

GATEWAY

INTEGRATION GUIDE

Version: 2.00

VERSION CONTROL

Ver.	Date	Author	Update information
1.00	30/11/19	N Turner	New guide replacing original separate Hosted and Direct Integration Guides.
1.01	24/08/20	N Turner	Updated appendix A-12.1 to include settlement outcome in test amounts table.
1.02	23/09/20	N Turner	Updated appendix A-23.2.1 and appendix A-24.1.2 for 3DS v2.
1.03	22/10/20	N Turner	Updated section 5.5.4 to reflect changes to 3DS options.
1.04	25/10/20	N Turner	Removed CUROPT_SSL_VERIFYPEER from sample code.
1.05	25/11/20	N Turner	Removed threeDSVersion and merchantCategoryCode fields from sample code.
1.06	07/12/20	N Turner	Replaced Merchant ID and MID with Merchant Account ID. Updated appendix A-15 to indicate specific MOTO or CA account may be required.
1.07	08/12/20	N Turner	Added appendix detailing Visa Stored Credentials Framework (Credentials on File).
1.08	23/01/21	N Turner	Updated section 26 to add Google Pay details.
1.09	28/01/21	N Turner	Corrected 'AmazonPay' to 'Amazon Pay' and other minor spelling corrections.
1.10	03/02/21	N Turner	Removed details for eReceipts integration.
1.11	21/02/21	N Turner	Updated appendix A-12 to detail 3DS response simulation.
1.12	18/03/21	N Turner	Added section 26.8 covering the features of Digital Wallet Payment Tokens.
1.13	23/03/21	N Turner	Updated appendix A-12 to add SCA soft-decline test amounts.
1.14	13/06/21	N Turner	Revised appendix A-11 adding more details and support for Discover and Diners Club. Updated appendix A-12 to add further testing details for Referral response testing. Corrected mistakes in the available threeDSOptions in section 5.5.4. Amended section 1.7.8 to remove XML format and explain how to pass boolean values. Added rtAgreementType, rtSequenceCount and rtSequenceNumber fields to section 2.1. Added rtSequenceCount and rtSequenceNumber fields to appendix A-15.3. Corrected the descriptions for response code's 65794 and 65796 in appendix A-1. Removed the text '(reserved for future use)' from response code descriptions in appendix A-1. Reformatted CSS selectors and attribute names and added details regarding custom fonts to the Hosted Fields Styling appendix A-21.3.10. Added formAmountEditable field to appendix A-20. Updated threeDSEnrolled and threeDSAAuthenticated values in section 5 and appendix A-3.
1.15	16/06/21	N Turner	Added further explanations and updated the response codes in appendix A-1.
1.16	22/07/21	S Fowle	Added links to fields mentioned in Response Codes in appendix A-1. Updated Response Code descriptions in appendix A-1. Anonymised content, removing any specific URLs, Merchant Account IDs, etc.
1.17	14/08/21	N Turner	Various formatting changes and clarifications. Added more details to sections 1.7.1 and 1.7.8. Added details on how to switch between latest and legacy 3-D Secure responses to section 5.3. Updated details about mandatory 3-D Secure information to sections 5.3, 5.4 and 5.5.4. Updated details regarding complex fields threeDSRequest, threeDSResponse, checkoutRequest and checkoutResponse to sections 5.4, 21.4 and 22.4. Updated details on 3-D Secure requests in sections 5.5 and 5.6. Added details on 3-D Secure fallback to version 1 and PSD2 SCA in section 5.7. Added PSD2 SCA Compliance and exemptions in appendix A-18. Added clarification that Hosted Fields can be used with standard fields in appendix A-21.3.1. Updated and moved Hosted Payment Form Options to appendix A-20. Moved details on Duplicate Transaction checking to appendix A-9. Revised details on Delaying Capture and Settlement in appendix A-10. Moved details on Recurring transaction and Credentials on File to section 12. Removed rtSequenceCount and rtSequenceNumber fields from section 2.1. Added details on Acquirer specific options and response details in section 18. Added card token details to section 19. Updated cloned fields in appendix A-17.1. Added cardFlags field and 'Scheme Code' table column to appendix A-11.
2.00	18/10/21	N Turner	Added example threeDSOptions to code samples in appendix A-23.2.1 and A-24.1.2. Added addition information on the 3-D Secure fields to appendix A-3. Added matrix for correct Credentials on File (COF) flagging in new appendix A-18. Added more details on SCA declines and new appendix A-19.2. Added note that Diners Club do not support AVS to appendix A-12.2.9

CONTENTS

1	Gateway Integration	4
2	New Transactions	22
3	Management Requests.....	26
4	AVS/CV2 Checking	28
5	3-D Secure Authentication.....	32
6	Risk Checking	57
7	Payment Facilitators.....	65
8	UK MCC 6012 Merchants	67
9	Billing Descriptor	69
10	Surcharges	71
11	Receipts and Notifications.....	75
12	Credentials on File.....	79
13	Recurring Transaction Agreements	85
14	Dynamic Currency Conversion	89
15	Purchase Data	97
16	Custom Data.....	100
17	Advanced Data	101
18	Acquirer Data	109
19	Gateway Wallet	111
20	Masterpass Wallet	118
21	PayPal Transactions.....	129
22	Amazon Pay Transaction	154
23	PPRO Transactions	166
24	Pay by Bank app (PBBA) Transactions.....	179
25	SecurePlus Transactions.....	187
26	Digital Wallet Transactions.....	191
A-1	Response Codes.....	197
A-2	AVS / CV2 Check Response Codes	226
A-3	3-D Secure Authentication Data	228
A-4	3-D Secure Enrolment/Authentication Only	231
A-5	3-D Secure Legacy API.....	232
A-6	Request Checking Only	238
A-7	Merchant Account Mapping.....	239
A-8	Velocity Control System (VCS)	240
A-9	Duplicate Transaction Checking	241
A-10	Capture Delay.....	242
A-11	Card Identification	243
A-12	Integration Testing	246
A-13	Sample Signature Calculation	254
A-14	Transaction Life cycle	256
A-15	Transaction types	260
A-16	Payment Tokenisation.....	261
A-17	Transaction Cloning	264
A-18	Credentials on File Matrix	270
A-19	PSD2 SCA Compliance	272
A-20	Hosted Payment Page Options	277
A-21	Integration Libraries	279
A-22	Example HTTP Requests	313
A-23	Example Integration Code	321
A-24	Example Library Code.....	332
A-25	Frequently Asked Questions	348
INDEX	349

1 Gateway Integration

1.1 About This Guide

This guide provides the information required to integrate with our Payment Gateway and gives a very basic example of code for doing so. It is expected that you have some experience in server-side scripting with languages such as PHP or ASP; or that an off-the-shelf software package is being used that has inbuilt or plug-in support for our Gateway.

Disclaimer

This guide provides the integration documentation necessary for enabling Merchants to process payments via our Gateway. Whilst every effort has been made to ensure these guides are accurate and complete, we expect Merchants undertaking any integration to test all their technical work fully and satisfy their own standards. The authors of this guide are not responsible or liable for any Merchant or Third-Party integration

1.2 Terminology

The following terms are used throughout this guide:

Gateway

The Payment Gateway.

Merchant

The Merchant using the Gateway's services.

Our

The Payment Gateway Provider.

You/your

The Merchant or its representative performing the integration.

Acquirer

The bank or financial institution used by the Merchant.

Customer

A Customer of the Merchant making a payment.

Card

A payment credit, debit, prepayment or gift card issued by the Card Schemes.

Card Scheme

The operator of a payment Card network, such as Visa, Mastercard, et al.

Cardholder

The person who owns the payment Card, usually the Customer.

Issuer

The bank or financial institution that issued the payment Card to the Cardholder.

Merchant Account

An account on the Gateway mapped to an Acquirer-provided account.

Checkout

Third-party checkout solution such as PayPal, Amazon Pay other alternative payment methods.

Wallet

Third-party wallet solution such as Masterpass.

Hosted Payment Page (HPP)

A page hosted on our secure server used to collect Customer details.

Hosted Payment Field (HPF)

An individual form field hosted on our secure server used to collect sensitive Cardholder data.

1.3 Integration Methods

There are three methods of integration provided to process your transactions through the Gateway, allowing for different levels of control and communication from your website.

1.3.1 Hosted Integration

The Hosted Integration method makes it easy to add secure payment processing to your e-commerce business, using our Hosted Payment Pages (HPP). You can use this method if you do not want to collect and store Cardholder data.

The Hosted Integration method works by redirecting the Customer to our Gateway's Hosted Payment Page, which will collect the Customer's payment details and process the payment before redirecting the Customer back to a page on your website, letting you know the payment outcome. This allows you the quickest path to integrating with the Gateway.

The standard Hosted Payment Page is designed to be shown in a lightbox over your website and styled with logos and colours to match. Alternatively, you can arrange for fully customised Hosted Payment Pages to be produced that can match your website's style and layout. These fully customised pages are usually provided using a browser redirect, displaying full-page in the browser, or can be displayed embedded in an iframe on your website.

For greater control over the customisation of the payment page, our Gateway offers the use of Hosted Payment Fields, where only the individual input fields collecting the sensitive Cardholder data are hosted by the Gateway while the remainder of the payment form is provided by your website. These Hosted Payment Fields fit seamlessly into your payment page and can be styled to match your payment fields. When your payment form is submitted to your server, the Gateway will submit a payment token representing the sensitive card data it collected and your webserver can then use the Direct Integration to process the payment without ever being in contact with the collected Cardholder data. For more information, please refer to our Hosted Payment Fields SDK Guide.

1.3.2 Direct Integration

The Direct Integration works by allowing you to keep the Customer on your system throughout the checkout process, collecting the Customer's payment details on your own secure server before sending the collected data to our Gateway for processing. This allows you to provide a smoother, more complete checkout process to the Customer.

In addition to basic sales processing, the Direct Integration can be used to perform other actions such as refunds and cancellations, which can provide a more advanced integration with our Gateway.

1.3.3 Batch Integration

The Batch Integration is an enhancement to the Direct Integration, allowing you to send multiple transactions in a single request and monitor their status. This is useful if you wish to capture multiple transactions or collect multiple payments – for example, collecting subscription charges or loan repayments.

In addition to basic sales processing, the Batch Integration can be used to perform other actions, such as refunds and cancellations, which can provide a more advanced integration with our Gateway.

Unlike the Hosted and Direct Integrations, the Batch Integration does not process transactions sent to it immediately. Instead, the Gateway queues these transactions to be processed and returns a batch reference number which can be used to download a file that contains the current status of the transactions.

Batch Processing does not support transactions that require Customer interaction such as 3-D Secure transactions, or alternative payment methods with interactive Wallet or Checkout pages.

1.4 Integration Libraries

We can provide a range of libraries to help you to integrate with the Gateway.

These libraries include simple server-side classes in many popular programming languages, through to client-side scripts to help with the integration of the Hosted Payment Page or Hosted Payment Fields.

For more information about these libraries, please refer to appendix A-20.

1.5 Security and Compliance

Each method requires a different level of server security and compliance with the Payment Card Industry Data Security Standard (PCI DSS).

If you use Hosted Payment Pages with the Hosted Integration or Hosted Payment Fields with the Direct or Batch Integrations, then your webserver does not need an SSL certificate and you require the lowest level of PCI DSS compliance.

If your website collects and/or stores sensitive Cardholder data, such as the card number (PAN) or card security code (CVV/CV2), then your webserver must have an SSL certificate and serve all payment forms using HTTPS. You will also need a higher level of PCI DSS compliance and to complete a PCI validation form annually.

For more information, please see <https://www.pcisecuritystandards.org/>

1.6 Prerequisites

You will need the following information to integrate with the Gateway which will be provided during onboarding:

Merchant Account ID	Your unique Merchant Account ID.
Hosted Integration URL	Your unique URL to use the Hosted Integration.
Direct Integration URL	Your unique URL to use the Direct Integration.
Batch Integration URL	Your unique URL to use the Batch Integration.

You will be provided with unique production and test Merchant Account IDs during the onboarding process. You will also be provided with the integration URLs.

You must use the URLs provided and no others as they may be customised to your account. Any code samples in this guide use dummy Merchant Account IDs in the form 100001 and dummy integration URLs of the form 'https://gateway.example.com/<integration>'. These dummy values must be replaced in full by the values you have been provided with.

For testing purposes, you can use test amounts and test cards provided in appendix A-12 to run a test transaction.

1.7 Integration Details

1.7.1 HTTP Requests

A request can be sent to the Gateway by submitting a HTTP POST request to the integration URL provided.

The request should have a `Content-Type: application/x-www-form-urlencoded` HTTP header and the request should be name, value pairs URL encoded as per RFC 1738.

Complex fields consisting of single or multidimensional records or arrays must be formatted as per the PHP [http_build_query\(\)](#) method using square brackets to represent multiple dimensions. The sub-field names must be numeric or alphanumeric only, alphanumeric fields must not start with a numeric. Any square brackets around the nested field names should be URL encoded, [as %5B and] as %5D.

The following example request contains a complex `items` field consisting of an array of records representing the following table of purchased items.

Description	Quantity	Amount
Newspaper	1	110
Chocolate bar	3	249
Carrier bag	1	10

For example, a request would be URL encoded as:

```
merchantID=100001&action=SALE&type=1&amount=1001&currencyCode=826&countryCode=826&transactionUnique=55f6db1c81d95&orderRef=Test+purchase&customerPostCode=NN17+8YG&responseCode=0&responseMessage=AUTHCODE%3A350333&state=captured&xref=15091702MG47WN32MM88LPK&cardNumber=4929+4212+3460+0821&cardExpiryDate=1215&items%5B0%5D%5Bdescription%5D=Newspaper&items%5B0%5D%5Bquantity%5D=1&items%5B0%5D%5Bamount%5D=110&items%5B1%5D%5Bdescription%5D=Chocolate+bar&items%5B1%5D%5Bquantity%5D=3&items%5B1%5D%5Bamount%5D=249&items%5B2%5D%5Bdescription%5D=Carrier+bag&items%5B2%5D%5Bquantity%5D=1&items%5B2%5D%5Bamount%5D=1
```

For more information on field encoding please refer to section 1.7.8.

Please note that the field and sub-field names must be alphanumeric only and are cAsE sEnSiTiVe. Root integration fields must be numeric only and alphanumeric fields must not start with a numeric.

The response will use the same URL encoding and return the request fields in addition to any dedicated response field. If the request contains a field that is also intended as a response field, then any incoming request value will be overwritten by the correct response value.

The Gateway may add new response fields at any time and so your integration must be able to handle and ignore such fields until the time you upgrade your integration to use the new response data.

1.7.2 Hosted HTTP Requests

When using the Hosted Integration, the request must be sent from the Customer's web browser as the response will be a HTML Hosted Payment Page (HPP), used to collect the Customer's details. The format of the request is designed so that it can be sent using a standard HTML form with the data in hidden form fields. The browser will then automatically encode the request correctly according to `application/x-www-form-urlencoded` format

When the Hosted Payment Page has been completed and the payment processed, the Customer's browser will be automatically redirected to the URL provided via the `redirectURL` field. The response will be returned to this page in `application/x-www-form-urlencoded` format, using a HTTP POST request.

All request fields will be returned in the response and a Merchant may add custom request fields as detailed in section 16. If the request contains a field that is also intended as a response field, then any incoming request value will be overwritten by the correct response value.

The Gateway may add new request and response fields at any time and so your integration must take care not to send request fields that may conflict with future Gateway fields and be able to ignore response fields which it doesn't yet understand.

An example of a Hosted Integration request is provided in appendix A-22.1 and sample code is provided in appendix A-23.1.

1.7.3 Direct HTTP Requests

When using the Direct Integration, the response will be received in the same URL encoded format, unless a `redirectURL` field is provided.

If a `redirectURL` field is provided, then the response will be a HTML page designed to redirect a browser to the URL provided, using a HTTP POST request containing the response. This allows you to collect the Cardholder's payment details on your own server, using a HTML form which POSTs to the Direct Integration, which then effectively POSTs the results back to this URL your webserver, where you can display the transaction outcome.

All request fields will be returned in the response and a Merchant may add custom request fields as detailed in section 16. If the request contains a field that is also intended as a response field, then any incoming request value will be overwritten by the correct response value.

The Gateway may add new request and response fields at any time and so your integration must take care not to send request fields that may conflict with future Gateway fields and be able to ignore response fields which it doesn't yet understand.

An example of a Direct Integration request is provided in appendix A-22.1 and sample code is provided in appendix A-23.1.

1.7.4 Batch HTTP Requests

When using the Batch Integration, a single HTTP POST request can contain multiple individual requests using the `multipart/mixed` content type with a boundary string specified. Within that main HTTP request, each of the parts contains a nested Direct Integration HTTP request, separated by the boundary string.

Each part should begin with a `Content-Type: application/x-www-form-urlencoded` HTTP header and contain a single Direct Integration HTTP request, as documented in section 1.7.3.

You can optionally specify a `Content-Id` HTTP header to identify each part message uniquely; if not provided, the Gateway will assign a unique id to each part. The `Content-Id` HTTP header is returned in the response. The Gateway will not validate the uniqueness of any id provided. After the mandatory `Content-type` and the optional `Content-Id` header, two carriage return/line feed pairs must follow (ie `\r\n\r\n`). Any deviation from this structure might lead to the part being rejected or incorrectly interpreted. The part request payload, formatted as a regular HTTP URL encoded request, must follow the two line breaks directly.

To reduce the size of large batch requests, the Gateway supports compression using a `Content-Encoding` HTTP header with either a 'gzip' or 'x-gzip' value. This header can be provided in the main request or in the part request or both.

An `Authorization` HTTP header can be used in the request to provide the username and password of a Gateway Merchant Management System user account. If correct, the batch details will be recorded as having been submitted by that user; if invalid, then the request will fail and respond with a 401 (Unauthorised) HTTP status code.

The Gateway will respond in the same manner as the request with a `multipart/mixed` content type; each part is the response to one of the requests in the batched request. In addition, the response will contain a standard `Location` HTTP header, providing a URL from which further batch update responses can be downloaded; and a standard `Content-Disposition` header, allowing a browser to download the response to a file. If the request contained an `Authorization` HTTP header, then the response will contain an `X-P3-Token` HTTP header containing an authentication token that can be sent in future requests instead of the username and password. The authentication token has a limited life span, but each future request will return a new token and thus effectively rejuvenate the token's life.

Like the parts in the request, each response part contains a HTTP response, including headers and body. Each response part is preceded by a `Content-Type` HTTP header and `Content-ID` HTTP header. In addition, an `X-Transaction-ID` HTTP header is added containing the requests transaction id together with an `X-Transaction-Response` HTTP header containing a textual description of the transaction processing status.

The Gateway will not process the transactions immediately but will queue them up to process over time. The transactions may not be processed in the order provided, so should not have interdependencies. Transactions will only appear in the Merchant Management System when they have been processed. The status of queued transaction is only available by querying the status of the batch.

The current status of a batch can be queried at any time by issuing a HTTP GET request to the URL provided in the initial responses `Location` HTTP header.

An `Authorization` HTTP header must be provided in the status request, containing either the username and password of a Gateway Merchant Management System user account or an authentication token returned in the batch submission response's `X-P3-Token` HTTP header. If a valid username and password or a valid token is provided, then the response will be an updated version of the initial submission response providing the current status of each transaction. The response will only contain transactions that the authenticated user has permission to view.

All request fields will be returned in the response and a Merchant may add custom request fields as detailed in section 16. If the request contains a field that is also intended as a response field, then any incoming request value will be overwritten by the correct response value.

The Gateway may add new request and response fields at any time and so your integration must take care not to send request fields that may conflict with future Gateway fields and be able to ignore response fields which it doesn't yet understand.

An example of a Batch Integration request is provided in appendix A-22.3 and sample code is provided in appendix A-23.3.

1.7.5 Handling Errors

When the Gateway is uncontactable due to a communications error, or problem with the internet connection, you may receive a HTTP status code in the 500 to 599 range. In this situation, you may want to retry the transaction. If you do choose to retry a transaction, then we recommend that you perform a limited number of attempts with an increasing delay between each attempt.

If the Gateway is unavailable during a scheduled maintenance period, you will receive a HTTP status code of 503 'Service Temporarily Unavailable'. In this situation, you should retry the transaction after the scheduled maintenance period has expired. You will be notified of the times and durations of any such scheduled maintenance periods in advance, by email, and given a time when transactions can be reattempted.

If you are experiencing these errors, then we recommend you consider the following steps as appropriate for the integration method being used:

- Ensure the request is being sent to HTTPS and not HTTP. HTTP is not supported and is not redirected.
- Send transactions sequentially rather than concurrently.
- Configure your integration code with try/catch loops around individual transactions to determine whether they were successful or not and retry if required, based on the return code or HTTP status returned.
- Configure the integration so that if one transaction fails, the entire batch does not stop at that point – ie log the failure to be checked and then skip to the next transaction rather than stopping entirely.

1.7.6 Redirect URL

The **redirectURL** request field is used to provide the URL of a webpage on your server.

When provided, the Gateway will respond with a HTML page designed to redirect the Customer's browser to the URL provided, using a HTTP POST request containing the URL encoded response.

For the Hosted Integration, this will redirect the Customer from the Hosted Payment Page back to this URL on your website.

For the Direct Integration, this allows you to collect the Cardholder's payment details on your own server using a HTML form that POSTs to the Direct Integration. which then effectively POSTs the results back to this URL on your webserver, where you can display the transaction outcome. This usage is not recommended as it makes it harder to sign the message.

The URL is mandatory for the Hosted Integration and optional for the Direct Integration. It is not supported by the Batch Integration.

The **redirectURL** must be a fully qualified URL, containing at least the scheme and host components.

1.7.7 Callback URL

The **callbackURL** request field allows you optionally to request that the Gateway sends a copy of the response to an alternative URL. In this case, each response will then be POSTed to this URL in addition to the normal response. This allows you to specify a URL on a secure shopping cart or backend order processing system, which will then fulfil any order associated with the transaction.

The URL is optional for both the Hosted Integration and the Direct Integration. It is not supported by the Batch Integration.

The **callbackURL** must be a fully qualified URL, containing at least the scheme and host components.

1.7.8 Field Formats

Most integration field values are either numerical or textual, and either free format or from a range of predetermined values. Some field values are records or arrays of records.

Unless otherwise stated, numerical values are whole integer values with no decimal points. Textual values should use the UTF-8 character set and will be automatically truncated if too long, unless stated otherwise in the field's description. Textual values may be transliterated¹ when sending to third parties such as Acquirers but the original value is stored by Gateway and displayed in the Merchant Management System.

Field values should use the following formats unless otherwise stated in the field's description:

Field Type	Value Format
Monetary Amounts	Either major currency units by providing a value that includes a single decimal point such as '10.99'; or in minor currency units by providing a value that contains no decimal points such as '1099'.
Timestamps	Date in the format 'YYYY-MM-DD HH:MM:SS'
Dates	Date in the format 'YYYY-MM-DD'
Country Codes	Either the ISO-3166-1 2-letter, 3-letter or 3-digit code.
Currency Codes	Either the ISO-4217 3-letter or 3-digit code.
Records	Records can be provided using the <i>[Y]</i> notation, where <i>Y</i> is the record's sub-field name. Records can be nested to any depth, that is a sub-field's value can be another record. Arrays can be provided by using numeric sub-fields starting with the value 0 and incrementing by 1. For example: to send a value for the sub-field <i>Z</i> , of the sub-field <i>Y</i> in the integration field <i>X</i> , use the field name <i>X[Y][Z]</i> ; however, to send a value for the sub-field <i>Z</i> in the fourth record for integration field <i>X</i> , then use the field name <i>X[4][Z]</i> etc. Boolean values must be sent as the words 'true' or 'false'.
Serialised Records	Certain fields allow records to be sent as JSON or URL serialised strings. If the first character of the serialised string is '{', then the string is assumed to be in JSON format with any boolean values sent as their JSON equivalents, all other strings will be assumed to be application/x-www-form-urlencoded format with any boolean values sent as the words 'true' or 'false'.

Note: *Record* format is useful when posting sub-fields directly from individual field in a HTML FORM. However, unlike the main integration fields, a record's sub-fields are not sorted when constructing the signature and are processed in the order received. *Serialised record* format can overcome any problems caused by the sub-fields of a *record* being received in a different order to that used when generating the signature. Not all fields using the *record* format also support the *serialised record* format especially the **threeDSRequest**, **threeDSResponse**, **checkoutRequest**, **checkoutResponse** and the purchase **items** field.

Boolean values cannot be represented when using the *record* format or the application/x-www-form-urlencoded *serialised record* format and the words 'true' and 'false' must be used. The JSON *serialised record* format does not have this restriction and a JSON boolean can be used.

¹ Transliteration involves the changing of character case, stripping of accents from characters and removal of unsupported characters so that the values meet the requirements of the third-party.

1.8 Authentication

All requests must specify which Merchant Account they are for, using the `merchantID` request field. In addition to this, the following security measures can be used:

1.8.1 Password Authentication

You can configure a password for each Merchant Account, using the Merchant Management System (MMS). This password must then be sent in the `merchantPwd` field in each request. If an incorrect password is received by the Gateway, then the transaction will be aborted and an error response is returned.

Warning: Use of a password is discouraged in any integration where the transaction is posted from a form in the client browser as the password may appear in plain text in code.

1.8.2 Message signing

You can configure a signing secret phrase for each Merchant Account using the Merchant Management System (MMS). When configured, each request will need to be 'signed' by providing a `signature` field containing a hash generated from the combination of the serialised request and this signing secret phrase. On receipt, the Gateway will then re-generate the hash and compare it with the one sent. If the two hashes are different then the request received must not be the same as that sent and so the contents must have been tampered with and the transaction will be aborted and an error response is returned.

The Gateway will also return hash of the response message in the returned `signature` field, allowing you to create your own hash of the response (minus the `signature` field) and verify that the hashes match.

Message signing maybe mandatory on some Merchant Accounts and if so, the Merchant Management System will only allow the secret phrase to be changed but not removed entirely.

If message signing is enabled, then the data POSTed to any callback URL will also be signed.

See appendix A-13 for information on how to create the hash.

1.8.3 Allowed IP addresses

You can configure a list of IP addresses using the Merchant Management System (MMS). Two different address lists can be configured, one for standard requests, such as sales; and one for advanced requests, such as refunds and cancellations. If a request is received from an address other than those configured, then it will be aborted and an error response is returned.

1.9 Supported Actions

All requests must specify what action they require the Gateway to perform, using the **action** request field. The Direct and Batch Integrations support all actions; however, the Hosted Integration only supports the basic payment actions.

1.9.1 SALE

This will create a new transaction and attempt to seek authorisation for a sale from the Acquirer. A successful authorisation will reserve the funds on the Cardholder's account until the transaction is settled.

The **captureDelay** field can be used to state whether the transaction should be authorised only and settled at a later date. For more details on delayed capture, refer to appendix A-9.

1.9.2 VERIFY

This will create a new transaction and attempt to verify that the card account exists with the Acquirer. The transaction will result in no transfer of funds and no hold on any funds on the Cardholder's account. It cannot be captured and will not be settled. The transaction **amount** must always be zero.

This transaction type is the preferred method for validating that the card account exists and is in good standing; however, it cannot be used to validate that it has sufficient funds.

1.9.3 PREAUTH

This will create a new transaction and attempt to seek authorisation for a sale from the Acquirer. If authorisation is approved, then it is immediately voided (where possible) so that no funds are reserved on the Cardholder's account. The transaction will result in no transfer of funds. It cannot be captured and will not be settled.

This transaction type can be used to check whether funds are available and that the account is valid. However, due to the problem highlighted below, it is recommended that Merchants use the VERIFY action when supported by their Acquirer.

Warning: If the transaction is to be completed then a new authorisation must be sought using the SALE action. If the PREAUTH authorisation could not be successfully voided, then this will result in the funds' being authorised twice effectively putting two holds on the amount on the Cardholder's account and thus requiring twice the amount to be available in the Cardholder's account. It is therefore recommended only to PREAUTH small amounts, such as £1.00 to check mainly account validity.

1.9.4 REFUND_SALE

This will create a new transaction and attempt to seek authorisation for a refund of a previous SALE from the Acquirer. The transaction will then be captured and settled if and when appropriate. It can only be performed on transactions that have been successfully settled. Up until that point, a CANCEL or partial CAPTURE can be used, to refund or partially refund the original SALE transaction. The previous SALE transaction should be specified using the **xref** field.

Partial refunds are allowed by specifying the **amount** to refund. Any amount must not be greater than the original received amount minus any already refunded amount. Multiple partial refunds may be made while there is still a portion of the originally received amount un-refunded.

The **captureDelay** field can be used to state whether the transaction should be authorised only and settled at a later date. For more details on delayed capture refer to appendix A-9.

This action is not supported by the Hosted Integration.

1.9.5 REFUND

This will create a new transaction and attempt to seek authorisation for a refund from the Acquirer. The transaction will then be captured and settled if and when appropriate. This is an independent refund and need not be related to any previous SALE. The amount is therefore not limited by any original received amount.

The **captureDelay** field can be used to state whether the transaction should be authorised only and settled at a later date. For more details on delayed capture refer to appendix A-9.

This action is not supported by the Hosted Integration.

1.9.6 CAPTURE

This will capture an existing transaction, identified using the **xref** request field, making it available for settlement at the next available opportunity. It can only be performed on transactions that have been authorised but not yet captured. An **amount** to capture may be specified but must not exceed the original amount authorised.

The original transaction must have been submitted with a **captureDelay** value that prevented immediate capture and settlement leaving the transaction in an authorised but un-captured state. For more details on delayed capture refer to appendix A-9.

This action is not supported by the Hosted Integration.

1.9.7 CANCEL

This will cancel an existing transaction, identified using the **xref** request field, preventing it from being settled. It can only be performed on transactions, which have been authorised but not yet settled, and it is not reversible. Depending on the Acquirer it may not reverse the authorisation and release any reserved funds on the Cardholder's account. In such cases authorisation will be left to expire as normal, releasing the reserved funds. This may take up to 30 days from the date of authorisation.

