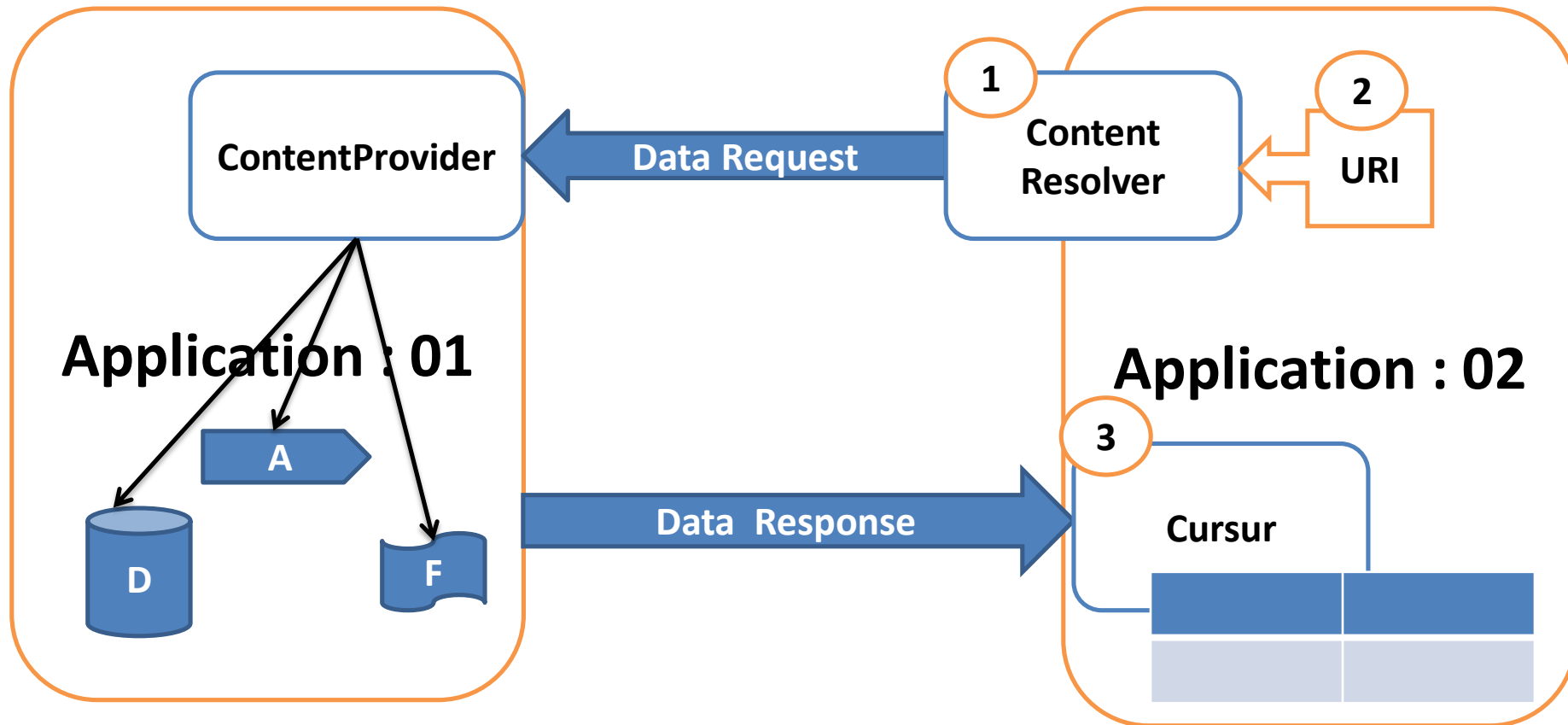
Application : 02

Data Response

Android OS

Content Provider

ContentProvider hides the details related to database, files etc., What does it mean App:02 request for data and content provider hides details on the App:01 side and provide detail to App:01



Android OS

Content Resolver

- ✓ **Content Resolver:** We need to use the ContentResolver object in our application, in order to communicate with the content providers for data access.
- ✓ **ContentRsolver resolver = getContnetResolver();**
- ✓ **Cursor cursor = resolver.query(uri, projection, selection, selectionArgs, sortOrder);**

Content Resolver

- ✓ The Content Resolver is the single, global instance in your application that provides access to your (and other applications') content providers.
- ✓ The Content Resolver behaves exactly as its name implies: it accepts requests from clients, and resolves these requests by directing them to the content provider with a distinct authority.
- ✓ To do this, the Content Resolver stores a mapping from authorities to Content Providers.

