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# API Specification for United Kingdom Cards and Alternate Payment Methods

Version: 1.1

## Description

This document introduces the **OpenAPI specification** for the REST APIs of the HSBC Collection of digital payments - HSBC Omni Collect in the UK.

The target audience of this document is the Developer, Business Analyst and other related Project Team Members.

## Update Log

- [Mar 19, 2022] **v1.1** Revised several content sections
- [Nov 23, 2021] **v1.0** Initial Version

## How to Read this Document

Get to know what we offer in the [Features Overview](#) and take away the key ideas of our [API operations](#). Before you connect to our APIs, remember to collect all prerequisites and go through all requirements in the [How to Connect](#) section.

## Features Overview

### Checkout Solutions for Payment

You accept payments from your customers by integrating your website or app with the Hosted Payment Page or Direct Payment serving different payment methods.

#### IMPORTANT NOTE:

Conditions may apply to the availability of each checkout solution and its associated payment options, please check with our support team for details.

#### Hosted Payment

#### Hosted Payment Page

**Overview** The Hosted Payment Page (HPP) is a PCI DSS v3.2 compliant redirect solution, allowing you capture card data without having to worry about the PCI overhead associated with a traditional API integration.

- Debit / Credit Cards** - Card Data is captured securely inside HPP
- Paypal** - Redirect to Paypal Checkout page
- WeChat Pay** - Payment QR Code will be displayed in a redirected page
- Test Pay** - A payment simulator available in Sandbox environment for testing purpose.

#### Supported Payment Options

Please choose a payment method below

Cards



Pay with another payment method



256-bit SSL encrypted

Secure payment by Global Payments

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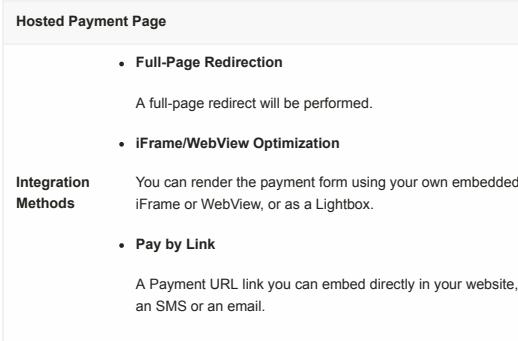
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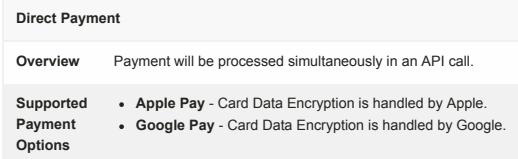
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## Direct Payment

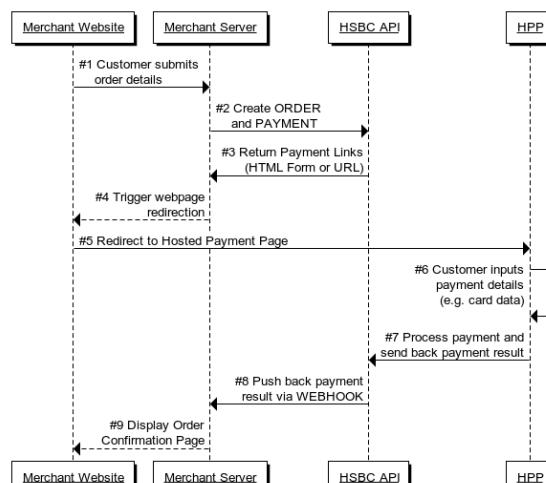


**Integration Method**

**Step 1. Obtain a Payment Token** - Payment Token is a token provided by Apple or Google that the merchant can use to bind a particular customer's card detail stored securely in Apple's or Google's server. Please visit Apple Pay and Google Pay developer site to learn how to obtain a Payment Token by calling their APIs.

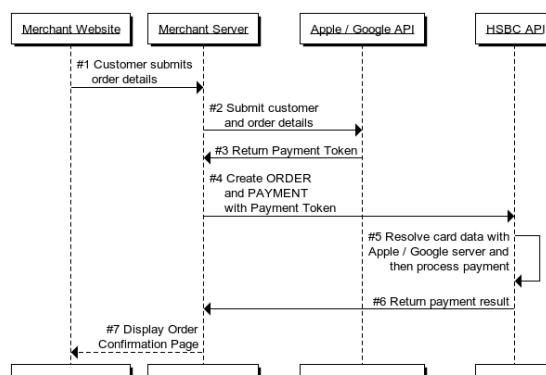
**Step 2. Process Payment** - Put the Payment Token in the corresponding API request message and HSBC Omni Collect processes the payment simultaneously as a typical card payment. A successful or a failed payment is returned in the synchronous API response message.

## API Use Case of Hosted Payment Page



Please see API operations [Create Order](#), [Create Payment for an Order](#) and [Webhooks](#) for more details.

## API Use Case of Direct Payment



Please see API operations [Create Order](#) and [Create Payment for an Order](#) for more details.

## Void or Refund a Payment

A payment can be voided (cancelled) before settlement. Please refer to API operation [Update a Payment](#) for more details.

You can also perform a full or partial refund if a payment transaction has been settled or batched. Please refer to API operation [Create Refund for a Payment](#)

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## Webhooks for Payment

An asynchronous callback will be pushed back to the Merchant for different payment events, such as a successful payment or a failed payment. Please refer to [Webhooks](#) for details.

## How to Connect

API Connectivity refers to all measures and their components that establish a connection between HSBC - the API Provider and the Merchant - the API Consumer.

	Definition	Components
<b>API Authentication</b>	HTTP BASIC Authentication	<ul style="list-style-type: none"> <li>• <a href="#">Username</a></li> <li>• <a href="#">Password</a></li> </ul>
	Locate API Gateway Policy of the corresponding user	<ul style="list-style-type: none"> <li>• <a href="#">Profile ID</a></li> </ul>
<b>User Identification</b>	A Merchant Profile	<ul style="list-style-type: none"> <li>• <a href="#">Merchant ID</a></li> <li>• <a href="#">Merchant Profile</a></li> </ul>
<b>Connection Security</b>	HTTPS Connection (TLS 1.2) and Network Whitelisting	<ul style="list-style-type: none"> <li>• <a href="#">SSL Certificate</a></li> <li>• <a href="#">Network Whitelist</a></li> </ul>
<b>Message Security</b>	Digital Signing and Data Encryption	<ul style="list-style-type: none"> <li>• A pair of Private Key &amp; Public Key Certificate (PKI Model)</li> <li>• <a href="#">JWS Key ID</a></li> <li>• <a href="#">JWE Key ID</a></li> </ul>

## API Gateway URL

To make API calls, you need to include this before each API endpoint.

<b>Production</b>
<a href="https://ws-api-platform.business.hsbc.co.uk/glcm-mobilecoll-mcuk-eamerchantservices-proxy/v1">https://ws-api-platform.business.hsbc.co.uk/glcm-mobilecoll-mcuk-eamerchantservices-proxy/v1</a>
<b>Sandbox</b>
<a href="https://ws-api-platform-pprd.business.hsbc.co.uk/glcm-mobilecoll-mcuk-eamerchantservices-proxy/v1">https://ws-api-platform-pprd.business.hsbc.co.uk/glcm-mobilecoll-mcuk-eamerchantservices-proxy/v1</a>

## API Authentication

<b>Username &amp; Password</b>
<b>Purpose</b> All APIs are authorized using <a href="#">Basic Authorization</a>
<b>Components</b> <ul style="list-style-type: none"> <li>• Username</li> <li>• Password</li> </ul>
<b>Where to get it?</b> Delivered by HSBC via secure email during onboarding procedure
<b>Implementation</b> In HTTP header: <code>Authorization: Basic [Base64-encoded Credential]</code>

<b>Profile ID</b>
<b>Purpose</b> API Gateway locates the corresponding policy of the specific API consumer
<b>Components</b> <ul style="list-style-type: none"> <li>• Profile ID</li> </ul>
<b>Where to get it?</b> Delivered by HSBC via secure email during onboarding procedure
<b>Implementation</b> In HTTP header: <code>x-hsbc-profileid: [Profile ID]</code>

## User Identification

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Merchant Profile & Merchant ID		
Purpose	<ul style="list-style-type: none"><li>Merchant Profile contains all necessary information from a Merchant in order to enable payment service.</li></ul>	<ul style="list-style-type: none"><li>Merchant ID is used for Merchant identification in each API call.</li></ul>
Components	<ul style="list-style-type: none"><li>Merchant Profile</li></ul>	<ul style="list-style-type: none"><li>Merchant ID</li></ul>
Where to get it?	<ul style="list-style-type: none"><li>Set up by HSBC team after collecting information from Merchant</li></ul>	<ul style="list-style-type: none"><li>Delivered by HSBC via secure email during onboarding procedure</li></ul>
Implementation	<i>nil</i>	In HTTP header: <code>x-hsbc-msg-encrypt-id: [Merchant ID]+[JWS ID]+[JWE ID]</code>

## Connection Security

SSL Certificate & Network Whitelist		
Purpose	<ul style="list-style-type: none"><li>Request HSBC API over HTTPS connection (TLS 1.2)</li></ul>	<ul style="list-style-type: none"><li>Accept Callback API request over HTTPS connection (TLS 1.2)</li></ul>
Components	<ul style="list-style-type: none"><li>Public SSL Certificate issued by HSBC</li></ul>	<ul style="list-style-type: none"><li>Merchant's web server or domain whose HTTPS connection is enabled</li><li>Network Whitelist on HSBC system</li></ul>
Where to get it?	<ul style="list-style-type: none"><li>Downloaded automatically by Browsers or API Tools, if any problem found, please contact HSBC</li></ul>	<i>nil</i> <i>nil</i>
Implementation	<i>nil</i>	<ul style="list-style-type: none"><li>Merchant's domain URL will be configured in HSBC's network whitelist by HSBC team</li></ul>

## Message Security - Data Encryption and Signing

In addition to the Transport Layer Security, HSBC adopts additional security - Data Encryption on the message being passed across the session. This serves as a type of locked briefcase containing the data (the API message) within the HTTPS "tunnel". In other words, the communication has double protection.

### DID YOU KNOW?

Javascript Object Signing and Encryption (JOSE™), is a framework that secures information transferred between parties. To achieve this, the JOSE framework provides a collection of specifications, including JSON Web Signature (JWS™) and JSON Web Encryption (JWE™).

HSBC uses [JWS](#) to sign message payloads, and [JWE](#) to encrypt the signed message. These are created by using the [Private Key & Public Key Certificate \(PKI Model\)](#).

Private Key & Public Key Certificate (PKI Model)		
Purpose	<ul style="list-style-type: none"><li>Digitally sign a API request message</li><li>Decrypt a API response message</li></ul>	<ul style="list-style-type: none"><li>Encrypt the signed API request message</li><li>Verify a signed API response message</li></ul>

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Private Key & Public Key Certificate (PKI Model)		
<b>Components</b>	<ul style="list-style-type: none"><li>• Private Key issued by Merchant</li><li>• Public Key Certificate issued by HSBC</li></ul>	
<b>Where to get it?</b>	<ul style="list-style-type: none"><li>• Created by any Public Key Infrastructure (PKI) toolkits, such as Keytool™ and OpenSSL™.</li><li>• Exchanged with HSBC with the Public Key Certificate issued by Merchant</li></ul>	<ul style="list-style-type: none"><li>• Technical detail is in <a href="#">here</a></li></ul>
<b>Implementation</b>	Please see the technical detail in <a href="#">here</a>	

**NOTE:**  
Technically, an X.509 certificate can serve as a SSL Certificate as well as a Public Key Certificate for Data Encryption. However, for segregation of certificate usage, HSBC recommends that the Merchant uses a different X.509 Certificate for Data Encryption. Moreover, the Public Key Certificate does not have to be CA-signed. However, if the Merchant decides to enhance security, a CA-Signed Certificate is acceptable.

keyID of JWS™ & JWE™		
<b>Purpose</b>	<ul style="list-style-type: none"><li>• The unique identifier to bind Merchant's Private Key in order to create a JWS object - a signed Message Payload</li><li>• The unique identifier to bind HSBC's Public Key Certificate in order to create a JWE object - an encrypted JWS object</li></ul>	
<b>Components</b>	<ul style="list-style-type: none"><li>• keyID of JWS™</li><li>• keyID of JWE™</li></ul>	
<b>Where to get it?</b>	<ul style="list-style-type: none"><li>• Mutual agreed between Merchant and HSBC</li><li>• Mutual agreed between Merchant and HSBC</li></ul>	
<b>Implementation</b>	Define in program coding, see demo in <a href="#">here</a>	

**NOTE:**  
For security purposes, [HSBC's Public Key Certificate](#) and its associated [keyID](#) is renewed every year and a Certificate Renewal process is triggered. More detail is covered in the section [Key Renewal](#)

## How to Sign and Encrypt Outgoing Message

Every message sent to HSBC must be signed and encrypted. From the Merchant's perspective, an **Outgoing Message** means:

- the Request Message of a Service API, or
- the Respond Message of a Callback API.

To help you understand how to construct a Signed and Encrypted Message, let's take the Java program below as an example. Don't worry if you are not familiar with Java, the idea is to let you know the steps and the required components:

**NOTE:** These Java codes are for demonstration only - it's not *plug and play*.

```
private JWSObject signMessage(String messagePayload, KeyStore ks
throws UnrecoverableKeyException, KeyStoreException, NoSuchAlgorithmException
#1 Payload payload = new Payload(messagePayload);

#2 JWSSigner signer = new JWSSigner
.Builder(JWSAlgorithm.RS256)
.keyId("0001")
.customParam("iat", Instant.now().getEpochSecond());
#3 JWSObject jwsObject = new JWSObject(header, payload);

#4 PrivateKey privateKey = (PrivateKey) ks.getKey(keyAlias, keyPassword);
JWSSigner signer = new RSASSASigner(privateKey);
#5 jwsObject.sign(signer);

return jwsObject;
}
```

1. Prepare your **Message Payload**, that is, the plain [json](#) request message.
2. Create a **JWS Header** where the parameters are as follows:

```
{
  "alg": "RS256",           // Signing Algorithm is RS256
  "kid": "0001",             // Put your own Key ID value, "0001" is
  "iat": "1625587913"       // Issued At - the time this request is
}
```

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3. Create a **JWS Object** by combining JWS Header and Message Payload.
4. Retrieve your **Private Key** as the signer.
5. Create a **Signed JWS Object** by signing it with the Private Key.