This action is not supported by the Hosted Integration.

1.9.8 QUERY

This will query an existing transaction, identified using the **xref** request field, returning the original response. This is a simple transaction lookup action.

This action is not supported by the Hosted Integration.

2 New Transactions

You can perform a new transaction, such as a sale, by sending a request with the required action and transaction type together with details about the order and payment method.

2.1 Request Fields

Field Name	Mandatory?	Description
<code>merchantID</code>	Yes	Your Gateway Merchant Account ID.
<code>merchantPwd</code>	No ¹	Any password used to secure this account. Refer to section 1.8.1 for details.
<code>signature</code>	Yes ²	Any hash used to sign this request. Refer to section 1.8.2 for details.
<code>action</code>	Yes	<p>The action requested. Refer to section 1.9 for supported actions.</p> <p>Possible values are: PREAUTH, VERIFY, SALE, REFUND, REFUND_SALE.</p> <p>If a REFUND_SALE action is used, then the request must not attempt to change the payment details, or it will fail with a <code>responseCode</code> of 65542 (REQUEST MISMATCH) because the refund must be made to the original card.</p>
<code>amount</code>	Yes ³	The amount of the transaction.
<code>type</code>	Yes ³	<p>The type of transaction. Refer to appendix A-15 for details.</p> <p>Possible values are: 1 – E-commerce (ECOM) 2 – Mail Order/Telephone Order (MOTO). 9 – Continuous Authority (CA).</p>
<code>countryCode</code>	Yes ³	Merchant's location.
<code>currencyCode</code>	Yes ³	Transaction currency.
<code>paymentMethod</code>	No	The payment method required. For card payments either omit this field or use the value card .
<code>cardNumber</code>	Yes ^{3,4}	The primary account number (PAN) as printed on the front of the payment card. Digits and spaces only.
<code>cardExpiryMonth</code>	Yes ^{3,4}	Payment card's expiry month from 1 to 12.
<code>cardExpiryYear</code>	Yes ^{3,4}	Payment card's expiry year from 00 to 99.
<code>cardExpiryDate</code>	No ^{3,4}	Payment card's expiry date in MMY format as an alternative to sending a separate <code>cardExpiryMonth</code> and <code>cardExpiryYear</code> .

Field Name	Mandatory?	Description
cardCVV	Yes ^{3,4}	Payment card's security number. The 3-digit number printed on the signature strip.
transactionUnique	No ³	You can supply a unique identifier for this transaction. This is an added security feature to combat transaction spoofing.
orderRef	No ³	Free format text field to store order details, reference numbers, etc. for the Merchant's records.
orderDate	No	Optional date to record with the transaction.
captureDelay	No	Number of days to wait between authorisation of a payment and subsequent settlement. Refer to appendix A-9 for details.
xref	No ⁵	Reference to a previous transaction. Refer to appendix A-16 for details.
redirectURL	No ⁶	URL to which the hosted form will redirect the Customer's browser after the transaction has been completed. The URL must be fully qualified and include at least the scheme and host components. Refer to section 1.7.6 for details.
callbackURL	No ⁶	URL which will receive a copy of the transaction result by POST. The URL must be fully qualified and include at least the scheme and host components. Refer to section 1.7.7 for details.
remoteAddress	No ⁷	IP address of client making the transaction. This should be provided where possible to aid fraud prevention.
rtAgreementType	No ⁸	Agreement between Merchant and Cardholder for the storage of, or subsequent use of, payment details. Refer to section 12 for further details.

¹ A password is not recommended if using the Hosted Integration, use a signature instead.

² A signature maybe mandatory on some Merchant Accounts and requests.

³ Optional if an **xref** is provided as the value will be taken from the cross-referenced transaction.

⁴ Optional if using the Hosted Integration, any value provided will be used to initialise any HPP input field.

⁵ Mandatory for a REFUND_SALE request to specify the original SALE transaction.

⁶ Not supported by the Batch Integration.

⁷ Not supported by the Hosted Integration, which will automatically use the Customer's IP address.

⁸ Mandatory for recurring transactions or other transactions using stored credentials.

2.2 Response Fields

The response will contain all the fields sent in the request (minus any **cardNumber** and **cardCVV**) plus the following:

Field Name	Returned?	Description
responseCode	Always	A numeric code providing the specific outcome. Common values are: 0 - Successful / authorised transaction. 1 - Card referred – Refer to card issuer. 2 - Card referred – Special condition. 4 - Card declined – Keep card. 5 - Card declined. Check responseMessage for more details of any error that occurred. Refer to appendix A-1 for details.
responseStatus	Always	A numeric code providing the outcome category. Possible values are: 0 – Authorisation Approved / No reason to decline 1 – Authorisation Declined. 2 – Authorisation Error / Transaction malformed.
responseMessage	Always	Message received from the Acquiring bank, or any error message.
transactionID	Always	A unique ID assigned by the Gateway.
xref	Always	You may store the cross reference for repeat transactions. Refer to appendix A-16 for details.
state	Always	Transaction state. Refer to appendix A-14.2 for details.
timestamp	Always	Time the transaction was created or last modified.
transactionUnique	If supplied	Any value supplied in the initial request.
authorisationCode	On success	Authorisation code received from Acquirer.
referralPhone	If provided	Telephone number supplied by Acquirer to phone for voice authorisation when provided.
amountReceived	On success	Amount the Acquirer authorised. This should always be the full amount requested.
amountRefunded	If refund	Total amount of original SALE that has so far been refunded. Returned when action is REFUND_SALE.
orderRef	If supplied	Any value supplied in the initial request.
cardNumberMask	Always	Card number masked for Merchant storage.

Field Name	Returned?	Description
cardTypeCode	Always	Code identifying the type of card used. Refer to appendix A-11 for details.
cardType	Always	Description of the type of card used. Refer to appendix A-11 for details.
cardSchemeCode	Always	Code identifying the Card Scheme used. Refer to appendix A-11 for details.
cardScheme	Always	Description of the card scheme used. Refer to appendix A-11 for details.
cardIssuer	Always	Card Issues name (when known).
cardIssuerCountry	Always	Card issuing country's name (when known).
cardIssuerCountryCode	Always	Card issuing country's ISO-3166 2-letter code (when known).

Other response fields may be returned as documented elsewhere in this guide. Undocumented fields may be returned at the Gateways discretion but should not be relied upon.

The **acquirerResponseXXXX** fields are dependent on the Acquirer in use and are supplied for additional information only.

The response is also POSTed to any URL provided by optional **callbackURL**.

3 Management Requests

You can perform a management action on an existing transaction, such as a capture or cancellation, by sending a request with the required action together with the cross reference for the transaction to act on.

Management requests are supported by the Direct and Batch Integrations, they are not supported by the Hosted Integration.

3.1 Request Fields

Field Name	Mandatory?	Description
merchantID	Yes	Your Gateway Merchant Account ID.
merchantPwd	No ¹	Any password used to secure this account. Refer to section 1.8.1 for details.
signature	Yes ²	Any hash used to sign this request. Refer to section 1.8.2 for details.
action	Yes	The action requested. Refer to section 1.9 for supported actions. Possible values are: AUTHORISE, CAPTURE, CANCEL, QUERY .
xref	Yes	Reference to a previous transaction. Refer to appendix A-16 for details.
amount	No ³	The amount to capture or refund.
callbackURL	No	A non-public URL which will receive a copy of the transaction result by POST. The URL must be fully qualified and include at least the scheme and host components. Refer to section 1.7.7 for details.

¹ A password is not recommended if using the Hosted Integration, use a signature instead.

² A signature may be mandatory on some Merchant Accounts and requests.

³ An amount is only required for partial refunds or partial captures.

3.2 Response Fields

Apart from the fields below, the response will be the same as for a new transaction but will contain the details of the existing transaction.

Field Name	Returned?	Description
responseCode	Always	A numeric code providing the outcome of the management request. Check responseMessage for more details of any error that occurred. Refer to appendix A-1 for details.
responseStatus	Always	A numeric code providing the outcome category. Possible values are: 0 – Authorisation Approved / No reason to decline 1 – Authorisation Declined. 2 – Authorisation Error / Transaction malformed.
responseMessage	Always	Description of above response code.
action	Always	The requested action and original action separated by a colon. For example. CANCEL:SALE

Other response fields may be returned as documented elsewhere in this guide. Undocumented fields may be returned at the Gateways discretion but should not be relied upon.

The response is also POSTed to any URL provided by optional **callbackURL**.

4 AVS/CV2 Checking

4.1 Background

AVS and CV2 fraud checking is available on all card transactions processed by the Gateway where supported by the Acquirer.

These fraud prevention checks are performed by the Acquirer while authorising the transaction. You can choose how to act on the outcome of the check (or even to ignore them altogether).

4.1.1 AVS Checking

The Address Verification System (AVS) uses the address details that are provided by the Cardholder to verify that the address is registered to the card being used. The address and postcode are checked separately.

4.1.2 CV2 Checking

CV2, CVV, or Card Verification Value is a 3-digit or 4-digit security code. The check verifies that the code is the correct one for the card used.

For most cards, the CVV is a 3-digit number to the right of the signature strip. For American Express cards, this is a 4-digit number printed, not embossed, on the front right of the card.

The AVS/CV2 checking preferences can be configured per Merchant Account within the Merchant Management System (MMS). These preferences can be overridden per transaction by sending one of the preference fields documented in section 4.3 that hold a comma separated list of the check responses that should be allowed in order to continue to completion. Responses not in the list will result in the transaction being declined with a **responseCode** of **5 (AVS/CV2 DECLINED)**.

AVS/CV2 fraud checking is not available with all Acquirers and must be enabled on your Merchant Account before it can be used. Please contact support to find out whether your Acquirer supports it and if it can be enabled on your Merchant Account.

4.2 Benefits and Limitations

4.2.1 Benefits

- Can be enabled with just a few extra integration fields.
- The results are available immediately and returned as part of the transaction.
- The checks can be managed independently, allowing you the utmost control over how the results are used.
- The checks can be configured to decline a transaction automatically, where required.
- There are no extra costs for using AVS/CV2 checking with your transactions.
- Fully configurable within the Merchant Management System (MMS).

4.2.2 Limitations

- The AVS checks are mainly supported by Visa, MasterCard and American Express in the USA, Canada and United Kingdom. Cardholders with a bank that does not support the checks might receive declines due to the lack of data.
- Because AVS only verifies the numeric portion of the address and postcode, certain anomalies such as apartment numbers and house names can cause false declines.
- The checks are meant for consumer cards. Company cards are not fully supported due to the Acquirers' not having access to this information.

4.3 Request Fields

These fields should be sent in addition to basic request fields in section 2.1.

Field Name	Mandatory?	Description
customerAddress	Yes ¹	For AVS checking, this must be a registered billing address for the card.
customerPostCode	Yes ²	For AVS checking, this must be a registered postcode for the card.
cardCVV	Yes ³	For CVV checking, this must be the Card Verification Value printed on the card.
avscv2CheckRequired	No ⁴	Is AVS/CV2 checking required for this transaction? Possible values are: N – Checking is not required. Y – Abort if checking is not enabled.
cv2CheckPref	No ⁴	List of cv2Check response values that are to be accepted; any other value will cause the transaction to be declined. Refer to appendix A-2 for details. Value is a comma separated list containing one or more of the following: not known, not checked, matched, not matched, partially matched .
addressCheckPref	No ⁴	List of addressCheck values that are to be accepted; any other value will cause the transaction to be declined. Refer to appendix A-2 for details. Value is a comma separated list containing one or more of the following: not known, not checked, matched, not matched, partially matched .
postcodeCheckPref	No ⁴	List of postcodeCheck response values that are to be accepted; any other value will cause the transaction to be declined. Refer to appendix A-2 for details. Value is a comma separated list containing one or more of the following: not known, not checked, matched, not matched, partially matched .

¹ Mandatory if AVS address checking is required.

² Mandatory if AVS postcode checking is required.

³ Mandatory if CV2 checking is required.

⁴ Overrides any Merchant Account setting configured via the Merchant Management System (MMS).

4.4 Response Fields

These fields will be returned in addition to the AVS/CV2 request fields in section 4.3 and the basic response fields in section 2.2.

Field Name	Returned?	Description
avscv2CheckEnabled	Always	Is AVS/CV2 checking enabled for this Merchant Account? Possible values are: N – Merchant account is not enabled. Y – Merchant account is enabled.
avscv2ResponseCode	If checks performed	The result of the AVS/CV2 check. Refer to appendix A-2 for details.
avscv2ResponseMessage	If checks performed	The message received from the Acquiring bank, or any error message with regards to the AVS/CV2 check. Refer to appendix A-2 for details.
avscv2AuthEntity	If checks performed	Textual description of the AVS/CV2 authorising entity as described in appendix A-2. Possible values are: not known, merchant host, acquirer host, card scheme, issuer.
cv2Check	If checks performed	Description of the AVS/CV2 check as described in appendix A-2. Possible values are: not known, not checked, matched, not matched, partially matched.
addressCheck	If checks performed	Description of the AVS/CV2 address check as described in appendix A-2. Possible values are: not known, not checked, matched, not matched, partially matched.
postcodeCheck	If checks performed	Description of the AVS/CV2 postcode check as described in appendix A-2. Possible values are: not known, not checked, matched, not matched, partially matched.

5 3-D Secure Authentication

5.1 Background

3-D Secure authentication is an additional fraud prevention scheme that is on all e-commerce card transactions processed by the Gateway, where supported by the Acquirer.

It allows the Cardholder to assign a password to their card that is then verified whenever a transaction is processed through a site that supports the use of the scheme. The addition of password protection allows extra security on transactions that are processed online.

3-D Secure stands for Three Domain Secure. There are 3 parties that are involved in the 3-D Secure process:

- The company from which the purchase is being made.
- The Acquiring Bank (the bank of the company)
- VISA and Mastercard (the card issuers themselves)

The gateway supports 3-D Secure as implemented by Visa, Mastercard and American Express and marketed under the brand names of Verified by VISA (VBV), Mastercard Secure Code (MSC) and American Express (SafeKey). Implementations by JCB (J/Secure) and DCI (ProtectBuy) are not currently supported.

3-D Secure is also the only fraud prevention scheme available that offers you liability cover for transactions that are verified by the checks. This provides additional protection for transactions using the scheme as distinct from those that do not.

The 3-D Secure preferences can be configured per Merchant Account within the Merchant Management System (MMS). These preferences can be overridden per transaction by sending one of the preference fields documented in section 5.5.1, which hold a comma separated list of the check responses that should be allowed to continue to completion. Responses not in the list will result in the transaction being declined with a **responseCode** of **65803 (3DS_NOT_AUTHENTICATED)**.

The Gateway supports both 3-D Secure version 1 and version 2 and will use the highest version available. Version 2 is also commonly known as EMV 3-D Secure.

3-D Secure is not available with all Acquirers and must be enabled on your Merchant Account before it can be used. Please contact support to find out whether your Acquirer supports it and if it can be enabled on your Merchant Account.

3-D Secure is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

5.2 Benefits and Limitations

5.2.1 Benefits

- The results are available immediately and returned as part of the transaction.
- The checks can be managed independently allowing you the utmost control over how the results are used.
- The checks can be configured to decline the transaction automatically, where required.
- If authentication is completed, liability for any subsequent fraud-related chargeback on that transaction shifts from you to the card issuer (but note the limitations below and check your Acquirer's Terms and Conditions fully on this point).
- There are no extra Gateway costs for using 3-D Secure. Your Acquirer may charge to add this onto your business account; however, you may also find that your transaction charges are lower as a result of using 3-D Secure.
- Fully configurable within the Merchant Management System (MMS).

5.2.2 Limitations

- Authenticated 3-D Secure transactions do not guarantee a liability shift and chargebacks can still occur. This is decided at the discretion of your Acquirer, with whom you should check its policy.
- The gateway does not support 3-D Secure for JCB or Diner's club cards.
- 3-D Secure transactions require a browser in order to display the Customer authentication dialog.

5.3 Hosted Implementation

If your Merchant Account is set up for 3-D Secure, the Hosted Payment Page will automatically attempt to display the 3-D Secure authentication page for the Customer's bank.

The 3-D Secure authentication form is designed and controlled by the Customer's Issuing bank and will display the Merchant Account name and any website address added when the account was onboarded. You can change the displayed name and website address by sending the **merchantName** and/or **merchantWebsite** request fields. Any **merchantWebsite** must be a fully qualified URL containing at least the scheme and host components.

For 3-D Secure version 2 you may also pass additional information about the transaction and Cardholder, using the **threeDSOptions** field as documented in section 5.5.4. This extra information can help the Issuer decide on whether a challenge is required. This version also requires your Merchant Account to be configured with your Merchant Category Code (MCC). This value can be configured in the Merchant Management System (MMS) or provided using the **merchantCategoryCode** or **threeDSOptions** request fields.

If you would like an example of a 3-D Secure Hosted Integration, please refer to our sample code appendix A-23.1.

For backward compatibility, the Hosted Integration will currently return the legacy 3-D Secure API response fields as documented in Appendix A-5 if it performs 3-D Secure version 1.

If 3-D Secure version 2 is used or one of the latest API 3-D Secure request, response or any of the device fields are used in the request, then it will return the latest API response fields as documented in section 5.6.2. (Note: response and device fields will be ignored in any request but will cause it to switch response format.)

*To switch to always using the latest API response fields we highly recommend you pass in one of the following fields: **threeDSPolicy**, **threeDSOptions** or **initiator**.*

5.4 Direct Implementation

If your Merchant account is set up for 3-D Secure, the Gateway will require further authentication details provided by the 3-D Secure system.

The 3-D Secure authentication form is designed and controlled by the Customer's Issuing bank and will display the Merchant Account name and any website address added when the account was onboarded. You can change the displayed name and website address by sending the **merchantName** and/or **merchantWebsite** request fields. Any **merchantWebsite** must be a fully qualified URL containing at least the scheme and host components.

For 3-D Secure version 2 you must also provide details about the Cardholder's device, using the fields documented in section 17.7 or using the associated options in the **threeDSOptions** field as documented in section 5.5.3. You may also use the **threeDSOptions** field to pass additional information about the transaction and Cardholder, which can help the Issuer decide on whether a challenge is required. This version also requires your Merchant Account to be configured with your Merchant Category Code (MCC). This value can be configured in the Merchant Management System (MMS) or provided using the **merchantCategoryCode** or **threeDSOptions** request fields.

The direct integration uses two complex fields to pass data between the 3-D Secure Access Control Server (ACS) and the Gateway. The **threeDSRequest** field will be provided by the Gateway and is a record whose name/value properties must be sent via a HTTP POST request to the ACS usually via means of a hidden HTML form you have rendered in Cardholder's browser and then submitted using JavaScript. The corresponding **threeDSResponse** field should be returned to the Gateway and must be a record containing name/value properties taken from the HTTP POST received from the ACS when it redirects the Cardholder's browser back to your **threeDSRedirectURL** on completion of any challenge.

Note that the contents of the **threeDSRequest** and **threeDSResponse** fields are formatted using the *record* format detailed in section 1.7.8 and their contents should be regarded as opaque and all name/value pairs received from the Gateway must be sent to the ACS, and vice versa. The Gateway does not currently support these fields to be provided in the serialised record format.

If you would like an example of a 3-D Secure Direct Integration, please refer to our sample code appendix A-23.2.

5.4.1 Initial Request (Verify Enrolment)

If no 3-D Secure authentication details are provided in the initial request, the Gateway will determine if the transaction is eligible for 3-D Secure by checking whether the card is enrolled in the 3-D Secure scheme.

If the Gateway determines that the transaction is not eligible for 3-D Secure, then it will continue to process it as a normal transaction without 3-D Secure, unless the **threeDSRequired** request field indicates that the transaction should be aborted instead.

To support 3-D Secure, you must pass the **threeDSRedirectURL** field in the initial request. This field must contain the complete URL to a web page on your server that the 3-D Secure Access Control Server (ACS) will HTTP POST the authentication results back to, when the authentication has been completed.

If the Gateway determines that the transaction is eligible, it will respond with a **responseCode** of **65802 (3DS AUTHENTICATION REQUIRED)** and included in the response will be a **threeDSRequest** containing data that should be sent to the ACS at the **threeDSURL** using a HTTP POST request. The response will also contain a **threeDSRef** that can be used to continue the transaction when the authentication has been completed.

5.4.2 Continuation Request (Check Authentication and Authorise)

On completion of the 3-D Secure authentication the ACS will send the challenge results to the **threeDSRedirectURL** provided in the initial request using a HTTP POST request. The contents of this POST request should be returned to the Gateway unmodified in the **threeDSResponse** field together with the **threeDSRef** received in the initial response. This new request will check the authentication results and either response with the details for a further challenge, send the transaction to the Acquirer for approval or abort the transaction depending on the authentication result and your preferences, either sent in the **threeDSCheckPref** field or set in the Merchant Management System (MMS).

5.4.3 Multiple Challenges and Frictionless Flow

The API supports the issuing of multiple challenges where the continuation request may indicate the requirement to perform another challenge by responding with a **responseCode** of **65802 (3DS AUTHENTICATION REQUIRED)** and including a further **threeDSRequest**, **threeDSURL** and **threeDSRef**. When this happens, these further challenge details should be treated the same as the first and POSTed to the ACS.

For 3-D Secure version 1, a single challenge is performed. However, for version 2, there may be zero, one or two challenges.

With 3-D Secure version 2, an initial device fingerprinting method might have to be invoked on the ACS, the results of which are used to determine whether the Cardholder must complete a challenge or whether a frictionless flow can be achieved where the transaction can continue unchallenged.

5.4.4 Cardholder Challenge

The Cardholder challenge takes place with the Cardholder's browser, usually within an IFRAME embedded on the payment form. To start the challenge, the IFRAME should contain a HTML FORM with hidden INPUT fields storing the name/value pairs returned in the **threeDSRequest** record. JavaScript should then be used to submit the form automatically, causing the form data to be sent via a HTTP POST to the **threeDSURL**.

The IFRAME should be of sufficient size to display the ACS challenge form. For 3-D Secure version 1, this is a fixed size of 390x400 pixels. However, version 2 allows different sizes to be specified giving the Merchant more flexibility in the design of its payment form. The required size can be set using the 'challengeWindowSize' option, passed in the **threeDSOptions** field in the initial request.

5.4.5 Device Fingerprinting Challenge

The device fingerprinting method invocation is handled in the same way as a normal Cardholder challenge, except that it can be done silently in a hidden IFRAME, invisible to the normal payment flow. This silent device fingerprinting method request can be determined by the presence of a **threeDSMethodData** element in the **threeDSRequest** record (this is one time when the normally opaque data does need to be checked).

This method should take no longer than 10 seconds and therefore if the ACS has not POSTed the results back within 10 seconds then the browser can stop waiting and the transaction can be continued as normal but the **threeDSResponse** field should be returned indicating the timeout by including a **threeDSMethodData** element with the value of 'timeout', for example,
`"threeDSResponse[threeDSMethodData]=timeout"`

5.4.6 External Authentication Request

You can choose to obtain the 3-D Secure authentication details from a third-party, in which case they should provide them as part of a standard request. If the Gateway receives valid third-party authentication details, then it will use those and not attempt to contact the 3-D Secure system itself.

5.5 Request Fields

5.5.1 Initial Request (Hosted and Direct Integration)

These fields should be sent in addition to basic request fields in section 2.1.

Field Name	Mandatory?	Description
merchantName	No ¹	Merchant name to use on 3DS challenge form.
merchantWebsite	No ¹	Merchant website to use on 3DS challenge form. The website must be a fully qualified URL and include at least the scheme and host components.
merchantCategoryCode	No ¹	Merchant category code (3DS v2 only).
threeDSRequired	No ¹	Is 3DS required for this transaction? Possible values are: N – 3DS is not required. Y – Abort if 3DS is not enabled.
threeDSCheckPref	No ¹	List of threeDSCheck response values that are to be accepted, any other value will cause the transaction to be declined. Value is a comma separated list containing one or more of the following values: ' not known ', ' not checked ', ' not authenticated ', ' attempted authentication ', ' authenticated '.
threeDSRedirectURL	Yes ²	A URL on the Merchant's server to which the ACS can POST the challenge results, thus redirecting the challenge IFRAME to this page.
threeDSOptions	No ³	Record containing 3DS options that can be used by the ACS for advance fraud checking. Refer to section 5.5.3 for further details.
threeDSPolicy	No ¹	3DS Policy used. Refer to appendix A-19.4 for further details.
threeDSVersion	No ¹	Force a particular version to be used rather than using the highest available for the transaction details. Use of this request field is not encouraged under normal circumstances.
scaExemption	No ¹	An SCA exemption can be used to request that a frictionless flow is preferable when using 3DS v2. Refer to appendix A-19.4 for further details.

¹ Overrides any Merchant Account setting configured via the Merchant Management System (MMS).

² Not required for Hosted Integration

³ Some browser configuration options are mandatory if the corresponding device detail fields are not provided.

5.5.2 External Authentication Request (Direct Integration)

These fields should be sent in addition to basic request fields from section 2.1.

Field Name	Mandatory?	Description
threeDSEnrolled	If 3DS enabled	The 3DS enrolment status for the credit card. Refer to appendix A-3 for details. Possible values are: Y – Enrolled. N – Not enrolled. U – Unable to verify if enrolled (3DS v1 only). E – Error verifying enrolment (3DS v1 only).
threeDSAuthenticated	If 3DS enrolled	The 3DS authentication status for the credit card. Refer to appendix A-3 for details. Possible values are: Y – Authenticated. A – Attempted to authenticate. N – Not authenticated. I – Information only (3DS v2 only). U – Unable to authenticate. E – Error checking authentication.
threeDSXID	If 3DS authenticated	The unique identifier for the transaction in the 3DS system. Refer to appendix A-3 for details.
threeDSECI	If 3DS authenticated	The Electronic Commerce Indicator (ECI). Refer to appendix A-3 for details.
threeDSCAVV	If 3DS authenticated	The Cardholder Authentication Verification Value (CAVV). Refer to appendix A-3 for details.

Note: If 3-D Secure is not enabled for the Merchant Account, then any 3-D Secure authentication fields sent in the request are ignored and the transaction is processed as normal without 3-D Secure.

When an external 3-D Secure provider is used then you are responsible for deciding whether to continue at the different 3-D Secure stages and any preferences provided in the MMS or using the **threeDSCheckPref** request field are ignored.

If the external provider returns an authentication status of 'R' then you must not continue with the transaction either with or without 3-D Secure. Do not attempt to send a **threeDSAuthentication** status of 'R' expecting the Gateway to reject the transaction.

5.5.3 Continuation Request (Direct Integration)

These fields may be sent alone¹.

Field Name	Mandatory?	Description
threeDSRef	Yes	The value of the threeDSRef field in the initial Gateway response.
threeDSResponse	Yes	The data POSTed back from the ACS when the challenge has completed.

¹ Note: It is only necessary to send the **threeDSRef** and the **threeDSResponse** in the continuation request, because the **threeDSRef** will identify the Merchant Account and initial request. The message does not need to be signed. However, you can send any of the normal request fields to modify or supplement the initial request. Any card details and transaction amount sent in the second request must match those used in the first request, else the second request will fail with a **responseCode** of **64442 (REQUEST MISMATCH)**.

5.5.4 3-D Secure 2 Options (Hosted and Direct Integration)

The following options may be sent in the **threeDSOptions** field to provide additional information to help customise the 3-D Secure version 2 experience or to help the ACS decide if a challenge is required. There are currently no options supported for 3-D Secure version 1.

Some additional information will be automatically provided by the Gateway from standard integration fields unless overridden by providing the associated option. The standard integration field associated with each option is shown in brackets below the options field name. The standard integration field should be used rather than the option, apart from the very rare circumstances where the two must have different values.

A few additional information values, such as the Cardholder's browser details¹, are mandatory and therefore either the standard integration field or the option must be provided. These fields are marked as 'Yes' in the Mandatory column of the table below.

Further details what information is mandatory can be found at the end of this section.

The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Option Name	Mandatory?	Description
accountAgeIndicator	No	Length of time that the cardholder has had the account with the 3DS Requestor. Possible values are: 01 – No account (guest check-out) 02 – Created during this transaction 03 – Less than 30 days 04 – 30-60 days 05 – More than 60 days
accountChangeDate	No	Date that the cardholder's account with the 3DS Requestor was last changed. Accepted date format is YYYYMMDD.
accountChangeIndicator	No	Length of time since the cardholder's account information with the 3DS Requestor was last changed. Possible values are: 01 – Changed during this transaction 02 – Less than 30 days 03 – 30-60 days 04 – More than 60 days
accountDate	No	Date that the cardholder opened the account with the 3DS Requestor. Accepted date format is YYYYMMDD.
accountDayTransactions	No	Number of transactions (successful and abandoned) for this cardholder account with the 3DS Requestor across all payment accounts in the previous 24 hours.

¹ The Hosted Integrations Payment Page will ignore any browser options and use its own details.

Option Name	Mandatory?	Description
accountId	No	Identifier for any Cardholder's account with the Merchant.
accountPasswordChangeDate	No	Date that cardholder's account with the 3DS Requestor had a password change or account reset. Accepted date format is YYYYMMDD.
accountPasswordChangeIndicator	No	Indicates the length of time since the cardholder's account with the 3DS Requestor had a password change or account reset. Possible values are: 01 – No change 02 – Changed during this transaction 03 – Less than 30 days 04 – 30-60 days 05 – More than 60 days
accountProvisioningAttempts	No	Number of account provisioning attempts in the last 24 hours.
accountPurchaseCount	No	Number of purchases with this cardholder account during the previous six months.
accountType	No	Indicates the type of account. Possible values are: 01 – Not applicable 02 – Credit 03 – Debit
accountYearTransactions	No	Number of transactions (successful and abandoned) for this cardholder account with the 3DS Requestor across all payment accounts in the previous year.
acquirerBIN	No	Acquirer bank identification number. (Default on file)
acquirerCountryCode	No	Acquirer country code when the Acquirer country differs from the Merchant country and the Acquirer is in the EEA (this could mean that the transaction is covered by PSD2). (Default on file)
acquirerMerchantID	No	Acquirer-assigned merchant identifier. (Default on file)
acsChallengeMandatedIndicator	No	Indication of whether a challenge is required for the transaction to be authorized due to local/regional mandates or other variables.
addressMatch	No	Indicates to the ACS whether the cardholder shipping address and billing address are the same. Possible values are: Y – Shipping address matches billing address. N – Shipping address does not match billing address.

