OneSpan

Image Scanner SDK

Integration Guide

Version: 4.27

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1 Introduction

Welcome to the Image Scanner SDK Integration Guide! This guide describes how to integrate the Image Scanner SDK into any application.

This guide provides information about:

- Functions of the Image Scanner SDK, with parameter and method descriptions
- Integration steps

1.1 OneSpan Mobile Security Suite Documentation 2

1.1 OneSpan Mobile Security Suite Documentation

The OneSpan Mobile Security Suite product documentation comprises the following guides:

- *OneSpan Mobile Security Suite Product Guide*: Provides an overview of OneSpan Mobile Security Suite and its components.
- *Biometric Sensor SDK Integration Guide*: Provides instructions to integrate the Biometric Sensor SDK.
- *Client Device Data Collector SDK Integration Guide*: Provides instructions to integrate the Client Device Data Collector SDK.
- *Device Binding SDK Integration Guide*: Provides instructions to integrate the Device Binding SDK.
- *DIGIPASS SDK Integration Guide*: Provides instructions to integrate the DIGIPASS SDK.
- *Digipass Software Advanced Provisioning Protocol SDK Integration Guide*: Provides instructions to integrate the Digipass Software Advanced Provisioning Protocol SDK.
- *FIDO UAF SDK Developer Guide*: Provides instructions to integrate the FIDO UAF SDK.
- *Image Generator SDK Integration Guide*: Provides instructions to integrate the Image Generator SDK.
- *Image Scanner SDK Integration Guide*: Provides instructions to integrate the Image Scanner SDK.
- *Notification SDK Integration Guide*: Provides instructions to integrate the Notification SDK.
- *Orchestration SDK Integration Guide*: Provides instructions to integrate the Orchestration SDK.
- *Root Detection SDK Integration Guide*: Provides instructions to integrate the Root Detection SDK.

- *Secure Messaging SDK Client Integration Guide*: Provides instructions to integrate the Secure Messaging SDK Client.
- *Secure Messaging SDK Server Integration Guide*: Provides instructions to integrate the Secure Messaging SDK Server.
- *Secure Storage SDK Integration Guide*: Provides instructions to integrate the Secure Storage SDK.
- *White-Box Cryptography SDK Integration Guide*: Provides instructions to integrate the White-Box Cryptography SDK.

2 What's new in the Image Scanner SDK

This section provides an overview of changes introduced in the Image Scanner SDK to facilitate the integration of the SDK and provide information on backward compatibility.

2.1 Version 4.27.0

2.1.1 iOS

API updates – NSErrors API support for Objective-C added

The Objective-C API points no longer throw an `NSException`. All API points that previously would throw such an `NSException` now require an `NSError` pointer. If an error occurs, it will be attached to the pointer that is provided as parameter. Refer to the Objective-C sample included in the product package for full code examples.

3 Usage of the Image Scanner SDK

This section contains an overview of the Image Scanner SDK and information about the functions of the SDK.

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3.1 Overview

The Image Scanner SDK facilitates the Digipass application development: it provides you with the image scanning functionality to capture QR codes and **Cronto**[1] images. The Image Scanner SDK package includes the following:

- `QRCodeScannerSDK.xcframework` for iOS
- `QRCodeScannerSDK.aar` for Android

The Image Scanner SDK can be used on a variety of devices and supports the following platforms:

- Android 5.0 and later
- iOS 12.0 and later

> **NOTE:** As of OneSpan Mobile Security Suite 4.20.0, the integration of the Image Scanner SDK has changed for iOS. For more information, see **4.2 Integrate the Image Scanner SDK with iOS**.

3.1.1 Image Requirements

The Image Scanner SDK requires the target image to meet the following requirements:

- The image containing the QR code must be clear and well-focused.
- The QR code should be in the center of the image.
- The photo should not be taken too closely.
- The maximum width and height is 2048 pixels (applies to iOS only).

[1] Colorful cryptogram, similar to a QR code; used for visual transaction signing.

3.1.2 Exposed APIs

The Image Scanner SDK APIs are exposed as follows:

- Android: The APIs are exposed in the `com.vasco.digipass.sdk.utils.qrcodescanner` package.

3.1.3 Exception Management

When an error occurs, a `QRCodeScannerSDKException` is thrown. This exception consists of an error code and, if the exception is an internal error, the cause of the exception.

3.1.4 Error Codes

Table 1 lists the constants which can be retrieved from the `QRCodeScannerSDKErrorCodes` class.