Next, **Encrypt** the Signed JWS Object:

```
private JWEObject getEncryptedJWEObject(JWSObject jwsObject, RSASignatureAlgorithm algorithm) throws JOSEException {  
    #1 Payload jwepayload = new Payload(jwsObject.serialize());  
  
    #2 JWEHeader jweheader = new JWEHeader.Builder(algorithm).build();  
    #3 JWEObject jweObject = new JWEObject(jweheader, jwepayload);  
  
    #4 JWEEncrypter encrypter = new RSAEncrypter(key);  
    #5 jweObject.encrypt(encrypter);  
  
    return jweObject;  
}
```

1. Prepare your **JWE Payload**, that is, the **Signed JWS Object**.
2. Create the **JWE Header**. The algorithm used to encrypt the message body is **A128GCM** while the algorithm used to encrypt the encryption key is **RSA\_OAEP\_256**. **JWE keyID** is **0002**.
3. Create the **JWE Object** by combining JWE Header and JWE Payload.
4. Retrieve the **HSBC's Public Key** as the encrypter.
5. Create the **Encrypted JWE Object** by encrypting it with HSBC's Public Key.

You are now ready to put the Encrypted JWE Object in the message body (*you may need to first serialize it into String format, depends on your program code design*) of any API call.

## How to Decrypt Message and Verify Signature of an Incoming Message

Every message sent from HSBC must be decrypted and verified. From the Merchant's perspective, an **Incoming Message** means:

- the Respond Message of a Service API, or
- the Request Message of a Callback API.

Let's look into the following example to see how to decrypt a response message from HSBC:

```
private String decryptMessage(String respMsgPayload, KeyStoreFactory ks) throws KeyStoreException, NoSuchAlgorithmException, CertificateException, java.text.ParseException, UnrecoverableKeyException, JSONException {  
    #1 JWEObject jweObject = JWEObject.parse(respMsgPayload);  
  
    #2 PrivateKey privateKey = (PrivateKey) keyStore.getKey("alias", null);  
  
    #3 JWEDecrypter decrypter = new RSAEncrypter(privateKey);  
    #4 jweObject.decrypt(decrypter);  
  
    #5 String signedMessage = jweObject.getPayload().toString();  
    return signedMessage;  
}
```

1. Create an **Encrypted JWE Object** by parsing the encrypted response message payload.
2. Retrieve the **Private Key** as the decrypter.
3. Decrypt the JWE Object using your Private Key.
4. Get the **Signed Message** from the decrypted JWE Object.

You are now able to extract the plain **json** message, but first you **must verify** the signature to guarantee data integrity.

```
private String verifySignature(String signedMessage, KeyStoreFactory ks) throws KeyStoreException, JOSEException, ParseException {  
    #1 JWSObject jwsObject = JWSObject.parse(signedMessage);  
  
    #2 Certificate certificate = ks.getCertificate("alias");  
    #3 JWSVerifier verifier = new RSASSAVerifier((RSAPublicKey) certificate.getPublicKey());  
  
    #4 if (!jwsObject.verify(verifier)) {  
        throw new ValidationException("Invalid Signature");  
    }  
    #5 return jwsObject.getPayload().toString();  
}
```

1. Create a **JWS Object** by parsing the **Signed Message**.
2. Retrieve the **HSBC's Public Key** as the verifier.
3. Verify the signed JWS Object. Invoke error handling if an invalid signature is found (*depends on your code design*).
4. Get the plain **json** message for further actions.

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Components \ Steps	Message Signing	Message Encryption	Message Decryption	Verify Signature
JWS Object	Signing Algorithm: RSA_256	JWE Algorithm: RSA_OAEP_256		
JWE Object		Encryption Method: A128GCM		
KeyID	0002	0002		
Merchant's Private Key	Used as Signer	Used as Decrypter		
HSBC's Public Key	Used as Encrypter	Used as Verifier		

## How to Make an API Request

An API request can be submitted without Message Encryption, in case you want to:

- learn about the basic API Call;
- test API connectivity before spending substantial development effort on Message Encryption.

Data encryption is a required data security imposed by HSBC standards. The Merchant has to invoke the encryption logic before moving to Production and must be fully tested during the testing phase.

## Make Your API Request with Plain Messages

### NOTE:

In the Sandbox Environment you can skip message encryption. However, this is for testing purpose only.

### Submit an example API request using cURL™

cURL™ is a simple command-line tool that enables you to make any HTTP request. Merchant can choose any other GUI tool such as Postman™ and SoapUI™.

**Step 1.** Run this command on your platform:

#### POST

```
#1 curl -X POST "https://ws-api-platform-pprd.business.hsbc
#2 -H "message_encrypt: false"
#3 -H "Authorization: Basic ew91cl91c2VybmcFzTp5b3vyX3Bhc3
#4 -H "x-HSBC-profileid: 8b915a4f6b5047f091f210e2232b5ced"
#5 -H "x-HSBC-msg-encrypt-id: 42298549900001+0001+0002"
#6 -H "Content-Type: application/json"
#7 -d "{ \"txRef\": \"PAY-QJZV956664\", \"merId\": \"42298549900001+0001+0002\"}
```

1. Submit the `POST` request to the API URL endpoint.
2. Set the secret header `message_encrypt: false` to indicate this API request is without message encryption. This header is only applicable in Sandbox environment.
3. Put the `Basic Authorization` in HTTP header `Authorization`.
4. Put the `Profile ID` in HTTP header `x-HSBC-profileid`.
5. Put the `Merchant ID`, the `JWS ID` and the `JWE ID` in HTTP header `x-HSBC-msg-encrypt-id` respectively.
6. Set the `Content-Type` to JSON format.
7. Plain `json` message payload.

#### GET

```
#1 curl -X GET "https://ws-api-platform-pprd.business.hsbc
#2 -H "message_encrypt: false"
#3 -H "Authorization: Basic ew91cl91c2VybmcFzTp5b3vyX3Bhc3
#4 -H "x-HSBC-profileid: 8b915a4f6b5047f091f210e2232b5ced"
#5 -H "x-HSBC-msg-encrypt-id: 42298549900001+0001+0002"
#6 -H "Content-Type: application/json"
```

1. Submit the `GET` request to the API URL endpoint.
2. Set the secret header `message_encrypt: false` to indicate this API request is without message encryption. This header is only applicable in Sandbox environment.

3. Put the **Basic Authorization** in HTTP header `Authorization`.
4. Put the **Profile ID** in HTTP header `x-HSBC-profileid`.
5. Put the **Merchant ID**, the **JWS ID** and the **JWE ID** in HTTP header `x-HSBC-msg-encrypt-id` respectively.
6. Set `Content-Type` to JSON format.

**Step 2.** Receive the response message in plain `json` format.

## Making API Request with Message Encryption

**Step 1.** Run this cURL™ command on your platform:

**POST**

```
#1 curl -X POST "https://ws-api-platform-pprd.business.hsbc
#2 -H "Authorization: Basic ew91cL91c2VybmcFzTp5b3Vx3Bhc3
#3 -H "x-HSBC-profileid: 8b915a4f5b5047f091f210e2232b5ced"
#4 -H "x-HSBC-msg-encrypt-id: 4229854990001+0001+0002"
#5 -H "Content-type: application/json"
#6 -d "eyJraWQiOiIwMDAxIiwizW5IjoiQTEyOEdDTIsImFsZyI6IlJ
```

1. Submit the `POST` request to the API URL endpoint. Any `{id}` adhered in the URL must be encrypted.
2. Put the **Basic Authorization** in HTTP header `Authorization`.
3. Put the **Profile ID** in HTTP header `x-HSBC-profileid`.
4. Put the **Merchant ID**, the **JWS ID** and the **JWE ID** in HTTP header `x-HSBC-msg-encrypt-id` respectively.
5. Set the `Content-Type` to JSON format.
6. The Encrypted Message Payload.

**GET**

```
#1 curl -X GET "https://ws-api-platform-pprd.business.hsbc,
#2 -H "Authorization: Basic ew91cL91c2VybmcFzTp5b3Vx3Bhc3
#3 -H "x-HSBC-profileid: 8b915a4f5b5047f091f210e2232b5ced"
#4 -H "x-HSBC-msg-encrypt-id: 4229854990001+0001+0002"
#5 -H "Content-type: application/json"
```

1. Submit the `GET` request to the API URL endpoint. Any `{id}` adhered in the URL must be encrypted.
2. Put the **Basic Authorization** in HTTP header `Authorization`.
3. Put the **Profile ID** in HTTP header `x-HSBC-profileid`.
4. Put the **Merchant ID**, the **JWS ID** and the **JWE ID** in HTTP header `x-HSBC-msg-encrypt-id` respectively.
5. Set the `Content-Type` to JSON format.

### ! NOTE:

Data Encryption invokes compulsory prerequisites, such as **JOSE library** and program coding, please make sure the section on **Message Security** has been gone through thoroughly.

**Step 2.** For a successful request (HTTP Status Code 200), an encrypted response message is returned, otherwise, a plain `json` with failure message is returned.

## Data Type Overview

### Data Type Control:

Data Type	Allowed Characters	Definition & Important Notice
String <i>(For general field)</i>	Alphanumeric and Symbols	General field means field which is <b>NOT</b> a critical field. HSBC system will execute characters checking upon all string fields we received in order to tackle security vulnerability, such as Cross-site Scripting. Yet, we recommend you to try use Alphanumeric only for most cases.

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Data Type	Allowed Characters	Definition & Important Notice
String (For critical field)		Critical field is used to be either a key or search criteria in HSBC backend system and hence tight restriction is applied to the allowed characters.  Moreover, the starting and ending space of the string value will be trimmed before stored in HSBC system. For example, string " example 12 34 " will be trimmed to "example 12 34".  <b>List of Critical Fields:</b> All <code>id</code> (s)
Integer		Instead of having Max Length check for String, integer range will be checked, e.g. <code>0 ≤ x ≤ 9999</code>

### Field Mandatory Control:

Field Type	Mandatory	Definition & Important Notice
	Mandatory	Annotated with <code>required</code> tag in field definition section.
	Optional	Field & value must be present in the request with valid <code>JSON</code> format.
	Conditional	Annotated with <code>optional</code> tag in field definition section.
		If you don't want to pass fields that are optional, your handler should not pass neither empty strings <code>{"example": ""}</code> nor blank value <code>{"example": " "}</code> .
		Annotated with <code>conditional</code> tag in field definition section.
		Required under a specific condition whose logic is always provided in the field definition if it is a Conditional Field.

### Time Zone Control:

Aspect	Format	Definition & Important Notice
In Request Message		Time zone is expected to be <code>GMT+8</code> (Malaysia standard time). Merchant is required to perform any necessary time zone conversion before submit request if needed.
In Response Message		Timezone returned in <code>api_gw</code> object is generated from HSBC API Gateway which located in Cloud and hence is calculated in <code>GMT+0</code> .  On the other hand, time field in <code>response</code> object will be returned together with timezone information. For more details, please read each field definition carefully.

## FAQ

### SSL Connection Questions

#### Where can I find the HSBC SSL server certificates?

The Merchant developer can export SSL server certificates installed in your browser. To achieve this, visit the domain of the corresponding API endpoint in your browser. For example, to get the SSL certificate of sandbox environment, use the domain name <https://ws-api-platform-pprd.business.hsbc.co.uk/>

However, in production, we provide a certificate and require TLS 1.2 implementation.

### Message Encryption Questions

#### What certificates do I need to work with Message Encryption in HSBC's sandbox and production environments?

A self-sign certificate is acceptable. However, if the Merchant decides to enhance security, a CA-Signed Certificate is also acceptable.

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## Javascript Object Signing and Encryption (JOSE) Framework Questions

### Where can I get more information about JOSE Framework?

If you want to fully understand the framework, you can read [here](#) for more details.

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### Where can I download JOSE libraries for development?

For your reference, you may find the following JOSE libraries of different programming languages.

- [Ruby](#)
- [Python](#)
- [PHP](#)
- [Java](#)
- [Node](#)
- [.NET](#)

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## Orders

Create Orders and link them to [Payments](#). Order creation is the first and an important step as it helps you associate every payment with an order. Orders and payments can be created in one-go or separately.

Orders

### Create an Order

POST /orders

#### DESCRIPTION

This endpoint creates an Order.

To facilitate the checkout process of an e-commerce sale, this endpoint can offer a faster way to create [Order](#) and [Payment](#) in one-go by expanding the API operation to multiple entities. Please see the details as follows.

Nevertheless, merchant can still choose to create [Order](#) and [Payment](#) separately which may fit more on some other use cases such as bill payment or bulk processing.

#### REQUEST PARAMETERS

**Authorization** BASIC [[Base64-encoded Credential](#)]

required  
in header

**x-hsbc-profileid** [Profile ID]

required  
in header

**x-hsbc-msg-encrypt-id** [[Merchant ID](#)]+[[JWS ID](#)]+[[JWE ID](#)]

required  
in header

**Content-Type** application/json

required  
in header

**\$expand: string[]** in query  
The [\\$expand](#) system query option specifies the related resources to be included in line with the original resource.