Option Name	Mandatory?	Description
authenticationIndicator	No	Provides additional information to the ACS to determine the best approach for handling an authentication request. Possible values are: 01 – Payment - default 02 – Recurring 03 – Instalment 04 – Add Card 05 – Maintain Card 06 – Verify Cardholder 07 – Billing Agreement
billingAddressCity (customerTown)	No	The city of the address. Maximum length is 50 characters.
billingAddressCountryCode (customerCountryCode)	No	The country of the address as an ISO 3166-1 3-digit code or its 2 or 3 letter equivalents.
billingAddressLine1 (customerAddress)	No	The first line of the street address or equivalent local portion of the address. Maximum length is 50 characters.
billingAddressLine2	No	The second line of the street address or equivalent local portion of the address. Maximum length is 50 characters.
billingAddressLine3	No	The third line of the street address or equivalent local portion of the address. Maximum length is 50 characters.
billingAddressPostcode (customerPostcode)	No	The ZIP or other postal code of the address. Maximum length is 16 characters.
billingAddressState	No	The state or province of the address as an ISO 3166-2 country subdivision code. Maximum length is 3 characters.
browserAcceptHeader (deviceAcceptContent)	Yes ¹	HTTP accept header sent from the Cardholder's browser.
browserIPAddress (remoteAddress)	Yes ¹	IP v4 address of the Cardholder's browser.
browserJavaEnabled (deviceCapabilities)	Yes ¹	Ability of the Cardholder's browser to execute Java. Possible values are ² : true – browser can execute Java false – browser cannot execute Java
browserJavaScriptEnabled (deviceCapabilities)	Yes ¹	Ability of the Cardholder's browser to execute JavaScript. Possible values are ² : true – browser can execute JavaScript false – browser cannot execute JavaScript

Option Name	Mandatory?	Description
browserLanguage (deviceAcceptLanguage)	Yes ¹	The Cardholder's browser language. The browser language as defined in IETF BCP 47.
browserScreenColourDepth or browserScreenColorDepth (deviceScreenResolution)	Yes ^{1,3}	The screen colour depth of the Cardholder's browser. A value representing the bit depth of the colour palette, in bits per pixel, for displaying images. Possible values are: 1, 4, 8, 15, 16, 24, 32, 48.
browserScreenHeight (deviceScreenResolution)	Yes ^{1,3}	The screen height of the Cardholder's browser.
browserScreenWidth (deviceScreenResolution)	Yes ^{1,3}	The screen width of the Cardholder's browser.
browserTimeZone (deviceTimeZone)	Yes ¹	The difference between UTC time and the cardholder's browser local time in minutes.
browserUserAgent (deviceIdentity)	Yes ¹	The User-Agent header provided by the Cardholder's browser.
cardholderEmail (customerEmail)	No	The Cardholder's email address.
cardholderHomePhone (customerPhone)	No	The Cardholder's home phone number specified in the following format: "+CountryCode Subscriber" (eg "+44 1234567899").
cardholderMobilePhone (customerMobile)	No	The Cardholder's mobile phone number specified in the following format: "+CountryCode Subscriber" (eg "+44 1234567899").
cardholderName (customerName)	No	Name of the Cardholder. Limited to the alphanumeric characters listed in EMV Book 4, Annex B.
cardholderWorkPhone	No	The Cardholder's work phone number specified in the following format: "+CountryCode Subscriber" (eg "+44 1234567899").
challengeWindowSize	No	The dimensions of the challenge window that has been displayed to the cardholder. The ACS shall reply with content that is formatted to appropriately render in this window to provide the best possible user experience. Possible values are: 01 – 250 x 400 02 – 390 x 400 (default) 03 – 500 x 600 04 – 600 x 400 05 – Full screen
deliveryEmailAddress (deliveryEmail)	No	Email Address to which the merchandise was delivered for electronic delivery.

Option Name	Mandatory?	Description
deliveryTimeframe	No	Merchandise Delivery Timeframe. Possible values are: 01 – Electronic Delivery 02 – Same day shipping 03 – Overnight shipping 04 – Two-day or more shipping
giftCardAmount	No	For prepaid or gift card purchase, the purchase amount total of prepaid or gift card(s) in major units (for example, USD 123.45 is 123).
giftCardCount	No	For prepaid or gift card purchase, total count of individual prepaid or gift cards/codes purchased.
giftCardCurrencyCode	No	For prepaid or gift card purchase, the currency code of the card as an ISO 4217 3-digit code or its 3 letter equivalent.
instalmentPaymentData or installmentPaymentData	No	Indicates maximum number of authorizations permitted for instalment payments. Value must be greater than 1.
merchantCategoryCode (merchantCategoryCode)	No	Code describing the Merchant's type of business, product, or service.
merchantCountryCode (countryCode)	No	Country code of the merchant as an ISO 3166-1 3-digit code or its 2 or 3 letter equivalents.
merchantFraudRate	No	Merchant's fraud rate in the EEA (all EEA card fraud divided by all EEA card volumes) calculated as per PSD2 RTS. This value is sent to Mastercard only who will not calculate or validate the fraud score. Value will be a numeric value, between 1 and 99, representing the fraud rate, such as: 1 – less than or equal to 1 basis point (bp), which is 0.01% 2 – between 1 bp + - and 6 bps 3 – between 6 bps + - and 13 bps 4 – between 13 bps + - and 25 bps 5 – greater than 25 bps
merchantName (merchantName)	No	Merchant name.
paymentAccountAge	No	Date that the payment account was enrolled in the cardholder's account with the 3DS Requestor. Accepted date format is YYYYMMDD.

Option Name	Mandatory?	Description
paymentAccountAgeIndicator	No	Indicates the length of time that the payment account was enrolled in the cardholder's account with the 3DS Requestor. Possible values are: 01 – No account (guest check-out) 02 – Created during this transaction 03 – Less than 30 days 04 – 30-60 days 05 – More than 60 days
preOrderDate	No	For a pre-ordered purchase, the expected date that the merchandise will be available. Accepted date format is YYYYMMDD.
preOrderPurchaseIndicator	No	Indicates whether Cardholder is placing an order for merchandise with a future availability or release date. Possible values are: 01 – Merchandise available 02 – Future availability
priorAuthData	No	Data that documents and supports a specific authentication process.
priorAuthMethod	No	Mechanism used by the Cardholder to previously authenticate to the 3DS Requestor. Part of the optional 3DS Requestor Prior Transaction Authentication Information that contains information about a 3DS cardholder authentication that occurred prior to the current transaction. Possible values are: 01 – Frictionless authentication occurred by ACS 02 – Cardholder challenge occurred by ACS 03 – ACS verified 04 – Other issuer methods
priorAuthTimestamp	No	Date and time in UTC of the prior cardholder authentication. Accepted date format is YYYYMMDDHHMM.
priorReference	No	Provides additional information to the ACS to determine the best approach for handling a request. It contains an ACS Transaction ID for a prior authenticated transaction (for example, the first recurring transaction that was authenticated with the cardholder).
recurringExpDate	No	This field contains the date after which no further authorizations shall be performed. The format of this field must be: YYYYMMDD
recurringFrequency	No	This field indicates the minimum number of days between authorizations.

Option Name	Mandatory?	Description
reorderItemsIndicator	No	Indicates whether the cardholder is reordering previously purchased merchandise. Possible values are: 01 – First time ordered 02 – Reordered
reqAuthData	No	Data that documents and supports a specific authentication process. In the current version of the specification, this data element is not defined in detail, however the intention is that for each 3DS Requestor Authentication Method, this field carry data that the ACS can use to verify the authentication process.
reqAuthMethod	No	Method used by the Cardholder to authenticate to the 3DS Requestor. Part of the 3DS Requestor Authentication Information which contains optional information about how the cardholder authenticated during login to their 3DS Requestor account. Possible values are: 01 – No 3DS Requestor authentication occurred (ie cardholder "logged in" as guest) 02 – Login to the cardholder account at the 3DS Requestor system using 3DS Requestor's own credentials 03 – Login to the cardholder account at the 3DS Requestor system using federated ID 04 – Login to the cardholder account at the 3DS Requestor system using issuer credentials 05 – Login to the cardholder account at the 3DS Requestor system using third-party authentication 06 – Login to the cardholder account at the 3DS Requestor system using FIDO Authenticator
reqAuthTimestamp	No	Date and time in UTC of the cardholder authentication. Accepted date format is YYYYMMDDHHMM.

Option Name	Mandatory?	Description
requestorChallengeIndicator	No	<p>Indicates whether a challenge is requested for this transaction. For example: you may be using this to obtain SCA and not want to be challenged as you have provided an exemption. This also allows you to request a challenge when adding a card to a wallet or to follow mandates.</p> <p>Possible values are: 01 – No preference 02 – No challenge requested 03 – Challenge requested: 3DS Requestor Preference 04 – Challenge requested: Mandate 05 – No challenge requested (TRA is already performed) 06 – No challenge requested (data share only) 07 – No challenge requested (SCA is already performed) 08 – No challenge requested (utilize whitelist exemption) 09 – Challenge requested (whitelist prompt requested)</p> <p>Values 05 to 09 are for protocol version 2.2.0 but will be accepted for 2.1.0 and 05 to 08 will be downgraded to 02, and 09 to 01.</p> <p>Values 05 to 07 will be passed to Mastercard as part of their 'Merchant Data' extension.</p> <p>Values 08 and 09 are only valid for protocol version 2.2.0.</p>
requestorID	No	Directory server assigned 3DS Requestor identifier. (Default on file)
requestorName	No	Directory server assigned 3DS Requestor name. (Default on file)
requestorURL (merchantWebsite)	No	3DS Requestor website or customer care site.
secureCorporatePaymentIndicator	No	Indicates dedicated payment processes and procedures were used, potential secure corporate payment exemption applies.
serverOperatorID	No	3DS Server identifier. (Default on file)
serverRefNumber	No	Assigned server reference number. (Default on file)
shipAddressUsageDate	No	Date when the shipping address used for this transaction was first used with the 3DS Requestor. Accepted date format is YYYYMMDD.

Option Name	Mandatory?	Description
shipAddressUsageIndicator	No	<p>Indicates the length of time since the shipping address used for this transaction was first used with the 3DS Requestor.</p> <p>Possible values are: 01 – This transaction 02 – Less than 30 days 03 – 30-60 days 04 – More than 60 days</p>
shipIndicator	No	<p>Indicates shipping method chosen for the transaction. Merchants must choose the Shipping Indicator code that most accurately describes the cardholder's specific transaction, not their general business. If one or more items are included in the sale, the Shipping Indicator code for the physical goods is used, or if all digital goods, the Shipping Indicator code that describes the most expensive item.</p> <p>Possible values are: 01 – Ship to cardholder's billing address 02 – Ship to another verified address on file with merchant 03 – Ship to address that is different than the cardholder's billing address 04 – "Ship to Store" / Pick-up at local store (Store address shall be populated in shipping address fields) 05 – Digital goods (includes online services, electronic gift cards and redemption codes) 06 – Travel and Event tickets, not shipped 07 – Other (for example, Gaming, digital services not shipped, emedia subscriptions, etc.)</p>
shipNameIndicator	No	<p>Indicates if the Cardholder Name on the account is identical to the shipping Name used for this transaction.</p> <p>Possible values are: 01 – Account Name identical to shipping Name 02 – Account Name different than shipping Name</p>
shippingAddressCity (deliveryTown)	No	The city of the address. The maximum length is 50 characters.
shippingAddressCountryCode (deliveryCountryCode)	No	The country of the address as an ISO 3166-1 3-digit code or its 2 or 3 letter equivalents.
shippingAddressLine1 (deliveryAddress)	No	The first line of the street address or equivalent local portion of the address. Maximum length is 50 characters.
shippingAddressLine2	No	The second line of the street address or equivalent local portion of the address. Maximum length is 50 characters.

Option Name	Mandatory?	Description
shippingAddressLine3	No	The third line of the street address or equivalent local portion of the address. Maximum length is 50 characters.
shippingAddressPostcode (deliveryPostcode)	No	The ZIP or other postal code of the address. Maximum length is 16 characters.
shippingAddressState	No	The state or province of the address as an ISO 3166-2 country subdivision code. Maximum length is 3 characters.
suspiciousAccountActivity	No	Indicates whether the 3DS Requestor has experienced suspicious activity (including previous fraud) on the cardholder account. Possible values are: 01 – No suspicious activity has been observed 02 – Suspicious activity has been observed
transactionType	No	Identifies the type of transaction being authenticated. This field is required in some markets (eg for Merchants in Brazil). Possible values are: 01 – Goods/ Service Purchase 03 – Check Acceptance 10 – Account Funding 11 – Quasi-Cash Transaction 28 – Prepaid Activation and Load
whitelistStatus	No	Whitelist status. Possible values are: Y – 3DS Requestor is whitelisted by cardholder N – 3DS Requestor is not whitelisted by cardholder

¹ The Hosted Integrations Payment Page will ignore any browser options and use its own details.

² Boolean values must be sent as the strings 'true' or 'false' unless JSON serialisation is used (refer to section 1.7.8)

³ This value is not mandatory if the browser doesn't support JavaScript.

Some 3-D Secure v2 information is mandatory and must be provided using the following **threeDSOptions** field or preferably using the associated standard integration field, in brackets, apart from the very rare circumstances where the two must have different values.

If this mandatory information is not available, then 3-D Secure v2 will fail and, when possible, fallback to using 3-D Secure v1 (refer to section 5.7.1 for more details on fallback).

The following information is mandatory:

- **requestorName** (**merchantName**) *default stored on file – also required for 3DSv1*
- **requestorURL** (**merchantWebsite**) *default stored on file – also required for 3DSv1*

- **merchantCategoryCode** (**merchantCategoryCode**) *default stored on file*
- **browserIPAddress** (**remoteAddress**)
- **browserUserAgent** (**deviceIdentity**)
- **browserAcceptHeader** (**deviceAcceptContent**)
- **browserLanguage** (**deviceAcceptLanguage**)

If the **browserJavaScriptEnabled** (**deviceCapabilites**) field is provided and indicates that JavaScript is enabled on the Cardholder's browser then the following information is also mandatory:

- **browserScreenColourDepth/browserScreenColorDepth** (**deviceScreenResolution**)
- **browserScreenWidth** (**deviceScreenResolution**)
- **browserScreenHeight** (**deviceScreenResolution**)
- **browserTimeZone** (**deviceTimeZone**)

5.6 Response Fields

5.6.1 Challenge Response (Direct Integration)

These fields are returned when a 3-D Secure challenge is required and provide the information necessary for you to request the Access Control Server (ACS) perform that challenge.

These fields will be returned in addition to the request fields from section 5.5.1 and the basic response fields in section 2.2.

Field Name	Returned?	Description
threeDSEnabled	Always	Is 3DS enabled for this Merchant Account? Possible values are: N – Merchant Account is not enabled. Y – Merchant Account is enabled.
threeDSPolicy	If available	The unique identifier for the transaction in the 3DS system.
threeDSVETimestamp	If 3DS enabled	The time the card was checked for 3DS enrolment and any initial challenge determined.
threeDSEnrolled	If 3DS enabled	The 3DS enrolment status for the credit card. Refer to appendix A-3 for details. Possible values are: Y – Enrolled. N – Not enrolled. U – Unable to verify if enrolled (3DS v1 only). E – Error verifying enrolment (3DS v1 only).
threeDSRef	If 3DS enabled	Value to return in the continuation request.
threeDSURL	If 3DS enrolled	The URL of the ACS to which the challenge data should be sent via a HTTP POST request from the Cardholder's browser.
threeDSRequest	If 3DS enrolled	Record containing the name/value pairs that should be sent to the ACS via HTTP POST request from the Cardholder's browser.

5.6.2 Final Response (Hosted and Direct Integration)

These fields are returned when the 3-D Secure stage has completed, and no further challenge is required.

These fields will be returned in addition to the request fields from section 5.5.1; any continuation request fields from section 5.5.3; any challenge response fields from section 5.6.1; and the basic response fields in section 2.2.

Field Name	Returned?	Description
threeDSEnabled	Always	Is 3DS enabled for this Merchant Account? Possible values are: N – Merchant Account is not enabled. Y – Merchant Account is enabled.
threeDSPolicy	If available	3DS Policy used. Refer to appendix A-19.4 for further details.
threeDSXID	If 3DS enabled	The unique identifier for the transaction in the 3DS system.
threeDSVETimestamp	If 3DS enabled	The time the card was checked for 3DS enrolment and any initial challenge determined.
threeDSEnrolled	If 3DS enabled	The 3DS enrolment status for the credit card. Refer to appendix A-3 for details. Possible values are: Y – Enrolled. N – Not enrolled. U – Unable to verify if enrolled (3DS v1 only). E – Error verifying enrolment (3DS v1 only).
threeDSCATimestamp	If 3DS enrolled	The time the last challenge was checked.
threeDSAAuthenticated	If 3DS enrolled	The 3DS authentication status for the credit card. Refer to appendix A-3 for details. Possible values are: Y – Authenticated. A – Attempted to authenticate. N – Not authenticated. R – Reject transaction I – Information only (3DS v2 only). U – Unable to authenticate. E – Error checking authentication.
threeDSECI	If 3DS authenticated	This contains a two-digit Electronic Commerce Indicator (ECI) value. Refer to appendix A-3 for details. The data contained within this property is only valid if the threeDSAAuthenticated value is Y or A .

Field Name	Returned?	Description
threeDSCAVV	If 3DS authenticated	<p>This contains a 28-character Base-64 encoded Cardholder Authentication Verification Value (CAVV). Refer to appendix A-3 for details.</p> <p>The data contained within this property is only valid if the threeDSAuthenticated value is Y or A.</p>
threeDSCAVVAlgorithm	If 3DS authenticated	The algorithm used to calculate the CAVV. This is return 3-D Secure version 1 only.
threeDSDetails	If 3DS authenticated	<p>Record containing further details about the 3-D Secure processing stage. Notable sub fields are:</p> <ul style="list-style-type: none"> • version – 3-D Secure version used • versions – 3-D Secure versions available • fallback – whether fell back to version 1 • fallbackReason – reason for fallback to version 1 • psd2Region – whether payment in PSD2 jurisdiction
threeDSErrorCode	If 3DS error	Any error response code returned by the ACS if there is an error in determining the card's 3DS status.
threeDSErrorDescription	If 3DS error	Any error response description returned by the ACS if there is an error in determining the card's 3DS status.
threeDSResponseCode	Always	<p>A numeric code providing the specific outcome of the 3-D Secure processing stage.</p> <p>Check threeDSResponseMessage for more details of any error that occurred.</p> <p>Refer to appendix A-1 for details.</p>
threeDSResponseMessage	Always	Any error message relating to the outcome of the 3-D Secure processing stage.

5.6.3 External Authentication Response (Direct Integration)

These fields will be returned in addition to the request fields from section 5.5.2 and the basic response fields in section 2.2.

Field Name	Returned?	Description
threeDSEnabled	Always	Is 3DS enabled for this Merchant Account? Possible values are: N – Merchant Account is not enabled. Y – Merchant Account is enabled.

Note: If 3-D Secure is not enabled for the Merchant Account, then any 3-D Secure authentication fields sent in the request are ignored and the transaction is processed as normal without 3-D Secure.

5.6.4 Cardholder Information (Hosted and Direct Integration)

In the case of a frictionless flow, the card Issuer may sometimes wish to provide a message to the Cardholder. In this case, the **threeDSResponseMessage** will start with the text 'Cardholder Info: ' and be followed by the message from the card Issuer.

5.7 Advanced Features

5.7.1 Fallback to Version 1

If a transaction supports both 3-D Secure version 1 and version 2 then it will always try to use version 2 and then if this fails it will automatically fallback to version 1. Fallback is always between major versions, the Gateway will not attempt version 2.2.0 and then fallback to 2.2.1, it would fallback to 1.0.2.

Any failure must be due to technical reasons only and never because the Cardholder entered their credentials incorrectly. A failure to provide the correct credentials is a successful 3-D Secure request and the transaction will continue with a **threeDSAuthenticated** value of 'N'.

Failures could be due to invalid or missing request fields or options required by the higher 3-D Secure version or by external problems with the 3-D Secure system, such as communication errors with the Directory Server.

When fallback occurs, this will be indicated by the **threeDSVersion** response field and the **fallback** and **fallbackReason** entries in the **threeDSDetails** response field.

To help prevent fallback please ensure that you provide accurate details about the Cardholder's device, using the **threeDSOptions** document in section 5.5.4 or the device fields documented in section 17.7. Also ensure any extra **threeDSOptions** provided are accurate along with any **merchantName** and **merchantWebsite**. You may find that you will need to provide values containing standard alpha-numeric characters only and do not include accented characters or other language specific characters. You must also ensure that the Merchant Account has a valid Merchant Category Code configured or that you pass a valid **merchantCategoryCode** field in your request.

5.7.2 PSD2 Strong Customer Authentication

3-D Secure can be used to provide the Strong Customer Authentication (SCA) required by the European Union's Payment Services Directive 2 (PSD2).

For more details on how to use 3-D Secure to maintain PSD2 SCA Compliance please refer Appendix A-19.4.

6 Risk Checking

6.1 Background

The Gateway is integrated with Kount, the leading solution for digital fraud prevention.

If you have an existing account with Kount, or sign up for one, you can request that the Gateway pass your transactions to them for risk checking before they are sent to the Acquirer for authorisation.

Kount's patented fraud prevention technology combines device fingerprinting; supervised and unsupervised machine learning; a robust policy and rules engine; business intelligence tools; and a web-based case-management and investigation system.

Their team of experts can help you understand and identify the rules necessary to optimise your protection, as well as provide ongoing support. To get the most out of your investment, you may want to dedicate an individual or a team to monitor your rules and ensure they continue to work as intended.

The risk checking preferences can be configured per Merchant Account within the Merchant Management System (MMS). These preferences can be overridden per transaction by sending new preferences as documented in section 6.4.1. You must use the Kount management portal to configure your risk parameters and thresholds.

Risk checking is an advanced feature and must be enabled on your Merchant Account before it can be used. Please contact support if you wish to have it enabled.

6.2 *Benefits and Limitations*

6.2.1 Benefits

- The results are available immediately and returned as part of the transaction.
- The checks can be managed independently, allowing you the utmost control over how the results are used.
- The checks can be configured to decline the transaction automatically where required.
- Leverage the ability to review transactions and decide what course of action to take.
- The checks can reduce chargebacks by blocking transactions made without the Cardholder's consent that would have resulted in the Cardholder raising a chargeback to recover the fraudulent transaction amount.
- Providing enhanced risk checking increases Customer confidence and thus increases the likelihood of their making a purchase.
- Fully configurable within the Merchant Management System (MMS).

6.2.2 Limitations

- Checking cannot prevent all fraudulent transactions and could even prevent some non-fraudulent transactions.
- There are additional fees associated with having a Kount account.
- You will have to spent time analysing your transactions and establishing fraud rules.

6.3 Implementation

When risk checking is required, each transaction will be sent to Kount for checking and the result of the check will be returned in the **riskCheck** response field with one of the following values:

- **not known** - the checks could not be performed due to our error
- **not checked** - the checks could not be performed by Kount
- **approve** - the transaction is not risky and should proceed
- **decline** - the transaction is risky and should be declined
- **review** - the transaction is risky but proceed with caution
- **escalate** - the transaction is risky but proceed with caution

The actions to take for each **riskCheck** response can be configured for the Merchant Account, using the Merchant Management System. Alternatively, the preferred actions can be passed with the transaction request in the **riskCheckPref** field. The possible actions are as follows:

- **continue** - continue processing as normal
- **authoronly** - authorise only, don't capture
- **decline1** - decline without reason
- **decline2** - decline with reason
- **finished** - abort with reason

The **continue** action allows the transaction to continue as normal and be sent to the Acquirer for authorisation. *A **riskCheck** value of **approve** will always be treated as if the action was **continue**, regardless of whether the preferences say otherwise.*

The **authoronly** action allows the transaction to be authorised but not automatically captured giving you time to review it and decide whether you want to take the risk and capture the transaction or assume it to be fraudulent and cancel it.

The **decline1** and **decline2** actions will cause the transaction to be declined. Both decline the transaction and return with a **responseCode** of **5 (DECLINED)** and a **responseMessage** of 'DECLINED' or 'RISK DECLINED' respectively. The first action should be used if you don't wish to alert the Customer to the fact that you suspected that their transaction was fraudulent and declined it for that reason.

The finished action will abort the transaction, causing it to return with a **responseCode** of either **65857 (RISK_CHECK_ERROR)** or **65862 (RISK_CHECK_DECLINED)** depending on whether an error prevented the transaction from being checked by Kount, resulting in a **riskCheck** value of 'not known' or 'not checked'.

The **riskCheckPref** field can be provided in the request to override any settings configured in the Merchant Management System (MMS) for this Merchant Account. The value should be a comma separated list of *result=actions* pairs. If a result is not specified in the list, then an action of **decline1** is assumed. For example: "**decline=decline1,review=authoronly,escalate=authoronly**".

6.4 Request Fields

6.4.1 Request Fields

These fields should be sent in addition to basic request fields in section 2.1.

Field Name	Mandatory?	Description
riskCheckRequired	No ¹	Is risk checking required for this transaction? Possible values are: N – risk checking is not required. Y – risk checking is required.
riskCheckPref	No ¹	List of riskCheck response values and the action to be taken for those responses. Value is a comma separated list containing one or more of the following risk check results and associated actions: Results: not known, not checked, approve, decline, review, escalate . Actions: continue, decline1, decline2, authonly, finished .
riskCheckOptions	No	Record containing options used to customise the risk checking. Refer to section 6.4.2 for values.

¹ Overrides any Merchant Account setting configured via the Merchant Management System (MMS).

6.4.2 Risk Check Options

The following options may be sent in the **riskCheckOptions** field to customise the risk checking. Where possible, the options will be initialised from standard integration fields as shown in brackets below the option name. The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Option Name	Description
IPAD (remoteAddress)	Customer's IPv4 address (X.X.X.X).
MACK	Merchant's acknowledgement to ship/process the order (Y or N).
SESS	Unique Session ID ¹ . Used to link to Kount's browser device data collector.
ANID	Automatic Number Identification (ANI) submitted with order.
CASH	Total cash amount in currency submitted.
ORDR (merchantOrderRef)	Merchant's Order Number.
UNIQ (merchantCustomerRef)	Merchant assigned account number for Customer.
EPOC	Date Customer account was created by merchant.
NAME (customerName)	Customer's name (or name submitted with the order).
GENDER (customerGender)	Customer's gender (M or F)
BPREMISE (customerCompany)	Customer's billing address premises name (UK only).
BSTREET (customerStreet, customerAddress)	Customer's billing address street (UK only).
B2A1 (customerAddress)	Customer's billing address county/state.
B2A2 (customerAddress2)	Customer's billing address county/state.
B2CI (customerTown)	Customer's billing address county/state.
B2ST (customerCounty)	Customer's billing address county/state.
B2PC (customerPostcode)	Customer's billing address postcode.
B2CC (customerCountryCode)	Customer's billing address country code.

Option Name	Description
EMAL (customerEmail)	Cardholder's email address.
B2PN (customerPhone)	Cardholder's phone number.
DOB (customerDateOfBirth, recipientDateOfBirth)	Cardholder's date of birth.
S2NM (deliveryName)	Name of person receiving the delivery.
SPREMISE (deliveryCompany)	Delivery premises name (UK only).
SSTREET (deliveryStreet, deliveryAddress)	Delivery street address (UK only).
S2A1 (deliveryAddress)	Delivery address line 1.
S2A2 (deliveryAddress2)	Delivery address line 2.
S2CI (deliveryTown)	Delivery town/city.
S2ST (deliveryCounty)	Delivery county/state.
S2PC (deliveryPostcode)	Delivery postcode.
S2CC (deliveryCountryCode)	Delivery country code.
S2EM (deliveryEmail)	Delivery email address.
S2PN (deliveryPhone)	Phone number of delivery location.
SHTP (shippingType, shippingMethod)	Shipping type.
PROD_TYPE[XX] (items.XX.description)	Type for the XX th item purchased.
PROD_ITEM[XX] (items.XX.productCode)	SKU for the XX th item purchased.
PROD_DESC[XX] (items.XX.description)	Description XX th item purchased.

Option Name	Description
PROD_QUANT [XX] (items.XX.quantity)	Quantity of XX th item purchased.
PROD_PRICE [XX] (items.XX.amount)	Unit amount for XX th item purchased.
UDF [XXXX]	User defined field XXXX.

¹ SESS, the unique session id, is automatically sent from the Kount Device Collector loaded in the Hosted Payment Page.

For further information on the options, refer to the Kount Integration documentation:
<https://kount.github.io/docs/ris-data-submission/>.

6.5 Response Fields

These fields will be returned in addition to the risk check request fields in section 6.4 and the basic response fields in section 2.2.

Field Name	Returned?	Description
riskCheckEnabled	Always	Is risk checking enabled for this Merchant Account? Possible values are: N – Merchant account is not enabled. Y – Merchant account is enabled.
riskCheck	If checked	The result of the risk check. Possible values are: approve – ok, recommend proceed to authorisation. decline – probably fraudulent, recommend decline. review – possibly fraudulent, recommend review. escalate – possibly fraudulent, recommend review.
riskCheckDetails	If checked	Record containing the raw response received from Kount minus any sensitive data.
riskCheckResponseCode	If checked	Response code for the risk processing stage.
riskCheckResponseMessage	If checked	Response message for the risk processing stage.

