INSTITUTO POLITÉCNICO NACIONAL

ESCUELA SUPERIOR DE CÓMPUTO

INGENIERÍA EN SISTEMAS COMPUTACIONALES

MATERIA: APPLICATION DEVELOPMENT FOR MOBILE DEVICES

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“TAREA 36 – NFC”

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Ejemplo parte 1 - Aplicación con NDEF Writer

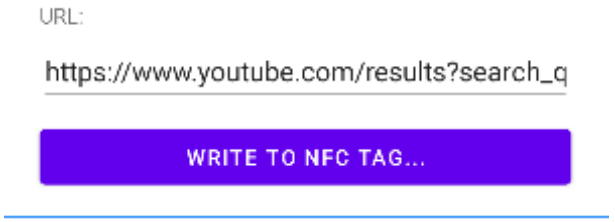
Paso 2: El AndroidManifest y NFC

- Solicitud de permiso para usar NFC
- Se requieren dispositivos con hardware NFC

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android">

    <uses-sdk android:minSdkVersion="10"
        android:targetSdkVersion="10"/>

    <uses-permission android:name="android.permission.NFC"/>

    <uses-feature android:name="android.hardware.nfc"
        android:required="true"/>
```

Paso 3: Agregar una interfaz de usuario

```xml
<?xml version="1.0" encoding="utf-8"?>
<ScrollView
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <LinearLayout
        android:orientation="vertical"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="URL: "
            android:layout_marginLeft="30dp"
            android:layout_marginRight="30dp"
            android:layout_marginTop="15dp"
            android:layout_marginBottom="5dp"/>
        <EditText
            android:id="@+id/myUrl"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="https://www.youtube.com/results?search_query=ace+of+spades"
            android:inputType="textUri"
            android:layout_marginLeft="30dp"
            android:layout_marginRight="30dp"
            android:layout_marginTop="0dp"
            android:layout_marginBottom="10dp"/>
        <Button
            android:id="@+id/myWriteUriButton"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Write to NFC Tag..."
            android:layout_marginLeft="30dp"
            android:layout_marginRight="30dp"
            android:layout_marginTop="0dp"
            android:layout_marginBottom="15dp"
            android:gravity="center"/>
    </LinearLayout>
```

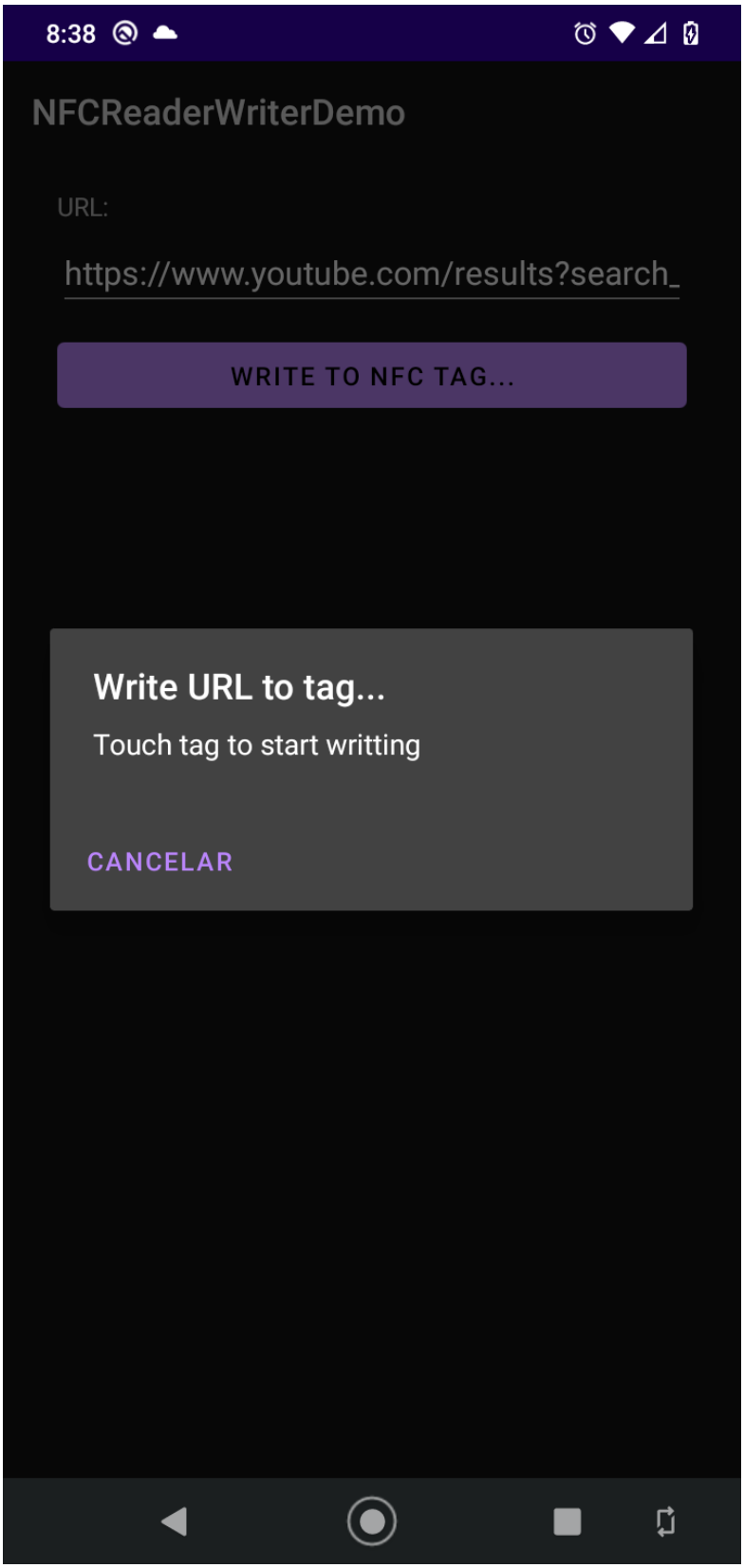


Paso 4: Creación de la actividad