Table 1: Error Codes

Name	Value	Description
`INTERNAL_ERROR`	–4500	Internal error.
`INPUT_PARAMETER_NULL`	–4501	Call-back / delegate is null.
`CAMERA_NOT_AVAILABLE`	–4502	Camera not present on the device.
`PERMISSION_DENIED`	–4503	Permission to access the camera is not set.
`NATIVE_LIBRARY_NOT_LOADED`	–4504	Native library has not been loaded (Android only).
`INVALID_IMAGE`	–4505	Provided Image is invalid and cannot be decoded.
`IMAGE_TOO_BIG`	–4506	Provided image is too big to process (iOS only)
`INVALID_CODE_TYPE`	–4507	Provided code type is invalid and cannot be processed.

CAUTION: To be able to access the camera of the device, you need to set the appropriate permissions in your application configuration.

For *Android*, you need to add the *CAMERA* and *VIBRATE* permissions to the `AndroidManifest.xml` file.

3.2 Image Decoding Method for Android

The Android API contains a method to decode and view the results of the static images in the Image Scanner SDK.

3.2.1 Image Decoding Method

The following method decodes the QR code in the image once it is detected:

```
public static QRCodeScannerSDKDecodingResultData decodeImage(Image image, int codeType) throws QRCodeScannerSDKException, LinkageError
```

3.2.2 Obtain Decoding Results

After decoding the QR code in the image, the `QRCodeScannerSDKDecodingResultData` obtains the results of the scan with the following methods:

```
public int getScannedImageFormat()
```

```
public String getScannedImageData()
```

3.3 Functions for Android

The Android API consists of the `QRCodeScannerSDKActivity` class, which manages the behavior of the Image Scanner SDK.

The Android API returns a result code to indicate if a scan has been successful.

3.3.1 Display the scan result

When a code is flashed, the `QRcodeScannerSDKActivity` class ends the scan process, and the activity is closed with the following code:

```
resultCode == RESULT_OK
```

The scan result will be transmitted with the `OUTPUT_RESULT` key.

3.3.2 Cancel the scan process

When the back button is pressed, the `QRCodeScannerSDKActivity` instance is closed with the following code:

```
resultCode == RESULT_CANCELED
```

3.3.3 Exception

If an error occurs, the caught exception is converted to a `QRCodeScannerSDKException` object. The `QRCodeScannerSDKActivity` ends the process and returns the following code:

```
resultCode == RESULT_ERROR
```

The result of the scan will be transmitted with the `OUTPUT_EXCEPTION` key.

3.3.4 QRCodeScannerSDKConstants for Android

The `QRCodeScannerSDKConstants` class contains the constants. The following table lists the available constants and parameters.

Properties

Table 2: QRCodeScannerSDKConstants Properties for Android

Property Name	Data Type	Description
Android Extra Parameters		
`EXTRA_VIBRATE`	Boolean	Indicates whether the device must vibrate when a QR code is scanned. Key value: `extra_vibrate` Default value: `true`
`EXTRA_CODE_TYPE`	int	Indicates which type of code can be parsed. Key value: `extra_code_type` Possible values are: • `QRCodeScannerSDKConstants.QR_CODE` • `QRCodeScannerSDKConstants.CRONTO_CODE` • `QRCodeScannerSDKConstants.QR_CODE + QRCodeScannerSDKConstants.CRONTO_CODE` Default value: `QRCodeScannerSDKConstants.QR_CODE + QRCodeScannerSDKConstants.CRONTO_CODE`
`QR_CODE`	int	Indicates that the Image Scanner SDK must parse the image to search QR codes. Key value: `0x01`
`EXTRA_SCANNER_OVERLAY`	Boolean	Indicates that a scanner overlay will be displayed in scan view. Key value: `extra_scanner_overlay` Default value: `false`
`EXTRA_SCANNER_OVERLAY_COLOR`	int	Indicates the color that will be applied in the scanner overlay. Key value: `extra_scanner_overlay_color` Default value: `0x99000000`
`CRONTO_CODE`	int	Indicates that the Image Scanner SDK must parse the image to search Cronto images. Key value: `0x02`
Android Return Parameters		
`OUTPUT_RESULT`	String	Result of the scan. Key value: `output_result`

Table 2: QRCodeScannerSDKConstants Properties for Android (continued)

Property Name	Data Type	Description
OUTPUT_EXCEPTION	Exception	Caught exception. Key value: output_exception
OUTPUT_CODE_TYPE	int	Code type result. Key value: output_code_type Possible values are: • QR_CODE • CRONTO_CODE
RESULT_ERROR	int	Indicates whether an exception has been thrown during the scanning process. Key value: RESULT_FIRST_USER + 1