7 Payment Facilitators

7.1 Background

If you are a Payment Facilitator (PayFac/PF) or Independent Sales Organisation (ISO), then you must send additional fields to identify yourself and your sub-merchants.

These fields must be sent with every new transaction; however, they can be cloned from an existing transaction if using an **xref** as described in appendix A-17.

Payment Facilitator support is not available with all Acquirers. Please contact support to find out if your Acquirer supports it and what fields are required.

7.2 Request Fields

Field Name	Mandatory?	Description
facilitatorID	Yes	Your facilitator identifier as assigned by the Scheme.
facilitatorName	No ¹	Your trading name as registered with the Scheme.
isoID	No ¹	Your ISO identifier as assigned by the Scheme.
subMerchantID	No ¹	Unique identifier assigned to this Sub Merchant.
merchantXXXX	No ¹	Sub Merchant details as documented in section 17.2.
statementNarrativeX	No ¹	Statement details as documented in section 9.1.2.

¹ Which additional fields are mandatory will depend on your Acquirer.

8 UK MCC 6012 Merchants

8.1 Background

Every Merchant Account has a category code, also known as the MCC code, attached to it. This category code identifies the market that the payment is related to, allowing issuing banks to identify what product or service is, or was, being provided.

The merchant category code 6012 is related to payments taken for financial institutions, primarily those merchants that deal with loan payments or other credit-related activities. According to Visa, this is the most fraudulent merchant category in the UK market due to compromised debit card details' being used to pay or transfer balances to other cards. Acquirers are therefore unable to confirm whether a payment is genuine, despite matching the full CVV2 with AVS.

To address this situation, issuing banks have requested additional payment information to be provided with payment requests in order to verify that the cardholder is knowingly entering into a credit-related contractual agreement with the merchant.

If you are a Merchant who has been assigned the MCC 6012 you must collect the following data for the primary recipient for each UK domestic Visa or Mastercard transaction¹.

- Unique account identifier for the loan or outstanding balance funded. For example, the loan account number or the PAN (Primary Account Number) if it is a credit card balance.
- Last name (family name)
- Date of Birth (D.O.B)
- Postcode

Primary recipients are the entities (people or organisations) that have a direct relationship with the financial institution. Also, these primary recipients have agreed to the terms and conditions of the financial institution.

The new fields are not currently mandatory. However, some Acquirers are now declining transactions that are missing this information and so we recommend the information is always provided, even if your Acquirer doesn't currently mandate them.

If you are not a UK MCC 6012 Merchant or the payment is not a UK domestic one, then you need not provide these additional authentication details though the Gateway will accept them if you do.

¹ The additional details are currently only required by Visa and Mastercard however we recommend sending for all card types in order to be prepared for when other card Schemes follow suite.

8.2 Request Fields

To comply with the rules, an MCC6012 Merchant must send these additional fields:

Field Name	Mandatory?	Description
merchantCategoryCode	Yes ¹	Merchant's VISA MCC (should be 6012).
receiverName	Yes	Surname only - up to 6 letters allowed.
receiverAccountNo	Yes	Account number. If a PAN is supplied only the first 6 and last 4 digits will be used.
receiverDateOfBirth	Yes	Primary recipient's date of birth.
receiverPostcode	Yes	Primary recipient's postcode. (Only the district is required but full postcodes are accepted, therefore 'W12 8QT' or just 'W12' are acceptable values).

¹ Only required if the Merchants Category Code is not configured on your gateway account.

9 Billing Descriptor

9.1 Background

The Billing Descriptor is how your details appear on the Cardholder's statement. It is set up with the Acquirer when the Merchant Account is opened. It is used by the Cardholder to identify who a payment was made to on a particular transaction.

Selecting a clear Billing Descriptor is important for you to avoid a chargeback when the Cardholder does not recognise the name on the transaction.

9.1.1 Static Descriptor

The Static Descriptor is the descriptor agreed between yourself and your Acquirer when the Merchant Account is opened. The descriptor used is typically your trading name, location and contact phone number.

9.1.2 Dynamic Descriptor

The Dynamic Descriptor is a descriptor sent with the transaction that includes details on the goods purchased or service provided, this is often used by large companies that provide many services and where the brand of the service is more familiar than the company name. The Dynamic Descriptor usually replaces any Static Descriptor on a per transaction basis.

Not all Acquirers accept Dynamic Descriptors and, for those that do, the required format varies. Often, your Merchant name is shortened to three (3) letters, followed by an asterisk (*), followed by a short description of the service or product that the business provides. This field typically has a limit of twenty-five (25) characters including the phone number.

For more information on whether your Acquirer allows Dynamic Descriptor and the format in which they should be sent, please contact customer support.

9.2 Request Fields

The Dynamic Descriptor is built using one or more of the following narrative fields.

Field Name	Mandatory?	Description
statementNarrative1	No	Merchant's name.
statementNarrative2	No	Product, service or other descriptive info.

10 Surcharges

10.1 Background

Surcharges are an additional charge that you can apply to the transactions that are processed through your Merchant Account.

Transactions that are sent for authorisation are subject to processing charges from your Acquirer and surcharges enable you to pass the processing charges that you incur on to your Customers.

You may, for example, be charged a fixed amount for debit card transactions and a percentage amount for credit card transactions. Consequently, the Gateway gives you the option to add both a fixed amount and percentage amount when applying a surcharge.

Surcharges should only be added to cover the processing charges that are incurred by your business. There is no Gateway imposed limit to the value of the surcharges that can be added to your transaction, although there are legal requirements. As a rule, the surcharge must not exceed the processing costs that you pay.

Some businesses apply surcharges to cover all the costs that they incur; while others use the surcharges to subsidise the charges.

Surcharge amounts may be limited or illegal in your jurisdiction. For example, surcharging is illegal in the European Union and many US states. It is up to you to check with your Acquirer and comply with any laws.

Surcharges is an advanced feature and must be enabled on your Merchant Account before it can be used. Please contact support if you wish to have it enabled.

10.2 Implementation

10.2.1 Surcharge Rules

The **surchargeRules** field allows you to provide multiple rules specifying what surcharges should be applied to a transaction. If a transaction matches multiple rules, then the most specific rule will be used; or the first in the list.

Each surcharge rule contains the following fields:

Field Name	Mandatory?	Description
cardType	Yes	One or more 2-letter card type codes for which this rule applies (see) The following two card type codes are also supported, in addition to the codes listed in appendix A-11: CC – matches any credit card. DD – matches any debit card.
currency	No	Zero or more 3-letter ISO-4217 currency codes.
surcharge	Yes	Surcharge amount in minor (N) or major (N.N) units or a percentage (N%).

The surcharge rules should be passed in a sequential array of records, either as nested records or serialised records as described in section 1.7.8. The record field names are case sensitive.

10.2.2 Surcharge Amounts

The Gateway doesn't usually validate that any **amount** and **grossAmount** fields are the same and that any **netAmount**, **taxAmount** and **taxRate** tally. However, in order to update them when a surcharge is applied, the amount and **grossAmount** must match and the correct **taxRate** must be provided or be able to be calculated from one or more of the other fields. Failure in this respect can cause the Gateway to return one of the following **responseCode** values; **66360 (INVALID_GROSSAMOUNT)**, **66361 (INVALID_NETAMOUNT)**, **66338 (INVALID_TAXAMOUNT)**, **66362 (INVALID_TAX_RATE)**.

If the request contains a **surchargeAmount** field, then the Gateway will assume that surcharging has already been performed externally and will not attempt to apply any further surcharges.

10.3 Request Fields

Field Name	Mandatory?	Description
surchargeRequired	No ¹	Is surcharging required for this transaction? Possible values are: N – Surcharging is not required. Y – Surcharging is required.
surchargeRules	No ¹	Surcharge rules as documented in section 10.2.1.
surchargeAmount	No	Surcharge amount already added. A further surcharge will not be added.

¹ Overrides any Merchant Account setting configured via the Merchant Management System (MMS).

10.4 Response Fields

These fields will be returned in addition to the Surcharge request fields in section 10.3 and the basic response fields in section 2.2.

Field Name	Returned?	Description
surchargeEnabled	Always	Is surcharging enabled on this Merchant Account?
surchargeAmount	Always	Surcharge amount added.
amount	Always	Original request value with additional surcharge.
grossAmount	Conditional	Original request value adjusted for new amount .
netAmount	Conditional	Original request value adjusted for new amount .
taxAmount	Conditional	Original request value adjusted for new amount .

11 Receipts and Notifications

11.1 *Background*

The Gateway can be configured to email transaction receipts automatically to the Customer and notifications to the Merchant.

11.2 Customer Email Receipts

The Customer can be emailed a transaction receipt automatically each time a transaction is processed by the Gateway. Receipts are sent at the time the transaction is authorised and only for transactions where the Acquirer has approved the authorisation. Receipts are not sent for declined or referred authorisations or aborted transactions.

This functionality is enabled globally on a per Merchant Account basis using the Merchant Management System (MMS). This global setting can also be overridden per transaction if required, using the `customerReceiptsRequired` field.

Customer receipts require the Customer to provide an email address; if no email address is provided, using the Hosted Payment Page or the `customerEmail` field, then no receipt will be sent.

11.2.1 Merchant Email Notifications

You can be automatically emailed a transaction notification each time a transaction is processed by the Gateway. Notifications are sent at the time the transaction is authorised and only for transactions where the Acquirer approved, declined or referred the authorisation. Notifications are not sent for aborted transactions.

This functionality is enabled globally on a per Merchant Account basis, using the Merchant Management System (MMS). This global setting can also be overridden per transaction if required, using the `notifyEmailRequired` field.

Merchant notifications require you to provide an email address; if no email address is provided, using the Merchant Management System (MMS) or the `notifyEmail` field, then no notification will be sent.

11.3 Request Fields

Field Name	Mandatory?	Description
<code>customerReceiptsRequired</code>	No ¹	Send a Customer receipt if possible. Possible values are: N – Don't send a receipt. Y – Send if Customer's email provided.
<code>customerEmail</code>	No	Customer's email address.
<code>notifyEmailRequired</code>	No ¹	Send a notification email if possible. Possible values are: N – Don't send a notification. Y – Send if notification email provided.
<code>notifyEmail</code>	No ¹	Merchant's notification email address.

¹ Overrides any Merchant Account setting configured via the Merchant Management System (MMS).

11.4 Response Fields

The request fields for the required receipts and notifications are returned together with the appropriate fields from the following:

Field Name	Returned?	Description
customerReceiptsResponseCode	If required	Result of sending email to Customer. Refer to appendix A-1 for details.
customerReceiptsResponseMessage	If required	Description of above response code.
notifyEmailResponseCode	If required	Result of sending email to Merchant. Refer to appendix A-1 for details.
notifyEmailResponseMessage	If required	Description of above response code.

12 Credentials on File

12.1 Background

You may need to repeat a payment or perform a new payment using payment details previously requested from the Customer and stored by either yourself or the Gateway. These payment details could be stored in previous transaction or in the Gateway wallet. These repeat payments could be one off payments, scheduled recurring payments, or repeats due to authorisation problems or industry requirements. All must be correctly flagged to allow the payment network to process them.

The stored details, or credentials, are termed Credentials on File (COF) and refer to any payment details (including, but not limited to, an account number or payment token) that the Consumer has authorised you to store to perform future transactions without the need for them to enter their payment details again.

These transactions must always be identified with the reason for storing or using the stored credentials and who initiated the transaction – the Consumer (CIT) or the Merchant (MIT). You may store the credentials and send them with the future transaction, or you may store the details in the Gateway's Wallet as described in section 19 or by taking advantage of the Payment Tokenisation feature of the Gateway as described in appendix A-16. Either way you must tell the Gateway of your intentions, it will not assume that just because you have asked, for example, to store credentials in the Wallet that those are legitimate stored credentials and follow all the requirements laid out below.

If you store credentials on file, then you must:

- Disclose to consumers how those credentials will be used.
- Obtain consumers' consent to store the credentials.
- Notify consumers when any changes are made to the terms of use.
- Inform the card issuer via a transaction that payment credentials are now stored on file.
- Identify transactions with appropriate **rtAgreementType** when using stored credentials.
- Perform a PREAUTH, SALE or VERIFY transaction during the initial credential setup.

Note: Credentials stored to complete a single transaction (or a single purchase) for a Consumer, including multiple authorisations related to that particular transaction or future refunds are not considered stored credentials and can be stored and used without the following the above rules.

Note: A new recurring transaction will be a clone of the cross-referenced transaction, including any stored credentials details except for any new data provided in the new transaction. If the new transaction provided different payment details, then any stored credentials in the cross-referenced transaction cannot be used. The **cloneFields** request field can also be used to control which fields in the cross-referenced transaction are used in the repeat transaction (refer to appendix A-17).

12.2 Consumer Initiated Transactions (CIT)

Consumer Initiated Transactions (CIT) are any transaction where the Consumer is actively participating in the transaction. This can be either through a checkout experience online, via a mail order or telephone order, with or without the use of an existing stored credential.

A Consumer Initiated Transaction is one whose **action** field is one of **PREAUTH**, **SALE** or **VERIFY** and whose **type** is one of **1** (ECOM) or **2** (MOTO).

To indicate that the card details are to be stored as, or were stored as, Credentials on File then send the **rtAgreementType** field as one of the following values:

- **cardonfile** – card details stored as Credential on File
- **recurring** – initial payment as the start of a recurring payment agreement.
- **instalment** – initial payment as the start of an instalment payment agreement.

If the card details are cloned from an existing transaction or loaded from a Gateway Wallet which also stored the Credentials on File, then the transaction will be flagged as subsequent use of stored credentials rather than first use of them¹.

If the transaction is the first in a recurring or instalment sequence then the optional **rtSequenceCount** field can be used to specify how many transactions will be taken in total, with a value greater than 1, and any optional **rtSequenceNumber** field specifying the which transaction it is in the sequence will be expected to have a value of 0.

¹ For flagging of subsequent use, the existing credentials will usually need to have been stored with the same Acquirer.
V2.00

12.3 Merchant Initiated Transactions (MIT)

Merchant Initiated Transactions (MIT) are any transaction where you have performed the transaction without the active participation of the Consumer. This would normally always be as a follow-up to a previous Consumer Initiated Transaction (CIT).

Refer to section 13 for information on how the Gateway can be instructed to take Merchant Initiated recurring transactions automatically, according to a pre-determined schedule.

Merchant Initiated Transactions are broken down in to two categories as follows.

12.3.1 Standing Instruction MITs

Merchant Initiated Transactions defined under this category are performed to address pre-agreed standing instructions from the Consumer for the provision of goods or services.

The following transaction types are standing instructions transactions:

- **Instalment Payments:** A transaction in a series of transactions that use a stored credential and that represent Consumer agreement for the merchant to initiate one or more future transactions over a period for a single purchase of goods or services. An example of such a transaction is a higher purchase repayment.
- **Recurring Payments:** A transaction in a series of transactions that use a stored credential and that are processed at fixed, regular intervals (not to exceed one year between transactions), representing Consumer agreement for the merchant to initiate future transactions for the purchase of goods or services provided at regular intervals. An example of such a transaction is a gym membership subscription.
- **Unscheduled Credential on File (UCOF):** A transaction using a stored credential for a fixed or variable amount that does not occur on a scheduled or regularly occurring transaction date, where the Consumer has provided consent for the merchant to initiate one or more future transactions. An example of such a transaction is an account auto-top up transaction.

The Gateway classifies the first two types of instalment and recurring payments as Continuous Authority (CA) payments and the third type as a normal Cardholder not present payments. Different Acquirers may use different classifications, but the Gateway will handle this and send the classification expected by the Acquirer.

12.3.2 Industry-Specific Business Practice MIT

Merchant Initiated Transactions defined under this category are performed to fulfil a business practice as a follow-up to an original Consumer-Merchant interaction that could not be completed with one single transaction. Not every industry practice Merchant Initiated Transaction requires a stored credential, for example, if you store card details for a single transaction or a single purchase, it is not considered as a stored credential transaction.

The following transaction types are industry specific transactions¹:

- **Incremental²:** Incremental authorizations can be used to increase the total amount authorised if the authorised amount is insufficient. An incremental authorization request may also be based on a revised estimate of what the Consumer may spend.
- **Resubmission:** You can perform a resubmission in cases where it requested an authorization but received a decline due to insufficient funds; however, the goods or services were already delivered to the Consumer. In such scenarios, you can resubmit the request to recover outstanding debt from Consumers.
- **Reauthorization:** You can initiate a reauthorization when the completion or fulfilment of the original order or service extends beyond the authorization validity limit set by the card scheme.
- **Delayed Charges:** Delayed charges are performed to make a supplemental account charge after original services have been rendered and payment has been processed.
- **No Show:** Consumers can use their payment credentials to make a guaranteed reservation with certain merchant segments. A guaranteed reservation ensures that the reservation will be honoured and allows you to perform a No Show transaction to charge the Consumer a penalty according to your cancellation policy. If no payment is made to guarantee a reservation, then it is necessary to perform a VERIFY Consumer Initiated Transaction at the time of reservation to be able perform a No Show transaction later.

¹ Not all Acquirers support all transaction types.

² The Gateway does not currently support incremental authorisations.

A Merchant Initiated Transaction is one whose **action** field is one of **PREAUTH**, **SALE** or **VERIFY** and whose **type** is one of **2** (MOTO) or **9** (CA) depending on the category.

To indicate the type of MIT, send the **rtAgreementType** field as one of the following values:

- **recurring** – subsequent payment as the start of a recurring payment agreement (CA).
- **instalment** – subsequent payment as the start of an instalment payment agreement (CA).
- **unscheduled** – subsequent payment not to a fixed schedule (MOTO)
- **incremental** – subsequent payment to increment initial amount authorised (MOTO)
- **resubmission** – subsequent payment due to failed initial payment (MOTO)
- **reauthorisation** – subsequent payment to refresh expired initial payment (MOTO)
- **delayedcharges** – subsequent payment for additional charges (MOTO)
- **noshow** – subsequent payment as penalty for missed reservation (MOTO)

In addition, the optional **rtSequenceCount** field can be used to specify how many transactions will be taken in total, with a value greater than 1, and the optional **rtSequenceNumber** field can be used to specify which transaction this is in the sequence, with a value greater than 0.

The **xref** of the initial Consumer Initiated Transaction must be provided as follows:

- For standing order MITs the initial authorisation must have been a successful Consumer Initiated Transaction with Credentials on File. This MIT will be a subsequent use of those Credentials on File. For **recurring** and **instalment** MITs the initial authorisation must have used the same **rtAgreementType**. The xref can be to the previous MIT in which case the Gateway will follow the chain of transactions back to the initial CIT.
- For industry practice MITs the initial authorisation must be successful (apart from for a **resubmission**) but need not have Credentials on File. For example, it may not be known at the time of the initial authorisation that the MIT would be required and so the initial authorisation would not necessarily have stored the Credentials on File. This is an example of when an industry practice Merchant Initiated Transaction does not require a stored credential

Note: For compatibility with existing practices, Instalment Payments and Recurring Payments MITs use Continuous Authority (CA) **type** transactions while other MITs Mail Order/Telephone Order (MOTO) **type** transactions. This use of MOTO is different to its use with a Consumer Initiated Transaction (CIT).

12.4 Request Fields

Field Name	Mandatory?	Description
xref	Yes	Reference to initial CIT or previous MIT transaction.
type	Yes ¹	The type of transaction. Possible values are: 1 – E-commerce (ECOM) (CIT). 2 – Mail Order/Telephone Order (MOTO) (CIT). 9 – Continuous Authority (CA) (MIT).
rtAgreementType	Yes ²	Consumer/Merchant agreement type. Possible values are: cardonfile – credential storage agreed (CIT/MIT). recurring – recurring type agreed (CIT/MIT). instalment – instalment type agreed (CIT/MIT). unscheduled – ad hoc COF payment (MIT). incremental ³ – authorisation amount increment (MIT). resubmission – failed authorisation retry (MIT). reauthorisation – expired authorisation refresh (MIT). delayedcharges – post authorisation charges (MIT). noshow – missed reservation penalty (MIT).
rtSequenceCount	No ⁴	Number of transactions in a recurring sequence if known.
rtSequenceNumber	No ⁴	Transaction number in a recurring sequence if known.
initiator	No ⁵	Indicate who initiated the transaction. Possible values are: consumer – consumer initiated (CIT) merchant – merchant initiated (MIT)

¹ Required differentiate between initial and subsequent **recurring** or **instalment** transaction.

² Not required on the initial transaction for a subsequent Industry-Specific Business Practice MIT to be used.

³ MIT type **incremental** is not currently supported but reserved for future use.

⁴ Mandatory for some Acquirers, its use is highly recommended with recurring transactions.

⁵ If not provided the Gateway will attempt to determine the initiator from the other request values.

For backwards compatibility, the Gateway will try to automatically identify if a transaction is CIT or MIT from the values provided for the **action**, **type** and **rtAgreementType** fields.

You may also pass the **initiator** field in the request to force a classification. This can be used if the Gateway is unable to correctly determine classify the transaction. If, however, the requested classification is incompatible with the provided request fields then the transaction will fail with a **responseCode** of **66944** (INVALID INITIATOR).

The **initiator** field will be returned in the response with either the value passed in the request or the automatically identified value.

13 Recurring Transaction Agreements

13.1 Background

A Recurring Transaction Agreement (RTA) is used to request that the Gateway should perform repeat payments on your behalf, using pre-agreed amounts and schedules.

An RTA can be configured easily and quickly, using the Merchant Management System (MMS). An RTA can also be set up while performing the initial transaction request, by including the integration request fields described in section 13.3. The RTA is only set up in the transaction results in a successful payment authorisation.

The transaction should be either SALE or VERIFY transaction and the **rtAgreementType** field should be provided to indicate whether the transactions are part of a recurring or instalment.

Merchants who use this system to implement billing or subscription type payments must use **recurring** or **instalment** type Continuous Authority (CA) transactions to comply with Card Payment Scheme practices. *Your Acquirer may refuse to accept the recurring transactions if they are not subject to an agreement between yourself and your Customer.*

Refer to section 12 for more information on the different types of repeat or recurring transactions.

13.2 Scheduling

There are two different types of scheduling available when requesting the Gateway to take recurring transactions automatically on the Merchant's behalf. In addition, a start date can be provided to allow for a recurring subscription with an initial free trial period.

13.2.1 Fixed Scheduling

Fixed scheduling causes the subsequent transaction to be taken at fixed intervals of time and for fixed amounts. A different initial date and amount or final date and amount can be provided for use when the agreed payment term or amount doesn't exactly divide by the fixed time intervals.

Fixed scheduling is specified by providing an **rtScheduleType** field with a value of 'fixed' and providing the **rtCycleDuration**, **rtCycleAmount** and **rtCycleCount** fields to define the interval at which transactions should be taken and the number of transactions to take.

An **rtCycleCount** field value of 0 can be provided to indicate that transactions should be taken ad-indefinitum until the RTA is stopped.

13.2.2 Variable Scheduling

Variable scheduling causes the subsequent transaction to be taken on prespecified dates and for prespecified amounts.

Variable scheduling is specified by providing an **rtScheduleType** field with a value of 'variable' and providing the **rtSchedule** field with a value containing an array of one or more schedule records.

Each schedule record must contain the following fields:

Field Name	Mandatory?	Description
date	Yes	Date on which to take a payment.
amount	Yes	Amount to take on the provided date.

The schedule records should be passed in a sequential array of records, either as nested records or serialised records as described in section 1.7.8. The record field names are case sensitive.

13.3 Request Fields

Field Name	Mandatory?	Description
rtName	No	Free format short name for the agreement.
rtDescription	No	Free format longer description for the agreement.
rtPolicyRef	No	Merchant Policy Reference Number (MPRN).
rtAgreementType	No	Recurring transaction agreement type. Indicates the type of Continuous Payment Authority or Repeat Billing agreement made with the Cardholder. Possible values are: recurring – recurring type CPA agreed. instalment – instalment type CPA agreed.
rtMerchantID	No	Merchant Account ID to use for the recurring transactions (defaults to merchantID).
rtStartDate	No	Start date of agreement (defaults to date received).
rtScheduleType	No	Schedule type. Possible values are: fixed – fixed interval schedule (default). variable – variable interval schedule.
rtSchedule	Yes ¹	Nested array or serialised string containing payment schedule information as per section 13.2.2.
rtInitialDate	No ²	Date of initial payment (defaults to rtStartDate).
rtInitialAmount	No ²	Amount of initial payment (defaults to rtCycleAmount).
rtFinalDate	No ²	Date of final payment.
rtFinalAmount	No ²	Amount of final payment (defaults to rtCycleAmount).
rtCycleAmount	No ²	Amount per cycle (defaults to amount).
rtCycleDuration	Yes ²	Length of each cycle in rtCycleDurationUnit units.
rtCycleDurationUnit	Yes ²	Cycle duration unit. One of: day , week , month or year .
rtCycleCount	Yes ²	Number of cycles to repeat (zero to repeat forever).
rtMerchantData	No	Free format Merchant data field.
rtCloneFields	No	Fields to clone from one recurring transaction to the next. Refer to appendix A-17.

¹ For use with variable schedules only.

² For use with fixed schedules only.

13.4 Response Fields

Field Name	Returned?	Description
rtID	Always	Recurring Transaction Agreement ID.
rtResponseCode	Always	Result of setting up RT Agreement. Refer to appendix A-1 for details.
rtResponseMessage	Always	Description of above response code.

14 Dynamic Currency Conversion

14.1 Background

Dynamic Currency Conversion is a process where the amount of a credit card transaction is converted by the Gateway into the Cardholder's local currency as determined by the card's country of issue.

It allows your Customer to pay in their currency, but you will receive the funds in the original transaction currency. You can profit from a mark-up on the exchange rate used, as negotiated with your Acquirer and DCC Provider.

Dynamic Currency Conversion is not available with all Acquirers and must be enabled on your Merchant Account before it can be used. Please contact support to find out whether your Acquirer supports it and if it can be enabled on your Merchant Account.

Dynamic Currency Conversion is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

14.2 *Benefits and Limitations*

14.2.1 Benefits

- You may see fewer abandoned transactions because the Cardholder can choose to pay in a familiar currency and need not carry out any mental conversions.
- You can gain income from an exchange rate mark-up.
- Currency conversion can be viewed in your transaction reports.
- Fully configurable within the Merchant Management System (MMS).

14.2.2 Limitations

- Cardholders can be sceptical of use due to previously unfavourable exchange rates' being offered.
- There may be extra costs involved, though you may also find that you can recover this from your conversion mark-up.
- Not all card types are supported.

14.3 Hosted Implementation

If your Merchant Account is set up for Dynamic Currency Conversions, then the Hosted Payment Page will offer the Cardholder the option of paying in their native currency.

14.4 Direct Implementation

If your Merchant Account is set up for Dynamic Currency Conversions, then the Gateway will need you to present the conversion offer to the Cardholder and ask whether they wish to accept or refuse the offer.

14.4.1 Initial Request (Fetch DCC Conversion details)

If no DCC conversion details are provided in the initial request, the Gateway will determine whether the transaction is eligible for DCC and whether any suitable conversion rate is available.

If the Gateway determines that the transaction is not eligible for DCC or no conversion rate is available, then it will continue and process it as a normal transaction without DCC.

If a rate was checked for but none was available, then the transaction response will contain DCC conversion details but the `dccRate` field will be zero.

If the Gateway determines that the transaction is eligible, it will respond with a `responseCode` of **65890 (DCC REQUIRED)** and the response will include details of the DCC offer to ask the Cardholder whether they wish to accept, together with a `dccRef` transaction continuation reference.

14.4.2 Continuation Request (Accept/Refuse DCC offer)

When the DCC offer has been presented to the Cardholder and their acceptance or refusal obtained, then a new request should be sent to the Gateway containing their decision in the `dccAccepted` and the original `dccRef` field received above.

14.4.3 External Authentication Request

You can choose to obtain the DCC details from a third party, in which case you should provide their details as part of a standard request. If the Gateway receives valid third-party DCC details, then it will use those and not attempt to fetch rates from its own DCC Provider.

14.5 Request Fields

14.5.1 Initial Request (Hosted and Direct Integration)

These fields should be sent in addition to basic request fields described in section 2.1.

Field Name	Mandatory?	Description
dccRequired	No ¹	Is 3DS required for this transaction? Possible values are: N – DCC is not required. Y – DCC is not required.

¹ Any other value will use the preference set in the Merchant Management System (MMS).

14.5.2 Continuation Request (Direct Integration)

These fields may be sent alone¹.

Field Name	Mandatory?	Description
dccRef	Yes	The value of the dccRef field in the initial Gateway response.
dccAccepted	Yes	The Cardholder's acceptance to pay using the DCC conversion offered. If they don't accept then the original transaction currency is used. Possible values are: N – Cardholder refused the DCC offer. Y – Cardholder accepted the DCC offer.

¹ It is only necessary to send the **dccRef** and the **dccAccepted** in the continuation request, because the **dccRef** will identify the Merchant Account and initial request. However, you can send any of the normal request fields to modify or supplement the initial request. Any card details and transaction amount sent in the second request must match those used in the first request, else the second request will fail with a **responseCode** of **64442 (REQUEST MISMATCH)**.

14.5.3 External Authentication Request (Direct Integration)

These fields should be sent in addition to basic request fields from section 2.1.