Available Value: [payment](#)

POST /orders?\$expand=payment

**Use Case:** Create objects [Order](#) and [Payment](#) in one go. This is recommended for easing the no. of API calls.

Request Content-Types: application/json

Request Example

Submit without Payment

```
{  
  "txn_reference": "ORDER-1234QWER",  
  "account_name": "internet",  
  "amount": 1000,  
  "currency": "GBP",  
  "items": [  
    {  
      "product_name": "Product Item 1",  
      "product_id": "A",  
      "unitAmt": 900,  
      "unit": 1,  
      "vat": 100,  
      "subAmt": 1000  
    },  
    "metadata": {  
      "note_1": "Customer is a VIP",  
      "note_2": "In-store credit is used"  
    }  
  ]  
}
```

Submit with Hosted Payment

```
{  
  "txn_reference": "ORDER-1234QWER",  
  "account_name": "internet",  
  "amount": 1000,  
  "currency": "GBP",  
  "items": [  
    {  
      "product_name": "Product Item 1",  
      "product_id": "A",  
      "unitAmt": 900,  
      "unit": 1,  
      "vat": 100,  
      "subAmt": 1000  
    },  
    "metadata": {  
      "note_1": "Customer is a VIP",  
      "note_2": "In-store credit is used"  
    }  
  ]  
}
```

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POST /orders?\$expand=payment

How-to: Include `Payment` object in the request body

POST /orders

Use Case: Only `Order` will be created. This gives the flexibility to link to a `Payment` object at a later time

How-to: Exclude `Payment` object in the request body. After an `Order` is created, create `Payment` and link `Order` by `POST /orders/{id}/payment`

`enable_payment_url:`  
string  
in query

Available Value: `Y`

POST /orders?enable\_payment\_url=Y

Use Case: Enable to return Payment URL Link in response message:

PATH:  
`$.response.order.payments[0]`  
`.payment_method.hosted_payment`  
`.access_method.payment_link`

NOTE: Default value is `N`. Suggest to enable only when you need it since generating a Payment URL link needs extra computing resource.

## REQUEST BODY

OrderInput

*Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

```
"items": [
  {
    "product_name": "Product Item 1",
    "product_id": "A",
    "unitAmt": 900,
    "unit": 1,
    "vat": 100,
    "subAmt": 1000
  }
],
"metadata": {
  "note_1": "Customer is a VIP",
  "note_2": "In-store credit is used"
},
"payment": {
  "payment_method": {
    "hosted_payment": {
      "url_settings": {
        "return_page": "https://merchant.com/returnPage",
        "notification": "https://merchant.com/returnStatus"
      },
      "payment_option": [
        "cards",
        "paypal",
        "wechatpay"
      ],
      "billing": {
        "first_name": "james",
        "last_name": "mason",
        "email": "james.mason@example.com",
        "street1": "Flat 123",
        "street2": "House 456",
        "street3": "Unit 4",
        "city": "Halifax",
        "postal_code": "W5 9HR",
        "country": "826"
      }
    }
  }
}
```

## Submit with Direct Payment

```
{
  "txn_reference": "ORDER-1234QWER",
  "account_name": "internet",
  "amount": 1000,
  "currency": "GBP",
  "items": [
    {
      "product_name": "Product Item 1",
      "product_id": "A",
      "unitAmt": 900,
      "unit": 1,
      "vat": 100,
      "subAmt": 1000
    }
  ],
  "metadata": {
    "note_1": "Customer is a VIP",
    "note_2": "In-store credit is used"
  },
  "payment": {
    "payment_method": {
      "direct_payment": {
        "payment_option": "applepay",
        "token": "<payment token>"
      }
    }
  }
}
```

Response Content-Types: application/json

Response Example (200 OK)

## Submit without Payment

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "200",
    "returnReason": "Successful operation",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "order": {
      "id": "ORDER-1234QWER",
      "txnid": "ORDER-1234QWER",
      "created_at": "2021-06-11T12:10:25Z",
      "last_modified": null,
      "account_name": "internet",
      "amount": 1000,
      "currency": "GBP",
      "items": [
        {
          "product_name": "Product Item 1",
          "product_id": "A",
          "unitAmt": 900,
          "unit": 1,
          "vat": 100,
          "subAmt": 1000
        }
      ],
      "metadata": {
        "note_1": "Customer is a VIP",
        "note_2": "In-store credit is used"
      },
      "links": [
        {
          "href": "/orders/@order_id"
        }
      ]
    }
  }
}
```

## RESPONSES

200 OK

OrderOutput

Successful operation.

*Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

400 Bad Request

Exception

Missing or invalid Parameters.

403 Forbidden

Authorization credentials are missing or invalid.

404 Not Found

Empty resource/resource not found.

500 Internal Server Error

The request failed due to an internal error.

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```
        "order": {
          "id": {
            "href": "/orders/@order_id/payment",
            "id": {
              "order_id": "ORDER-1234QWER"
            },
            "rel": "self",
            "method": "GET"
          }
        }
      }
    ]
  }
}
```

## Submit with Hosted Payment

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "200",
    "returnReason": "Successful operation",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "order": {
      "id": "ORDER-1234QWER",
      "txnid": "ORDER-1234QWER",
      "created_at": "2021-06-11T12:10:25Z",
      "last_modified": null,
      "account_name": "internet",
      "amount": 1000,
      "currency": "GBP",
      "items": [
        {
          "product_name": "Product Item 1",
          "product_id": "A",
          "unitAmt": 900,
          "unit": 1,
          "vat": 100,
          "subAmt": 1000
        }
      ],
      "metadata": {
        "note_1": "Customer is a VIP",
        "note_2": "In-store credit is used"
      },
      "payments": [
        {
          "id": "PAYMENT-5678TYUI",
          "pasref": null,
          "created_at": "2021-06-11T12:10:25Z",
          "last_modified": null,
          "amount": null,
          "currency": null,
          "status": "initiated",
          "payment_method": {
            "hosted_payment": {
              "access_method": {
                "form_post": "
<Encoded_Redirect_Submit_Form>",
                "iframe_form_post": "
<Encoded_Redirect_Submit_Form>",
                "payment_link": "https://pay.sandbox.realexpayments.com/card.html?guid=f82dc878-4752-4d25-8c4b-7d48b3a863ec"
              },
              "url_settings": {
                "return_page": "https://merchant.com/returnPage",
                "notification": "https://merchant.com/notification"
              },
              "payment_option": null,
              "billing": {
                "first_name": "james",
                "last_name": "mason",
                "email": "james.mason@example.com",
                "street1": "Flat 123",
                "street2": "House 456",
                "street3": "Unit 4",
                "city": "Halifax",
                "postal_code": "W5 9HR",
                "country": "826"
              }
            }
          },
          "metadata": null,
          "links": [
            {
              "href": "/payments/@payment_id",
              "id": {
                "payment_id": "PAYMENT-5678TYUI"
              },
              "rel": "self",
              "method": "GET"
            },
            {
              "href": "/payments/@payment_id",
              "id": {
                "payment_id": "PAYMENT-5678TYUI"
              },
              "rel": "update",
              "method": "PATCH"
            }
          ]
        }
      ],
      "links": [
        {
          "href": "/orders/@order_id",
          "id": {
            "order_id": "ORDER-1234QWER"
          },
          "rel": "self",
          "method": "GET"
        }
      ]
    }
  }
}
```

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```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "200",  
    "returnReason": "Successful operation",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "order": {  
      "id": "ORDER-1234QWER",  
      "txn_reference": "ORDER-1234QWER",  
      "created_at": "2021-06-11T12:10:25Z",  
      "last_modified": null,  
      "account_name": "internet",  
      "amount": 1000,  
      "currency": "GBP",  
      "items": [  
        {  
          "product_name": "Product Item 1",  
          "product_id": "A",  
          "unitAmt": 900,  
          "unit": 1,  
          "vat": 100,  
          "subAmt": 1000  
        }  
      ],  
      "metadata": {  
        "note_1": "Customer is a VIP",  
        "note_2": "In-store credit is used"  
      },  
      "payments": [  
        {  
          "id": "14627849160897986",  
          "pasref": "14627849160897986",  
          "created_at": "2021-06-11T14:10:25Z",  
          "last_modified": null,  
          "amount": 1000,  
          "currency": "GBP",  
          "status": "pending",  
          "payment_method": {  
            "direct_payment": {  
              "payment_option": "applepay",  
              "token": "<payment token>",  
              "card": {  
                "brand": "VISA",  
                "authcode": "12345",  
                "mcn": "401200*****1112",  
                "cvv_result": "MATCHED",  
                "dcc": {  
                  "amount": 1324,  
                  "currency": "USD",  
                  "ccp": "EXCO",  
                  "fx_rate": 1.3244,  
                  "margin_percentage": 3.75  
                }  
              }  
            }  
          },  
          "metadata": null,  
          "links": [  
            {  
              "href": "/payments/@payment_id",  
              "id": {  
                "payment_id": "14627849160897986"  
              },  
              "rel": "self",  
              "method": "GET"  
            },  
            {  
              "href": "/payments/@payment_id",  
              "id": {  
                "payment_id": "14627849160897986"  
              },  
              "rel": "update",  
              "method": "PATCH"  
            },  
            {  
              "href": "/payments/@payment_id/refund",  
              "id": {  
                "payment_id": "14627849160897986"  
              },  
              "rel": "refund",  
              "method": "POST"  
            }  
          ]  
        }  
      ],  
      "links": [  
        {  
          "href": "/orders/@order_id",  
          "id": {  
            "order_id": "ORDER-1234QWER"  
          },  
          "rel": "self",  
          "method": "GET"  
        }  
      ]  
    }  
  }  
}
```

## Response Example (400 Bad Request)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "400",  
    "returnReason": "<Corresponding Error Message>",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "error": {  
    "code": "400",  
    "message": "Bad Request",  
    "details": "

The provided payment method is invalid or unsupported.

"  
  }  
}
```

```

    "response": {
      "request_result": {
        "api_gateway": {
          "code": "999999",
          "message": "System Error"
        },
        "payment_gateway": {
          "code": "101",
          "message": "Declined by Bank"
        }
      }
    }
  }
}

```

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## Retrieve a particular Order by ID

GET /orders/{id}

### DESCRIPTION

This endpoint retrieves the details of a particular Order.

Retrieval of other related-objects such as Payment and Refund in one single action is possible by expanding the API operation to multiple entities. This can benefit merchant by reducing the number of API calls. However, it may hit performance issue if one particular Order associates a long list of Payments or Refunds, so please choose to use this feature wisely.

### REQUEST PARAMETERS

**Authorization** BASIC [Base64-encoded Credential]

**required**  
in header

**x-hsbc-profileid** [Profile ID]

**required**  
in header

**x-hsbc-msg-encrypt-id** [Merchant ID]+[JWS ID]+[JWE ID]

**required**  
in header

**Content-Type** application/json

**required**  
in header

**id: string** Unique **id** of **order**

**required**  
in path

*Data Encryption is enforced.*

**\$expand: string[]** in query

The **\$expand** system query option specifies the related resources to be included in line with the original resource.

Available Values: **payment** **refund**

**GET /orders/{id}**

Only **Order** will be returned in response, all other related-objects will be associated in **links**

**GET /orders/{id}?\$expand=payment**

**Order** and **Payment** will be returned in response, all other related-objects will be associated in **links**

**GET /orders/{id}?**

**\$expand=payment/refund**

**Order**, **Payment** and **Refund** will be returned in response

### RESPONSES

**200 OK**

[OrderOutput](#)

Successful operation.

*Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

**400 Bad Request**

[Exception](#)

Missing or invalid Parameters.

**403 Forbidden**

Authorization credentials are missing or invalid.

Response Content-Types: application/json

Response Example (200 OK)

Order only

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "200",
    "returnReason": "Successful operation",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "order": {
      "id": "12345678901234567890123456789012"
    }
  }
}
```

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---	---	---

## Order + Payment

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "200",
    "returnReason": "Successful operation",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "order": {
      "id": "ORDER-1234QWER",
      "txnid": "ORDER-1234QWER",
      "created_at": "2021-06-11T12:10:25Z",
      "last_modified": null,
      "account_name": "internet",
      "amount": 1000,
      "currency": "GBP",
      "items": [
        {
          "product_name": "Product Item 1",
          "product_id": "prod-9ijn8uhb",
          "unitAmt": 900,
          "unit": 1,
          "vat": 100,
          "subAmt": 1000
        }
      ],
      "metadata": null,
      "payments": [
        {
          "id": "PAYMENT-5678TYUI",
          "pasref": "14627849160897986",
          "created_at": "2021-06-11T14:10:25Z",
          "last_modified": "2021-06-12T14:10:25Z",
          "amount": 1000,
          "currency": "GBP",
          "status": "batched",
          "payment_method": {
            "hosted_payment": {
              "access_method": {
                "form_post": "<Encoded_Redirect_Submit_Form>",
                "iframe_form_post": "<Encoded_Redirect_Submit_Form>",
                "payment_link": "https://pay.sandbox.realexpayments.com/card.html?guid=f82dc878-4752-4d25-8c4b-7d4803a863ec"
              },
              "url_settings": {
                "return_page": "https://merchant.com/returnPage",
                "notification": "https://merchant.com/returnStatus"
              }
            },
            "payment_option": "cards",
            "billing": {
              "first_name": "james",
              "last_name": "mason",
              "email": "james.mason@example.com",
              "street1": "Flat 123",
              "street2": "House 456",
              "street3": "Unit 4",
              "city": "Halifax",
              "postal_code": "W5 9HR",
              "country": "826"
            },
            "card": {
              "brand": "VISA",
              "authcode": "12345",
              "mcn": "401200*****1112",
              "cvv_result": "MATCHED",
              "dcl": {
                "amount": 1324,
                "currency": "USD",
                "ccp": "FEXCO",
                "fx_rate": 1.3244,
                "margin_percentage": 3.75
              }
            }
          ],
          "metadata": null,
          "links": [
            {
              "href": "/payments/@payment_id",
              "id": {
                "payment_id": "14627849160897986"
              }
            }
          ]
        }
      ]
    }
  }
}
```

```

    "payment_id": "PAYMENT-5678TYUI"
},
"rel": "self",
"method": "GET"
},
{
  "href": "/payments/@payment_id",
  "id": {
    "payment_id": "PAYMENT-5678TYUI"
  },
  "rel": "update",
  "method": "PATCH"
},
{
  "href": "/refunds/@refund_id",
  "id": {
    "refund_id": "16219383951512048"
  },
  "rel": "refund",
  "method": "GET"
},
{
  "href": "/payments/@payment_id/refund",
  "id": {
    "payment_id": "PAYMENT-5678TYUI"
  },
  "rel": "refund",
  "method": "POST"
}
]
},
"links": null
}
}

```

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## Order + Payment + Refund