Example

```
01. public void OnScanClicked(View v)
02. {
03.   ..
04.   // We want a vibration feedback after scanning
05.   // Note that the vibration feedback is activated by default
06.   intent.putExtra(QRCodeScannerSDKConstants.EXTRA_VIBRATE, true);
07.
08.   // Indicate which sort of image we want to scan
09.   intent.putExtra(QRCodeScannerSDKConstants.EXTRA_CODE_TYPE,
                  QRCodeScannerSDKConstants.QR_CODE +
                  QRCodeScannerSDKConstants.CRONTO_CODE);
10.
11.   // Launch Image Scanner activity
12.   startActivityForResult(intent, 1);
13. }
14. @Override
15. protected void onActivityResult(int requestCode, int resultCode, Intent data)
```

```
{
  switch (resultCode)
  {
    case RESULT_OK:
      ..
      String result = data.getStringExtra
                      (QRCodeScannerSDKConstants.OUTPUT_RESULT);
      int codeType = data.getIntExtra
                      (QRCodeScannerSDKConstants.OUTPUT_CODE_TYPE, 0);

      // Convert the result
      if (codeType == QRCodeScannerSDKConstants.CRONTO_CODE)
      {
        // we have scan a cronto code => convert the hexa string to string
        byte[] tmp = hexaToBytes(result);
        ..
      }
      else if (codeType == QRCodeScannerSDKConstants.QR_CODE)
      {
        // we have scanned a QR code => display directly the result
        resultTextView.setText(result);
        ..
      }
  }
}
```

3.4 Image Decoding Method for iOS

The iOS API contains a method to decode and view the results of the static images in the Image Scanner SDK.

3.4.1 Image Decoding Method

The following method decodes the QR code in the image once it is detected.

In Objective-C:

```
+ (QRCodeScannerSDKDecodingResultData * _Nullable)decodeImage:(UIImage *)image
ofType:(int)codeType error:(NSError ** _Nullable)error;
```

In Swift:

```
public static func decodeImage(_ image: UIImage, codeType: CodeType) throws ->
QRCodeScannerSDKDecodingResultData
```

3.4.2 Obtain Decoding Results

After decoding the QR code in the image, the `QRCodeScannerSDKDecodingResultData` obtains the results of the scan. The result contains the following fields.

In Objective-C:

```
int codeType;
```

```
NSString *result;
```

In Swift:

```
var codeType: CodeType
```

```
var result: String
```

3.5 Functions for iOS

The main entry is a `UIViewController` returned by the SDK. The following API is available to obtain the instance:

Objective-C:

```
@interface QRCodeScannerSDK : NSObject
+ (UIViewController * _Nullable)getQRCodeScannerSDKViewControllerWithDelegate:
(id<QRCodeScannerSDKDelegate>)delegate
        vibrate:(BOOL)vibrate
        codeType:(int)codeType
        image:(UIImage *_Nullable)image
        error:(NSError **_Nullable)error;
+ (UIViewController * _Nullable)getQRCodeScannerSDKViewControllerWithDelegate:
(id<QRCodeScannerSDKDelegate>)delegate
        vibrate:(BOOL)vibrate
        codeType:(int)codeType
        image:(UIImage *_Nullable)image
        scannerOverlay:(BOOL)scannerOverlay
        scannerOverlayColor:(UIColor *_Nullable)color
        error:(NSError **_Nullable)error;
+ (const NSString *)version;
@end
```

Swift:

```
01. public class QRCodeScannerSDK {
02. public static func getQRCodeScannerSDKViewController(delegate: ScannerDelegate, vibrate: Bool, codeType: CodeType, image: UIImage?) throws -> UIViewController
03. public static func getQRCodeScannerSDKViewController(delegate: ScannerDelegate, vibrate: Bool, codeType: CodeType, image: UIImage?, scannerOverlay: Bool, scannerOverlayColor: UIColor?) throws -> UIViewController
04. public static var version: String
05. }
```

Parameter details:

- `vibrate`: input parameter. The phone will vibrate when a QR code or a **Cronto**[1] image has been flashed, if the corresponding option is configured. This option is available when the `vibrate` input parameter is used.

- `codeType`: input parameter. The Image Scanner SDK can scan either the content of the QR code or the Cronto image, or both. This option is available when the `codeType` input parameter is used. Possible values are:

  Objective-C:

  ```
  QRCodeScannerSDKConstants.QR_CODE
  ```

  ```
  QRCodeScannerSDKConstants.CRONTO_CODE
  ```

  ```
  QRCodeScannerSDKConstants.QR_CODE +
  QRCodeScannerSDKConstants.CRONTO_CODE
  ```

  The default value enables scanning for all types.

  Swift:

  ```
  CodeType.qrCode
  ```

[1]Colorful cryptogram, similar to a QR code; used for visual transaction signing.

```
CodeType.crontoCode
```

```
CodeType.all
```

The default value enables scanning for all types.