Field Name	Mandatory?	Description
dccAccepted	No	The Cardholder's acceptance to pay using the DCC conversion offered. If they don't accept then the original transaction currency is used. Possible values are: N – Cardholder refused the DCC offer. Y – Cardholder accepted the DCC offer.
dccProvider	Yes	DCC provider code name.
dccMargin	Yes	Percentage markup (0-9999.999999)
dccCommission	Yes	Percentage commission (0-9999.999999)
dccSource	Yes	Source of exchange rate
dccCreated	Yes	Time rate sourced (YYYY-MM-DD HH:MM:SS)
dccExpires	Yes	Time rate expires (YYYY-MM-DD HH:MM:SS)
dccCurrencyCode	Yes	Cardholder's currency
dccAmount	No	The amount of the transaction in the Cardholder's minor currency converted at the rate provided.

Note: If DCC is not enabled for the Merchant Account then any DCC conversion fields sent in the request are ignored and the transaction is processed as normal without DCC. If DCC is enabled but the transaction is otherwise not eligible for DCC conversion, then any DCC field sent in the request will result in an error response.

14.6 Response Fields

14.6.1 Initial Response (Direct Integration)

These fields will be returned in addition to the request fields from section 5.5.1 and the basic response fields in section 2.2.

Field Name	Returned?	Description
dccEnabled	Always	Is DCC enabled for this Merchant Account? Possible values are: N – Merchant Account is not enabled. Y – Merchant Account is enabled.
dccRequired	Always	Is DCC required for this transaction? Possible values are: N – DCC is not required. Y – DCC is required.
dccProvider	Yes	DCC provider code name.
dccRate	Always	Conversion rate (0-999.999999)
dccMargin	Yes	Percentage markup (0-9999.999999)
dccCommission	Yes	Percentage commission (0-9999.999999)
dccSource	Yes	Source of exchange rate
dccCreated	Yes	Time rate sourced (YYYY-MM-DD HH:MM:SS)
dccExpires	Yes	Time rate expires (YYYY-MM-DD HH:MM:SS)
dccCurrencyCode	Yes	Cardholder's currency
dccAmount	Yes	The amount of the transaction in the Cardholder's minor currency converted at the rate provided.
dccResponseCode	Yes	Any response code generated while performing the DCC processing.
dccResponseMessage	Yes	Any response description corresponding to the above dccResponseCode .

14.6.2 Continuation Response (Direct Integration)

No further fields will be returned in addition to the request fields from section 14.5.1; the initial response fields in section 14.6.1; and the basic response fields in section 2.2.

14.6.3 External Authentication Response (Direct Integration)

No further fields will be returned in addition to the request fields from section 14.5.3 and the basic response fields in section 2.2.

15 Purchase Data

15.1 Background

The Gateway can be sent advanced purchase information with each transaction, where required.

The Gateway provides a number of fields that you can use to store advanced purchase information about the transaction, including details on individual items purchased. These fields are only sent to the Acquirer if needed. The stored data can be obtained by sending a QUERY request.

The details may also be used for advanced purposes, such as displaying shopping cart information on the Masterpass wallet, or PayPal checkout.

15.1.1 American Express Purchases

Purchases using American Express cards will send a subset of this information to the card scheme as appropriate.

With American Express, you can provide tax **or** discount reason (but not both). If **taxAmount** is provided, then **taxReason** is used; if **discountAmount** is provided, then **discountReason** is used. If both are provided, then **taxReason** is used.

Only the description, quantity, and amount of the first six line item details are sent to American Express.

15.1.2 Purchase Orders

These fields together with other advanced fields, as detailed in section 16, can be used to send full information relating to a purchase order and related invoice indicating types; quantities; and agreed prices for products or services. Details on the supplier; shipping; delivery can also be included.

At present, this information is not sent to the Acquirer, unless needed, but future enhancements to the Gateway may include sending such information as Level 2 or 3 Purchasing data as defined by the relevant card schemes.

15.2 Request Fields

The following request fields may be sent to provide more information on the breakdown of the purchase amount:

Field Name	Mandatory?	Description
grossAmount	No	Total gross amount of sale.
netAmount	No	Total net amount of sale.
taxRate	No	Total tax rate (percentage).
taxAmount	No ¹	Total tax amount of sale.
taxReason	No ¹	Reason for above tax (eg VAT).
discountAmount	No ¹	Total discount amount of sale.
discountReason	No ¹	Reason for above discount.
handlingAmount	No	Handling costs.
insuranceAmount	No	Insurance costs.

¹ Amex/Diners require either tax or discount, not both.

The following request fields may be sent to provide more information on the purchased items:

Field Name	Mandatory?	Description
itemXXAmount ¹	No	Amount for XX th item purchased.
itemXXDescription ¹	No	Description of XX th item purchased.
itemXXQuantity ¹	No	Quantity of XX th item purchased.
itemXXGrossAmount ¹	No	Gross amount for XX th item purchased.
itemXXNetAmount ¹	No	Net amount for XX th item purchased.
itemXXTaxAmount ¹	No	Tax amount for XX th item purchased.
itemXXTaxRate ¹	No	Total tax rate for XX th item purchased.
itemXXTaxReason ¹	No	Tax reason for XX th item purchased.
itemXXDiscountAmount ¹	No	Total discount for XX th item purchased.
itemXXDiscountReason ¹	No	Discount reason for XX th item purchased.
itemXXProductCode ¹	No	Product code for XX th item purchased.
itemXXProductURL ¹	No	Shopping cart URL for XX th item purchased.
itemXXCommodityCode ¹	No	Commodity code for XX th item purchased.

Field Name	Mandatory?	Description
<code>itemXXUnitOfMeasure¹</code>	No	Unit of measure for XX th item purchased.
<code>itemXXUnitAmount¹</code>	No	Unit amount for XX th item purchased.
<code>itemXXImageUrl¹</code>	No	Image of XX th item purchased.
<code>itemXXSize¹</code>	No	Size of XX th item purchased in the format 'LengthxWidthxHeight Unit'.
<code>itemXXWeight¹</code>	No	Weight of XX th item purchased in the format 'Weight Unit'.
<code>items</code>	No	Nested line item records (see below).

¹ XX is a number between 1 and 99.

The purchased items can be passed as either individual `itemXXField` fields; or as a single `items` field whose value is a sequential array of nested records as described in section 1.7.8.

Both formats cannot be used together. The presence of an `items` field will cause the Gateway to ignore any individual fields.

The Gateway does not currently support `items` to be formatted as a serialised array of records.

Note: no attempt is made to check that any gross, net and tax amounts are correct with respect to each other. It is the sender's responsibility to ensure alternative amount formats are correct.

Line item fields can either be sent 'flat' using field names containing the item row number as a sequential number from 1 to 99; or be sent using nested arrays of the form `items[XX][field]` where `XX` is the row number from 1 to 99 and `field` is the field name from the above table without the `itemXX` prefix and starting with a lowercase first letter. For example, the tax rate for item 5 can be sent either as `item5TaxRate`; or as `items[5][taxRate]`. The two formats should not be mixed. If a request field of `items` is seen, then the 'flat' fields are ignored.

16 Custom Data

You may send arbitrary data with the request by appending extra fields, which will be returned unmodified in the response. These extra fields are merely 'echoed' back and not stored by the Gateway.

Caution should be made to ensure that any extra fields do not match any currently documented fields or possible future fields. One way to do this is to prefix the field names with a value unique to you, the Merchant.

If the request contains a field that is also intended as a response field, then any incoming request value will be overwritten by the correct response value.

The Gateway may add new request and response fields at any time and so your integration must take care not to send request fields that may conflict with future Gateway fields and be able to ignore response fields which it doesn't yet understand.

You can also use the `merchantData` field to store custom data with the transaction. This stored data can then be retrieved at a later date, using a QUERY request. Complex data can be stored as per the details for nested records in section 1.7.8, however the Gateway does not currently support this fields to be provided in the serialised record format. Alternatively, you can serialise the data before storing and unserialise it on retrieval.

16.6 Request Fields

Field Name	Mandatory?	Description
<code>merchantData</code>	No	Arbitrary data to be stored together with this transaction.

17 Advanced Data

The Gateway provides a number of fields that you can use to store information about the transaction. These fields are only sent to the Acquirer if needed. The stored data can be obtained by sending a QUERY request.

17.1 Customer Request Fields

These fields can be used to store details about the Customer and any relationship between the Customer and Merchant such as any purchase order raised.

If AVS checks are in use, then the Customer and Cardholder are assumed to be the same person and the address and postcode fields are taken as being the registered billing address of the card.

Field Name	Mandatory?	Description
customerName	No	Customer's name.
customerCompany	No	Customer's company (if applicable).
customerAddress	No ¹	Customer's address.
customerPostcode	No ¹	Customer's postcode.
customerTown	No	Customer's town/city.
customerCounty	No	Customer's county/province.
customerCountryCode	No	Customer's country.
customerPhone	No	Customer's phone number.
customerMobile	No	Customer's mobile phone number.
customerFax	No	Customer's fax number.
customerEmail	No	Customer's email address.
customerDateOfBirth	No	Customer's date of birth.
customerOrderRef	No	Customer's reference for this order (Purchase Order Reference).
customerMerchantRef	No	Customer's reference for the Merchant.
customerTaxRef	No	Customer's tax reference number.

¹ Mandatory if AVS checking required.

17.2 Merchant Request Fields

These fields can be used to store details about the Merchant and any relationship between the Merchant and Customer such as any invoice reference.

Field Name	Mandatory?	Description/Value
merchantName	No	Merchant's contact name.
merchantCompany	No	Merchant's company name.
merchantAddress	No	Merchant's contact address.
merchantTown	No	Merchant's contact town/city.
merchantCounty	No	Merchant's contact county.
merchantPostcode	No	Merchant's contact postcode.
merchantCountryCode	No	Merchant's contact country.
merchantPhone	No	Merchant's phone number.
merchantMobile	No	Merchant's mobile phone number.
merchantFax	No	Merchant's fax number.
merchantEmail	No	Merchant's email address.
merchantWebsite	No	Merchant's website. The website must be a fully qualified URL and include at least the scheme and host components.
merchantOrderRef	No	Merchant's reference for this order (Invoice/Sales Reference).
merchantCustomerRef	No	Merchant's reference for the Customer.
merchantTaxRef	No	Merchant's tax reference number.
merchantOriginalOrderRef	No	Reference to a back order.
merchantCategoryCode	No	Scheme assigned Merchant Category Code (MCC).
merchantType	No	Acquirer assigned Merchant type code.
merchantAccountNo	No	Merchant's bank account number

17.3 Supplier Request Fields

These fields can be used to store details about the Supplier. This is where any purchased goods are being supplied by a third-party and not directly from the Merchant.

Field Name	Mandatory?	Description/Value
supplierName	No	Supplier's contact name.
supplierCompany	No	Supplier's company name.
supplierAddress	No	Supplier's contact address.
supplierTown	No	Supplier's contact town/city.
supplierCounty	No	Supplier's contact county.
supplierPostcode	No	Supplier's contact postcode.
supplierCountryCode	No	Supplier's contact country.
supplierPhone	No	Supplier's phone number.
supplierMobile	No	Supplier's mobile phone number.
supplierFax	No	Supplier's fax number.
supplierEmail	No	Supplier's email address.
supplierOrderRef	No	Supplier's reference for this order (Invoice/Sales Reference).
supplierAccountNo	No	Supplier's bank account number

17.4 Delivery Request Fields

These fields can be used to store details about the delivery address. This is where any purchased goods are being delivered to if different from the Customer's address.

Field Name	Mandatory?	Description/Value
deliveryName	No	Name of person receiving the delivery.
deliveryCompany	No	Name of company receiving the delivery.
deliveryAddress	No	Delivery address.
deliveryTown	No	Delivery town/city.
deliveryCounty	No	Delivery county.
deliveryPostcode	No	Delivery postcode.
deliveryCountryCode	No	Delivery country.
deliveryPhone	No	Phone number of delivery location.
deliveryMobile	No	Mobile phone number of delivery location.
deliveryFax	No	Fax number of delivery location.
deliveryEmail	No	Delivery email address.

17.5 Receiver Request Fields

These fields can be used to store details about the recipient of the purchased goods where different from the Customer's and Delivery details. It is most commonly used by Financial Institutions (MCC 6012 Merchants) who need to record the primary recipient of a loan.

Field Name	Mandatory?	Description/Value
receiverName	No	Receiver's contact name.
receiverCompany	No	Receiver's company name.
receiverAddress	No	Receiver's contact address.
receiverTown	No	Receiver's contact town/city.
receiverCounty	No	Receiver's contact county.
receiverPostcode	No	Receiver's contact postcode.
receiverCountryCode	No	Receiver's contact country.
receiverPhone	No	Receiver's phone.
receiverMobile	No	Receiver's mobile phone number.
receiverFax	No	Receiver's fax number.
receiverEmail	No	Receiver's email address.
receiverAccountNo	No	Receiver's account number.
receiverDateOfBirth	No	Receiver's date of birth.

17.6 Shipping Request Fields

These fields can be used to store details about the shipping method and costs.

Field Name	Mandatory?	Description/Value
shippingTrackingRef	No	Shipping tracking reference.
shippingMethod	No	Shipping method (eg Courier, Post, etc.).
shippingAmount	No	Cost of shipping.
shippingGrossAmount	No	Gross cost of shipping.
shippingNetAmount	No	Net cost of shipping.
shippingTaxRate	No	Tax rate as percentage to 2 decimal places.
shippingTaxAmount	No	Tax cost of shipping.
shippingTaxReason	No	Tax reason (eg VAT).
shippingDiscountAmount	No	Discount on shipping.
shippingDiscountReason	No	Reason for discount.

Note: no attempt is made to check that any gross, net and tax amounts are correct with respect to each other. It is the sender's responsibility to ensure alternative amount formats are correct.

17.7 Device Information Fields

These fields can be used to provide details of the device from which the transaction is being made. Although not strictly mandatory, they may be required for fraud checking or 3-D Secure authentication, in which case it is highly recommended that they be provided.

Field Name	Mandatory?	Description/Value
deviceType	No	Type of Consumer's device. One of the following values: desktop , laptop , tablet , phone , other .
deviceChannel	No	Communications channel used by the Consumer's device. One of the following values: browser , app , other .
deviceIdentity	No ¹	Content of the HTTP User-Agent header received from the Consumer's device. Truncated to 2048 characters maximum.
deviceTimeZone	No ¹	Time zone offset in minutes between UTC and the Consumer's device. The offset is positive if the local time zone is behind UTC and negative if it is ahead.
deviceCapabilities	No ¹	Comma separated list of capabilities supported by the Consumer's device. One or more of the following values: java , javascript .
deviceAcceptContent	No ¹	Content of HTTP Accept header received from the Consumer's device. Truncated to 2048 characters maximum.
deviceAcceptCharset	No ¹	Content of HTTP Accept-Charset header received from the Consumer's device. Truncated to 2048 characters maximum.
deviceAcceptEncoding	No ¹	Content of HTTP Accept-Encoding header received from the Consumer's device. Truncated to 2048 characters maximum.
deviceAcceptLanguage	No ¹	Content of HTTP Accept-Language header received from the Consumer's device. Truncated to 2048 characters maximum.

Field Name	Mandatory?	Description/Value
deviceScreenResolution	No ¹	<p>Screen resolution of the Consumer's device.</p> <p>Formatted as [HxWxD] where:</p> <ul style="list-style-type: none"> • H – screen height in pixels • W – screen width in pixels • D – colour depth in bits <p>Screen height and width must be between 1 and 999999 pixels.</p> <p>Colour depth must be one of the following values: 1, 4, 8, 15, 16, 24, 32, 48.</p>
deviceOperatingSystem	No	<p>Operating system used by the Consumer's device.</p> <p>One of the following values: win, unix, linux, macos, ios, android, other.</p>

¹ This field is mandatory for 3-D Secure v2 unless an alternative is provided via the **threeDSOptions** field.

18 Acquirer Data

The Gateway supports the passing of Acquirer specific data where needed by an individual Acquirer to provide additional or non-standard features.

When supported, this data can be passed in the **acquirerOptions** request field, which must be provided using the *record* or *serialised record* format detailed in section 1.7.8.

Please contact our customer support team if you need information about what options can be provided to your Acquirer.

The Gateway also supports the returning of Acquirer specific details in the request in situations where the Gateway considers the data to be of value.

When supported, this data will be returned in the **acquirerResponseDetails** response field, which will be returned using the *record* format detailed in section 1.7.8.

In addition to this the Gateway will return the original response code and message received from the Acquirer and any transaction referenced provided by the Acquirer. This later reference can help you identify the transaction when you have access to the Acquirers merchant management portal or need to contact them to query a transaction.

The original Acquirer response code may not be numeric and information on these codes will need to be requested from the Acquirer.

The Gateway may support new acquirer options and return new acquirer details at any time and so your integration must be able to handle such changes and not reject unknown fields.

18.1 Request Fields

Field Name	Mandatory?	Description
acquirerOptions	No	Record containing Acquirer specific options.

18.2 Response Fields

Field Name	Mandatory?	Description
acquirerResponseCode	No	Response code supplied by the Acquirer, maybe prefixed with 'G:' if the Acquirer is itself a payment Gateway.
acquirerResponseMessage	No	Response message supplied the Acquirer.
acquirerResponseDetails	No	Record containing Acquirer specific response details.
acquirerTransactionID	No	Transaction identifier/reference used to identify the transaction in the Acquirer's system.

19 Gateway Wallet

19.1 Background

The Gateway supports an internal digital Wallet that is available to all Merchants using the Gateway.

The Gateway allows you to store your Customer's payment card, billing and delivery address details and other information securely encrypted in its internal Wallet. You can then allow your Customer to select from stored payment cards to check out faster on your website.

Management of this Wallet is done using the Gateway's REST API. However, you can use the Hosted, Direct or Batch Integrations to perform transactions, using cards and addresses stored in the Wallet; or to store new cards and address used with successful transactions.

19.2 *Benefits and Limitations*

19.2.1 Benefits

- Details can be used from or added to the Wallet with just a few extra integration fields.
- Customers can select from previously stored details, making the checkout process more streamlined, resulting in fewer abandoned carts and thus increasing sales.
- Compatible with existing card base fraud solutions such as Address Verification Service (AVS), 3-D Secure and third-party fraud providers.
- There are no extra costs to use the internal Gateway Wallet.
- The Wallet transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.
- Stored cards are assigned a Card Token which is fully LUHN checkable PAN ending in the same last 4 digits as stored card and thus can be used to replace the PAN in any system that is expecting to store PANs and not arbitrary card identifiers.

19.2.2 Limitations

- The payment details are stored internally by the Gateway and not available for use with other Gateway Merchants or other payment gateways.

19.3 Hosted Implementation

If a transaction is sent to the Hosted Integration, then with the addition of a few extra integration fields, the Customer can be asked whether they wish to save their details in the internal Wallet for future use.

Customers who have payment details already saved will have the option to select from those details rather than having to reenter them. Customers will also have the option to delete stored details¹.

The details are only saved if the transaction is successful, ensuring that the Wallet is not filled up with invalid payment details.

The details requiring to be stored in the Wallet are validated when the transaction is performed, prior to any authorisation with the Acquirer. If any of the details are invalid, then the transaction will be aborted with a **responseCode** of **66304 (INVALID_REQUEST)** and a **responseMessage** indicating which data could not be stored in the Wallet. Any failure that occurs post authorisation will not abort the transaction but will be available in the appropriate **xxxxStoreResponseCode** response fields.

The **walletOwnerRef** field can be used to assign a unique Customer reference to the Wallet, allowing you to identify which of your Customers owns the Wallet. This could be the Customer reference you use within your own Customer accounts or Shopping Cart software. You must ensure that this value is less than 50 characters, or the transaction will be aborted with a **responseCode** of **65xxx (INVALID_WALLETCUSTOMERREF)**.

¹ There is no option to modify stored payment details. However, the Customer can delete them and then restore them.

19.4 Direct Implementation

If a transaction is sent to the Direct Integration, then with the addition of a few extra integration fields, it can be instructed to use payment details stored in the Wallet and/or store the used payment details.

Using stored payment details is similar to performing cross-referenced transactions where the payment details are cloned from a previous transaction¹. However, in this case the payment details are taken from the Wallet and not a previous transaction.

The details are only saved if the transaction is successful, ensuring that the Wallet is not filled up with invalid payment details.

The details requiring to be stored in the Wallet are validated when the transaction is performed prior to any authorisation with the Acquirer. If any of the details are invalid, then the transaction will be aborted with a **responseCode** of **66304 (INVALID_REQUEST)** and a **responseMessage** indicating which data could not be stored in the Wallet. Any failure that occurs post authorisation will not abort the transaction but will be available in the appropriate **xxxxStoreResponseCode** response fields.

The **walletOwnerRef** field can be used to assign a unique Customer reference to the Wallet allowing you to identify which of your Customers owns the Wallet. This could be the Customer reference you use within your own Customer accounts or Shopping Cart software. You must ensure that this value is less than 50 characters, or the transaction will be aborted with a **responseCode** of **65xxx (INVALID_WALLETCUSTOMERREF)**.

¹ Refer to appendices A-15 through to A-17 for details on cross referenced transactions and cloning.

19.5 Request Fields

Field Name	Mandatory?	Description
walletID	No	Identifier for an existing Wallet to use.
walletName	No	Name for any new Wallet created.
walletDescription	No	Description for any new Wallet created.
walletOwnerRef	No	Owner Reference for any new Wallet created.
walletData	No	Merchant Data for any new Wallet created.
walletStore	No	Request that all payment details be stored in the Wallet. A new Wallet will be created if needed. Possible values are: Y - store all payment details. N - store details according to their xxxStore value.
cardID	No	Identifier for an existing card stored in a Wallet.
cardToken	No	Identifier for an existing card stored in a Wallet represented as valid PAN ending with same last 4 digits as the stored PAN.
cardName	No	Name for any new card stored.
cardDescription	No	Description for any new card stored.
cardData	No	Merchant Data for any new card stored.
cardStore	No	Request that the payment card details be stored in the Wallet. A new Wallet will be created if needed. Possible values are: Y - store the card details. N - do not store the card details.
customerAddressID	No	Identifier for an existing address stored in a Wallet.
customerAddressName	No	Name for any new address stored.
customerAddressDescription	No	Description for any new address stored.
customerAddressData	No	Merchant Data for any new address stored.
customerAddressStore	No	Request that the customer address details be stored in the Wallet. A new Wallet will be created if needed. Possible values are: Y - store the customer address details. N - do not store the customer address details.
deliveryAddressID	No	Identifier for an existing address stored in a Wallet.

deliveryAddressName	No	Name for any new address stored.
deliveryAddressDescription	No	Description for any new address stored.
deliveryAddressData	No	Merchant Data for any new address stored.
deliveryAddressStore	No	Request that the delivery address details be stored in the Wallet. A new Wallet will be created if needed. Possible values are: Y- store the delivery address details. N- do not store the delivery address details.

19.6 Response Fields

These fields will be returned in addition to the request fields from section.

Field Name	Mandatory?	Description
walletStoreResponseCode	No	Result of creating or updating the Wallet details. Refer to appendix A-1 for details.
walletStoreResponseMessage	No	Description of above response code.
cardStoreResponseCode	No	Result of creating or updating the card details. Refer to appendix A-1 for details.
cardStoreResponseMessage	No	Description of above response code.
customerAddressStoreResponseCode	No	Result of creating or updating the address details. Refer to appendix A-1 for details.
customerAddressStoreResponseMessage	No	Description of above response code.
deliveryAddressStoreResponseCode	No	Result of creating or updating the address details. Refer to appendix A-1 for details.
deliveryAddressStoreResponseMessage	No	Description of above response code.

If new items are stored in the Wallet, then their identifiers will be returned in the appropriate **walletID**, **cardID**, **customerAddressID** and **deliveryAddressID** together with any values provided for or assigned by default to the other item fields.

Failure to store any of the details in the Wallet will be reported using the appropriate **xxxxStoreResponseCode** response field.

20 Masterpass Wallet

20.1 Background

Masterpass is a digital wallet from Mastercard that is available to all Merchants using the Gateway.

It allows customers to store their payment and shipping information in one central, secure location. With Masterpass, customers can shop, click, and check out faster on your website.

Masterpass transactions process and settle just like credit card transactions. You can identify Masterpass transactions in the Merchant Management System by their unique payment type logo, which includes the credit card brand name at the bottom.

There are no additional fees for processing Masterpass transactions – pricing for Masterpass is the same as your other credit card transactions.

Masterpass versions 6 and 7 are supported by the Gateway.

Masterpass has upgraded to Mastercard's new guest checkout option and Customers can no longer sign up. As such this integration is subject to change.

Masterpass is an advanced feature and must be enabled on your Merchant Account before it can be used. Please contact support if you wish to have it enabled.

Masterpass is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

20.2 *Benefits and Limitations*

20.2.1 Benefits

- The Wallet details are stored externally to the Gateway and available with any third-party Checkout that supports Masterpass.
- Customers can select from previously stored details, making the checkout process more streamlined, resulting in fewer abandoned carts and thus increasing sales.
- Compatible with existing card base fraud solutions such as Address Verification Service (AVS), 3-D Secure and third-party fraud providers.
- There are no extra costs to add Masterpass to your Gateway account.
- The Masterpass transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.

20.2.2 Limitations

- Your Customer will need a Masterpass Wallet with some stored card details in order to make full use of this payment method.
- Repeat transactions using the retrieved payment details are supported but may require permission from Masterpass.

20.3 Hosted Implementation

If a transaction is sent to the Hosted Integration using a `merchantID` that has Masterpass enabled, then the Hosted Payment Page will display a Masterpass payment button that, when clicked, will open the Masterpass Wallet and allow the Customer to select their payment card and address details.

To customise the Masterpass Wallet experience, you may send various options in the `masterPassCheckoutOptions` field in your initial request.

Additional information available from the Masterpass Wallet will be made available in the `masterPassCheckoutDetails` response field.

Note: Custom Hosted Payment Pages might not support the displaying of the Masterpass button. If you have a custom page that doesn't support this, then you would need to contact support to have your Hosted Payment Page upgraded.

20.4 Direct Implementation

Masterpass transactions require you to display the Masterpass Wallet to your Customer as part of the transaction flow. The transaction must be done in two stages, with the Wallet being displayed between the stages. They can optionally also be done in three stages, allowing you to display an order confirmation after the Wallet and before authorising the transaction. You can change the amount at this stage to allow for shipping costs when you know the confirmed delivery address the Customer selected from the Wallet.

To customise the Masterpass Wallet experience, you may send various options in the `masterPassCheckoutOptions` field in your initial request.

Additional information available from the Masterpass Wallet will be made available in the `masterPassCheckoutDetails` response field.

20.4.1 Initial Request (Checkout Preparation)

To request that a transaction be processed using details selected from the Customer's Masterpass Wallet, the request must contain a `paymentMethod` of 'masterpass' and a `masterPassCallbackURL` containing the URL of a page on your server to return to when the Wallet is closed. In addition, you may send `masterPassCheckoutOptions` to customise the Wallet experience. When the Gateway receives these two fields, assuming there are no other errors with the request, it will attempt to find a suitable Masterpass enabled Merchant Account in the current account mapping group (refer to Appendix A-7).

If the Gateway is unable to find a suitable account, then the transaction will be aborted and it will respond with a `responseCode` of **65569 (MASTERPASS_NOT_SUPPORTED)**.

Otherwise, the Gateway will respond with a `responseCode` of **65572 (MASTERPASS_CHECKOUT_REQUIRED)** and the response will include a `masterPassCheckoutURL` field containing the URL required to load the Masterpass Wallet and a `masterPassCheckoutOptions` containing any data required to be sent to the Wallet. The response will also contain a unique `masterPassData` field that must be echoed back in the continuation requests. No transaction will have been created by the Gateway at this stage and this request will not appear in the Merchant Management System.

At this point your server must redirect the Customer's browser to the Masterpass Wallet at the provided `masterPassCheckoutURL`. Alternatively, the `masterPassCheckoutURL` can be used in conjunction with the Masterpass JavaScript code to implement a lightbox style Wallet that allows the Merchants website to remain visible in the background. Further details on how to use the Masterpass JavaScript SDK can be obtained from Masterpass.

20.4.2 Continuation Request (Checkout Details and Authorise)

On completion of the Masterpass Wallet, it will redirect the Customer's browser to the `masterPassCallbackURL` provided, including an OAuth token, OAuth verifier and status URL parameters. Masterpass version 6 may also return a resource URL. If the checkout was

successful, the status will be 'success'. Alternatively, if the checkout was cancelled the status will be 'cancel'.

These URL parameters should be sent to the Gateway in the **masterPassToken**, **masterPassVerifier**, **masterPassStatus**, **masterPassResourceURL** fields of a new request. The new request must contain the **masterPassData** received in the initial response. This new request will retrieve the Customer's chosen payment and delivery details from Masterpass and then send the transaction to the Acquirer for authorisation, returning the result similarly to a normal card-based authorisation transaction.

If the continuation request contains any details that would normally be read from the Masterpass Wallet, then these will take precedence and overwrite the Wallet details. Note: in such cases, the transaction will no longer class as being a Masterpass transaction and will be treated by the Acquirers as if the Wallet was not used.

If the chosen details cannot be retrieved or if the **masterPassStatus** field indicated that the Wallet was cancelled, then the Gateway will return a **responseCode** of **65570 (MASTERPASS_CHECKOUT_FAILURE)**.

20.4.3 Separate Checkout Details and Authorisation Requests

You can choose to obtain the Wallet details before sending the transaction for authorisation by sending the **masterPassOnly** field in the above continuation request. If this field is sent with a value of 'Y', then the Gateway will load the Wallet details and then return them to you without sending the request for authorisation. You can then display them and/or adjust the amount, for example, according to delivery charges appropriate to the received delivery address. You should then send a new request, containing the **masterPassData** received, to continue the transaction and authorise it.

If the continuation request contains any details that would normally be read from the Masterpass Wallet, then these will be ignored, and the Wallet details returned. Note: this is different from usual processing, where incoming fields usually take precedence.