```

{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "200",
    "returnReason": "Successful operation",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "order": {
      "id": "ORDER-1234QWER",
      "txnid": "ORDER-1234QWER",
      "created_at": "2021-06-11T12:10:25Z",
      "last_modified": null,
      "account_name": "internet",
      "amount": 1000,
      "currency": "GBP",
      "items": [
        {
          "product_name": "Product Item 1",
          "product_id": "prod-9ijn8uhb",
          "unitAmt": 900,
          "unit": 1,
          "vat": 100,
          "subAmt": 1000
        }
      ],
      "metadata": null,
      "payments": [
        {
          "id": "PAYMENT-5678TYUI",
          "pasref": "14627849160897986",
          "created_at": "2021-06-11T14:10:25Z",
          "last_modified": "2021-06-12T14:10:25Z",
          "amount": 1000,
          "currency": "GBP",
          "status": "batched",
          "payment_method": {
            "hosted_payment": {
              "access_method": {
                "form_post": "<Encoded_Redirect_Submit_Form>",
                "iframe_form_post": "<Encoded_Redirect_Submit_Form>"
              },
              "url_settings": {
                "return_page": "https://merchant.com/returnPage",
                "notification": "https://merchant.com/notification"
              },
              "payment_option": "cards",
              "billing": {
                "first_name": "james",
                "last_name": "mason",
                "email": "james.mason@example.com",
                "street1": "Flat 123",
                "street2": "House 456",
                "street3": "Unit 4",
                "city": "Halifax",
                "postal_code": "W5 9HR",
                "country": "B26"
              },
              "card": {
                "brand": "VISA",
                "authcode": "12345",
                "mcn": "401200*****1112",
                "cvv_result": "MATCHED",
                "dcc": {
                  "amount": 1324,
                  "currency": "USD",
                  "ccp": "EXCO",
                  "fx_rate": 1.3244,
                  "margin_percentage": 3.75
                }
              }
            }
          },
          "metadata": null,
          "refunds": [
            {

```



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```

    "id": "16219383951512048",
    "parsef": "16219383951512048",
    "created_at": "2021-06-11T14:10:25Z",
    "last_modified": "2021-06-12T14:10:25Z",
    "amount": 1000,
    "currency": "GBP",
    "status": "pending",
    "metadata": null,
    "links": [
      {
        "href": "/refunds/@refund_id",
        "id": {
          "refund_id": "16219383951512048"
        },
        "rel": "self",
        "method": "GET"
      }
    ],
    "links": [
      {
        "href": "/payments/@payment_id",
        "id": {
          "payment_id": "PAYMENT-5678TYUI"
        },
        "rel": "self",
        "method": "GET"
      },
      {
        "href": "/payments/@payment_id",
        "id": {
          "payment_id": "PAYMENT-5678TYUI"
        },
        "rel": "update",
        "method": "PATCH"
      },
      {
        "href": "/payments/@payment_id/refund",
        "id": {
          "payment_id": "PAYMENT-5678TYUI"
        },
        "rel": "refund",
        "method": "POST"
      }
    ],
    "links": null
  }
}

```

## Response Example (400 Bad Request)

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "400",
    "returnReason": "<Corresponding Error Message>",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "request_result": {
      "api_gateway": {
        "code": "999999",
        "message": "System Error"
      },
      "payment_gateway": {
        "code": "101",
        "message": "Declined by Bank"
      }
    }
  }
}
```

## Payments

You can accept payments from your customers by integrating your website or app with Hosted Payment Page or Direct Payment which serves different payment methods.

Please see the following checkout solutions:

### IMPORTANT NOTE:

Conditions may apply to the availability of each checkout solution and its associated payment options, please check with our support team for details.

### Hosted Payment

#### Hosted Payment Page

The Hosted Payment Page (HPP) is a PCI DSS v3.2 compliant redirect solution, allowing you capture card data without having to worry about the PCI overhead associated with a traditional API integration.

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**Hosted Payment Page**

- Debit / Credit Cards - Card Data is captured securely inside HPP
- Paypal - Redirect to Paypal Checkout page
- WeChat Pay - Payment QR Code will be displayed in a redirected page
- Test Pay - A payment simulator available in Sandbox environment for testing purpose.

**Full-Page Redirection**

A full-page redirect will be performed. A pre-rendered auto-executable HTML submit form will be returned in response field

PATH: \$.response.payment.payment\_method  
.hosted\_payment.access\_method.form\_post

This is a sample: (escape character is removed)

```
<script language="javascript">window.onload=func<form id="pay_form" name="pay_form" action="https<input name="TIMESTAMP" type="hidden" id="TIMESTAM<input name="MERCHANT_ID" type="hidden" id="MERCHANT_ID<input name="ACCOUNT" type="hidden" id="ACCOUNT"/* More Input Fields Here... */</form>
```

**Integration Methods**

- iFrame/WebView Optimization

You can render the payment form using your own embedded iFrame or WebView, or as a Lightbox. The HTML submit form is similar but with some additional input fields. It will be returned in response field

PATH: \$.response.payment.payment\_method  
.hosted\_payment.access\_method.iframe\_form\_post

- Pay by Link

A Payment URL link you can embed directly in your website, an SMS or an email. The link will be returned in response field

PATH: \$.response.payment.payment\_method  
.hosted\_payment.access\_method.payment\_link

**Direct Payment**

**Direct Payment**

**Overview** Payment will be processed simultaneously in an API call.

**Supported Payment Options**

- Apple Pay - Card Data Encryption is handled by Apple.
- Google Pay - Card Data Encryption is handled by Google.

**Step 1. Obtain a Payment Token** - Payment Token is a token provided by Apple or Google that merchant can use it to bind a particular customer's card detail stored securely in Apple's or Google's server. Please visit Apple Pay and Google Pay developer site to learn how to obtain a Payment Token by calling their APIs.

```
/* A Payment Token example from Apple Pay */{"data": "SkipYr1MYT4SMEKLlibAPF342Lzy3GEZJzd0Z0LdM"
```

**Integration Method**

```
/* A Payment Token example from Google Pay */{"signature": "MEUCIHI37nu9JakubEtif26PtEvw9lUC4kB"
```

**Step 2. Process Payment** - Put the Payment Token in the corresponding API request message and HSBC Omni Collect will process the payment simultaneously as a typical card payment. A successful or a failed payment will be returned in the synchronous API response message.

Payments

## Create a Payment for an Order

POST /orders/{id}/payment

### DESCRIPTION

This endpoint creates a Payment which links to a specific Order.

### REQUEST PARAMETERS

Authorization BASIC [Base64-encoded Credential]  
required in header

x-hsbc-profileid [Profile ID]

Request Content-Types: application/json

Request Example

Submit with Hosted Payment

{

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required  
in header

x-hsbc-msg-encrypt-id [Merchant ID]+[JWS ID]+[JWE ID]  
required  
in header

Content-Type application/json  
required  
in header

id: string Unique id of order  
required  
in path *Data Encryption is enforced.*

enable\_payment\_url: string Available Value: Y  
in query

**POST /orders/{id}/payment?**  
**enable\_payment\_url=Y**

**Use Case:** Enable to return Payment URL  
Link in response message:  
PATH:  
\$.response.order.payments[0].payment\_method.hosted\_payment.access\_method.payment\_link

**NOTE:** Default value is N. Suggest to enable only when you need it since generating a Payment URL link needs extra computing resource.

```
"payment_method": {  
  "hosted_payment": {  
    "url_settings": {  
      "return_page": "https://merchant.com/returnPage",  
      "notification": "https://merchant.com/returnStatus"  
    },  
    "payment_option": [  
      "cards",  
      "paypal",  
      "wechatpay"  
    ],  
    "billing": {  
      "first_name": "james",  
      "last_name": "mason",  
      "email": "james.mason@example.com",  
      "street1": "Flat 123",  
      "street2": "House 456",  
      "street3": "Unit 4",  
      "city": "Halifax",  
      "postal_code": "W5 9HR",  
      "country": "826"  
    }  
  }  
},  
}  
}
```

## Submit with Direct Payment

```
{  
  "payment_method": {  
    "direct_payment": {  
      "payment_option": "applepay",  
      "token": "<payment token>"  
    }  
  }  
}
```

Response Content-Types: application/json

Response Example (200 OK)

## Submit with Hosted Payment

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "200",  
    "returnReason": "Successful operation",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "payment": {  
      "id": "PAYMENT-5678TYUI",  
      "pasref": null,  
      "created_at": "2021-06-11T12:10:25Z",  
      "last_modified": null,  
      "amount": null,  
      "currency": null,  
      "status": "initiated",  
      "payment_method": {  
        "hosted_payment": {  
          "access_method": {  
            "form_post": "Encoded\_Redirect\_Submit\_Form",  
            "iframe_form_post": "Encoded\_Redirect\_Submit\_Form",  
            "payment_link": "https://pay.sandbox.realexpayments.com/card.html?guid=f82dc878-4752-4d25-8c4b-7d48b3a863ec"  
          },  
          "url_settings": {  
            "return_page": "https://merchant.com/returnPage",  
            "notification": "https://merchant.com/returnStatus"  
          },  
          "payment_option": null,  
          "billing": {  
            "first_name": "james",  
            "last_name": "mason",  
            "email": "james.mason@example.com",  
            "street1": "Flat 123",  
            "street2": "House 456",  
            "street3": "Unit 4",  
            "city": "Halifax",  
            "postal_code": "W5 9HR",  
            "country": "826"  
          }  
        },  
        "metadata": null,  
        "links": [  
          {  
            "href": "/payments@payment_id",  
            "id": {  
              "payment_id": "PAYMENT-5678TYUI"  
            },  
            "rel": "self",  
            "method": "GET"  
          },  
          {  
            "href": "/payments@payment_id",  
            "id": {  
              "payment_id": "PAYMENT-5678TYUI"  
            },  
            "rel": "update",  
            "method": "PATCH"  
          }  
        ]  
      }  
    }  
  }
```

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```
{  
  "links": [  
    {  
      "href": "/orders/@order_id",  
      "id": {  
        "order_id": "ORDER-1234QWER"  
      },  
      "rel": "order",  
      "method": "GET"  
    }  
  ]  
}
```

## Submit with Direct Payment

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "200",  
    "returnReason": "Successful operation",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "payment": {  
      "id": "14627849160897986",  
      "pasref": "14627849160897986",  
      "created_at": "2021-06-11T14:10:25Z",  
      "last_modified": null,  
      "amount": 1000,  
      "currency": "GBP",  
      "status": "pending",  
      "payment_method": {  
        "hosted_payment": {  
          "direct_payment": {  
            "payment_option": "applepay",  
            "token": "<payment token>",  
            "card": {  
              "brand": "VISA",  
              "authcode": "12345",  
              "mcn": "401200*****1112",  
              "cvv_result": "MATCHED",  
              "dcc": {  
                "amount": 1324,  
                "currency": "USD",  
                "ccp": "FEXCO",  
                "fx_rate": 1.3244,  
                "margin_percentage": 3.75  
              }  
            }  
          }  
        }  
      }  
    },  
    "metadata": null,  
    "links": [  
      {  
        "href": "/payments/@payment_id",  
        "id": {  
          "payment_id": "14627849160897986"  
        },  
        "rel": "self",  
        "method": "GET"  
      },  
      {  
        "href": "/payments/@payment_id",  
        "id": {  
          "payment_id": "14627849160897986"  
        },  
        "rel": "update",  
        "method": "PATCH"  
      },  
      {  
        "href": "/payments/@payment_id/refund",  
        "id": {  
          "payment_id": "14627849160897986"  
        },  
        "rel": "refund",  
        "method": "POST"  
      }  
    ],  
    "links": [  
      {  
        "href": "/orders/@order_id",  
        "id": {  
          "order_id": "ORDER-1234QWER"  
        },  
        "rel": "order",  
        "method": "GET"  
      }  
    ]  
  }  
}
```

## Response Example (400 Bad Request)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "400",  
    "returnReason": "<Corresponding Error Message>",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "request_result": {  
      "api_gateway": {  
        "code": "099999",  
        "message": "System Error"  
      },  
      "payment_gateway": {  
        "code": "101",  
        "message": "Declined by Bank"  
      }  
    }  
  }  
}
```

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## Retrieve a particular Payment by ID

GET /payments/{id}

### DESCRIPTION

This endpoint retrieves the details of a particular Payment.

### REQUEST PARAMETERS

Authorization: BASIC [Base64-encoded Credential]

required

in header

x-hsbc-profileid: [Profile ID]

required

in header

x-hsbc-msg-encrypt-id: [Merchant ID]+[JWS ID]+[JWE ID]

required

in header

Content-Type: application/json

required

in header

id: string Unique id of payment

required

in path

Data Encryption is enforced.

### RESPONSES

200 OK

PaymentOutput

Successful operation.  
Data Encryption is enforced. API Schema  
intends to demonstrate the skeleton of the  
message payload only.

400 Bad Request

Exception

Missing or invalid Parameters.

403 Forbidden

Authorization credentials are missing or  
invalid.

404 Not Found

Empty resource/resource not found.

500 Internal Server Error

The request failed due to an internal error.

Response Content-Types: application/json

Response Example (200 OK)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "200",  
    "returnReason": "Successful operation",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "payment": {  
      "id": "14627849160897986",  
      "pasref": "14627849160897986",  
      "created_at": "2021-06-11T14:10:25Z",  
      "last_modified": "2021-06-12T14:10:25Z",  
      "amount": 1000,  
      "currency": "GBP",  
      "status": "batched",  
      "payment_method": {  
        "hosted_payment": {  
          "access_method": {  
            "form_post": "<Encoded_Redirect_Submit_Form>",  
            "iframe_form_post": "<Encoded_Redirect_Submit_Form>"  
          },  
          "url_settings": {  
            "return_page": "https://merchant.com/returnPage",  
            "notification": "https://merchant.com/returnStatus"  
          },  
          "payment_option": "cards",  
          "billing": {  
            "first_name": "james",  
            "last_name": "mason",  
            "email": "james.mason@example.com",  
            "street1": "Flat 123",  
            "street2": "House 456",  
            "street3": "Unit 4",  
            "city": "Halifax",  
            "postal_code": "W5 9HR",  
            "country": "826"  
          },  
          "card": {  
            "brand": "VISA",  
            "authcode": "12345",  
            "mcn": "401200*****1112",  
            "cvv_result": "MATCHED",  
            "dcc": {  
              "amount": 1324,  
              "currency": "USD",  
              "ccp": "FEXCO",  
              "fx_rate": 1.3244,  
              "margin_percentage": 3.75  
            }  
          }  
        },  
        "metadata": null,  
        "links": [  
          {  
            "href": "/refunds/@refund_id",  
            "id": {  
              "refund_id": "1002345678999"  
            },  
            "rel": "refund",  
            "method": "GET"  
          }  
        ]  
      }  
    }  
  }  
}
```