```
private static final int DIALOG_WRITE_URL = 1;
private EditText mMyUrl;
private Button mMyWriteUrlButton;
private boolean mWriteUrl = false;
private static final int PENDING_INTENT_TECH_DISCOVERED = 1;
private NfcAdapter mNfcAdapter;

protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    mMyUrl = (EditText) findViewById(R.id.myUrl);
    mMyWriteUrlButton = (Button) findViewById(R.id.myWriteUriButton);

    //Set action for "Write URL to tag..." button:
    mMyWriteUrlButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            mWriteUrl = true;
            MainActivity.this.showDialog(DIALOG_WRITE_URL);
        }
    });
}
```

Paso 5: Un cuadro de diálogo: Listo para escribir en una etiqueta

```
protected Dialog onCreateDialog(int id, Bundle args){
    switch(id){
        case DIALOG_WRITE_URL:
            return new AlertDialog.Builder( context: this)
                    .setTitle("Write URL to tag...")
                    .setMessage("Touch tag to start writting")
                    .setCancelable(true)
                    .setNeutralButton(android.R.string.cancel, new DialogInterface.OnClickListener() {
                        @Override
                        public void onClick(DialogInterface d, int i) { d.cancel(); }
                    }).setOnCancelListener(new DialogInterface.OnCancelListener() {
                        @Override
                        public void onCancel(DialogInterface dialogInterface) {
                            mWriteUrl = false;
                        }
                    }).create();
    }
    return null;
}
```


8:38
NFCReaderWriterDemo
URL:
https://www.youtube.com/results?search_
WRITE TO NFC TAG...
Write URL to tag...
Touch tag to start writting
CANCELAR

Paso 6: Despacho en primer plano (Detección de etiquetas)

```
public void onResume(){
    super.onResume();

    //Retrieve an instance of the NfcAdapter:
    NfcManager nfcManager = (NfcManager) this.getSystemService(Context.NFC_SERVICE);
    mNfcAdapter = nfcManager.getDefaultAdapter();

    //Create a PendingIntent to handle discovery of Ndef and NdefFormateable tags:
    PendingIntent pi = createPendingResult(PENDING_INTENT_TECH_DISCOVERED, new Intent(), flags: 0);