The outcome of this request will depend on the value of the **masterPassStatus** field and the ability to communicate with Masterpass. On success, the Gateway will return a **responseCode** of **65571 (MASTERPASS_CHECKOUT_SUCCESS)** and response will include the chosen payment card and address details. If the Wallet was cancelled or if the chosen details cannot be retrieved, then the Gateway will return a **responseCode** of **65570 (MASTERPASS_CHECKOUT_FAILURE)**.

Note: this stage can be repeated multiple times by including the **masterPassOnly** field with a value of 'Y' each time. To complete the transaction, the final request must not contain the **masterPassOnly** field or it must not have a value of 'Y'.

20.5 Request Fields

20.5.1 Initial Request (Hosted and Direct Integrations)

These fields should be sent in addition to basic request fields in section 2.1 excluding any card details.

Field Name	Mandatory?	Description
paymentMethod	Yes ¹	Must contain the value 'masterpass' in lower case letters only.
masterPassCallbackURL	Yes ²	URL on Merchant's server to return to when the Masterpass Wallet is closed.
masterPassCheckoutOptions	No	Record containing options used to customise the Masterpass Wallet. Refer to section 21.5.3 for values.
masterPassCheckoutID	No	Merchant's unique checkout identifier as provided by Masterpass.

¹ Optional for Hosted Integration.

² Not required for Hosted Integration.

20.5.2 Continuation Request (Direct Integration)

Field Name	Mandatory?	Description
masterPassData	Yes	Unique reference returned in the initial response.
masterPassStatus	Yes ¹	The Wallet status returned to the Merchant.
masterPassToken	Yes ¹	The OAuth token returned to the Merchant.
masterPassVerifier	Yes ¹	The OAuth verifier returned to the Merchant.
masterPassResourceURL	Yes ¹	An optional resource URL (Masterpass v6 only).
masterPassOnly	No	Pass Y to complete the processing as far as the next Wallet stage and then return with the loaded Wallet details.

¹ These fields should be initialised with values received by your website when the wallet redirects to your **masterPassCallbackURL** URL. If the checkout was cancelled, then only the **masterPassStatus** field need be sent to the Gateway.

20.5.3 Wallet Options (Hosted and Direct Integrations)

The following options may be set in the **masterPassCheckoutOptions** field to customise the Masterpass Wallet. The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Field Name	Description
version	Masterpass version required. Possible values are: v6 – use version 6 of the Masterpass API (default). v7 – use version 7 of the Masterpass API (preferred).
requireLightboxCheckout	Use the lightbox version of the Masterpass Wallet rather than the full screen checkout when possible. Possible values are: false – use the full screen Wallet. true – use the lightbox Wallet if possible.
suppress3Ds	Suppress Masterpass 3-D Secure processing. This allows the Gateway to do the 3-D Secure processing using the chosen card details. Possible values are: false – allow the Wallet to handle 3-D Secure. true – allow the Gateway to handle 3-D Secure.
requestBasicCheckout	Deprecated name for suppress3Ds .
suppressShippingAddress	Suppress the requirement for the Customer to select a shipping address as well as payment card details. Possible values are: false – shipping address must be selected. true – shipping address need not be selected.
requestShippingAddressEnable	Deprecated name for suppressShippingAddress .
shippingLocationProfile	Provide a Masterpass shipping profile. Refer to the Masterpass document for details.
rewardsProgram	Enable the Masterpass loyalty program. Refer to the Masterpass document for details.
loyaltyEnabled	Deprecated name for rewardsProgram .
suppressWalletSelector	Suppress the ability to select alternative Wallet providers from within the Masterpass Wallet. Possible values are: false – allow alternative Wallets to be selected. true – don't allow alternative Wallets to be selected.
walletSelectorBypassEnable	Deprecated name for suppressWalletSelector
merchantCheckoutId	Merchant's unique checkout identifier as provided by Masterpass. Either as passed in the initial request or as configured on the Gateway for your account.

Field Name	Description
allowedCardTypes	List of Masterpass card types to allow selection from within the Wallet. Will be returned in the response from the card types configured for your Merchant Account.

The deprecated options were originally used with v6 of the Masterpass API and the Gateway will accept both the newer v7 option name and the original v6 option name regardless of the value of any version option provided. The Gateway may return the correct name for the version when it returns the **masterPassCheckoutOptions** in the initial response.

The nature of the URL returned in the **masterPassCheckoutURL** response field depends on whether the Masterpass lightbox or full-page redirect checkout is required as specified using the **requireLightboxCheckout** option. If the option is passed as 'true', then the URL will reference the Masterpass JavaScript file that should be loaded to provide the code required to open the lightbox style Wallet. The **masterPassCheckoutOptions** response values should then be passed to the JavaScript call to open the lightbox. If the option is not passed or not 'true', then the URL will be an address to redirect the Customer's browser to in order to display the Masterpass Checkout pages. This URL will have its query component initialised from any **masterPassCheckoutOptions** request values, and any response values need not be used.

If the **suppress3Ds** or **requestBasicCheckout** option is not passed, then it will be defaulted to 'true', so that the Gateway's 3-D Secure processing will be used as opposed to the Wallet's 3-D Secure processing. This ensures your 3-D Secure preferences are followed.

If the **suppressShippingAddress** or **suppressShippingAddressEnable** option is passed as 'true' then no attempt will be made to return the delivery address fields. Any delivery address fields passed in the transaction will be echoed back unaltered.

Any **merchantCheckoutId** or **allowedCardTypes** options will be overwritten and therefore should not be passed in the request but will be available in the response.

20.5.4 Purchase details (Hosted and Direct Integrations)

The following request fields may be sent to provide information on the purchased items and to populate the cart on the Masterpass Wallet (v6 only).

Field Name	Mandatory?	Description
<code>itemXXDescription</code>	No	Description of XX th item purchased.
<code>itemXXQuantity</code>	No	Quantity of XX th item purchased.
<code>itemXXGrossAmount</code>	No	Gross amount for XX th item purchased.
<code>itemXXTaxAmount</code>	No	Tax amount for XX th item purchased.
<code>itemXXProductCode</code>	No	Product code for XX th item purchased.
<code>itemXXImageUrl</code>	No	Shopping cart URL for XX th item purchased.
<code>itemXXSize</code>	No	Size of XX th item purchased in the format 'LengthxWidthxHeight Unit'.
<code>itemXXWeight</code>	No	Weight of XX th item purchased in the format 'Weight Unit'.
<code>items</code>	No	Nested array of line items.

Refer to section 15.2 for more information on these fields.

20.6 Response Fields

20.6.1 Initial Response (Direct Integration)

These fields will be returned in addition to the request fields from section 20.5.1 and the basic response fields in section 2.2 minus any card details.

Field Name	Mandatory?	Description
masterPassData	Yes	Unique reference required to continue this transaction when the Masterpass Wallet has completed.
masterPassCheckoutURL	Yes	URL required to load the Masterpass Wallet.
masterPassCheckoutOptions	No	Record containing options used to customise the Masterpass Wallet. Refer to section 21.5.3 for values.

20.6.2 Continuation Response (Direct Integration)

These fields will be returned in addition to the request fields from section 20.5.2; the initial response fields in section 20.6.1; and the basic response fields in section 2.2 minus any card details.

Field Name	Mandatory?	Description
masterPassData	No	Provided, if masterPassOnly was used in the continuation response to indicate that a further request will be sent to finalise the transaction.
masterPassWalletID	Yes	Masterpass Wallet ID.
masterPassCheckout	Yes	Masterpass Wallet details in original retrieved XML format minus any card numbers.
cardXXXX	Yes	Card details chosen in the Masterpass Wallet as documented in section 2.2.
customerXXXX	No ¹	Customer details if provided by the Masterpass Wallet as documented in section 17.1
deliveryXXXX	No ¹	Delivery details if provided by the Masterpass Wallet as documented in section 17.4

¹ The response will include Customer/billing address and delivery address details if provided by the Masterpass Wallet.

21 PayPal Transactions

21.1 Background

PayPal is an additional payment method that is available to all Merchants using the Gateway who have a PayPal account.

To use PayPal, you will be supplied with a separate PayPal Merchant Account that can be grouped with your main Merchant Account using the account mapping facility as documented in appendix A-7. This allows transactions to be sent using your main Merchant Account and then routed automatically to the PayPal Merchant Account in the same mapping group.

It allows you to offer payment via PayPal in addition to normal card payments.

PayPal transactions will appear in the Merchant Management System (MMS) alongside any card payments and can be captured, cancelled and refunded in the same way as card payments.

PayPal transactions can also be used for recurring billing but require you to indicate in the initial transaction that it will be the basis for recurring billing and that a billing agreement will be entered into between your Customer and PayPal when they agree to the payment.

PayPal transactions cannot be used for ad-hoc Credentials on File (COF) repeat transactions unless a billing agreement has been set up.

For more information on how to accept PayPal transactions, please contact customer support.

PayPal is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

21.2 *Benefits and Limitations*

21.2.1 Benefits

- Provides your customers with the flexibility of paying by using their PayPal account when this is more suitable to them than using a traditional credit or debit card.
- The in-context PayPal Express Checkout helps improve conversion rates with an easier way to pay without customers leaving your website.
- There are no extra costs for adding a PayPal Merchant Account. However, you will still be liable for the PayPal transaction fees.
- The full PayPal transaction information is available and returned as part of the transaction.
- Transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.

21.2.2 Limitations

- You will need a PayPal account.
- Recurring transactions are not supported unless as part of a prearranged billing agreement.
- Independent refunds that are not tied to a previous sale transaction are not supported without prior agreement.
- Transactions require a browser in order to display the PayPal Checkout.
- The PayPal Checkout cannot be opened from within a browser IFRAME and so care must be taken to ensure that any PayPal Checkout button is not placed within such an IFRAME.

21.3 Hosted Implementation

If a transaction is sent to the Hosted Integration using a **merchantID** that is part of a routing group containing a PayPal Merchant, then the Hosted Payment Page will display a PayPal payment button that, when clicked, will open the PayPal Checkout and allow the Customer to pay using their PayPal account.

To customise the PayPal Checkout experience, you may send various options in the **paypalCheckoutOptions** field in your initial request.

Additional information available from the PayPal Checkout will be made available in the **checkoutDetails** response field.

Note: Custom Hosted Payment Pages might not support the displaying of the PayPal Checkout button. If you have a custom page that doesn't support this, then you would need to contact support to have your Hosted Payment Page upgraded.

21.4 Direct Implementation

PayPal transactions require you to display the PayPal Checkout to your Customer as part of the transaction flow. The transaction must be done in two stages, with the Checkout being displayed between the stages. They can also be optionally done in three stages allowing you to display an order confirmation after the Checkout and before authorising the transaction. You can change the amount at this stage to allow for shipping costs when you know the confirmed delivery address the Customer selected as part of the PayPal Checkout.

PayPal supports the normal payment and management actions. This section explains how to make payment requests. Management requests are performed as detailed in section 3.

To customise the PayPal Checkout experience, you may send various options in the **checkoutOptions** field in your initial request.

Additional information available from the PayPal Checkout will be made available in the **checkoutDetails** response field.

The direct integration uses two complex fields to pass data between the PayPal Checkout and the Gateway. The **checkoutRequest** field will be provided by the Gateway and is a record whose name/value properties should be used with the PayPal JavaScript SDK to open the Checkout. The corresponding **checkoutResponse** field should be returned to the Gateway and must be a record containing name/value properties received from the Checkout when it redirects the Cardholder's browser back to the URL provided using the **checkoutRedirectURL** on completion.

The contents of the **checkoutOptions**, **checkoutDetails**, **checkoutRequest** and **checkoutResponse** fields are formatted using the *record* format detailed in section 1.7.8, the **checkoutOptions** field also supports being provided using the *serialised record* format.

21.4.1 Initial Request (Checkout Preparation)

To request that a transaction be processed via PayPal the request must contain a **paymentMethod** of 'paypal' and a **checkoutRedirectURL** containing the URL of a page on your server to return to when the Checkout is closed. In addition, you may send **checkoutOptions** to customise the Checkout experience. When the Gateway receives this **paymentMethod**, assuming there are no other errors with the request, it will attempt to find a suitable PayPal Merchant Account in the current account mapping group (refer to appendix A-7).

If the Gateway is unable to find a suitable account, then the transaction will be aborted and it will respond with a **responseCode** of **66364 (INVALID PAYMENTMETHOD)**.

Otherwise, the Gateway will respond with a **responseCode** of **65826 (CHECKOUT REQUIRED)** and included in the response will be a **checkoutURL** field containing the URL required to load Checkout and a **checkoutRequest** containing any data required to be sent to the Checkout. The response will also contain a unique **checkoutRef** which must be echoed back in the continuation requests.

At this point your server must redirect the Customer's browser to the provided **checkoutURL**. Alternatively, the **checkoutURL** can be used in conjunction with the PayPal In-Context JavaScript code to implement an In-context Checkout which allows the Merchants website to remain visible in the background. Further details on how to use the In-Context Checkout are provided in the PayPal guide at https://developer.paypal.com/docs/classic/express-checkout/in-context/enable_in_context_checkout/.

21.4.2 Continuation Request (Checkout Details and Authorise)

On completion of the PayPal Checkout it will redirect the Customer's browser to the **checkoutRedirectURL** provided including a **token** and **status** URL parameters. If the checkout was successful, the status will be 'success' alternatively if the Checkout was cancelled the status will be 'cancel'. The received redirect request parameters inclusive of these **token** and **status** parameters should then be sent to the Gateway in the **checkoutResponse** fields of a new request. The **checkoutResponse** field can be sent either as the original URL query string received or as an array of the decoded query parameters. This new request will load the Checkout details including any delivery address if required and send the transaction to PayPal for authorisation, returning the result as per a normal authorisation transaction. The new request must contain the **checkoutRef** received in the initial response.

21.4.3 Separate Checkout Details and Authorisation Requests

You can choose to obtain the Checkout details before actually sending the transaction for authorisation by sending the **checkoutOnly** field in the above continuation request. If this field is sent with a value of 'Y' then the Gateway will load the Checkout details and then return them to you without sending the request for authorisation. You can then display them and/or adjust the amount, for example, according to delivery charges appropriate to the received delivery address. You should then send a new request containing the **checkoutRef** received to continue the transaction and authorise it.

Note: this stage can be repeated multiple times by including the **checkoutOnly** field with a value of 'Y' each time. To complete the transaction, the final request must not contain the **checkoutOnly** field or it must not have a value of 'Y'.

21.5 Request Fields

21.5.1 Initial Request (Hosted and Direct Integrations)

These fields should be sent in addition to basic request fields in section 2.1 excluding any card details.

Field Name	Mandatory?	Description
paymentMethod	Yes ¹	Must contain the value 'paypal' in lower case letters only.
checkoutRedirectURL	Yes ²	URL on Merchant's server to return to when the PayPal Checkout is closed.
checkoutOptions	No ³	Record containing options used to customise the PayPal Checkout. Refer to section 21.5.3 for values.
paypalCheckoutOptions	No ⁴	Record containing options used to customise the PayPal Checkout. Refer to section 21.5.3 for values.

¹ Optional for Hosted Integration.

² Not required for Hosted Integration.

³ Direct Integration Only

⁴ Hosted Integration Only

21.5.2 Continuation Request (Direct Integration)

These fields may be sent alone¹.

Field Name	Mandatory?	Description
checkoutRef	Yes	Unique reference return in the initial response.
checkoutResponse	Yes	The GET and or POST data received by the checkoutRedirectURL page.
checkoutOnly	No	Pass Y to complete the processing as far as the next Checkout stage and then return with the loaded Checkout details.

¹ It is only necessary to send the **checkoutRef** and the **checkoutResponse** in the continuation request because the **checkoutRef** will identify the Merchant Account and initial request. The message does not need to be signed. You can send any of the normal request fields to modify or supplement the initial request – however, in this case the request should be signed. The **checkoutRedirectURL** and **checkoutOptions** fields sent in the initial request cannot be modified and any sent in the second request must match those used in the first request, or the second request will fail with a **responseCode** of **64442 (REQUEST MISMATCH)**.

21.5.3 Checkout Options (Hosted and Direct Integrations)

The following options may be set in the `paypalCheckoutOptions` Hosted Integration field or the `checkoutOptions` Direct Integration field to customise the PayPal Checkout. The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Option Name	Description
<code>inContext</code>	Use the in-context PayPal Checkout rather than the full screen Checkout when possible. Possible values are: 0 – use the full screen Checkout. 1 – use the in-context Checkout if possible.
<code>userAction</code>	Determines whether buyers complete their purchases on PayPal or on your website. Possible values are: commit – sets the submit button text to ‘Pay Now’ on the PayPal Checkout. This text lets buyers know that they complete their purchases if they click the button. continue – sets the submit button text to ‘Continue’ on the PayPal Checkout. This text lets buyers know that they will return to the Merchant’s cart to complete their purchases if they click the button.
<code>maxAmount</code>	The expected maximum total amount of the order, including shipping and taxes. PayPal refer to this field as MAXAMT.
<code>reqBillingAddress</code>	Determines whether the buyer’s billing address on file with PayPal is returned. This feature must be enabled by PayPal.
<code>reqConfirmShipping</code>	Determines whether the buyer’s shipping address on file with PayPal must be a confirmed address. Possible values are: 0 – does not need to be confirmed 1 – must be confirmed
<code>noShipping</code>	Determines whether PayPal displays shipping address. Possible values are: 0 – display the shipping address 1 – do not display shipping address and remove shipping information 2 – If no <code>deliveryxxxx</code> fields passed, PayPal obtains them from the buyer’s account profile.
<code>addrOverride</code>	Determines whether the PayPal Checkout displays the shipping address sent using the <code>deliveryxxxx</code> fields and not the shipping address on file with PayPal for this buyer. Displaying the PayPal street address on file does not allow the buyer to edit that address. Possible values are: 0 – PayPal should not display the address. 1 – PayPal should display the address.
<code>localeCode</code>	Locale of the pages displayed by PayPal during Express Checkout. It is either a two-letter country code or five-character locale code supported by PayPal.

Option Name	Description
allowNote	Enables the buyer to enter a note to the merchant on the PayPal page during Checkout. The note is returned in the checkoutDetails response field.
pageStyle	Name of the Custom Payment Page Style used for the PayPal Checkout. It is the same name as the Page Style Name used when adding styles in the PayPal Account.
payflowColor	The HTML hex colour code for the PayPal Checkout's background colour. By default, the colour is white (FFFFFF).
cardBorderColor	The HTML hex colour code for the PayPal Checkout's principal identifying colour. The colour will be blended to white in a gradient fill that borders the cart review area.
hdrImg	URL for the image you want to appear at the top left of the payment page. The image has a maximum size of 750 pixels wide by 90 pixels high. PayPal requires that you provide an image that is stored on a secure (https) server. If you do not specify an image, the business name displays.
logoImg	A URL to your logo image. Use a valid graphics format, such as .gif, .jpg, or .png. Limit the image to 190 pixels wide by 60 pixels high. PayPal crops images that are larger. PayPal places your logo image at the top of the cart review area.
landingPage	Type of PayPal Checkout to display. Possible values are: Billing – Non-PayPal account Login – PayPal account login
channelType	Type of channel. Possible values are: Merchant – Non-auction seller eBayItem – eBay auction
solutionType	Type of Checkout flow. Possible values are: Sole – Buyer does not need to create a PayPal account to check out. This is referred to as PayPal Account Optional. Mark – Buyer must have a PayPal account to check out.
totalType	Type declaration for the label to be displayed in MiniCart for UX. Possible values are: Total EstimatedTotal
brandName	A label that overrides the business name in the PayPal account on the PayPal Checkout.
customerServiceNumber	Merchant Customer Service number displayed on the PayPal Checkout.

Option Name	Description
buyerEmailOptInEnable	<p>Enables the buyer to provide an email address on the PayPal pages to be notified of promotions or special events.</p> <p>Possible values are: 0 – Do not enable buyer to provide email. 1 – Enable the buyer to provide email.</p>
noteToBuyer	A note from the merchant to the buyer that will be displayed in the PayPal Checkout.
paymentAction	<p>Defines how to obtain payment. This can be used to override any <code>captureDelay</code> setting that can also be used to indicate a Sale or Authorisation only.</p> <p>Possible values are: Sale – sale with immediate capture. Authorization – authorisation subject to later capture (note spelling). Order – order subject to later authorisation and capture.</p>
allowedPaymentMethod	The payment method type. Specify the value <code>InstantPaymentOnly</code>
insuranceOptionOffered	<p>Indicates whether insurance is available as an option that the buyer can choose on the PayPal Review page.</p> <p>Possible values are: true – The Insurance option displays 'Yes' and the <code>insuranceAmount</code>. If true, the total shipping insurance for this order must be a positive number. false – The Insurance option displays 'No'.</p>
multiShipping	<p>Indicates whether this payment is associated with multiple shipping addresses.</p> <p>Possible values are: 0 – Single/No shipping address. 1 – Multiple shipping addresses.</p>
noteText	Note to the Merchant.
bucketCategoryType	<p>The category of a payment.</p> <p>Possible values are: 1 – International shipping 2 – Local delivery 3 – BOPIS, Buy online pick-up in store 4 – PUDO, Pick-up drop-off</p>
locationType	<p>Type of merchant location. Required if the items purchased will not be shipped, such as, BOPIS (Buy Online Pick-up In Store) or PUDO (Pick-Up Drop-Off) transactions.</p> <p>Possible values are: 1 – Consumer. 2 – Store, for BOPIS transactions. 3 – PickupDropoff, for PUDO transactions.</p>
locationID	Location ID specified by the merchant for BOPIS (Buy Online Pick-up In Store) or PUDO (Pick-Up Drop-Off) transactions.

Option Name	Description
sellerPayPalAccountID	Unique identifier for the Merchant. For parallel payments, this field is required and must contain the Payer Id or the email address of the Merchant.
invNum	Merchant's invoice or tracking number.
custom	Custom field for your own use.
buyerID	The unique identifier provided by eBay for this buyer. The value may or may not be the same as the username. In the case of eBay, it is different.
buyerUsername	The username of the user at the marketplaces site.
buyerRegistrationDate	Date when the user registered with the marketplace. In UTC/GMT format, for example, 2013-08-24T05:38:48Z.
allowPushFunding	Indicates whether the Merchant can accept push funding. Possible values are: 0 – Merchant cannot accept push funding. 1 – Merchant can accept push funding.
userSelectedFundingSource	This element could be used to specify the preferred funding option for a guest user. However, the <code>landingPage</code> Checkout option must also be set to Billing , otherwise, it is ignored. Possible values are: ChinaUnionPay. CreditCard. ELV. QIWI.
billingType	Type of billing agreement for reference transactions. You must have permission from PayPal to use this field. Possible values are: MerchantInitiatedBilling – PayPal creates a billing agreement for each transaction associated with buyer. MerchantInitiatedBillingSingleAgreement – PayPal creates a single billing agreement for all transactions associated with buyer. Use this value unless you need per-transaction billing agreements.
billingAgreementDescription	Description of goods or services associated with the billing agreement. This field is required for each recurring payment billing agreement. PayPal recommends that the description contain a brief summary of the billing agreement terms and conditions. For example, buyer is billed at "9.99 per month for 2 years".

Option Name	Description
paymentType	<p>Type of PayPal payment you require for the billing agreement.</p> <p>Possible values are: Any – The merchant accepts any payment method for the billing agreement, even if it could take a few working days for the movement of funds to the merchant account. This includes echeck, in addition to credit or debit cards and PayPal balance. InstantOnly – The payment options accepted by the merchant are credit cards, debit cards or PayPal balance only because the merchant expects immediate payment.</p>
taxIDType	<p>Buyer's tax ID type. This field is required for Brazil and used for Brazil only.</p> <p>For Brazil use only: The tax ID type is BR_CPF for individuals and BR_CNPJ for businesses.</p>
taxID	<p>Buyer's tax ID. This field is required for Brazil and used for Brazil only.</p> <p>For Brazil use only: The tax ID is 11 single-byte characters for individuals and 14 single-byte characters for businesses</p>
returnFMFDetails	<p>Flag to indicate whether you want the results returned by Fraud Management Filters when doing a recurring/reference transaction.</p> <p>Possible values are: 0 – Do not receive FMF details (default). 1 – Receive FMF details.</p>
riskSessionCorrelationID	The ID of the risk session for correlation purposes when doing a recurring/reference transaction.
merchantSessionID	The buyer session identification token when doing a recurring/reference transaction.
buttonSource¹	PayPal Partner's BN Code (if required).

¹ The BN code is the unique button source code provided by PayPal to its partners and added by its partners to the PayPal buttons used by merchants to offer the PayPal Services that are enabled through Partner Product. The button source code provides a means of identifying and tracking referred merchants' payments.

For further information on the options, refer to the PayPal Express Checkout documentation:
https://developer.paypal.com/docs/classic/api/merchant/SetExpressCheckout_API_Operation_NVP/.

21.5.4 Purchase details (Hosted and Direct Integrations)

The following request fields may be sent to provide information on the purchased items and to populate the cart on the PayPal Checkout.

Field Name	Mandatory?	Description
<code>shippingAmount</code>	No	Shipping costs.
<code>shippingDiscountAmount</code>	No	Discount applied to shipping costs.
<code>handlingAmount</code>	No	Handling costs.
<code>insuranceAmount</code>	No	Insurance costs.
<code>itemXXDescription</code>	No	Description of XX th item purchased.
<code>itemXXQuantity</code>	No	Quantity of XX th item purchased.
<code>itemXXAmount</code>	No	Gross amount for XX th item purchased.
<code>itemXXTaxAmount</code>	No	Tax amount for XX th item purchased.
<code>itemXXProductCode</code>	No	Product code for XX th item purchased.
<code>itemXXProductURL</code>	No	Shopping cart URL for XX th item purchased.
<code>itemXXSize</code>	No	Size of XX th item purchased in the format 'LengthxWidthxHeight Unit'.
<code>itemXXWeight</code>	No	Weight of XX th item purchased in the format 'Weight Unit'.
<code>items</code>	No	Nested array of line items.

Refer to section 15.2 for more information on these fields.

Note: The shopping cart items must total to the amount specified in the transaction. If they do not, cart items will not be sent to the PayPal Checkout.

21.6 Response Fields

21.6.1 Initial Response (Direct Integration)

These fields will be returned, in addition to the request fields from section 21.5.1 and the basic response fields in section 2.2 minus any card details.

Field Name	Mandatory?	Description
checkoutRef	Yes	Unique reference required to continue this transaction when the PayPal Checkout has completed.
checkoutName	Yes	Unique name of the Checkout. For PayPal this is the value paypal .
checkoutURL	Yes	URL required to load the PayPal Checkout.
checkoutRequest	No	Record containing details to send to provide to the PayPal Checkout.
checkoutOptions	No	Record containing any Checkout options passed in the request.
acquirerResponseDetails	Yes	Record containing details about the PayPal response containing any error messages and codes. This can be used together with the normal responseCode and responseMessage response fields to determine further the reason for any failure.

21.6.2 Continuation Response (Direct Integration)

These fields will be returned, in addition to the request fields from section 21.5.2, the initial response fields in section 21.6.1 and the basic response fields in section 2.2 minus any card details.

Field Name	Mandatory?	Description
checkoutRef	Yes	Provided if checkoutOnly was used in the continuation response to indicate that a further request will be sent to finalise the transaction.
checkoutName	Yes	Unique name of the Checkout. For PayPal, this is the value paypal .
checkoutDetails	Yes	Record containing options used to customise the PayPal Checkout. Refer to section 21.6.3 for values.
customerXXXX	No ¹	Customer details if provided by the PayPal Checkout as documented in section 17.1
deliveryXXXX	No ¹	Delivery details if provided by the PayPal Checkout as documented in section 17.4
acquirerResponseDetails	Yes	Record containing details about the PayPal response containing any error messages and codes. This can be used together with the normal responseCode and responseMessage response fields to determine further the reason for any failure.

¹ The response will include Customer/billing address and delivery address details if provided by the PayPal Checkout.

21.6.3 Checkout Details (Hosted and Direct Integration)

The following details may be provided in the `checkoutDetails` field included in the response. The details will be returned using the *record* format detailed in section 1.7.8

Sub-Field Name	Mandatory?	Description
<code>correlationID</code>	No	Correlation ID, which uniquely identifies the transaction to PayPal.
<code>checkoutStatus</code>	No	<p>Status of the Checkout session. If payment is completed, the transaction identification number of the resulting transaction is returned.</p> <p>Possible values are: PaymentActionNotInitiated PaymentActionFailed PaymentActionInProgress PaymentActionCompleted</p>
<code>invNum</code>	No	Merchant's invoice or tracking number, as set sent in <code>checkoutDetails.invNum</code> or assigned by the Gateway.
<code>custom</code>	No	Merchant's invoice or tracking number, as set sent in <code>checkoutDetails.custom</code> or assigned by the Gateway.
<code>paypalAdjustment</code>	No	A discount or gift certificate offered by PayPal to the buyer. This amount is represented by a negative amount. If the buyer has a negative PayPal account balance, PayPal adds the negative balance to the transaction amount, which is represented as a positive value.
<code>buyerMarketingEmail</code>	No ¹	Buyer's marketing email address.
<code>note</code>	No ²	Buyer's note to the Merchant.
<code>cartChangeTolerance</code>	No	<p>Indicates whether a cart's contents can be modified. If this parameter is not returned, then assume the cart can be modified. This will return NONE if financing was used in Germany.</p> <p>Possible values are: NONE – The cart cannot be changed. FLEXIBLE – The cart can be changed.</p>
<code>payerID</code>	No	Buyer's PayPal Customer Account ID.
<code>payerStatus</code>	No	<p>Buyer's PayPal status.</p> <p>Possible values are: verified unverified</p>

Sub-Field Name	Mandatory?	Description
billingName	No ³	Buyer's name. Also returned in customerName .
firstName	No ⁴	Buyer's first name. Also returned in customerName .
middleName	No ²	Buyer's middle name. Also returned in customerName .
lastName	No ²	Buyer's last name. Also returned in customerName .
suffix	No ²	Buyer's name suffix. Also returned in customerName .
business	No	Buyer's business name. Also returned in customerCompany .
street	No	Buyer's street first line. Also returned in customerAddress .
street2	No	Buyer's street second line. Also returned in customerAddress .
city	No	Buyer's city Also returned in customerTown .
state	No	Buyer's state. Also returned in customerCounty .
zip	No	Buyer's postal code. Also returned in customerPostcode .
countryCode	No	Buyer's country code. (ISO 2 char. code) Also returned in customerCountryCode .
countryName	No	Buyer's country name.
phoneNum	No	Buyer's contact phone number. Also returned in customerPhone .
email	No	Buyer's email address. Also returned in customerEmail .
shipToName	No	Name of person/entity to ship to. Also returned in deliveryName .
shipToStreet	No	Ship to street first line. Also returned in deliveryAddress .
shipToStreet2	No	Ship to street second line. Also returned in deliveryAddress .
shipToCity	No	Ship to city. Also returned in deliveryTown .