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```
"ref": "/refunds/@refund_id",
  "id": {
    "refund_id": "7778889996665"
  },
  "rel": "refund",
  "method": "GET"
},
{
  "href": "/payments/@payment_id/refund",
  "id": {
    "payment_id": "14627849160897986"
  },
  "rel": "refund",
  "method": "POST"
},
{
  "href": "/payments/@payment_id",
  "id": {
    "payment_id": "14627849160897986"
  },
  "rel": "update",
  "method": "PATCH"
}
],
"links": [
  {
    "href": "/orders/@order_id",
    "id": {
      "order_id": "ORDER-1234QWER"
    },
    "rel": "order",
    "method": "GET"
  }
]
}
```

## Response Example (400 Bad Request)

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "400",
    "returnReason": "<Corresponding Error Message>",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "request_result": {
      "api_gateway": {
        "code": "999999",
        "message": "System Error"
      },
      "payment_gateway": {
        "code": "101",
        "message": "Declined by Bank"
      }
    }
  }
}
```

## Update a Payment such as Void a Payment or Add Notes

Payments

PATCH /payments/{id}

### DESCRIPTION

A payment can be voided by updating its `status` or modified by adding/replacing its `metadata`.

**NOTE:**  
Only an unsettled payment can be voided.

### REQUEST PARAMETERS

Authorization BASIC [Base64-encoded Credential]

**required**  
in header

x-hsbc-profileid [Profile ID]

**required**  
in header

x-hsbc-msg-encrypt-id [Merchant ID]+[JWS ID]+[JWE ID]

**required**  
in header

Content-Type application/json

**required**  
in header

**id: string** Unique `id` of `payment`

**required**  
in path

*Data Encryption is enforced.*

Request Content-Types: application/json

Request Example

```
{
  "status": "void",
  "metadata": {
    "customer_id": "12345",
    "customer_comment": "engrave customer's name on product"
  }
}
```

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200 OK  
PaymentOutput

Successful operation.

*Data Encryption* is enforced. API Schema  
intends to demonstrate the skeleton of the  
message payload only.400 Bad Request  
Exception

Missing or invalid Parameters.

## 403 Forbidden

Authorization credentials are missing or  
invalid.

## 404 Not Found

Empty resource/resource not found.

## 500 Internal Server Error

The request failed due to an internal error.

Response Content-Types: application/json

Response Example (200 OK)

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "200",
    "returnReason": "Successful operation",
    "sentTime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "payment": {
      "id": "PAYMENT-5678TYUI",
      "pasref": "14627849160897986",
      "created_at": "2021-06-11T14:10:25Z",
      "last_modified": "2021-06-12T14:10:25Z",
      "amount": 1000,
      "currency": "GBP",
      "status": "voided",
      "payment_method": {
        "hosted_payment": {
          "access_method": {
            "form_post": "<Encoded_Redirect_Submit_Form>",
            "iframe_form_post": "<Encoded_Redirect_Submit_Form>",
            "payment_link": "https://pay.sandbox.realexpayments.com/card.html?guid=f82dc878-4752-4d25-8c4b-7d48b3a863ec"
          },
          "url_settings": {
            "return_page": "https://merchant.com/returnPage",
            "notification": "https://merchant.com/returnStatus"
          },
          "payment_option": "cards",
          "billing": {
            "first_name": "james",
            "last_name": "mason",
            "email": "james.mason@example.com",
            "street1": "Flat 123",
            "street2": "House 456",
            "street3": "Unit 4",
            "city": "Halifax",
            "postal_code": "W5 9HR",
            "country": "826"
          },
          "card": {
            "brand": "VISA",
            "authcode": "12345",
            "mcn": "401200*****1112",
            "cvv_result": "MATCHED",
            "dcc": {
              "amount": 1324,
              "currency": "USD",
              "ccp": "FEXCO",
              "fx_rate": 1.3244,
              "margin_percentage": 3.75
            }
          }
        },
        "metadata": {
          "customer_id": "12345",
          "customer_comment": "engrave customer's name on product"
        }
      },
      "links": [
        {
          "href": "/payments/@payment_id",
          "id": {
            "payment_id": "PAYMENT-5678TYUI"
          },
          "rel": "self",
          "method": "GET"
        },
        {
          "href": "/payments/@payment_id",
          "id": {
            "payment_id": "PAYMENT-5678TYUI"
          },
          "rel": "update",
          "method": "PATCH"
        },
        {
          "href": "/refunds/@refund_id",
          "id": {
            "refund_id": "1002345678999"
          },
          "rel": "refund",
          "method": "GET"
        },
        {
          "href": "/refunds/@refund_id",
          "id": {
            "refund_id": "7778889996665"
          },
          "rel": "refund",
          "method": "GET"
        },
        {
          "href": "/payments/@payment_id/refund",
          "id": {
            "payment_id": "PAYMENT-5678TYUI"
          },
          "rel": "refund",
          "method": "POST"
        }
      ],
      "links": [
        {
          "href": "/orders/@order_id",
          "id": {
            "order_id": "ORDER-1234QWER"
          },
          "rel": "order",
          "method": "GET"
        }
      ]
    }
  }
}
```

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## Refunds

You can make full or partial refunds to customers. Only a settled payment can be refunded.

Refunds

### Create a Refund for a Payment

**POST** /payments/{id}/refund

#### DESCRIPTION

This endpoint creates a Refund which links to a specific Payment.

#### REQUEST PARAMETERS

**Authorization** BASIC [Base64-encoded Credential]

required  
in header

**x-hsbc-profileid** [Profile ID]

required  
in header

**x-hsbc-msg-encrypt-id** [Merchant ID]+[JWS ID]+[JWE ID]

required  
in header

**Content-Type** application/json

required  
in header

**id: string** Unique [id](#) of [payment](#)

required  
in path  
*Data Encryption is enforced.*

#### REQUEST BODY

**RefundInput** *Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

#### RESPONSES

**200 OK**

Successful operation.

*Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

**400 Bad Request**

Exception

Missing or invalid Parameters.

**403 Forbidden**

Authorization credentials are missing or invalid.

**404 Not Found**

Empty resource/resource not found.

**500 Internal Server Error**

The request failed due to an internal error.

## Response Example (400 Bad Request)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "400",  
    "returnReason": "<Corresponding Error Message>",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "request_result": {  
      "api_gateway": {  
        "code": "999999",  
        "message": "System Error"  
      },  
      "payment_gateway": {  
        "code": "101",  
        "message": "Declined by Bank"  
      }  
    }  
  }  
}
```

Request Content-Types: application/json

Request Example

```
{  
  "amount": 1000,  
  "currency": "GBP"  
}
```

Response Content-Types: application/json

Response Example (200 OK)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "200",  
    "returnReason": "Successful operation",  
    "sentTime": "2016-11-15T10:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "refund": {  
      "id": "16219383951512048",  
      "pasref": "16219383951512048",  
      "created_at": "2021-06-11T14:10:25Z",  
      "last_modified": null,  
      "amount": 1000,  
      "currency": "GBP",  
      "status": "pending",  
      "metadata": {  
        "refund_reason": "Product is damaged"  
      },  
      "links": [  
        {"rel": "self", "href": "https://api.example.com/refunds/16219383951512048"}  
      ]  
    }  
  }  
}
```

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```
{  
  "href": "/refunds/@refund_id",  
  "id": {  
    "refund_id": "16219383951512048"  
  },  
  "rel": "self",  
  "method": "GET"  
}  
]  
,  
"links": [  
  {  
    "href": "/payment/@payment_id",  
    "id": {  
      "order_id": "14627849160897986"  
    },  
    "rel": "payment",  
    "method": "GET"  
  }  
]  
}
```

## Response Example (400 Bad Request)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "400",  
    "returnReason": "<Corresponding Error Message>",  
    "sentTime": "2016-11-15T0:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "request_result": {  
      "api_gateway": {  
        "code": "099999",  
        "message": "System Error"  
      },  
      "payment_gateway": {  
        "code": "101",  
        "message": "Declined by Bank"  
      }  
    }  
  }  
}
```

## Retrieve a particular Refund by ID

GET /refunds/{id}

### DESCRIPTION

This endpoint retrieves the details of a particular Refund.

### REQUEST PARAMETERS

Authorization BASIC [Base64-encoded Credential]

required  
in header

x-hsbc-profileid [Profile ID]

required  
in header

x-hsbc-msg-encrypt-id [Merchant ID]+[JWS ID]+[JWE ID]

required  
in header

Content-Type application/json

required  
in header

id: string Unique `id` of `refund`

required  
in path  
*Data Encryption is enforced.*

### RESPONSES

200 OK

RefundOutput

Successful operation.

*Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

400 Bad Request

Exception

Missing or invalid Parameters.

403 Forbidden

Authorization credentials are missing or invalid.

404 Not Found

Empty resource/resource not found.

500 Internal Server Error

The request failed due to an internal error.

Response Content-Types: application/json

## Response Example (200 OK)

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "200",  
    "returnReason": "Successful operation",  
    "sentTime": "2016-11-15T0:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "refund": {  
      "id": "16219383951512048",  
      "pasref": "16219383951512048",  
      "created_at": "2021-06-11T14:10:25Z",  
      "last_modified": null,  
      "amount": 1000,  
      "currency": "GBP",  
      "status": "pending",  
      "metadata": {  
        "refund_reason": "Product is damaged"  
      }  
    }  
  }  
}
```

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```
    "links": null
  },
  "links": [
    {
      "href": "/payment/@payment_id",
      "id": {
        "order_id": "14627849160897986"
      },
      "rel": "payment",
      "method": "GET"
    }
  ]
}
```

## Response Example (400 Bad Request)

```
{
  "system": {
    "messageId": "89817674-da00-4883",
    "returnCode": "400",
    "returnReason": "<Corresponding Error Message>",
    "sentime": "2016-11-15T10:00:00.000Z",
    "responseTime": "2016-11-15T10:00:00.000Z"
  },
  "response": {
    "request_result": {
      "api_gateway": {
        "code": "999999",
        "message": "System Error"
      },
      "payment_gateway": {
        "code": "101",
        "message": "Declined by Bank"
      }
    }
  }
}
```

## Webhooks

### What is a Webhook

Webhooks (Web Callback, HTTP Push API or Reverse API) is one way one web application can send information to another application in real-time when a specific event happens.

You can use HSBC Omni Collect Webhooks to receive notifications when a specific event occurs. When one of these events is triggered, we send an HTTP POST payload in encrypted JSON to the webhook's configured URL.

### Set Up

Entity	Event	URL Set Up
Payments	• payment.captured • payment.failed	Define in \$.payment_method.hosted_payment .url.notification when creating a <code>payment</code> resource

### Exception Handling

Every event that receives a non-2xx response is considered as an event delivery failure and retry mechanism will be triggered. Up to 4 retries will be triggered in every 2 minutes. Maximum 5 calls including the 1st attempt.

### Idempotency

There could be scenarios where your endpoint might receive the same webhook multiple times. This could happen as an expected behaviour such as the retry mechanism or any other exceptional behaviour such as network problem.

To handle duplicate webhooks, we offer a unique webhook ID `x-hsbc-webhook-id` where you can find it in the HTTP header on every webhook.

Webhooks

## Webhooks for Payments

POST /<Callback URL predefined by Merchant>

### DESCRIPTION

The table below lists the Webhook events available for payments.

Webhook Event	Definition
payment.captured	Triggered when a payment is successfully captured.
payment.failed	Triggered when a payment fails.

### REQUEST PARAMETERS

Request Content-Types: text/plain

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x-hsbc-webhook-id **UUID**  
required in header

Content-Type: string **text/plain**  
required in header

**REQUEST BODY**

PaymentWebhook *Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

**RESPONSES**

**200 OK** **Callback** Successful operation.  
*Data Encryption is enforced. API Schema intends to demonstrate the skeleton of the message payload only.*

## Schema Definitions

### OrderInput: object

**PROPERTIES**

**txn\_reference:** string range: (up to 50 chars) **required**  
Unique Transaction Reference defined by Merchant, it will be appeared to be the unique `id` of an `order`.

**account\_name:** string range: (up to 30 chars) **required**  
Merchant account name given during the merchant profile setup.

**amount:** integer range:  $1 \leq x \leq 999999999$  **required**  
Order Amount

- Format: Eliminate punctuation and sign, support 2 decimal places according to ISO 4217, e.g. £10.50 = 1050

**currency:** string enum: [ GBP, EUR, USD ] range: (up to 3 chars) **required**  
Order Currency

**items:** Array<`Item`> range: (up to 20 objects) **required**  
List of Product Descriptions in the basket

**metadata:** Metadata range: (up to 20 objects) **optional**  
Key-value pair that can be used to store additional information about the entity.

**payment:** `PaymentInput` **conditional**  
Required when query parameter `$expand=payment` is opted in. Including this will create `order` and `payment` resources in one-go.

**Request Example**