Content Resolver

- ✓ The Content Resolver includes the CRUD (create, read, update, delete) methods corresponding to the abstract methods (insert, query, update, delete) in the Content Provider class.
- ✓ The Content Resolver does not know the implementation of the Content Providers it is interacting with (nor does it need to know); each method is passed an URI that specifies the Content Provider to interact with.

```
Cursor cursor = getContentResolver().query(  
    URI,          // The content URI of the words table  
    projection,    // The columns to return for each row  
    selectionClause, // Selection criteria WHERE col = value  
    selectionArgs, // Selection criteria  
    sortOrder);    // The sort order for the returned rows
```

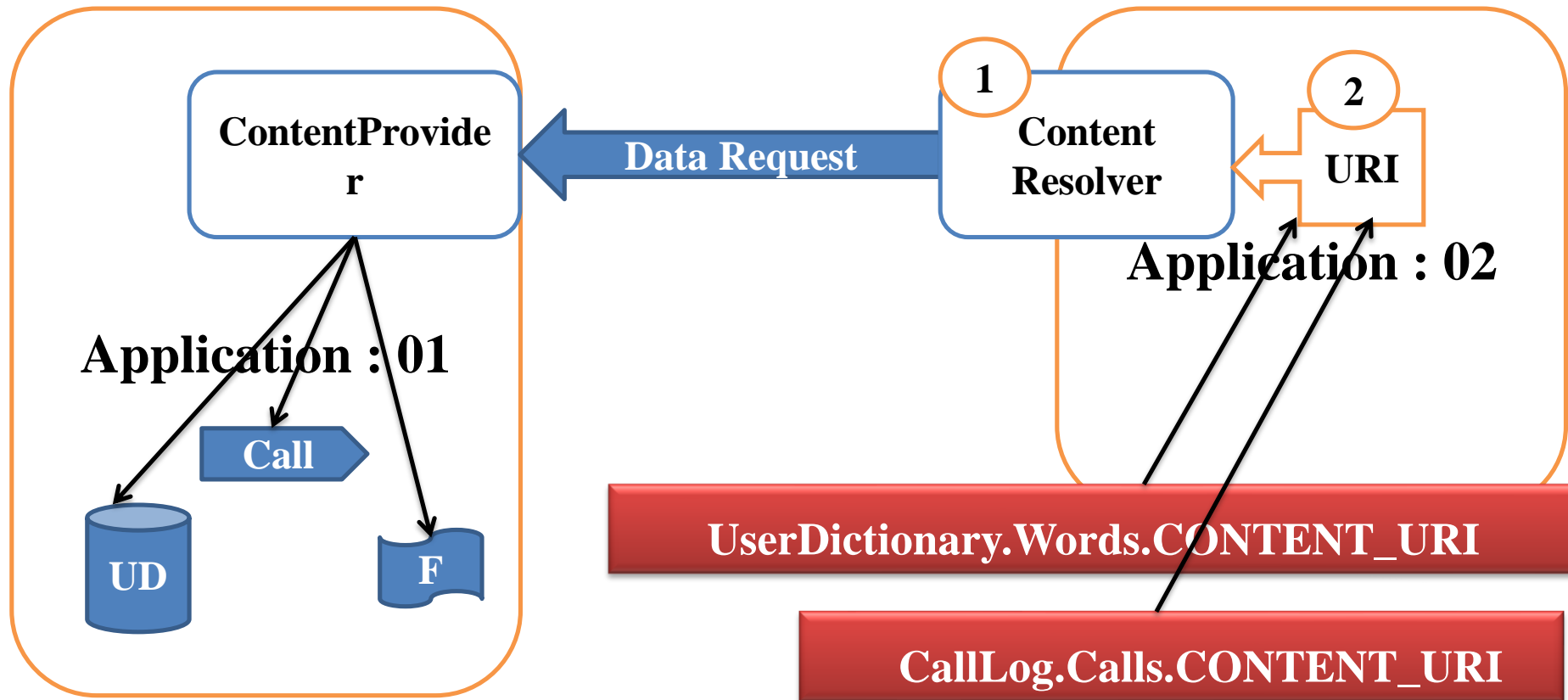
Example Select id, name from tbl_student where id =
student_id

ContentProvider Authorities and URI

- ✓ A content URI is a URI that identifies data in a provider. Content URIs include the symbolic name of the entire provider (its authority) and a name that points to a table (a path).
- ✓ <http://domain-name/data-in-the-site> - Uniquer domains in http urls.
- ✓ content://authority-name/data-in-the-provider
- ✓ content://user_dictionary/words
- ✓ where the user_dictionary string is the **provider's authority**, and the words string is the table's path.