Sub-Field Name	Mandatory?	Description
shipToState	No	Ship to state. Also returned in deliveryCounty .
shipToZip	No	Ship to postal code. Also returned in deliveryPostcode .
shipToCountryCode	No	Ship to country code. (ISO 2 char. code) Also returned in deliveryCountryCode .
shipToCountryName	No	Ship to country name.
shipToPhoneNum	No	Ship to phone number. Also returned in deliveryPhone .
shipToAddressStatus	No	Status of shipping address on file with PayPal. Possible values are: none Confirmed Unconfirmed
addressNormalizationStatus	No ⁵	The PayPal address normalisation status for Brazilian addresses. Possible values are: None Normalized Unnormalized UserPreferred
amount	No	Total amount for this order.
itemAmount	No	Total item amount for this order.
taxAmount	No	Tax amount for this order.
exchangeRate	No	Exchange rate for this order.
shippingAmount	No	Shipping amount for this order.
handlingAmount	No	Handling amount for this order.
insuranceAmount	No	Insurance amount for this order.
shipDiscountAmount	No	Shipping discount amount for this order.
desc	No	Description of items the buyer is purchasing.
currencyCode	No	ISO 3-letter currency code.

Sub-Field Name	Mandatory?	Description
isFinancing	No	Indicates whether the Customer ultimately was approved for and chose to make the payment using the approved instalment credit. Possible values are: FALSE – financing not in use TRUE – financing approved and used
financingFeeAmount	No	The transaction financing fee associated with the payment. This will be set to the instalment fee amount that is the same as the estimated cost of credit or the interest/fees amount the user will have to pay during the lifetime of the loan. This field will only be included in instalment credit orders. In the case of “same as cash” or “no interest” offers, this will be set to 0.
financingTerm	No	The length of the financing term, in months. Example values are 6, 12, 18 and 24 months.
financingMonthlyPayment	No	This is the estimated amount per month that the Customer will need to pay including fees and interest.
financingTotalCost	No	This is the estimated total payment amount including interest and fees that the user will pay during the lifetime of the loan.
financingDiscountAmount	No	Discount amount for the buyer if paid in one instalment.
regularTakeFeeAmount	No	Fee of the regular take rate on the transaction amount. It could be equal to financingDiscountAmount in the case of non-instalment transactions.
noteText	No	Note to Merchant.
transactionID	No	PayPal transaction ID.
allowedPaymentMethod	No	The payment method type as specified in the initial request.
paymentRequestID	No	A unique identifier of the specific payment request.
bucketCategoryType	No	The category of a payment as specified in the initial request.
instrumentCategory	No	Identifies the category of the promotional payment instrument. Possible values are: 1 – PayPal Credit® (formerly Bill Me Later®). 2 – A Private Label Credit Card (PLCC) or co-branded payment card.

Sub-Field Name	Mandatory?	Description
instrumentID	No	An instrument ID (issued by the external party) corresponding to the funding source used in the payment.
shippingCalculationMode	No	Describes how the options that were presented to the buyer were determined. Possible values are: API – Callback API – Flatrate
insuranceOptionSelected	No	The option that the buyer chose for insurance. Possible values are: Yes – opted for insurance. No – did not opt for insurance.
shippingOptionIsDefault	No	Indicates whether the buyer chose the default shipping option. Possible values are: true – chose the default shipping option. false – did not choose the default shipping option.
shippingOptionAmount	No	The shipping amount that the buyer chose.
shippingOptionName	No	The name of the shipping option, such as Air or Ground.
scheduledShippingDate	No	The scheduled shipping date is returned only if scheduled shipping options are passed in the request.
scheduledShippingPeriod	No	The scheduled shipping period is returned only if scheduled shipping options are passed in the request.
sellerPayPalAccountID	No	Unique identifier for the merchant. For parallel payments, this field contains either the Payer Id or the email address of the merchant.
taxIDType	No	Buyer's tax ID type. This field is required for Brazil and used for Brazil only. For Brazil use only: The tax ID type is BR_CPF for individuals and BR_CNPJ for businesses.
taxID	No	Buyer's tax ID. This field is required for Brazil and used for Brazil only. For Brazil use only: The tax ID is 11 single-byte characters for individuals and 14 single-byte characters for businesses

Sub-Field Name	Mandatory?	Description
billingAgreementID	No	Identification number of the billing agreement. When the buyer approves the billing agreement, it becomes valid and remains valid until it is cancelled by the buyer.
billingAgreementAcceptedStatus	No	<p>Indicates whether the buyer accepted the billing agreement for a recurring payment. Currently, this field is always returned in the response for agreement based products, such as subscriptions; reference transactions; recurring payments; and regular single payment transactions.</p> <p>0 – Not accepted. 1 – Accepted.</p>
paymentStatus	No	<p>Status of the payment.</p> <p>Possible values are:</p> <p>None – No status.</p> <p>Canceled-Reversal – A reversal has been cancelled: for example, when you win a dispute and the funds for the reversal have been returned to you.</p> <p>Completed – The payment has been completed and the funds have been added successfully to your account balance.</p> <p>Denied – You denied the payment. This happens only if the payment was previously pending because of possible reasons described for the pendingReason element.</p> <p>Expired – The authorisation period for this payment has been reached.</p> <p>Failed – The payment has failed. This happens only if the payment was made from your buyer's bank account.</p> <p>In-Progress – The transaction has not terminated: for example, an authorisation may be awaiting completion.</p> <p>Partially-Refunded – The payment has been partially refunded.</p> <p>Pending – The payment is pending. See the pendingReason field for more information.</p> <p>Refunded – You refunded the payment.</p> <p>Reversed – A payment was reversed due to a chargeback or other type of reversal. The funds have been removed from your account balance and returned to the buyer. The reason for the reversal is specified in the reasonCode element.</p> <p>Processed – A payment has been accepted.</p> <p>Voided – An authorisation for this transaction has been voided.</p>

Sub-Field Name	Mandatory?	Description
refundStatus	No	<p>Status of the refund.</p> <p>Possible value are:</p> <p>none – returned if the refund fails</p> <p>instant – refund was instant</p> <p>delayed – refund was delayed</p>
pendingReason	No ⁶	<p>The reason the payment is pending.</p> <p>Possible values are:</p> <p>none – No pending reason.</p> <p>address – The payment is pending because your buyer did not include a confirmed shipping address and your Payment Receiving Preferences is set such that you want to accept or deny each of these payments manually. To change your preference, go to the Preferences section of your Profile.</p> <p>authorization⁷ – The payment is pending because it has been authorised but not settled. You must capture the funds first.</p> <p>echeck – The payment is pending because it was made by an eCheck that has not yet cleared.</p> <p>intl – The payment is pending because you hold a non-U.S. account and do not have a withdrawal mechanism. You must manually accept or deny this payment from your Account Overview.</p> <p>multi-currency – You do not have a balance in the currency sent, and you do not have your Payment Receiving Preferences set to automatically convert and accept this payment. You must manually accept or deny this payment.</p> <p>order – The payment is pending because it is part of an order that has been authorised but not settled.</p> <p>payment-review – The payment is pending while it is being reviewed by PayPal for risk.</p> <p>regulatory-review – The payment is pending while we make sure it meets regulatory requirements. You will be contacted again in from 24 to 72 hours with the outcome of the review.</p> <p>unilateral – The payment is pending because it was made to an email address that is not yet registered or confirmed.</p> <p>verify – The payment is pending because you are not yet verified. You must verify your account before you can accept this payment.</p> <p>other – The payment is pending for a reason other than those listed above. For more information, contact PayPal Customer Service.</p>

Sub-Field Name	Mandatory?	Description
reasonCode	No	<p>The reason for a reversal if the transaction type is reversal.</p> <p>Possible values are: none – No reason code. chargeback – A reversal has occurred on this transaction due to a chargeback by your buyer. guarantee – A reversal has occurred on this transaction due to your buyer triggering a money-back guarantee. buyer-complaint – A reversal has occurred on this transaction due to a complaint about the transaction from your buyer. refund – A reversal has occurred on this transaction because you have given the buyer a refund. other – A reversal has occurred on this transaction due to a reason not listed above.</p>
protectionEligibilityType	No	<p>The kind of seller protection in force for the transaction.</p> <p>Possible values are: ItemNotReceivedEligible – Merchant is protected by PayPal's Seller Protection Policy for Item Not Received. UnauthorizedPaymentEligible⁷ – Merchant is protected by PayPal's Seller Protection Policy for Unauthorised Payments. Ineligible – Merchant is not protected under the Seller Protection Policy. (Multiple values are separated by commas)</p>
feeAmount	No	PayPal fee amount charged for the transaction.
settleAmount	No	Amount deposited in your PayPal account after a currency conversion.
storeID	No	Store identifier as entered in the transaction.
terminalID	No	Terminal identifier as entered in the transaction.

¹ Only available if email option was enabled in the initial request using **checkoutOptions.buyerEmailOptInEnable** option.

² Only available if the leaving of notes was enabled in the initial request using **checkoutOptions.allowNote** option.

³ Permission is needed from PayPal to support this field.

⁴ These fields are used when no permission to use **billingName**.

⁵ This field is passed directly to PayPal and therefore the field name and value must be spelt 'ize' and not 'ise'.

⁶ **pendingReason** is returned in the response only if **paymentStatus** is **Pending**.

⁷ This value is received directly from PayPal and so will use the 'ize' and not 'ise' spelling.

21.7 Transaction Lifecycle

PayPal transactions will use the normal Authorise, Capture life cycle as documented in appendix A-14.1 with the following differences. In addition, the PayPal **paymentAction** option can be included in the **checkoutOptions** field to alter the normal payment lifecycle further, to allow an Order, Authorise, Capture model or a straight Sale model to be specified.

21.7.1 Order

If a **paymentAction** with a value of 'Order' is sent, then PayPal will store the transaction but delay authorising it until instructed. To instruct PayPal to authorise the transaction, a further management request can be sent to the Gateway with an **action** of 'AUTHORISE' and the **xref** of the transaction to authorise. Alternatively, the AUTHORISE command can be selected in the Merchant Management System (MMS). The transaction will be left in the 'received' state.

21.7.2 Authorise

If no **paymentAction** is specified or a **paymentAction** with a value of 'Authorize' is sent, then PayPal will authorise the transaction on receipt as per a standard card transaction and you can capture it later if you used the **captureDelay** field. *Note that the value uses the PayPal spelling 'Authorize', and not the British spelling 'Authorise'.*

For the first three days (by default) of the authorisation, funds are reserved. This is known as the honour period. After the honour period, captures can still be attempted, but may be returned with insufficient funds.

Authorisations have a fixed expiry period of 29 days.

21.7.3 Sale

If a **paymentAction** with a value of 'Sale' is sent, then PayPal will immediately capture the transaction after authorisation. The transaction will be regarded as having been settled and you will not be able to capture it manually and it will not be sent for settlement that evening. The transaction will be left in either the **accepted** or **rejected** terminal states depending on whether PayPal accepted or rejected the transaction.

21.7.4 Capture

Transactions that have been authorised by PayPal and not immediately settled due to a **paymentAction** of 'Sale' will be able to be captured as normal.

Captures are sent to PayPal immediately and the PayPal response and the transaction will be left in either the **accepted** or **rejected** terminal state depending on whether PayPal accepted or rejected the capture request.

There is no need to wait for the nightly settlement batch to run as with normal card transactions. This means that it is not possible to change the amount to be captured or cancel the transaction once a capture has been requested.

Note: PayPal allows multiple captures where they sum the individual capture amounts – ie in a different manner from the Gateway's, where only a single capture operation can be processed.

21.7.5 Refund

PayPal transactions can be refunded in the same way as normal card transactions. However, in the same way as capture requests, these will be sent to PayPal immediately and not batched up to be sent as part of the nightly settlement process. This means that the transaction will be left in either the **accepted** or **rejected** terminal state, depending on whether PayPal accepted or rejected the refund request.

Refunds can be made for full or partial amounts, with multiple refunds allowed up to the original authorised amount.

By default, PayPal allows a Merchant up to 60 days from the original authorised transaction date to perform refunds.

21.7.6 Cancel

You should cancel any transactions that you do not wish to capture in order to prevent 'pending' transactions on the Customer's PayPal account.

Authorisations should be cancelled when an initial authorisation was created to confirm the validity of funds during checkout, but the goods will not ship for a significant amount of time (>29 days). Cancelling the transaction will mean that you will have to contact the Customer for an alternative payment method.

All transactions must be completed by being captured or cancelled.

21.7.7 Pending Payments

PayPal may put a transaction into a pending state when flagged for additional fraud review. This state is known to PayPal as payment review or IPR.

IPR transactions will be automatically cancelled by the Gateway and treated as referred transactions with a **responseCode** of **2** and a **responseMessage** indicating the reason that the transaction was put into a pending state. Unlike card referred transactions, an authorisation code cannot be obtained from PayPal verbally and then the transaction resent.

21.8 Reference Transactions

PayPal does not allow ad hoc Credentials on File (COF) type repeat or recurring transactions using the **xref** of a reference transaction unless that transaction has specifically started a PayPal Billing Agreement.

If you want to be able to make future repeat or recurring transactions, then the initial transaction must include the **billingType** and **billingAgreementDescription** options in the **checkoutOptions** so as to identify this transaction as the start of a recurring billing sequence.

This will cause the Gateway to request PayPal to set up a Billing Agreement between you and the Customer. In this case, the PayPal Billing Agreement ID will be returned as part of the **checkoutDetails** and displayed on the Merchant Management System (MMS) as part of the payment details, so that you can easily see which PayPal transactions can be used for recurring billing.

22 Amazon Pay Transaction

22.1 Background

Amazon Pay is an additional payment method that is available to all Merchants using the Gateway that have an Amazon Pay account.

To use Amazon Pay, you will be supplied with a separate Amazon Pay Merchant account that can be grouped with your main Merchant account using the account mapping facility as documented in appendix A-7. This allows transactions to be sent using your main Merchant Account and then routed automatically to the Amazon Pay Merchant Account in the same mapping group.

It allows you to offer payment via Amazon Pay in addition to normal card payments.

Amazon Pay transactions will appear in the Merchant Management System (MMS) alongside any card payments and can be captured, cancelled and refunded in the same way as card payments.

Amazon Pay transactions can also be used for recurring billing but require you to indicate in the initial transaction that it will be the basis for recurring billing and a billing agreement will be entered into between your Customer and Amazon Pay when they agree to the payment.

Amazon Pay transactions cannot be used for ad-hoc Credentials on File (COF) repeat transactions unless a billing agreement has been set up.

For more information on how to accept Amazon Pay transactions, please contact customer support.

Amazon Pay is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

22.2 *Benefits and Limitations*

22.2.1 Benefits

- Provides your customers with the flexibility of paying using their Amazon Pay account when this is more suitable to them.
- The Amazon Pay Checkout can be added as an overlay on the standard checkout to help improve conversion rates with an easier way to pay without customers leaving your website.
- There are no extra costs to add an Amazon Pay Merchant Account. However, you will still be liable for the Amazon Pay transaction fees.
- The full Amazon Pay transaction information is available and returned as part of the transaction.
- Transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.

22.2.2 Limitations

- You will need an Amazon Pay account.
- Recurring transactions are not supported unless part of a prearranged billing agreement.
- Independent refunds that are not tied to a previous sale transaction are not supported without prior agreement.
- Transactions require a browser in order to display the Amazon Pay Checkout widgets.

22.3 Hosted Implementation

If a transaction is sent to the Hosted Integration using a **merchantID** that is part of a routing group containing an Amazon Pay Merchant, then the Hosted Payment Page will display an Amazon Pay payment button which, when clicked, will open the Amazon Pay Checkout and allow the Customer to pay using their Amazon Pay account.

To customise the Amazon Pay Checkout experience, you may send various options in the **amazonPayCheckoutOptions** field in your initial request.

Additional information available from Amazon Pay will be made available in the **checkoutDetails** response field.

Note: Custom Hosted Payment Pages might not support the displaying of the Amazon Pay Checkout button. If you have a custom page that doesn't support this, then you would need to contact support to have your Hosted Payment Page upgraded.

22.4 Direct Implementation

Amazon Pay transactions require you to display an Amazon Pay Checkout to your Customer as part of the transaction flow. The transaction must be done in two stages, with the Checkout page being displayed between the stages. They can also optionally be done in three stages, allowing you to display an order confirmation after the Checkout page and before authorising the transaction. You can change the amount at this stage to allow for shipping costs when you know the confirmed delivery address the Customer selected as part of the Amazon Pay Checkout.

Amazon Pay do not provide a ready built Checkout page and require you to create one on your servers using the JavaScript widget toolkit they provide.

Amazon Pay supports the normal payment and management actions. This section explains how to make payment requests. Management requests are performed as detailed in section 3.

To customise the Amazon Pay Checkout experience, you may send various options in the **checkoutOptions** field in your initial request.

Additional information available from the Amazon Pay Checkout will be made available in the **checkoutDetails** response field.

The direct integration uses two complex fields to pass data between the Amazon Pay JavaScript widgets and the Gateway. The **checkoutRequest** field will be provided by the Gateway and is a record whose name/value properties should be used to help initialise the widgets. The corresponding **checkoutResponse** field should be returned to the Gateway and must be a record containing name/value properties received from the widgets.

The contents of the **checkoutOptions**, **checkoutDetails**, **checkoutRequest** and **checkoutResponse** fields are formatted using the *record* format detailed in section 1.7.8, the **checkoutOptions** field also supports being provided using the *serialised record* format.

22.4.1 Initial Request (Checkout Preparation)

To request that a transaction be processed via Amazon Pay, the request must contain a **paymentMethod** of 'amazonpay'. In addition, you may send **checkoutOptions** to customise the Checkout experience. When the Gateway receives this **paymentMethod**, assuming there are no other errors with the request, it will attempt to find a suitable Amazon Pay Merchant Account in the current account mapping group (refer to appendix A-7).

If the Gateway is unable to find a suitable account, then the transaction will be aborted, and it will respond with a **responseCode** of **66364 (INVALID PAYMENTMETHOD)**.

Otherwise, the Gateway will respond with a **responseCode** of **65826 (CHECKOUT REQUIRED)** and the response will include a **checkoutURL** field containing the URL required to load the Amazon Pay JavaScript Widgets; and a **checkoutRequest** containing any data required by those Widgets. The response will also contain a unique **checkoutRef** that must be echoed back in the continuation requests.

At this point, your server must create an Amazon Pay Checkout page using their JavaScript Widgets. Further details on how to use the Widgets are provided in the Amazon Pay guide at https://developer.amazonpay.com/docs/classic/express-checkout/in-context/enable_in_context_checkout/.

22.4.2 Continuation Request (Checkout Details and Authorise)

On completion of the Amazon Pay Widgets, the Merchant should send the information created by the Widgets to the Gateway together with a **status** value. If the Checkout was successful, the status will be 'success'; alternatively, if the Checkout was cancelled, the status will be 'cancel'. Any **accessToken** generated by the Amazon Pay Login Widget; **orderReferenceID**, generated by the Wallet or Address Widgets; and **billingAgreementID** generated by the optional Billing Widget, must be added to the **checkoutResponse** field and sent in a new request to the Gateway. The **checkoutResponse** field can be sent either as a URL query string; as a JSON encoded string; or as an array of parameters. This new request will load the Checkout details, including any purchaser and delivery address details as required, and send the transaction to Amazon Pay for authorisation, returning the result as in the case of a normal authorisation transaction. The new request must contain the **checkoutRef** received in the initial response.

22.4.3 Separate Checkout Details and Authorisation Requests

You can choose to obtain the Checkout details before actually sending the transaction for authorisation by sending the **checkoutOnly** field in the above continuation request. If this field is sent with a value of 'Y' then the Gateway will load the Checkout details and then return them to you without sending the request for authorisation. You can then display them and/or adjust the amount, for example, according to delivery charges appropriate to the received delivery address. You should then send a new request containing the **checkoutRef** received to continue the transaction and authorise it.

Note: this stage can be repeated multiple times by including the **checkoutOnly** field with a value of 'Y' each time. To complete the transaction, the final request must not contain the **checkoutOnly** field or it must not have a value of 'Y'.

22.5 Request Fields

22.5.1 Initial Request (Hosted and Direct Integration)

These fields should be sent in addition to basic request fields in section 2.1 excluding any card details.

Field Name	Mandatory?	Description
paymentMethod	Yes ¹	Must contain the value 'amazonpay' in lower case letters only.
checkoutRedirectURL	No ²	Reserved for future use.
checkoutOptions	No ³	Record containing options used to customise the Amazon Pay Checkout. Refer to section 22.5.3 for values.
amazonPayCheckoutOptions	No ⁴	Record containing options used to customise the Amazon Pay Checkout. Refer to section 22.5.3 for values.

¹ Optional for Hosted Integration

² Not required for Hosted Integration.

³ Direct Integration Only

⁴ Hosted Integration Only

22.5.2 Continuation Request (Direct Integration)

These fields may be sent alone¹.

Field Name	Mandatory?	Description
checkoutRef	Yes	Unique reference return in the initial response.
checkoutResponse	Yes	The data received from the Amazon Pay Checkout Widgets together with a status value.
checkoutOnly	No	Pass Y to complete the processing as far as the next Checkout stage and then return with the loaded Checkout details.

¹ It is only necessary to send the **checkoutRef** and the **checkoutResponse** in the continuation request because the **checkoutRef** will identify the Merchant Account and initial request. The message does not have to be signed. You can send any of the normal request fields to modify or supplement the initial request – however, in this case the request should be signed. The **checkoutRedirectURL** and **checkoutOptions** fields sent in the initial request cannot be modified and any sent in the second request must match those used in the first request, or the second request will fail with a **responseCode** of **64442 (REQUEST MISMATCH)**.

22.5.3 Checkout Options (Hosted and Direct Integration)

The following options may be sent in the **amazonPayCheckoutOptions** Hosted Integration field or the **checkoutOptions** Direct Integration field to customise the Amazon Pay Checkout. The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Sub-Field Name	Description
billingAgreementRequired	Can be used to specify that a billing agreement must be started. Alternatively, the rtAgreementType standard integration field can be used with a value of 'recurring' or 'instalment'.
shippingAddressRequired	Indication that the shipping address is required, and the Address Checkout Widget will be used.
sellerOrderID	The Merchant specified identifier for this order. If not sent, then any value in the merchantOrderRef standard integration field is used.
sellerNote	Represents a description of the order that is displayed in emails to the buyer.
sellerAuthorizationNote	A description for the authorisation transaction that is shown in emails to the buyer.
sellerCaptureNote	A description for the capture that is displayed in emails to the buyer.
sellerBillingAgreementID	The Merchant specified identifier for this billing agreement. If not sent, then any value in the rtPolicyRef standard integration field is used.
customInformation	Any additional information that you want to include with this order reference
supplementaryData	Supplementary data.
softDescriptor	The description to be shown on the buyer's payment statement
billingAgreementRequired	Can be used to specify that a billing agreement must be started. Alternatively, the rtAgreementType standard integration field can be used with a value of 'recurring' or 'instalment'.
shippingAddressRequired	Indication that the shipping address is required, and the Address Checkout Widget will be used.

For further information on the options refer to the Amazon Pay API Reference Guide:

<https://pay.amazon.com/us/developer/documentation/apireference/201751630>

22.5.4 Response Fields

22.5.5 Initial Response (Direct Integration)

These fields will be returned in addition to the request fields from section 21.5.1 and the basic response fields in section 2.2 minus any card details.

Field Name	Mandatory?	Description
checkoutRef	Yes	Unique reference required to continue this transaction when the Amazon Pay Checkout has completed.
checkoutName	Yes	Unique name of the Checkout. For Amazon Pay this is the value amazonpay .
checkoutURL	Yes	URL required to load the Amazon Pay JavaScript Widgets.
checkoutRequest	No	Record containing data required for the Amazon Pay Widgets such as: <ul style="list-style-type: none"> • merchantID – Amazon Pay merchant id • clientID – Amazon Pay client id • sandbox – true if Amazon Pay sandbox • region – Amazon Pay API region code • scope – Login Widget scope parameter
checkoutOptions	No	Record containing any Checkout options passed in the request.
acquirerResponseDetails	Yes	Record containing details about the Amazon Pay response containing any error messages and codes. This can be used together with the normal responseCode and responseMessage response fields to further determine the reason for any failure.

22.5.6 Continuation Response (Direct Integration)

These fields will be returned in addition to the request fields from section 21.5.2, the initial response fields in section 21.6.1 and the basic response fields in section 2.2 minus any card details.

Field Name	Mandatory?	Description
checkoutRef	Yes	Provided if checkoutOnly was used in the continuation response to indicate that a further request will be sent to finalise the transaction.
checkoutName	Yes	Unique name of the Checkout. For Amazon Pay this is the value amazonpay .
checkoutDetails	Yes	Record containing values made available by the Amazon Pay Checkout. Refer to section 22.5.7 for values.
customerXXXX	No ¹	Customer details if provided by the Amazon Pay Checkout as documented in section 17.1
deliveryXXXX	No ¹	Delivery details if provided by the Amazon Pay Checkout as documented in section 17.4
receiverXXXX	No	Buyer details if provided by Amazon Pay as documented in section 17.5. Amazon Pay will usually provide the buyer's name, postcode and email only, which are returned in the receiverName , receiverPostcode and receiverEmail fields accordingly
acquirerResponseDetails	Yes	Record containing details about the Amazon Pay response containing any error messages and codes. This can be used together with the normal responseCode and responseMessage response fields to further determine the reason for any failure.

¹ The response will include Customer/billing address and delivery address details if provided by the Amazon Pay Checkout.

22.5.7 Checkout Details (Hosted and Direct Integration)

The **checkoutDetails** field included in the response above will contain the following values and any further values received from Amazon Pay allowing the Merchant to see the full Amazon Pay order information. The details will be returned using the *record* format detailed in section 1.7.8

Sub-Field Name	Mandatory?	Description
referenceID	No	Amazon Pay reference id. Either the orderReferenceID or the billingReferenceID where appropriate.
accessToken	No	Amazon Pay order reference id as sent in the continuation request checkoutResponse data.
bilingAgreementID	No	Amazon Pay order reference id as sent in the continuation request checkoutResponse data.
orderReferenceID	No	Amazon Pay order reference id as sent in the continuation request checkoutResponse data.

22.6 Transaction Lifecycle

Amazon Pay transactions will use the normal Authorise, Capture life cycle as documented in appendix A-14.1 with the following differences.

22.6.1 Capture

Captures made by the Direct Integration or Merchant Management System (MMS) are sent to Amazon Pay immediately the transaction will be left in either the **accepted** or **rejected** terminal state depending on whether Amazon Pay accepted or rejected the capture request. Unlike card payments captures do not flag the transaction to be included in the nightly settlement batch and therefore, when done they cannot be redone. This means that it is not possible to change the amount to be captured or cancel the transaction when a capture has been requested.

Captures that are not explicitly performed such as normal transactions or those with a captureDelay are still done as part of the nightly settlement batch.

Transactions that are not captured within 3 days will be placed in a pending state in the Amazon Pay system which is reflected as the **tendered** state in the Gateway and will show on the Merchant Management System as being settled.

22.6.2 Refund Sale

Amazon Pay transactions can be refunded the same as normal card transactions however, like capture requests, these will be sent to Amazon Pay immediately and not batched up and sent as part of the nightly settlement process. This means the transaction will be left in either the **accepted** or **rejected** terminal state depending on whether Amazon Pay accepted or rejected the refund request.

Refunds can be made for full or partial amounts, with multiple refunds allowed up to the original authorised amount.

22.7 Reference Transactions

Amazon Pay does not allow ad hoc Credentials on File (COF) type repeat or recurring transactions using the **xref** of a reference transaction unless that transaction has specifically started an Amazon Pay Billing Agreement.

If you want to be able to make future repeat or recurring transactions, then the initial transaction must include an **rtAgreementType** of **recurring** or **instalment**. Alternatively, the **billingAgreementRequired** option can be included in the **checkoutOptions** so as to identify this transaction as the start of a recurring billing sequence.

This will cause the Gateway to request Amazon Pay setup a Billing Agreement between you and the Customer. In this case the Amazon Pay Billing Consent Widget must be used in the Checkout and the **billingAgreementID** it creates sent in the **checkoutResponse** data in the continuation request. Any billing agreement id will be displayed on the Merchant Management System (MMS) as part of the payment details so that you can easily see which Amazon Pay transactions can be used for recurring billing.

23 PPRO Transactions

23.1 Background

PPRO is an additional payment method that is available to all Merchants using the Gateway that have an PPRO account.

To use PPRO you will be supplied with a separate PPRO Merchant account that can be grouped with your main Merchant Account using the account mapping facility as documented in appendix A-7. This allows transactions to be sent using your main Merchant Account and then routed automatically to the PPRO Merchant Account in the same mapping group.

PPRO is an Acquirer that offers many Alternative Payment Methods (APM), that you can then offer to your Customers.