```
{ "webhook": { "event": "payment.captured", "entities": [ "payment" ] }, "payload": { "payment": { "id": "14627849160897986", "pasref": "14627849160897986", "created_at": "2021-06-11T14:10:25Z", "last_modified": null, "amount": 1000, "currency": "GBP", "status": "pending", "payment_method": { "hosted_payment": { "access_method": { "form_post": "<Encoded_Redirect_Submit_Form>", "iframe_form_post": "<Encoded_Redirect_Submit_Form>" } } } } }
```

**Response Content-Types:** application/json  
**Response Example (200 OK)**

```
{ "status": "SUCCESS" }
```

**Example**

```
{ "txn_reference": "ORDER-1234QWER", "account_name": "internet", "amount": 1000, "currency": "GBP", "items": [ { "product_name": "Product Item 1", "product_id": "prod-9ijn8uhb", "unitAmt": 900, "unit": 1, "vat": 100, "subAmt": 1000 } ], "metadata": null, "payment": { ...Refer to schema PaymentInput for details... } }
```

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## OrderOutput: object

## PROPERTIES

**system:** System required**response:** object optional

Return if it is a HTTP 200 response

## PROPERTIES

**order:** Order required

## Example

```
{
  "system": {
    ...Refer to schema System for details...
  },
  "response": {
    "order": {
      ...Refer to schema Order for details...
    }
  }
}
```

## Order: object

## PROPERTIES

**id:** string range: (up to 50 chars) requiredUnique Entity ID of an Order, technically derived from `txn_reference`**txn\_reference:** string range: (up to 50 chars) requiredUnique Transaction Reference defined by Merchant, it will be appeared to be the unique `id` of an `order`.**created\_at:** string range: (up to 20 chars) required

Created Time of the Order

**last\_modified:** string range: (up to 20 chars) required

Last Modified Time of the Order

**account\_name:** string range: (up to 30 chars) required

Merchant account name given during the merchant profile setup.

**amount:** integer range: 1 ≤ x ≤ 9999999999 required

Order Amount

• Format: Eliminate punctuation and sign, support 2 decimal places according to ISO 4217, e.g. £10.50 = 1050

**currency:** string enum: [ GBP, EUR, USD ] range: (up to 3 chars) required

Order Currency

**items:** Array< Item > required

List of Product Descriptions in the basket

**metadata:** Metadata range: (up to 20 objects) optional

Key-value pair that can be used to store additional information about the entity.

**payments:** Array< Payment > conditionalList of all payments linked with this Order, appear if query parameter `$expand=payment` is opted in.**links:** Array< HAL > conditionalList of all related resources. If query parameter `$expand=payment` is opted out, payments will be related here in HAL format.

## Example

```
{
  "id": "ORDER-1234QWER",
  "txn_reference": "ORDER-1234QWER",
  "created_at": "2021-06-11T12:10:25Z",
  "last_modified": "2021-06-12T15:00:25Z",
  "account_name": "internet",
  "amount": 1000,
  "currency": "GBP",
  "items": [
    {
      "product_name": "Product Item 1",
      "product_id": "prod-9ijn8uhb",
      "unitAmt": 900,
      "unit": 1,
      "vat": 100,
      "subAmt": 1000
    }
  ],
  "metadata": null,
  "payments": [
    {
      ...Refer to schema Payment for details...
    }
  ],
  "links": [
    {
      "href": "/orders/@order_id",
      "id": {
        "order_id": "ORDER-1234QWER"
      },
      "rel": "self",
      "method": "GET"
    },
    {
      "href": "/orders/@order_id/payment",
      "id": {
        "order_id": "ORDER-1234QWER"
      },
      "rel": "payment",
      "method": "POST"
    },
    {
      "href": "/payments/@payment_id",
      "id": {
        "payment_id": "14627849160897986"
      },
      "rel": "payment",
      "method": "GET"
    }
  ]
}
```

## PaymentInput: object

## PROPERTIES

**payment\_method:** object requiredCan be selected either `hosted_payment` or `direct_payment` at one time.

## PROPERTIES

**hosted\_payment:** object conditional

Invoke this object if the payment is processed by Hosted Payment.

## PROPERTIES

**url\_settings:** object required

URL settings for the Hosted Payment Page

## PROPERTIES

**return\_page:** string range: (up to 2083 chars) required

URL defined by Merchant for redirecting back to Merchant's website after the payment process is completed in the HPP.

**notification:** string range: (up to 2083 chars) requiredURL defined by Merchant for receiving `Payment Webhooks`.**payment\_option:** string[] optional

## Example

```
{
  "payment_method": {
    "hosted_payment": {
      "url_settings": {
        "return_page": "https://merchant.com/returnPage",
        "notification": "https://merchant.com/returnStatus"
      },
      "payment_option": [
        "cards",
        "paypal",
        "wechatpay"
      ],
      "billing": {
        "first_name": "james",
        "last_name": "mason",
        "email": "james.mason@example.com",
        "street1": "Flat 123",
        "street2": "House 456",
        "street3": "Unit 4",
        "city": "Halifax",
        "postal_code": "W5 9HR",
        "country": "826"
      }
    },
    "direct_payment": {
      "payment_option": "applepay"
    }
  }
}
```

Opt in Payment Option(s) to be displayed in the HPP, can be multiple. If no value is provided, all possible options will be displayed.

```
        "token": "<payment token>"  
    }  
}
```

Possible Value	Definition
cards	Credit / Debit Cards
paypal	Paypal
wechatpay	WeChat Pay
testpay	Test Pay (available in sandbox only)

#### ITEMS

string enum: [ cards, paypal, wechatpay, testpay ]

#### **billing:** object required

##### PROPERTIES

###### **first\_name:** string range: (up to 60 chars) required

Customer's first name. The value should be the same as the value that appears on the card.

###### **last\_name:** string range: (up to 60 chars) required

Customer's last name. The value should be the same as the value that appears on the card.

###### **email:** string range: (up to 254 chars) required

Customer's email address

###### **street1:** string range: (up to 50 chars) required

First line of the customer's billing address.

###### **street2:** string range: (up to 50 chars) required

Second line of the customer's billing address.

###### **street3:** string range: (up to 50 chars) required

Third line of the customer's billing address.

###### **city:** string range: (up to 40 chars) required

The city of the customer's billing address.

###### **postal\_code:** string range: (up to 16 chars) required

ZIP or other postal code customer's billing address.

###### **country:** string range: (up to 3 chars) required

The country of the customer's billing address. ISO 3166-1 numeric three-digit country code. For example, US = 840.

#### **direct\_payment:** object conditional

Invoke this object if the payment is processed by Direct Payment.

##### PROPERTIES

###### **payment\_option:** string enum: [ applepay, googlepay ] range: (up to 10 chars) required

Payment Option

Possible Value	Definition
applepay	Apple Pay
googlepay	Google Pay

###### **token:** string range: (up to 1000 chars) required

Payment Token from Apple Pay or Google Pay

```
/* A Payment Token example from Apple Pay */  
{ "data": "Sk1pYr1MYT4SMEKlibAPF342Lzy3GEZJzd0Z0LdMK55k3UN02G"  
  
/* Escape character added when cast into JSON String value */  
{ \"data\": \"Sk1pYr1MYT4SMEKlibAPF342Lzy3GEZJzd0Z0LdMK55k3UN02G"
```

```
/* A Payment Token example from Google Pay */  
{ "signature": "MEUCIHI37nu9JakubEtif26PtEwv9lUC4kBZ+pfqZM0A1"  
  
/* Escape character added when cast into JSON String value */  
{ \"signature\": \"MEUCIHI37nu9JakubEtif26PtEwv9lUC4kBZ+pfqZM0A1"
```

## PaymentPatch: object

##### PROPERTIES

###### **status:** string enum: [ void ] range: (up to 50 chars) optional

Payment Status, available to void an unsettled payment by changing the status to `void`

###### **metadata:** Metadata range: (up to 20 objects) optional

Key-value pair that can be used to store additional information about the entity.

##### Example

```
{  
  "status": "void",  
  "metadata": null  
}
```



**NOTE:**  
Updating metadata in here will replace existing record.

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## PaymentOutput: object

### PROPERTIES

**system:** System required

**response:** object optional

Return if it is a HTTP 200 response

### PROPERTIES

**payment:** Payment required

**links:** Array< HAL > required

List of all related resources.

### NOTE:

The HAL object in here indicates the immediate parent entity or entities of the entity `payment`.

## Example

```
{
  "system": {
    ...Refer to schema System for details...
  },
  "response": {
    "payment": {
      ...Refer to schema Payment for details...
    }
  },
  "links": [
    {
      "href": "/orders/@order_id",
      "id": {
        "order_id": "ORDER-1234QWER"
      },
      "rel": "order",
      "method": "GET"
    }
  ]
}
```

## PaymentWebhook: object

### PROPERTIES

**webhook:** object required

### PROPERTIES

**event:** string enum: [ payment.captured, payment.failed ] range: (up to 100 chars) required

Event Type

**entities:** string[] required

The list of Entities contained in this Webhook

### ITEMS

string enum: [ payment ]

**payload:** object required

### PROPERTIES

**payment:** Payment required

## Example

```
{
  "webhook": {
    "event": "payment.captured",
    "entities": [
      "payment"
    ],
    "payload": {
      "payment": {
        ...Refer to schema Payment for details...
      }
    }
  }
}
```

## Payment: object

### PROPERTIES

**id:** string range: (up to 50 chars) required

Unique Entity ID of a Payment

**pasref:** string range: (up to 50 chars) required

Payment Reference. A unique reference generated by Payment Gateway

**created\_at:** string range: (up to 20 chars) required

Created Time of the payment

**last\_modified:** string range: (up to 20 chars) required

Last Modified Time of the payment

**amount:** integer range: 1 ≤ x ≤ 999999999 required

Payment Amount

• Format: Eliminate punctuation and sign, support 2 decimal places according to ISO 4217, e.g. £10.50 = 1050

**currency:** string enum: [ GBP, EUR, USD ] range: (up to 3 chars) required

Payment Currency

**status:** string enum: [ batched, pending, delayed, voided ] range: (up to 50 chars) required

The payment/settlement status of the corresponding Payment, only available for Card Payment

## Example

```
{
  "id": "14627849160897986",
  "pasref": "14627849160897986",
  "created_at": "2021-06-11T14:10:25Z",
  "last_modified": "2021-06-12T14:10:25Z",
  "amount": 1000,
  "currency": "GBP",
  "status": "batched",
  "payment_method": {
    "hosted_payment": {
      "access_method": {
        "form_post": "<Encoded_Redirect_Submit_Form>",
        "iframe_form_post": "<Encoded_Redirect_Submit_Form>",
        "payment_link": "https://pay.sandbox.realexpayments.com/card.html?guid=f82dc878-4752-4d25-8c4b-7d48b3a863ec"
      },
      "url_settings": {
        "return_page": "https://merchant.com/returnPage",
        "notification": "https://merchant.com/returnStatus"
      }
    },
    "payment_option": "cards",
    "billing": {
      "first_name": "james",
      "last_name": "mason",
      "email": "james.mason@example.com",
      "street1": "flat 123",
      "street2": "House 456",
      "street3": "Unit 4",
      "city": "Halifax",
      "postal_code": "W5 9HR",
      "country": "B2G"
    }
  },
  "card": {
    ...Refer to schema Card for details...
  },
  "paypal": {
    "TransactionID": "0F513533U4356815L"
  }
}
```

### Possible Value

### Definition

initiated The transaction is yet to be processed.

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Possible Value	Definition
pending	The transaction has been successfully processed and is awaiting batching (midnight cutoff). Can still be voided prior to batching. Applies to both refunds and sales.
voided	The pending transaction has been voided and will not be batched for settlement. Applies to both refunds and sales.
batched	The transaction has been batched and sent for settlement, can no longer be voided. Applies to both refunds and sales.

**payment\_method: object** required

Either `hosted_payment` or `direct_payment` will be appeared at one time.

**PROPERTIES**

**hosted\_payment: object** conditional

Appear if the payment is processed by Hosted Payment.

**PROPERTIES**

**access\_method: object** required

The available method(s) of accessing the Payment Page

**PROPERTIES**

**form\_post: string range: (up to 5120 chars)** required

A HTML FORM POST with all parameters

**iframe\_form\_post: string range: (up to 5120 chars)** required

A HTML FORM POST with all parameters including exclusive settings for iframe-enabled layout

**payment\_link: string range: (up to 1024 chars)** required

Pay By Link. For merchants who wish to embed a payment link in an SMS or an email, you can send a request to HPP to create a transaction link to be paid within 24 hours. HPP will respond with the dedicated payment link which can then be sent on to your customer.

**url\_settings: object** required

URL settings for the Hosted Payment Page

**PROPERTIES**

**return\_page: string range: (up to 2083 chars)** required

URL defined by Merchant for redirecting back to Merchant's website after the payment process is completed in the HPP.

**notification: string range: (up to 2083 chars)** required

URL defined by Merchant for receiving [Payment Webhooks](#).

**payment\_option: string range: (up to 20 chars)** required

Payment Option selected in the HPP payment

Possible Value	Definition
cards	Credit / Debit Cards
paypal	Paypal
wechatpay	WeChat Pay
testpay	Test Pay (available in sandbox only)

**billing: object** required

**PROPERTIES**

**first\_name: string range: (up to 60 chars)** required

Customer's first name. The value should be the same as the value that appears on the card.

**last\_name: string range: (up to 60 chars)** required

Customer's last name. The value should be the same as the value that appears on the card.

**email: string range: (up to 254 chars)** required

Customer's email address

**street1: string range: (up to 50 chars)** required

First line of the customer's billing address.

**street2: string range: (up to 50 chars)** required

Second line of the customer's billing address.

**street3: string range: (up to 50 chars)** required

Third line of the customer's billing address.

**city: string range: (up to 40 chars)** required

The city of the customer's billing address.

**postal\_code: string range: (up to 16 chars)** required

ZIP or other postal code customer's billing address.

**country: string range: (up to 3 chars)** required

The country of the customer's billing address. ISO 3166-1 numeric three-digit country code. For example, US = 840.

**card: Card** conditional

Card Details. Appear if `"payment_option" = "cards"`

**paypal: object** conditional

Paypal Details. Appear if `"payment_option" = "paypal"`