    //Enable foreground dispatch for Ndef and NdefFormateable tags:
    mNfcAdapter.enableForegroundDispatch( activity: this, pi, new IntentFilter[]{ new IntentFilter(NfcAdapter.ACTION_TECH_DISCOVERED)},
            new String[][]{
                    new String[]{"android.nfc.tech.NdefFormatable"},
                    new String[]{"android.nfc.tech.Ndef"}
            });
}
```

Paso 7: Limpieza del despacho de primer plano

```
public void onPause(){
    super.onPause();
    //Disable foreground dispath:

    mNfcAdapter.disableForegroundDispatch( activity: this);
}
```

Paso 8: Recibir el intento del despacho de primer plano

```
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    super.onActivityResult(requestCode, resultCode, data);

    switch (requestCode) {
        case PENDING_INTENT_TECH_DISCOVERED:
            resolveIntent(data, foregroundDispatch: true);
            break;
    }
}

private void resolveIntent(Intent data, boolean foregroundDispatch){
    String action = data.getAction();
    if(NfcAdapter.ACTION_TECH_DISCOVERED.equals(action)){
        Tag tag = data.getParcelableExtra(NfcAdapter.EXTRA_TAG);
        if(foregroundDispatch && mWriteUrl){
            mWriteUrl = false;
            dismissDialog(DIALOG_WRITE_URL);
        }
    }
}
```

Paso 9: Preparar el mensaje URI NDEF

```
if(foregroundDispatch && mWriteUrl){
    mWriteUrl = false;
    //dismissDialog(DIALOG_WRITE_URL);
    String urlStr = mMyUrl.getText().toString();

    byte[] urlBytes = urlStr.getBytes(Charset.forName("UTF-8"));

    byte[] urlPayload = new byte[urlBytes.length+1];
    urlPayload[0] = 0;
    System.arraycopy(urlBytes, i: 0, urlPayload, i1: 1, urlBytes.length);

    NdefRecord urlRecord = new NdefRecord(NdefRecord.TNF_WELL_KNOWN,
            NdefRecord.RTD_URI,
            new byte[0],
            urlPayload);

    NdefMessage msg = new NdefMessage(new NdefRecord[]{urlRecord});
```

Paso 10: Escribir el NDEF a una etiqueta preformateada

```
NdefMessage msg = new NdefMessage(new NdefRecord[]{urlRecord});

Ndef ndefTag = Ndef.get(tag);
if(ndefTag != null){
    try{
        ndefTag.connect();
        ndefTag.writeNdefMessage(msg);
    }catch (Exception e){

    }finally {
        try{
            ndefTag.close();
        } catch (Exception e){

        }
    }
}else{

}
```

Paso 11: Escribir el NDEF a la etiqueta no formateada

```
}else{
    NdefFormatable ndefFormatableTag = NdefFormatable.get(tag);
    if(ndefFormatableTag != null){
        try {
            ndefFormatableTag.connect();
            ndefFormatableTag.format(msg);
        } catch (Exception e){

        } finally {
            try {
                ndefFormatableTag.close();
            } catch (Exception e){

            }
        }
    }
    dismissDialog(DIALOG_WRITE_URL);
}
```

Ejemplo (Parte 2): Aplicación con NDEF Reader

Paso 1: Una caja de diálogo: Se detectó una etiqueta

```
case DIALOG_NEW_TAG:
    return new AlertDialog.Builder( context: this)
            .setTitle("Tag detected")
            .setCancelable(true)
            .setNeutralButton(android.R.string.ok,
                    new DialogInterface.OnClickListener() {
                        @Override
                        public void onClick(DialogInterface d, int i) {
                            d.dismiss();
                        }
                    }).create();
```

```
protected void onPrepareDialog(int id, Dialog dialog, Bundle args){
    switch (id){
        case DIALOG_NEW_TAG:
            String message = args.getString(ARG_MESSAGE);
            if (message != null)
                ((AlertDialog) dialog).setMessage(message);
            break;
    }
}
```

Paso 2: Detección de la etiqueta

```
} else {
    StringBuilder tagInfo = new StringBuilder();

    byte[] uid = tag.getId();
    tagInfo.append("UID: ")
            .append(StringUtils.convertByteArrayToHexstring(uid))
            .append("\n\n");
}
```

Paso 3: Lectura del mensaje NDEF de la etiqueta