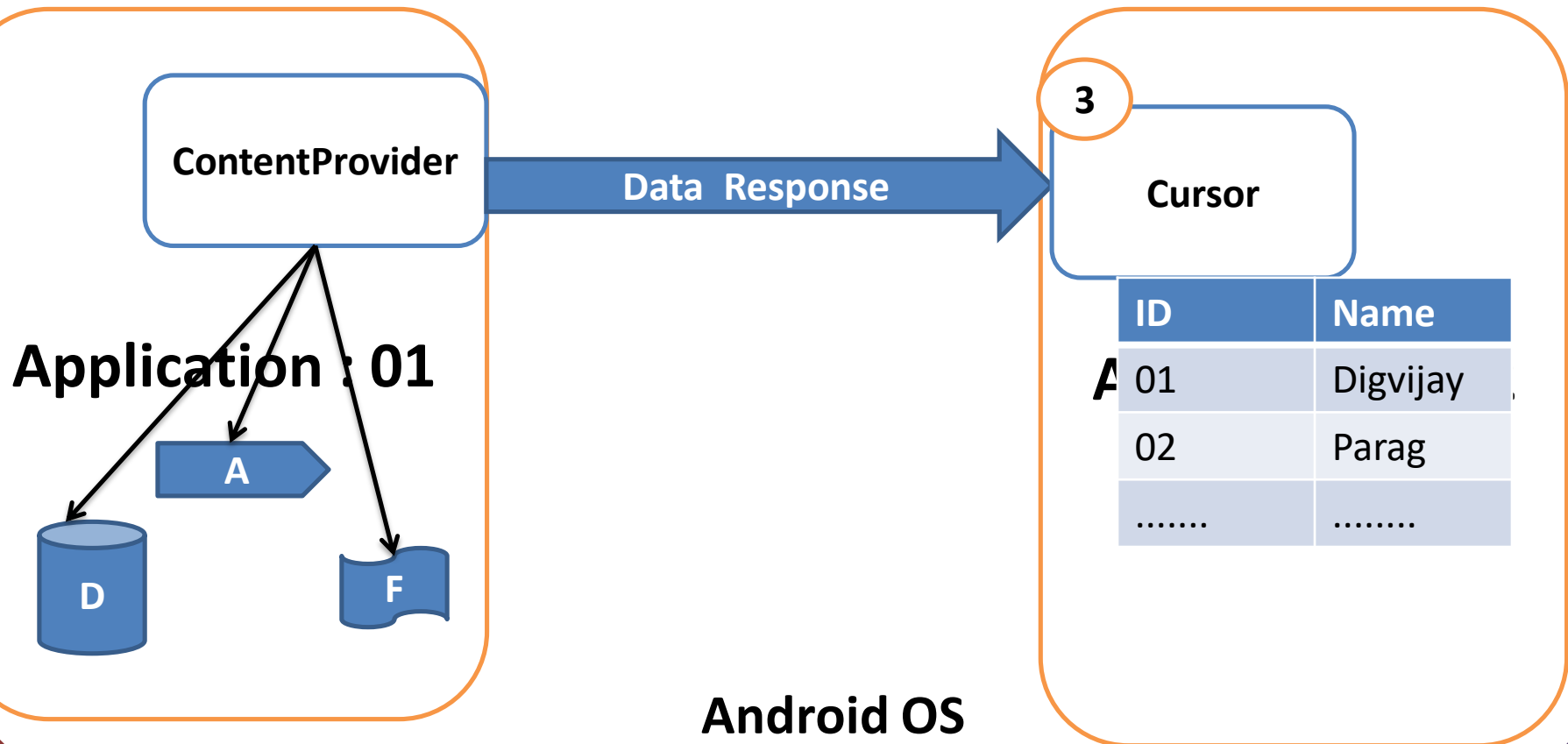
ContentProvider Authorities and URI

Each ContentProvider has unique Authority and Application : 02 can resolved the content provider using content://<AuthorityName>/table-name



Cursor

They must be created when you are executing a SELECT statement that returns more than one row. Even though the cursor stores multiple records, **only one record can be processed at a time**, which is called as current row. When you fetch a row the current row position moves to next row.



Cursor

```
✓ while (cursor.moveToNext()) {
```

}

- ✓ **Implementation of Android Services and discussion of source code.**
- ✓ `contentprovider_contacts_example` (Application will not run successfully)



Mobile Phone Security



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