```

    "SecureMerchantAccountId": "XXXXXXXXXXXXXX",
    "PayPalAccountId": "testmerchant9999@exmaple.com"
  },
  "direct_payment": {
    "payment_option": "applepay",
    "token": "<payment token>",
    "card": {
      ...Refer to schema Card for details...
    }
  },
  "metadata": null,
  "refunds": [
    {
      ...Refer to schema Refund for details...
    }
  ],
  "links": [
    {
      "href": "/payments/@payment_id",
      "id": {
        "payment_id": "14627849160897986"
      },
      "rel": "self",
      "method": "GET"
    },
    {
      "href": "/payments/@payment_id",
      "id": {
        "payment_id": "14627849160897986"
      },
      "rel": "update",
      "method": "PATCH"
    },
    {
      "href": "/refunds/@refund_id",
      "id": {
        "refund_id": "1002345678999"
      },
      "rel": "refund",
      "method": "GET"
    },
    {
      "href": "/payments/@payment_id/refund",
      "id": {
        "payment_id": "14627849160897986"
      },
      "rel": "refund",
      "method": "POST"
    }
  ]
]
}

```

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## PROPERTIES

**TransactionID:** string range: (up to 50 chars) required  
Transaction ID defined by Paypal  
**SecureMerchantAccountId:** string range: (up to 50 chars) required  
Secure Merchant Account ID defined by Paypal  
**PayPalAccountId:** string range: (up to 100 chars) required  
PayPal Account ID defined by Paypal

## direct\_payment: object conditional

Appear if the payment is processed by Direct Payment.

## PROPERTIES

**payment\_option:** string enum: [ applepay, googlepay ] range: (up to 10 chars) required  
Payment Option

Possible Value	Definition
applepay	Apple Pay
googlepay	Google Pay

## token: string range: (up to 1000 chars) required

Payment Token from Apple Pay or Google Pay

## card: Card required

Card Details of the corresponding Paypal payment

## metadata: Metadata range: (up to 20 objects) optional

Key-value pair that can be used to store additional information about the entity.

## refunds: Array< Refund > conditional

List of all Refunds linked with this Payment, appear if query parameter

`$expand=refund` is opted in.

## links: Array< HAL > conditional

List of all related resources. If query parameter `$expand=refund` is opted out, refunds will be related here in HAL format.

## RefundInput: object

### PROPERTIES

**amount:** integer range:  $1 \leq x \leq 9999999999$  required  
Refund Amount

- Format: Eliminate punctuation and sign, support 2 decimal places according to ISO 4217, e.g. £10.50 = 1050

**currency:** string enum: [ GBP, EUR, USD ] range: (up to 3 chars) required  
Refund Currency

### Example

```
{  
  "amount": 1000,  
  "currency": "GBP"  
}
```

## RefundOutput: object

### PROPERTIES

**system:** System required  
**response:** object optional  
Return if it is a HTTP 200 response

### PROPERTIES

**refund:** Refund required  
**links:** Array< HAL > required  
List of all related resources.

#### NOTE:

The HAL object in here indicates the immediate parent entity or entities of the entity `refund`.

### Example

```
{  
  "system": {  
    ...Refer to schema System for details...  
  },  
  "response": {  
    "refund": {  
      ...Refer to schema Refund for details...  
    },  
    "links": [  
      {  
        "href": "/payment/@payment_id",  
        "id": {  
          "order_id": "14627849160897986"  
        },  
        "rel": "payment",  
        "method": "GET"  
      }  
    ]  
  }  
}
```

## Refund: object

### PROPERTIES

**id:** string range: (up to 50 chars) required  
Unique Entity ID of a Refund, identical to `pasref`

### Example

```
{  
  "id": "16219383951512048",  
  ...  
}
```

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**pasref:** string range: (up to 50 chars) **required**  
Refund Reference. A unique reference generated by Payment Gateway

**created\_at:** string range: (up to 20 chars) **required**  
Created Time of the refund

**last\_modified:** string range: (up to 20 chars) **required**  
Last Modified Time of the refund

**amount:** integer range:  $1 \leq x \leq 9999999999$  **required**  
Refund Amount

- Format: Eliminate punctuation and sign, support 2 decimal places according to ISO 4217, e.g. £10.50 = 1050

**currency:** string enum: [ GBP, EUR, USD ] range: (up to 3 chars) **required**  
Refund Currency

**status:** string enum: [ batched, pending ] range: (up to 50 chars) **required**  
Refund Status

Possible Value	Definition
batched	The transaction has been batched and sent for settlement, can no longer be voided. Applies to both refunds and sales.
pending	The transaction has been successfully processed and is awaiting batching (midnight cutoff). Can still be voided prior to batching. Applies to both refunds and sales.

**metadata:** Metadata range: (up to 20 objects) **optional**  
Key-value pair that can be used to store additional information about the entity.

**links:** Array< HAL > **conditional**  
List of all related resources.

## Item: object

### PROPERTIES

**product\_name:** string range: (up to 200 chars) **required**  
Product Item Name / Description

**product\_id:** string range: (up to 50 chars) **required**  
Product Number / ID

**unitAmt:** integer range:  $100 \leq x \leq 9999999999$  **required**  
Unit Amount of each item

**unit:** integer range:  $1 \leq x \leq 9999$  **required**  
No. of Unit

**vat:** integer range:  $0 \leq x \leq 999999999$  **required**  
Total VAT Tax Amount for all units

**subAmt:** integer range:  $100 \leq x \leq 999999999$  **required**  
The Sum of one particular item with multiple orders plus VAT.

**NOTE:** For example, `unitAmt x unit + vat = subAmt` Do not use comma or dot. For example: Input `10000` instead of `100.00`

```
"pasref": "16219383951512048",
"created_at": "2021-06-11T14:10:25Z",
"last_modified": "2021-06-12T14:10:25Z",
"amount": 1000,
"currency": "GBP",
"status": "pending",
"metadata": null,
"links": [
  {
    "href": "/refunds/@refund_id",
    "id": {
      "refund_id": "16219383951512048"
    },
    "rel": "self",
    "method": "GET"
  }
]
```

### Example

```
{
  "product_name": "Product Item 1",
  "product_id": "prod-9ijn8uhb",
  "unitAmt": 900,
  "unit": 1,
  "vat": 100,
  "subAmt": 1000
}
```

## Card: object

### PROPERTIES

**brand:** string enum: [ VISA, MASTERCARD, AMEX, DINERS, DISCOVER, JCB, CUP ] range: (up to 50 chars) **required**  
Indicates the card brand that issued the card

**authcode:** string range: (up to 50 chars) **required**  
The authorization code generated when the card is successfully authorized

**mcn:** string range: (up to 16 chars) **required**  
Masked card number

**cvv\_result:** string enum: [ MATCHED, NOT\_MATCHED, NOT\_CHECKED ] range: (up to 50 chars) **required**  
The result of the CVV check

**dcc:** object **required**

### Example

```
{
  "brand": "VISA",
  "authcode": "12345",
  "mcn": "401200*****1112",
  "cvv_result": "MATCHED",
  "dcc": {
    "amount": 1324,
    "currency": "USD",
    "ccp": "FEXCO",
    "fx_rate": 1.3244,
    "margin_percentage": 3.75
  }
}
```

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## PROPERTIES

**amount:** integer range: 1 ≤ x ≤ 9999999999 required

Card Holder Amount

- Format: Eliminate punctuation and sign, support 2 decimal places according to ISO 4217, e.g. £10.50 = 1050

**currency:** string enum: [ GBP, EUR, USD ] range: (up to 3 chars) required

Card Holder Currency

**ccp:** string enum: [ FEXCO, EUROCONEX ] range: (up to 50 chars) required

The name of the Currency Conversion Processor (CCP) the request is to be sent to

**fx\_rate:** number (double) required

Exchange rate. In this example, 1 GBP = 1.3244 USD

**margin\_percentage:** number (double) required

Margin Percentage. The foreign exchange markup in relation to the ECB Daily Rate

## HAL: object

### DESCRIPTION

Hypertext Application Language (HAL) is an Open API standard convention for defining hypermedia such as links to related resources within JSON or XML code

### PROPERTIES

**href:** string range: (up to 100 chars) required

URL of the related resource

**id:** object required

### PROPERTIES

**entity\_id:** string range: (up to 100 chars)

Entity ID used in the URL

**rel:** string range: (up to 100 chars) required

Relation of the Resource

**method:** string enum: [ GET, POST, PATCH, DELETE ] range: (up to 100 chars) required

HTTP Method

## Exception: object

### PROPERTIES

**system:** System required

**response:** object optional

Return if the exception is taken place in any downstream system

### PROPERTIES

**request\_result:** object required

### PROPERTIES

**api\_gateway:** object required

Result returned by API Gateway

### PROPERTIES

**code:** string range: (up to 50 chars) required

Result code

**message:** string range: (up to 100 chars) required

Result message

**payment\_gateway:** object required

Result returned by Payment Gateway

### PROPERTIES

**code:** string range: (up to 50 chars) required

Result code

**message:** string range: (up to 100 chars) required

Result message

### Example

```
{  
  "href": "/entity/@entity_id",  
  "id": {  
    "entity_id": "entity-111222333"  
  },  
  "rel": "EntityName",  
  "method": "GET"  
}
```

### Example

```
{  
  "system": {  
    "messageId": "89817674-da00-4883",  
    "returnCode": "400",  
    "returnReason": "<Corresponding Error Message>",  
    "sentTime": "2016-11-15T0:00:00.000Z",  
    "responseTime": "2016-11-15T10:00:00.000Z"  
  },  
  "response": {  
    "request_result": {  
      "api_gateway": {  
        "code": "099999",  
        "message": "System Error"  
      },  
      "payment_gateway": {  
        "code": "101",  
        "message": "Declined by Bank"  
      }  
    }  
  }  
}
```

## System: object

### Example

## PROPERTIES

**messageId:** string range: (up to 36 chars) required

System generated unique message ID only for HSBC internal reference use

**returnCode:** string range: (up to 3 chars) required

System Return Code.

- This checking is on API Operational level, in other words, it checks upon Authorization, Connectivity and JSON Message Structure.

```
{  
  "messageId": "89817674-da00-4883",  
  "resultCode": "200",  
  "returnReason": "RETURN_MESSAGE",  
  "sentTime": "2016-11-15T10:00:00.000Z",  
  "responseTime": "2016-11-15T10:00:00.000Z"  
}
```

## Possible Value

200 Successful operation

400 Bad Request (With detail message in field returnReason)

500 Internal Error. Notices: Faster Payment System is a multiple-tiers system, system down or unavailable of any single dependent system (or tier) across the entire FPS pipeline can return HTTP Return Code 500 with different returnReason. Furthermore, if one tier which comes before the API Cloud Foundry is unavailable, such as the API Gateway, there will be even no json message returned. Developer is suggested to catch the native HTTP Return Code before trying to look into the resultCode in json message.

**returnReason:** string range: (up to 200 chars) required

Corresponding Text message of resultCode

## Cor. Return Code

### Return Message Sample

### Definition

		A successful API operation in terms of Authorization, Connectivity and valid JSON Message Structure. Any checking failure on Business Logic level will be still considered a successful API operation yet the Business Logic checking result will be returned in <span style="background-color: red; border-radius: 5px; padding: 2px;">response</span> object.
200	Successful operation	
400	Profile ID - Merchant ID mapping is not correct/updated!	The binding of Profile ID, Merchant ID and Merchant Public Certificate is incorrect or not up-to-date.
400	object has missing required properties [field name]	Fail to pass JSON Field Mandatory Check.
400	instance type [data type] does not match any allowed primitive type	Fail to pass JSON Field Type Check.
400	string [field value] is too long	Fail to pass JSON Field Max Length Check
400	instance failed to match at least one required schema among [no. of conditional field]	Fail to pass JSON Conditional Field Check.
500	java.net.ConnectException: Connection refused: connect	Notices: Message can be varied depended on the corresponding dependent system which returns this message. Yet, all reasons can be concluded into System Unavailable.

**sentTime:** string range: (up to 27 chars) required

Time of request received by HSBC system from client, only for HSBC internal reference use

**responseTime:** string range: (up to 27 chars) required

Time of HSBC system provides response to client, only for HSBC internal reference use

## Callback: object

## PROPERTIES

**status:** string range: (up to 30 chars) required

Return Message

## Example

```
{  
  "status": "SUCCESS"  
}
```

## Metadata: object

## PROPERTIES

## Example

```
"metadata": {  
    "key_1": "value_1",  
    "key_2": "value_2",  
    "key_3": "value_3",  
    ...More pairs can be defined below...  
}
```

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# Lifecycle of Cryptographic Keys

This section highlights the Lifecycle of cryptographic keys in the following stages:

1. Generate keys pair (Private Key and Public Key Certificate)
2. **Optional:** Export CSR (Certificate Signing Request) and sign using a CA (Certificate Authority)

### DID YOU KNOW?

In public key infrastructure (PKI) systems, a certificate signing request is a message sent from an applicant to a certificate authority in order to apply for a digital identity certificate. It usually contains the public key for which the certificate should be issued.

3. Exchange Certificate with HSBC
4. Certificate and Keys Maintenance
5. Certificate and Keys Renewal Process

The Key Renewal Process Command line tool **Java Keytool™** is used in the demonstration. The tool can generate public key / private key pairs and store them into a Java Keystore. The Keytool executable is distributed with the **Java SDK (or JRE)™**, so if you have an SDK installed you will also have the Keytool executable. The Merchant is free to choose any other tool to generate and manage keys, such as **OpenSSL™**.

## Key Generation and Certificate Exchange with HSBC

1. Create a new keys pair (Private Key and Public Key Certificate) with a new or existing Keystore.