```
Parcelable[] ndefRaw = data.getParcelableArrayExtra(NfcAdapter.EXTRA_NDEF_MESSAGES);
NdefMessage[] ndefMsgs = null;

if(ndefRaw != null){
    ndefMsgs = new NdefMessage[ndefRaw.length];
    for(int i = 0; i < ndefMsgs.length;++i){
        ndefMsgs[i] = (NdefMessage) ndefRaw[i];
    }
}
```

Paso 4: Encontrar el registro URI en los mensajes NDEF

```
if (ndefMsgs != null) {
    for (int i = 0; i < ndefMsgs.length; i++) {
        NdefRecord[] records = ndefMsgs[i].getRecords();
        if (records != null) {
            for (int j = 0; j < records.length; j++) {
                if ((records[j].getTnf() == NdefRecord.TNF_WELL_KNOWN) && Arrays.equals(records[j].getType(), NdefRecord.RTD_URI)) {
                    byte[] payload = records[j].getPayload();
                    String uri = new String(Arrays.copyOfRange(payload, from: 1, payload.length), Charset.forName("UTF-8"));
                    tagInfo.append("URI: ").append(uri).append("\n");
                }
            }
        }
    }
}
```

Paso 5: Mostrar los datos de la etiqueta en un cuadro de diálogo

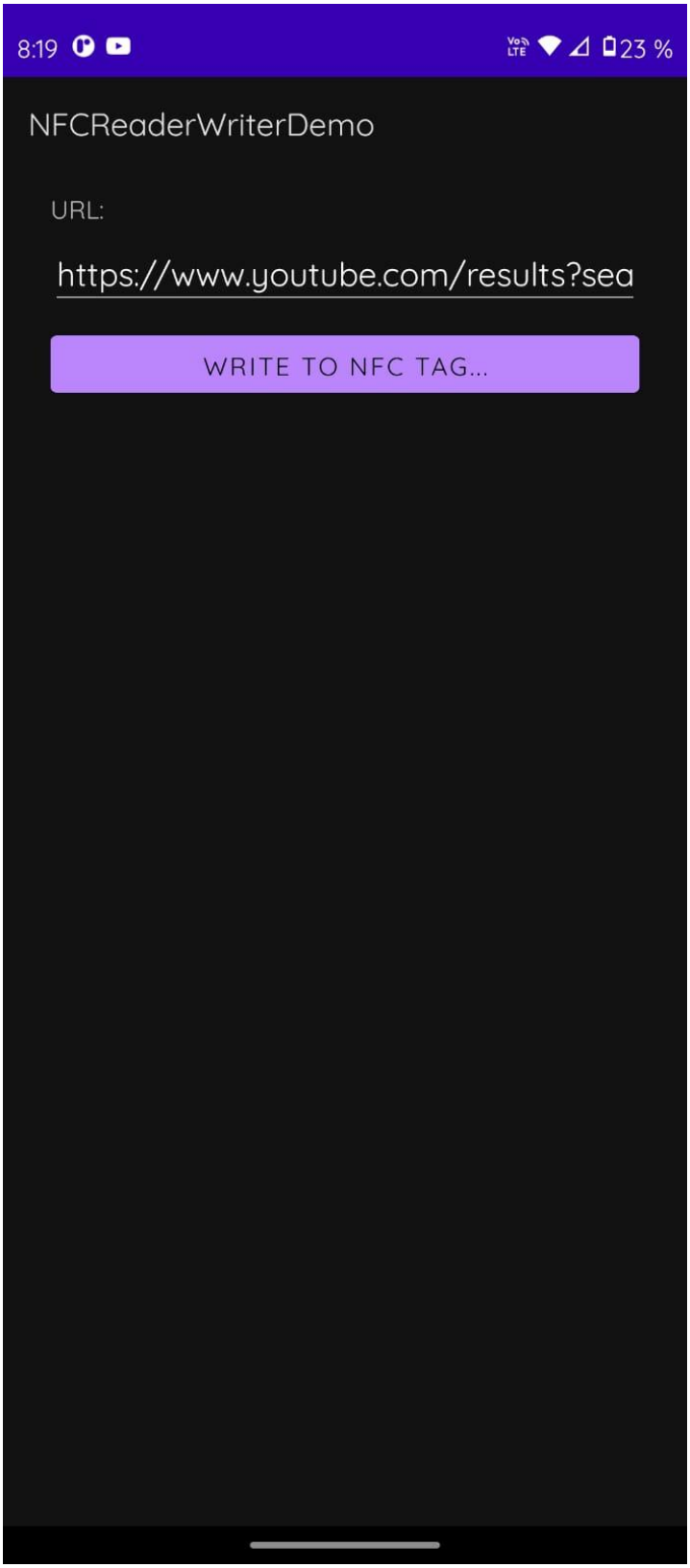
```
Bundle args = new Bundle();
args.putString(ARG_MESSAGE, tagInfo.toString());
showDialog(DIALOG_NEW_TAG, args);
```

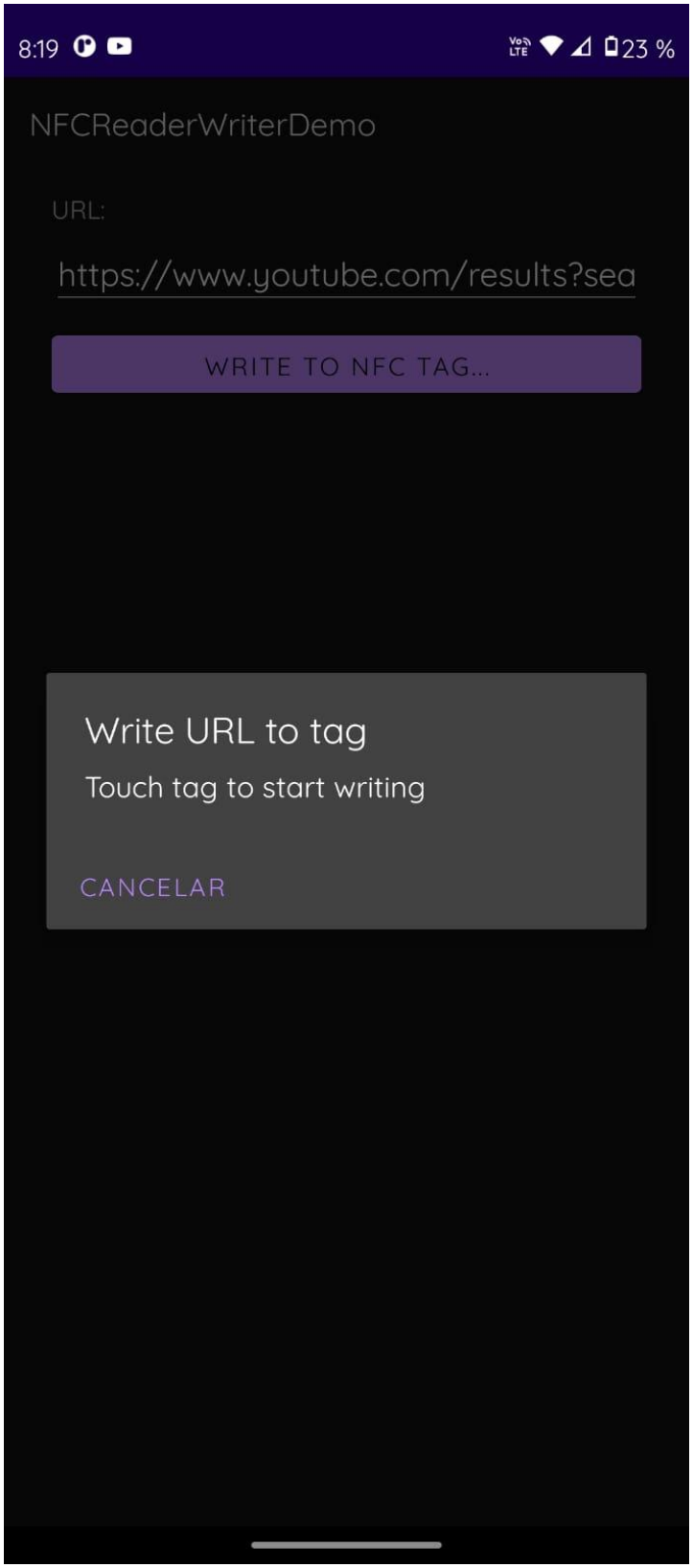
Ejemplo (Parte 3): Aplicación de Auto-inicio para la URI

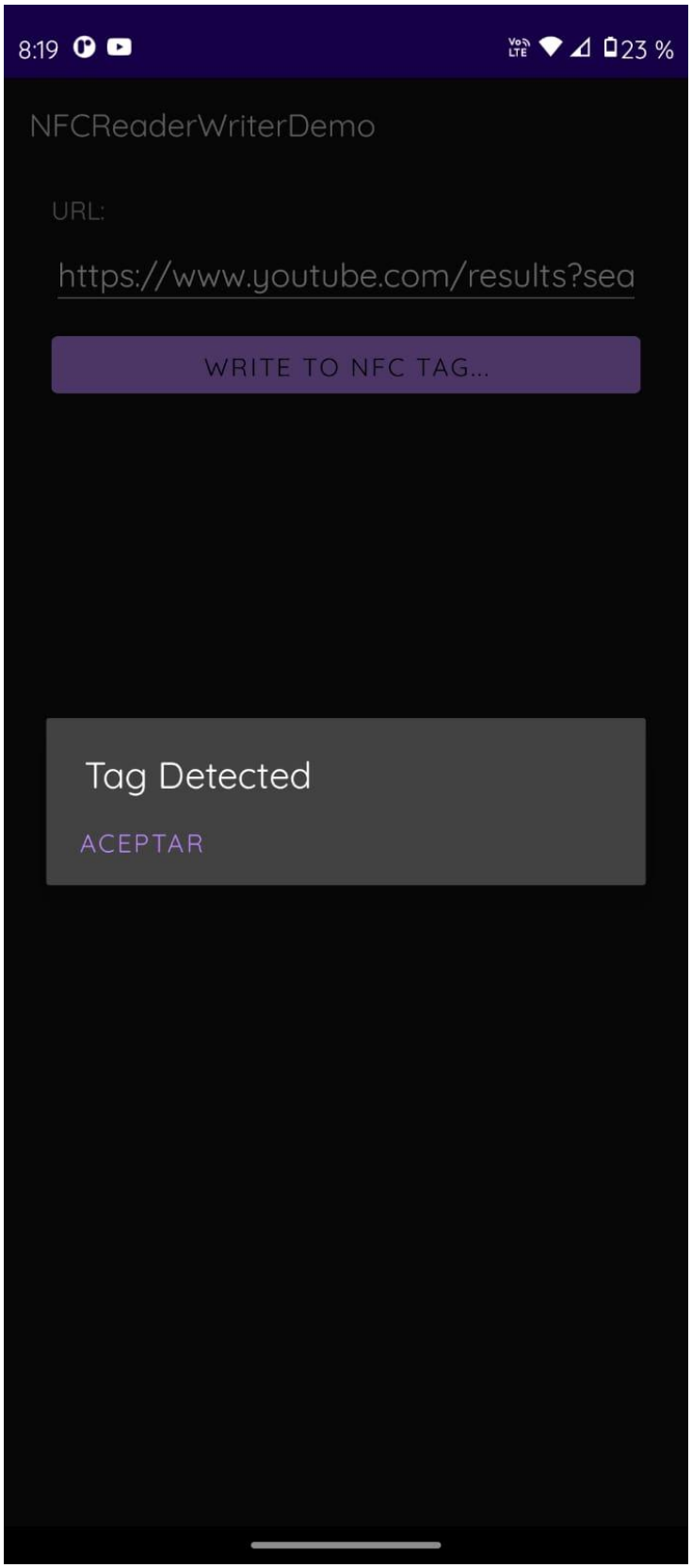
Paso 1: AndroidManifest y Auto-inicio en la etiqueta NFC