- `image`: to customize the icon for canceling the scan process.
- `delegate`: protocol to manage the callbacks of the view controller instance returned by the SDK. It contains three methods to manage the QR code scanning process and must be implemented in your application.
- `scannerOverlay`: if set to **YES**, a scanner overlay is added to the scan view. By default this overlay is disabled.
- `scannerOverlayColor`: To customize the color of the overlay. If set to null, the default color (**0x99000000**) is used.

3.5.1 Display the scan result

This method is called when a code has been scanned, with the result of the scan as the input parameter:

Objective-C:

```
(void)qrCodeScannerSDKController:(QRCodeScannerSDKViewController*) controller
didScanResult:(NSString *)result withCodeType:(int)codeType;
```

Swift:

```
func qrCodeScannerSDKController(_ controller: UIViewController, didScan result:
String, codeType: CodeType)
```

3.5.2 Cancel the scan process

When the end user presses the relevant icon, `qrCodeScannerSDKControllerDidCancel` is called, which closes the image scanner:

Objective-C:

```
(void)qrCodeScannerSDKControllerDidCancel:
(QRCodeScannerSDKViewController*)controller;
```

Swift:

```
func qrCodeScannerSDKControllerDidCancel(_ controller: UIViewController)
```

3.5.3 Exception

When an exception is thrown during the scan process, the callback `threwException` is called:

Objective-C:

```
(void)qrCodeScannerSDKController:(QRCodeScannerSDKViewController*) controller
threwException:(QRCodeScannerSDKException *)exception;
```

Swift:

```
func qrCodeScannerSDKController(_ controller: UIViewController, didReceive
error: ScannerError)
```

3.5.4 Example

Sample Applications in Objective-C and Swift are provided along with this package.

3.5.5 QRCodeScannerSDKConstants for iOS

The `QRCodeScannerSDKConstants` file contains the constant, fixed values for the Image Scanner SDK in iOS.

Table 3: `QRCodeScannerSDKConstants` **values for iOS**

Name	Value	Description
`QRCodeScannerSDKConstants_IMAGE_MAX_SIZE`	2048	Indicates the maximum width and height of a decoded image, in pixels.

4 Integrate the Image Scanner SDK

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4.2 Integrate the Image Scanner SDK with iOS 21

4.1 Integrate the Image Scanner SDK with Android

This procedure allows you to integrate and use the Image Scanner SDK in your Android project.

▸ To use the Image Scanner SDK in your Android project

1. Copy `QRCodeScannerSDK.aar` from the OneSpan Mobile Security Suite to the `libs` folder.
2. Declare `QrScannerSDKActivity` in your application manifest (refer to the Image Scanner SDK sample for details).

> **NOTE:** To be able to access the camera, you need to set the appropriate permissions in your application configuration. The *CAMERA* and *VIBRATE* permissions must be added to the `AndroidManifest.xml` file.
>
> For applications that target API 23 and run on Android 6.0+, the *CAMERA* permission must be explicitly requested at runtime. Refer to the Android sample for more details.
>
> For applications that target an API earlier than 23 and run on Android 6.0+: If the user first grants permission upon installation and then denies the permission in the device settings, the Image Scanner SDK may not work as expected (as indicated by the Android system).

You are now ready to use the Image Scanner SDK. For more information how to integrate the functions, see **3.3 Functions for Android**.

4.2 Integrate the Image Scanner SDK with iOS

This procedure allows you to integrate and use the Image Scanner SDK in your iOS project.

▸ To use the Image Scanner SDK in your iOS project

1. Link `QRCodeScannerSDK.xcframework` from the OneSpan Mobile Security Suite package to your Xcode project (linked framework and libraries).
2. Link the following libraries from the iOS SDK to your Xcode project with the *Link Binary With Libraries* build phase:
   - `Libiconv`
   - `libc++` (only required if the project is compiled in Objective-C and not in Objective-C++)

NOTE: `XCFramework` is compatible with Xcode 11 and later. OneSpan strongly recommends using `XCFramework`, as it facilitates the archiving of projects and it works with simulators.

CAUTION: Your project must be compiled with the `libc++` standard library.

CAUTION: In iOS 10, `NSCameraUsageDescription` is mandatory and must be added to the `.plist` file of the project.

CAUTION: If you use Swift, your project must be linked with the `-ObjC` flag. This should be set in `Other Linker Flags` in the target's build settings. In a pbxproj project file, the raw key is `OTHER_LDFLAGS`.

You are now ready to use the Image Scanner SDK. For more information how to integrate the functions, see **3.5 Functions for iOS**.

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