```
keytool -genkey  
        -alias merchant_key_pair  
        -keyalg RSA  
        -keystore merchant_keystore.jks  
        -keysize 2048  
        -validity 3650  
        -storepass <your keystore password>
```

- **-genkey** - command to generate keys pair.
- **-alias** - define the alias name (or unique identifier) of the keys pair stored inside the keystore.
- **-keyalg** - key algorithm, it must be `RSA` regarding to HSBC standard. If `RSA` is taken, the default hashing algorithm will be `SHA-256`.
- **-keystore** - file name of the keystore. If the file already exists in your system location, the key will be created inside your existing keystore, otherwise, a new keystore with the defined name will be created.

### DID YOU KNOW?

Keystore is a password-protected repository of keys and certificates. A file with extension `jks` means it is a Java Keystore which is originally supported and executable with Java™.

There are several keystore formats in the industry like `PKCS12` with file extension `p12` which is executable with Microsoft Windows™, merchant can always pick the one most fit their application.

- **-keysize** - key size, it must be `2048` regarding to HSBC standard.
- **-validity** - the validity period of the private key and its associated certificate. The unit is `day`, `3650` means 10 years.
- **-storepass** - password of the keystore.

- 1.1. Provide the `Distinguished Name` information after running the command:

### Information required for CSR generation

```
-----  
What is your first and last name?  
[Unknown]: MERCHANT INFO  
What is the name of your organizational unit?  
[Unknown]: MERCHANT INFO  
What is the name of your organization?  
[Unknown]: MERCHANT INFO  
What is the name of your City or Locality?  
[Unknown]: HK  
What is the name of your State or Province?  
[Unknown]: HK  
What is the two-letter country code for this unit?
```

```
[Unknown]: HK
Is CN=XXX, OU=XXX, O=XXX, L=HK, ST=HK, C=HK correct? (type "y" or "n"): yes

Enter key password for <merchant_key_pair>
(RETUR if same as keystore password):
Re-enter new password:
```

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**NOTE:**  
The Private Key password and Keystore password can be identical, however to be more secure, the Merchant should set them differently.

2. **Optional:** Export CSR and get signed with CA. This step can be skipped if the Merchant decides to work with a Self-Signed Certificate.

```
keytool -certreq
-alias merchant_key_pair
-keyalg RSA
-file merchant_csr.csr
-keystore merchant_keystore.jks
```

- **-certreq** - command to generate and export CSR.
- **-alias** - the name of the associated keys pair.
- **-keyalg** - key algorithm, it must be **RSA** regarding to HSBC standard.
- **-file** - file name of the CSR. This will be generated at the location where the command is run.
- **-keystore** - specify the keystore which you are working on.

- 2.1. Select and purchase a plan at Certificate Authority and then submit the CSR accordingly. After a signed Certificate is issued by CA, import the Certificate back to the Merchant's keystore.

```
keytool -import
-alias merchant_signed_cert_0001
-trustcacerts -file CA_signed_cert.p7b
-keystore merchant_keystore.jks
```

- **-import** - command to import object into a specific keystore.
- **-alias** - define the alias name (or unique identifier) of the signed Certificate.
- **-trustcacerts -file** - specify the file name of the signed Certificate in Merchant's local file system.

**NOTE:**  
**PKCS#7** is one of the common formats that contains certificates and has a file extension of **.p7b** or **.p7c**. The certificate format may be varied depending on the policy of the issuing CA.

- **-keystore** - specify the keystore which you are working on.

3. Export the Certificate and send it to HSBC for key exchange.

**DID YOU KNOW:**  
A Certificate or Public Key Certificate is an electronic document that contains a public key and additional information that prove the ownership and maintains integrity of the public key. It is essential for the sender to ensure the key is not altered by any chance during delivery.

```
keytool -export
-alias merchant_key_pair
-file merchant_cert_0001.cer
-keystore merchant_keystore.jks
```

- **-export** - command to export object from a specific keystore.
- **-alias** - the name of the associated keys pair.

**NOTE:**  
If the Merchant associates the original keys pair **merchant\_key\_pair**, the exported Certificate is without CA-signed, and hence, Self-Signed. However, if the Merchant associates the imported Certificate **merchant\_signed\_cert\_0001** mentioned in step #2, the exported Certificate is CA-signed.

- **-file** - specify the file name of the Certificate where the file will be exported to Merchant's local file system.

**NOTE:**  
The default Certificate file encoding is binary. HSBC accepts both binary and base64 encoding. To export a printable base64 encoding file, please attach an extra parameter **-rfc** in the command.  
e.g. **-file merchant\_cert\_0001.crt -rfc**.

- **-keystore** - specify the keystore which you are working on.

#### 4. Import HSBC's Certificate into the merchant's Keystore.

```
keytool -import
    -alias hsbc_cert_0002
    -file hsbc_cert_0002.cer
    -keystore merchant_keystore.jks
```

- **-import** - command to import object into a specific keystore.
- **-alias** - define the alias name of HSBC's Certificate in your keystore.
- **-file** - specify the file name of HSBC's Certificate in Merchant's local file system.
- **-keystore** - specify the keystore which you are working on.

#### 5. Optional: List keystore objects. Merchant is suggested to verify that all required objects are properly maintained. 2 - 3 entries should be found in your Java Keystore: (*Entries may be varied if other key repository format is used*)

Alias name	Corresponding Object	Remark
merchant_key_pair	<ul style="list-style-type: none"> <li>Merchant's Private Key</li> <li>Merchant's Public Certificate (Self-Signed)</li> </ul>	These two objects appear to be one entry in a JAVA Keystore. Merchant can still export them separately into two objects (files) on your local file system depending on your application design.
merchant_signed_cert_0001	<ul style="list-style-type: none"> <li>Merchant's Public Certificate (CA-Signed)</li> </ul>	Not exist Merchant skips step #2
hsbc_cert_0002	<ul style="list-style-type: none"> <li>HSBC's Public Certificate</li> </ul>	

```
keytool -list -v -keystore merchant_keystore.jks

Keystore type: JKS
Keystore provider: SUN

Your keystore contains 3 entries

Alias name: merchant_key_pair
Creation date: Jan 1, 2020
Entry type: PrivateKeyEntry

<Other Information>
*****
***** Alias name: merchant_signed_cert_0001
***** Creation date: Jan 1, 2020
***** Entry type: trustedCertEntry
<Other Information>
*****
***** Alias name: hsbc_cert_0002
***** Creation date: Jan 1, 2020
***** Entry type: trustedCertEntry
<Other Information>
*****
```

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## Certificates and Keys Maintenance

Here are some recommendations to Merchant of how to properly maintain certificates and keys:

Component	Storage	Validity
-----------	---------	----------

	Component	Storage	Validity
Merchant's Private Key	<p>Private Key should be maintained and handled with the most secure approach that a Merchant can apply. The most common and yet secure enough approach is:</p> <ul style="list-style-type: none"> <li>• <b>key password</b> - Do not save the password in plain text or hard-coded in application. Recommend to encrypt it by any Password Encryption Tools</li> <li>• <b>key storage</b> - Store inside password-protected key repository, such as <b>JKS</b> or <b>PKCS12</b> keystore. Keystore password should also be encrypted.</li> </ul>	No restriction on the Validity Period. However, if Merchant suspects there is any chance that the key is leaked or for any other security reason, a new Private Key and its associated Public Key Certificate should be generated.	
Merchant's Public Key Certificate	<p>Since Public Key Certificate is publicly distributed, a comparative moderate secure storage approach is acceptable. Merchant can store the physical file in any system's file system or store all keys and certificates in one single key repository for a centralised key management.</p>	<p>For a self-signed Certificate, the same condition has been mentioned as above.</p> <p>However, the validity period of a CA-signed Certificate is depended on the purchase plan of the issuing CA. The most common standard is 1 to 2 years.</p>	
HSBC's Public Key Certificate	Same as the above	1 Year	<p><b>NOTE:</b> Technically, the validity period is usually 1 Year plus 1 to 2 months more. The spare period is a buffer for a merchant to switch a "to-be-expired" Certificate to the new one during the Certificate Renewal Process. More technical detail will be covered in later section.</p>

## Certificates and Keys Renewal

Every Public Key Certificate has an expiration date. When either the Merchant's or HSBC's Certificate is about to expire, a key renewal process takes place. Please see the Key Renewal Process Flow below:

- SOME RULES YOU SHOULD KNOW:**
- **Keys Repository:** This is a mock-up for demonstration purpose only.
  - **Keys Name:** Using a **Key Name** | **KeyID** naming convention makes for a simpler demonstration. The suggested identifier of one key should be the alias name inside a key repository.
  - **KeyID Value:** HSBC uses the naming convention **0001**, **0002**, **0003** ... **n + 1**, each time the HSBC certificate is renewed, the **KeyID** value is **n + 1**.
  - **KeyID Binding:** The binding between the **KeyID** and the corresponding **Keys Pair** in the merchant's system can make use of any key/value logic, such as a Database table. In our example below, KeyID **000X** binds to **Private Key v.000X** and **Public Certificate v.000X**, etc.
  - **Validity Date:** All dates are made-up for demonstration purposes only.

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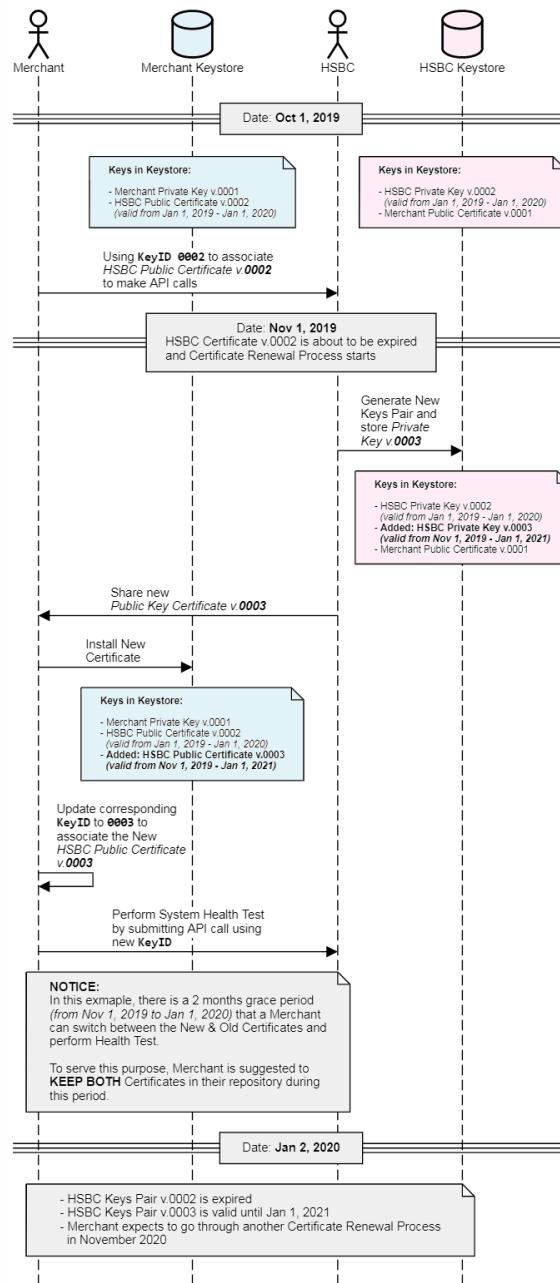
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## HSBC Public Key Certificate Renewal (Logical Flow)



Below is the technical flow showing how **Certificates**, **Alias Names** and **KeyIDs** work together during a normal process or a key renewal process:

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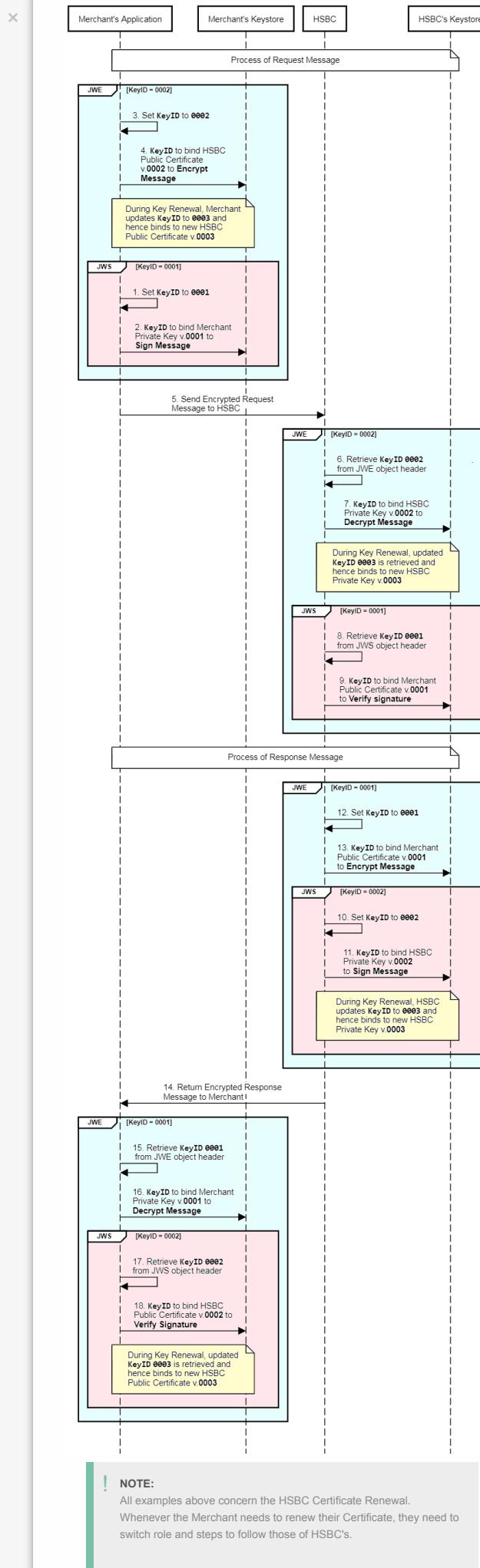
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