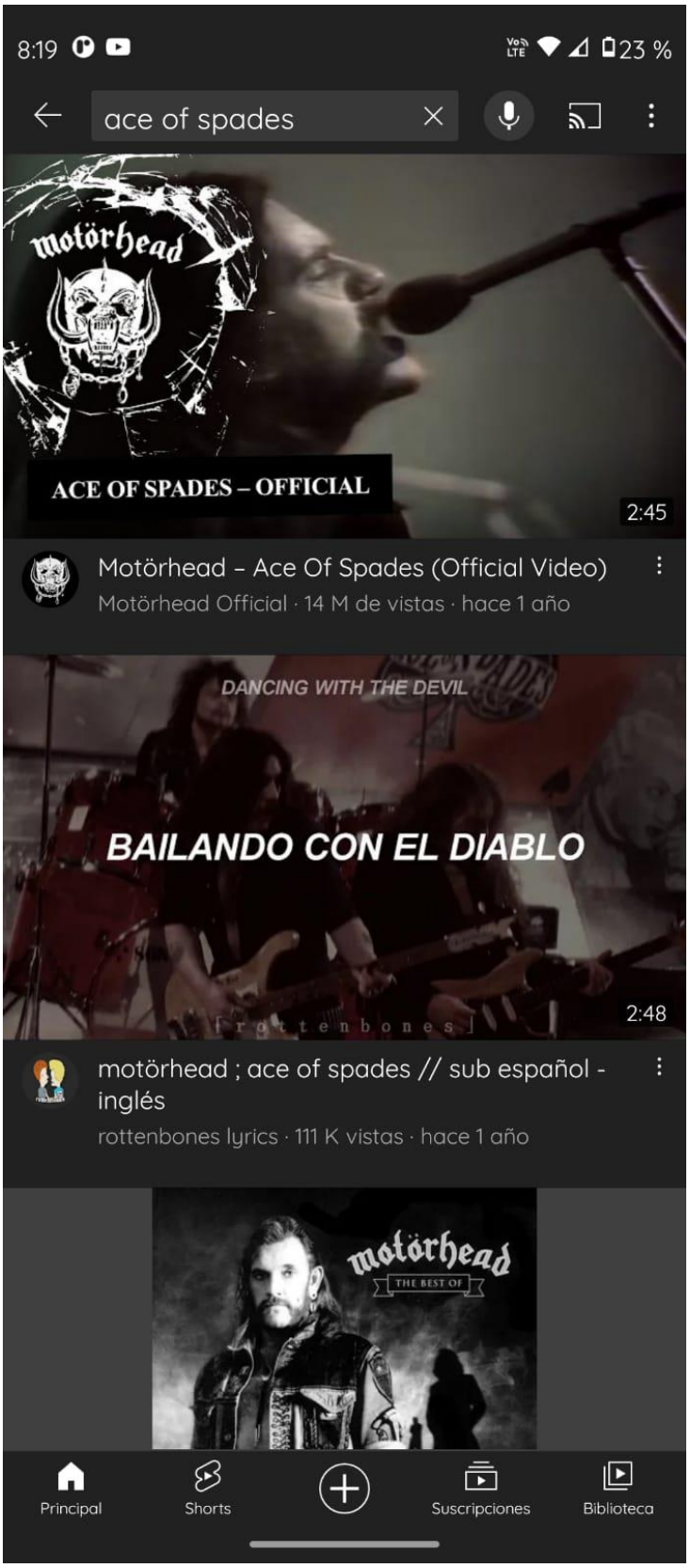
```
<application
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="NFCReaderWriterDemo"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/Theme.NFCReaderWriterDemo"
    android:launchMode="singleTask"
    android:configChanges="orientation|keyboardHidden">

    <activity
        android:name=".MainActivity"
        android:exported="true">
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />

            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
        <intent-filter>
            <action android:name="android.nfc.action.NDEF_DISCOVERED"/>
            <category android:name="android.intent.category.DEFAULT"/>
            <data android:scheme="http"
                android:host="www.mroland.at"
                android:pathPrefix="/" />
        </intent-filter>
    </activity>
</application>
```

Capturas de ejecución






8:19
23 %
NFCReaderWriterDemo
URL:
https://www.youtube.com/results?sea
WRITE TO NFC TAG...
Tag Detected
ACEPTAR


8:19
23 %
ace of spades
motörhead
ACE OF SPADES – OFFICIAL
2:45
Motörhead – Ace Of Spades (Official Video)
Motörhead Official · 14 M de vistas · hace 1 año
DANCING WITH THE DEVIL
BAILANDO CON EL DIABLO
rottenbones
2:48
motörhead ; ace of spades // sub español - inglés
rottenbones lyrics · 111 K vistas · hace 1 año
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Shorts
Suscripciones
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