E-wallets, SMS payments and PSP services are some of the many payment methods PPRO support (eg Alipay, EasyPay, Bancontact). This could allow a business to facilitate overseas transactions or alternative payment methods using a different payment method suitable for that country or business plan.

All transactions created with this payment method will appear in the Merchant Management System (MMS) together with the payment method that was used to process the transaction.

PPRO transactions cannot be used for ad-hoc Credential on File (COF) repeat transactions or for recurring billing.

For more information on how to accept PPRO transactions please contact customer support.

PPRO is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

23.2 *Benefits and Limitations*

23.2.1 Benefits

- Multiple alternative payment methods could be used.
- Expands range of payment methods for international use.
- Supports a variety of e-wallets, SMS and PSP's.
- Ability to perform refunds on supported payment methods.
- Transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.

23.2.2 Limitations

- You will need a PPRO account.
- Payment authorisation is not always instantaneous and may require additional 'QUERY' requests.
- An alternative payment method may only support one or a limited set of currencies or countries.
- Alternative payment methods require a browser in order to display their Checkout.

23.3 Hosted Implementation

If a transaction is sent to the Hosted Integration using a **merchantID** which is part of a routing group containing a PPRO Merchant Account, then the Hosted Payment Page will show alternative payment method buttons for each payment method listed in the **allowedPaymentMethods** field. When clicked on the Hosted Payment Page may request further details from the Customer before opening the APM Checkout allowing the Customer to pay using that APM.

To customise the alternative payment methods checkout experience, you may send various options in the **pproCheckoutOptions** field in your initial request.

Additional information available from PPRO will be made available in the **checkoutDetails** response field.

Note: Custom Hosted Payment Pages might not support the displaying of the Alternative Payment Methods. If you have a custom page that doesn't support this, then you would need to contact support to have your Hosted Payment Page upgraded.

23.4 Direct Implementation

PPRO transactions require you to display the alternative payment method's Checkout to your Customer as part of the transaction flow. The transaction must be done in two stages with the Checkout being displayed between the stages.

PPRO supports only the SALE, REFUND_SALE actions. This section explains how to make payment requests. Management requests are performed as detailed in section 3.

To customise the alternative payment method's Checkout experience, you may send various options in the **checkoutOptions** field in your initial request.

Additional information available from the alternative payment method's Checkout will be made available in the **checkoutDetails** response field.

The direct integration uses two complex fields to pass data between PPRO and the Gateway. The **checkoutRequest** field will be provided by the Gateway and is a record whose name/value properties represent the data provided in the **checkoutURL** and is provided for information purposes only. The corresponding **checkoutResponse** field should be returned to the Gateway and must be a record containing name/value properties received from the Checkout when it redirects the Cardholder's browser back to the URL provided using the **checkoutRedirectURL** on completion.

The contents of the **checkoutOptions**, **checkoutDetails**, **checkoutRequest** and **checkoutResponse** fields are formatted using the *record* format detailed in section 1.7.8, the **checkoutOptions** field also supports being provided using the *serialised record* format.

23.4.1 Payment Request

To request that a transaction be processed via PPRO the request must contain a **paymentMethod** of 'ppro.XXXX', where XXXX is the PPRO payment method tag listed in section 23.4.3 below. The request must also have a **checkoutRedirectURL** containing the URL of a page on your server to return to when the alternative payment method's Checkout is closed. In addition, you may send **checkoutOptions** to provide further custom fields required by the alternative payment method as details in section 23.4.2 below.

When the Gateway receives these fields, assuming there are no other errors with the request, it will attempt to find a suitable PPRO Merchant Account in the current account mapping group (Refer to appendix A-7).

If the Gateway is unable to find a suitable account, then the transaction will be aborted, and it will respond with a **responseCode** of **66364 (INVALID PAYMENTMETHOD)**.

Otherwise, the Gateway will respond with a **responseCode** of **65826 (CHECKOUT REQUIRED)** and included in the response will be a **checkoutURL** field containing the URL that the buyer's browser should be redirected to in order to complete the payment. The response will also contain a unique **checkoutRef** which must be echoed back in the continuation requests.

On completion of the third-party payment the browser will be directed to the **checkoutRedirectURL** you provided, complete with information about the payment in a HTTP POST request. The posted data will contain a **checkoutResponse** field that will contain any specific response data for the payment method.

23.4.2 Payment Specific Fields

Most of the information required by the alternative payment methods can be supplied using the standard Gateway request fields. However, there may be specific mandatory fields required by a payment method which are not available using the standard fields. In these cases, these fields can be sent in the **checkoutOptions** data, the value of which must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

For example, most European services may require the **nationalid** and **consumerref** fields.

Recurring transactions will require the use of **iban** (optionally **sequencetype**) and in follow-up payments; **mandatereference**, **mandatesignaturedate**, and **sequencetype**.

These fields are documented in your PPRO integration guide as **SPECIN** fields.

Customer support will be able to guide you on any mandatory options as you will find the transaction will fail with a **responseCode** of **65550 (PROCESSOR_ERROR - Invalid request data)** if any are missing.

23.4.3 Payment Method Tags

To specify which alternative payment method is required you need to send the **paymentMethod** field with a value using the format is 'ppro.XXXX', where XXXX is the alternative payment method's tag name as assigned by PPRO.

For example, to use the alternative payment method AstroPay Card that has a tag name of "astropaycard" (all lowercase); the resulting payment method code would be "ppro.astropaycard". This allows the Gateway to know that you're attempting to use AstroPay Card using the PPRO payment method.

The table below is a guide to the tag names available. This list is fluid as PPRO add and remove methods.

If you know of a payment method that is not on this list or the payment method cannot be used; please contact customer support for advice.

Payment Method Tag	Payment Method Name
affinbank	Affin bank
alipay	AliPay
ambank	AmBank

Payment Method Tag	Payment Method Name
argencard	Argencard
astropaycard	AstroPay Card
astropaydirect	AstroPay Direct
aura	Aura
baloto	Baloto
banamex	Banamex
bancodobrasil	Banco do Brasil
bancodechile	Banco de Chile
bancodeoccidente	Banco de Occidente
bancomer	Bancomer
bankislam	Bank Islam
bcmc	Bancontact
bitpay	Bitpay
boleto	Boleto Bancario
bradesco	Bradesco
cabal	Cabal
cartaomercadolivre	Cartao Mercado Livre
carulla	Carulla
ccauth	Credit/Debit Card
ccweb	Credit/Debit Card
cencosud	Cencosud
cimbclicks	CIMB Clicks
cmr	CMR
davivienda	Davivienda
directpay	Sofortüberweisung (Direct Pay)
dragonpay	Dragonpay
easypay	EasyPay
efecty	Efecty

Payment Method Tag	Payment Method Name
elo	Elo
empresedeenergia	Emprese de Energia
enets	eNETS
entercash	Entercash
eps	EPS
estonianbanks	Estonian Banks
giropay	Giropay
hipercard	Hipercard
hongleongbank	Hong Leong Bank
ideal	iDEAL
instanttransfer	Instant Transfer
int_payout	International Pay-Outs
itau	Itau
latvianbanks	Latvian Banks
lithuanianbanks	Lithuanian Banks
magna	Magna
maxima	Maxima
maybankwou	Maybank2u
multibanco	Multibanco
mybank	MyBank
myclearfpx	MyClear FPX
naranja	Naranja
narvesen	Narvesen
nativa	Nativa
oxxo	OXXO
p24	Przelewy24
p24payout	Przelewy24 Payout
pagofacil	Pago Facil

Payment Method Tag	Payment Method Name
paypost	PayPost
paysafecard	Paysafe Card
paysbuy	Paysbuy
paysera	Paysera
payu	PayU
perlas	Perlas Terminals
poli	OLI
presto	Presto
pse	PSE
pugglepay	Pugglepay
qiwi	QIWI
qiwipayout	QIWI Payout
rapipago	Rapipago
redpagos	Redpagos
rhbbank	RHB Bank
safetypay	SafetyPay
santander	Santander
sepadirectdebit	SEPA DirectDebit
sepapayout	SEPA Payout
seveneleven	Seveneleven (7eleven)
singpost	SingPost
skrill	Skrill
surtimax	Surtimax
tarjetashopping	Tarjeta Shopping
trustly	Trustly
trustpay	TrustPay
unionpay	UnionPay
verkkopankki	Verkkopankki – Finish Online Banking

Payment Method Tag	Payment Method Name
webpay	Webpay
yellowpay	Yellow Pay

23.5 Request Fields

23.5.1 Initial Request (Hosted and Direct Integration)

These fields should be sent in addition to the basic request fields in section 2.1 excluding any card details.

Field Name	Mandatory?	Description
paymentMethod	Yes ¹	Payment method to be used with PPRO (eg ppro.astropay , ppro.alipay , etc.).
checkoutRedirectURL	Yes ²	URL on Merchant's server to return to when the Alternative Payment Method's Checkout is closed.
checkoutOptions	No ^{3,4}	Record containing options used to customise the alternative payment methods Checkout. Refer to section 23.5.2 for values.
pproCheckoutOptions	No ^{5,4}	Record containing options used to customise the alternative payment methods Checkout. Refer to section 23.5.2 for values.

¹ Optional in Hosted Integration.

² Not required for Hosted Integration.

³ Direct Integration only.

⁴ Whilst the Gateway does not see this field as mandatory, PPRO may have payment methods that require additional configuration using checkout options.

⁵ Hosted Integration Only

23.5.2 Checkout Options (Hosted and Direct Integration)

The following options may be sent in the **pproCheckoutOptions** Hosted Integration field or the **checkoutOptions** Direct Integration field to customise the Checkout. The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Sub-Field Name	Description
nationalid	Consumer's national ID (up to 30 characters).
consumerref	Unique reference identifying the consumer within 1 to 20 characters and a format of A-Za-z0-9.%,&/+*\$-
siteid	Unique site identifier. Required for clients serving multiple points of sale and forwarded onwards whilst using the qiwi payment method.
iban	Valid IBAN of consumer/destination account.
sequencetype	Sequence type of the direct debit. Possible values are: oneOff – The direct debit is executed once (default) first – First direct debit in a series of recurring ones
mandatereference	Mandate reference as returned on the first transaction in the sequence (found from mandatereference in checkoutDetails)
mandatesignaturedate	Date of the initial transaction.
bic	Valid BIC (8 or 11 alphanumeric letters) – optionally supplied to skip the bank selection page (by using the bank referenced by BIC as supplied)
clientip	Optional IP address of the consumer during checkout using Trustly (127.0.0.1 is not allowed!)
address	Customer's billing address ¹
city	Customer's billing city ¹
phone	Customer's phone ¹
mobilephone	Customers mobile phone ¹
dob	MCC 6012 Date of Birth ¹
dynamicdescriptor	Statement narrative ¹

¹ This information is supplied to PPRO by default using the following fields: customerAddress, customerPostcode, customerTown, customerEmail, customerPhone, customerMobile, receiverDateOfBirth, statementNarrative1.

23.6 Response Fields

23.6.1 Initial Response (Direct Integration)

The fields below will be returned in addition to the basic response fields in section 2.2 for the start of a PPRO transaction and the PPRO checkout process.

Field Name	Mandatory?	Description
<code>checkoutRef</code>	Yes	Unique reference required to continue this transaction when the PPRO Checkout has completed.
<code>checkoutName</code>	Yes	The <code>paymentMethod</code> you used to identify the PPRO payment method.
<code>checkoutRedirectURL</code>	Yes	The URL to redirect the Customer to, to start the checkout process.
<code>checkoutOptions</code>	Yes	Record containing any Checkout options provided in the request.
<code>checkoutDetails</code>	Yes	Record containing additional information provided from the payment method used during checkout.
<code>checkoutRef</code>	Yes	The unique reference required to continue the transaction when PPRO checkout is complete.
<code>checkoutRequest</code>	Yes	Record containing the redirect secret, checksum and request status.

23.6.2 Completion Response (Hosted and Direct Integration)

Fields from the initial response in the previous section may be present as well as the fields below and will not contain any card details.

Field name	Mandatory?	Description
<code>checkoutResponse</code>	Yes	Containing additional information provided by the Checkout. Any change in the payment's status will be given in <code>responseMessage</code> and <code>responseCode</code> ¹
<code>checkoutStatus</code>	Yes	A string containing the result of the checkout process. This is not used to identify the transaction's payment status.

¹ Not all payment methods give an immediate payment status. This will require a further QUERY to the Gateway to see whether this value has changed to a status of 'tendered'.

23.6.3 Notifications and “Tendered” Payments

Whilst some payment methods give an immediate payment status (ie direct card payment methods rather than SMS and e-wallet systems), some payments may come back with the status of ‘tendered’. At this time, online shopping modules will not be able to monitor the transaction status. The use of a QUERY request may be of use as seen in section 1.9.8. Please ask customer support in this matter who will be able to give more information and may be able to provide better advice for your situation.

Notifications from PPRO regarding the payment status, seconds, minutes or hours after the checkout will automatically update the transaction status.

24 Pay by Bank app (PBBA) Transactions

24.1 Background

Pay by Bank app (PBBA) is an additional payment method that is available to all Merchants using the Gateway that have a Pay by Bank app account and an OBN Global Acquiring account.

PBBA, formerly known as Zapp, is an innovative, secure, and fully digital payment option in the UK, built and operated by VocaLink, a Mastercard company. It allows your Customers to pay, in real time, using the banking app on their phone. It's designed to make online checkout easier, whilst using all the security of their bank. Payments work through secure digital tokens, meaning your Customers never reveal any of their financial details when they are shopping.

To use PBBA you will be supplied with a separate PBBA Merchant account that can be grouped with your main Merchant Account using the account mapping facility as documented in appendix A-7. This allows transactions to be sent using your main Merchant Account and then routed automatically to the PBBA Merchant Account in the same mapping group.

All transactions created with this payment method will appear in the Merchant Management System (MMS) together with the payment method that was used to process the transaction.

PBBA transactions cannot be used for ad-hoc Credentials on File (COF) repeat transactions or for recurring billing.

For more information on how to accept PBBA transactions please contact customer support.

Pay by Bank app (PBBA) transactions are only available with an OBN Global merchant account. This payment method is pre-release and these integration details maybe subject to change before general release.

PBBA is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration.

24.2 Benefits and Limitations

24.2.1 Benefits

- Increased conversion rate through a simple, quick payment process.
- Secure payment processing in real time.
- Lower transaction cost compared to card payments.
- Minimal fraud risk thanks to 'Request to Pay' technology.
- Quick and convenient processing of refunds and disputes.
- Integration on websites and in mobile apps.
- Transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.

24.2.2 Limitations

- You will need a PBBA account and OBN Acquiring account.
- Recurring transactions are not supported.
- Independent refunds are not supported.
- Transactions require a browser or mobile device in order to display the PBBA Checkout.
- Your Customer will need a mobile device in order to display their Banking app.
- Payment authorisation is not instantaneous and will require additional 'QUERY' requests.
- Only available in the UK.
- Transactions require a browser or mobile device in order to display the PBBA Checkout.
- Customers require a mobile device in order to display their Banking app.

24.3 Hosted Implementation

If a transaction is sent to the Hosted Integration using a **merchantID** that is part of a routing group containing an PBBA Merchant, then the Hosted Payment Page will display a Pay by Bank App payment button which, when clicked, will display a Basket Reference Number (BRN) which the Customer can enter into their mobile banking application to complete the payment. When payment has been completed the Hosted Payment Page will display a payment confirmation page in the usual manner.

Only SALE transactions are supported.

Additional information available about the PBBA transaction will be made available in the **checkoutDetails** response field.

Note: Custom Hosted Payment Pages might not support the displaying of the Pay by Bank App payment button. If you have a custom page that doesn't support this, then you would need to contact support to have your Hosted Payment Page upgraded.

24.4 Direct Implementation

PBBA transactions are designed to be integrated with and invoked by the Merchant Button Integration Library code made available by Mastercard for embedding the PBBA payment button on your website or mobile application¹.

PBBA supports only supports the SALE, REFUND_SALE, CANCEL and CAPTURE actions. This section explains how to make payment requests. Management requests are performed as detailed in section 3.

24.4.1 Payment Request

To request that a transaction be processed via PBBA, the request must contain a **paymentMethod** of 'pbba'. In addition, you must send **checkoutOptions** to provide information about the Customer's device. When the Gateway receives these two fields, assuming there are no other errors with the request, it will attempt to find a suitable PBBA Merchant Account in the current account mapping group (refer to appendix A-7).

If the Gateway is unable to find a suitable account, then the transaction will be aborted, and it will respond with a **responseCode** of **66364 (INVALID PAYMENTMETHOD)**.

Otherwise, the Gateway will initiate the PBBA transaction and respond with a **responseCode** of **0 (SUCCESS)** and included in the response will be a **checkoutDetails** field containing the Basket Reference Number (BRN) that should be displayed to the Customer.

Please note that the payment has not completed until the Customer enters the BRN into their mobile banking application and confirms the payment. The response will contain a **state** of received until the Gateway has received confirmation from the banking network that the payment has been confirmed by the Customer.

To determine when payment has completed you may periodically poll the Gateway using a QUERY request to check the **state** of the transaction. For more information on the QUERY request, please refer to section 1.9.8

¹ The current PBBA Merchant Integration Libraries are available from Mastercard.

24.5 Request Fields

24.5.1 Payment Request (Hosted and Direct Integration)

These fields should be sent in addition to the basic request fields in section 2.1 excluding any card details.

Field Name	Mandatory?	Description
paymentMethod	Yes ¹	Payment method to be used. Must be pbba .
checkoutOptions	No ^{2,3}	Record containing options used to customise the PBBA Checkout. Refer to section 24.5.2 for values.

¹ Optional in Hosted Integration.

² Direct Integration only.

³ Whilst the Gateway does not see this field as mandatory, PBBA mandates that certain options are provided.

24.5.2 Checkout Options (Direct Integration)

The following options must be sent in the **checkoutOptions** Direct Integration field to customise the Checkout. *Unlike other payment methods these options are mandatory and must be sent.* The options must be formatted using the *record* or *serialised record* formats detailed in section 1.7.8.

Sub-Field Name	Description
device.type	Consumer device type. This field is mandatory and has no default value. Possible values are: ATM – ATM device MOBLPHN – Mobile phone device PCLAPTP – PC or Laptop device TABLET – tablet device OTHERS – other device type
device.os	Consumer device operating system. This field is mandatory and has no default value. Possible values are: AND – Android IOS – Apple iOS WIN – Microsoft Windows WINMOB – Microsoft Windows Mobile OTHERS – other operating system
browser.userAgent	Content of HTTP User-Agent header received from the Consumer's device. Maximum 127 characters.
browser.timeZone	Time zone offset in minutes between UTC and the Consumer's device. The offset is positive if the local time zone is behind UTC and negative if it is ahead.
browser.screenResolution	Screen resolution of the Consumer's device. Formatted as the height and width separated by a 'x'. The height and width must be between 1 and 9999 pixels.
browser.acceptEncoding	Content of HTTP Accept-Encoding header received from the Consumer's device. Maximum of 127 characters.
browser.acceptLanguage	Content of HTTP Accept-Encoding header received from the Consumer's device. Maximum of 127 characters.

The **category.name** format of the sub-field name indicates that option's value is a record called **category** containing a sub-field called **name**.

24.6 Response Fields

24.6.1 Payment Response (Hosted Integration)

There are no additional response fields for PBBA. The Hosted Integration will return the basic transaction response fields in section 2.2 minus any card related fields.

24.6.2 Payment Response (Direct Integration)

These fields will be returned in addition to the request fields from section 24.5.1 and the basic response fields in section 2.2 minus any card related fields.

Field Name	Mandatory?	Description
<code>checkoutDetails</code>	Yes	Record containing values made available by the PBBA Checkout. Refer to section 24.6.3.2.5.7 for values.

24.6.3 Checkout Details (Direct Integration)

The `checkoutDetails` field included in the response above will contain the following values which should be provided to the client-side PBBA Integration Library. The details will be returned using the *record* format detailed in section 1.7.8

Sub-Field Name	Mandatory?	Description
<code>transactionID</code>	Yes	Transaction identifier.
<code>settlementID</code>	Yes	Settlement retrieval identifier.
<code>pbbaCode</code>	Yes	Basket reference number (BRN).
<code>secureToken</code>	Yes	Secure token for client-size use.
<code>retrievalExpiryInterval</code>	Yes	Retrieval expiry time interval.
<code>confirmationExpiryInterval</code>	Yes	Confirmation expiry time interval.
<code>cookieSentStatus</code>	Yes	Cookie sent status.
<code>payConnectID</code>	No	Reserved for future use.
<code>cookieExpiryDays</code>	No	Reserved for future use.
<code>riskScore</code>	No	Reserved for future use.
<code>bankName</code>	No	Reserved for future use.

24.6.4 Refunds (Direct Integration)

Refund requests require that a reason code be included in either the `orderRef` or `cancelReason` fields.

The codes are as follows; **DUPLICATEORDER, GOODSRETURNED, ORDERCANCELLED, MERCHANTOUTOFSTOCK, GOODSNOTRECV, LATECONFIRMATION, DISPUTES.**

The code must be in uppercase and must appear as a separate word anywhere in the field's value.

For example, if refunding due to the purchased item being out of stock you could set the value to just "MERCHANTOUTOFSTOCK" or to a more complete description such as "Refund: Green polo shirt, XXL (MERCHANTOUTOFSTOCK)".

This also applies to refunds made by the Merchant Management System (MMS) where the reason code must be entered when prompted for the reason for the refund.

Only the refund code is sent to the PBBA system, any other text is stored by the Gateway for your benefit and viewable in the Merchant Management System (MMS).

25 SecurePlus Transactions

25.1 Background

SecurePlus is available if you have a Planet Merchant Account. It is a secure e-commerce payment solution designed to allow you to accept China UnionPay debit cards via the Planet Acquirer, with a reduced the risk of fraudulent transactions while providing a friction-free payment process for your Customers. SecurePlus divides the online payment process into separate authentication and authorisation transaction flows that authenticates the cardholder's identity before you submit the authorisation request.

To use SecurePlus you will be supplied with a separate Planet Merchant Account that can be grouped with your main Merchant Account using the account mapping facility as documented in appendix A-7. This allows transactions to be sent using your main Merchant Account and then routed automatically to the Planet Merchant Account in the same mapping group.

When UnionPay debit cards are issued, the Cardholder must register their mobile number with the Issuer. The SMS code authentication works at the time of checkout by submitting the payment details to UnionPay together with the Cardholder's mobile number. The Issuer verifies the card and registered mobile number and sends an SMS message to the to the Cardholder's mobile phone containing a unique 6-digit code. The Cardholder then enters this code into an authentication dialog provided by the Gateway so that it can be sent to UnionPay for verification. If approved, the final financial transaction is submitted.

The authentication process is only required for debit cards. Fraud liability is shifted from the Merchant to the Issuer when a transaction is successfully authenticated. To accommodate the use of cards stored in secure online wallet, the card authentication has some built-in flexibility when other compensating controls are employed.

SecurePlus transactions will appear in the Merchant Management System (MMS) alongside any card payments and can be captured, cancelled and refunded in the same way as card payments.

SecurePlus transactions can also be used for recurring billing with the SMS authentication not been required on recurring transactions as long as the initial transaction was successfully SMS authenticated.

For more information on how to accept SecurePlus transactions, please contact customer support.

SecurePlus transactions are only available with a Planet Merchant Account.

SecurePlus is supported by the Hosted and Direct Integrations. It is not supported by the Batch Integration apart from recurring billing.

25.2 *Benefits and Limitations*

25.2.1 Benefits

- Authorisations are available immediately and returned as part of the transaction.
- Provides your customers the flexibility of paying using their UnionPay debit card when this is more suitable to them than using other payment methods.
- Can be implemented with little or no extra integration work if you already support 3-D Secure transactions.
- There are no extra Gateway costs to use SecurePlus. Your Acquirer may charge to add this onto your business account; however, you may also find that your transaction charges are lower as a result of using 3-D Secure.
- Fully configurable within the Merchant Management System (MMS).

25.2.2 Limitations

- You will need a Planet Acquiring, however, such an account can also be used to process all your other card transactions.
- Only UnionPay debit cards are supported, however, UnionPay credit cards can be accepted without the need for SecurePlus.
- You must currently provide the Gateway with the Cardholder's mobile phone number at the time of the transaction. The Hosted Payment Page will prompt the Cardholder for this information if it detects that a UnionPay debit card is being supplied.
- The Cardholder must have access to their registered mobile phone during the payment process.
- Transactions require a browser in order to display the Customer SMS code entry dialog.

25.3 Hosted Implementation

If a transaction is sent to the Hosted Integration using a **merchantID** which is part of a routing group containing a Planet Merchant, then the Hosted Payment Page will automatically attempt to collect the Cardholder's mobile phone number if they detect that a UnionPay debit card has been entered. It will then display the SecurePlus authentication page to allow the Cardholder to enter the received SMS code.

The SecurePlus authentication page is designed and controlled by the Gateway, but you can change the Merchant name and website address that is displayed on the form by sending the **merchantName** and/or **merchantWebsite** request fields.

Any **merchantWebsite** must be a fully qualified URL containing at least the scheme and host components.

Note: Custom Hosted Payment Pages may not support the collection of the Cardholder's mobile number or the displaying of the SecurePlus authentication page. If you have a custom page which doesn't support this, then you would need to contact support to have your Hosted Payment Page upgraded.

25.4 Direct Implementation

SecurePlus transactions require you to support the standard 3-D Secure integration as documented in section 5 or the legacy 3-D Secure integration as documented in appendix A-5.

In addition, the Cardholder's mobile phone number must be provided in the transaction request.

25.5 Request Fields

These fields should be sent in addition to basic 3-D Secure request fields in section 5.5.1.

Field Name	Mandatory?	Description
customerMobile	Yes	Must contain the Cardholder's mobile phone number as registered with the Issuer. The number must be international format with a leading + symbol followed by up to 3 digits then a space then up to 10 more digits.

25.6 Response Fields

There are no additional response fields for SecurePlus other those defined for 3-D Secure in section 5.6.

26 Digital Wallet Transactions

26.1 Background

The Gateway supports payments made using the following Digital Wallets, Apple Pay, Android Pay and Google Pay™. These wallets can be used to enhance mobile purchasing experiences for customers with supported devices and produce a payment token which can be passed to the Gateway instead of the Cardholder's actual card details.

You can use these wallets with any Merchant Account that has been configured to accept them.

For more information on how to accept payment tokens, please contact customer support.

Digital Wallets are currently supported by the Direct Integration only. They are not supported by the Hosted or Batch Integration.

Digital wallet support is not available with all Acquirers and must be enabled on your Merchant Account before they can be used. Please contact support to find out whether your Acquirer supports the and which can be enabled on your Merchant Account.

26.2 *Benefits and Limitations*

26.2.1 Benefits

- The payment details are stored externally to the Gateway and can be used with any Merchant that supports the appropriate payment tokens.
- Customers can select from previously stored payment details, making the checkout process more streamlined, resulting in fewer abandoned carts and thus increasing sales.
- Compatible with existing card base fraud solutions such as Address Verification Service (AVS), 3-D Secure and third-party fraud providers.
- There are no extra costs to add these payment methods to your Gateway account.
- The transactions are controlled within the Merchant Management System (MMS) in the same manner as normal card transactions.

26.2.2 Limitations

- Your Customer will need a digital wallet enabled device with some stored card details in order to make full use of this payment method.
- The device needs to be integrated with the gateway using third-party provided software.
- Repeat transactions using the retrieved payment details are supported.

26.3 Configuration

The Merchant Account being used for the payments must be configured with your Digital Wallet credentials so that the Gateway can decrypt the payment token.

26.3.1 Apple Pay configuration

Apple Pay requires the Gateway to generate public/private key pair and then the public key must be shared with your Android Pay enabled application in the guise of an Apple Pay *payment process certificate*.

To configure an Apple Pay [payment processing certificate](#) you must have enrolled in the [Apple Developer Program](#) and [created a unique Apple Pay merchant identifier](#).

The *payment processing certificate* is associated with your merchant identifier and used to encrypt payment information. The certificate expires every 25 months. If the certificate is revoked, you can recreate it.

You would normally use the Merchant Management System (MMS) to configure your [payment processing certificate](#) by following the steps outlined below:

1. Open the [Apple Developer Certificates, Identifiers & Profiles](#) webpage and select 'Identifiers' from the sidebar.
2. Under 'Identifiers', select 'Merchant IDs' using the filter in the top-right.
3. On the right, select your merchant identifier.
4. Under 'Apple Pay Payment Processing Certificate', click 'Create Certificate'.
5. Download our certificate signing request (CSR) from the MMS and save to a file.
6. Click 'Choose File' and select the CSR you just downloaded.
7. Click 'Continue'.
8. Click 'Download' to download the *payment processing certificate* and save to a file.
9. Upload the payment processing certificate to the MMS.

26.3.2 Android Pay configuration

Android Pay is currently a deprecated payment method and as such you will need to contact our customer support for information on how to configure this payment method.

26.3.3 Google Pay configuration

Google Pay requires no specific configuration however you must use our Gateway identifier of '**crst**' and the correct Merchant Account identifier when configuring your Google Pay enabled application.

26.4 Hosted Implementation

Transactions using these Digital Wallet payment methods are currently not supported by the Hosted Integration.

26.5 Direct Implementation

Digital Wallet payments require the secure payment token generated by the wallet enabled application to be sent to the Gateway in the **paymentToken** field. The type of token must be specified by also sending the **paymentMethod** field with a value of '**applepay**', '**androidpay**' or '**googlepay**'.

26.6 Request Fields

These fields should be sent instead of the standard card details together with the fields in section 2.1.

Field Name	Mandatory?	Description
paymentMethod	Yes	The type of payment token sent. Value must be one of: applepay – to indicate an Apple Pay token androidpay – to indicate an Android Pay token googlepay – to indicate a Google Pay token
paymentToken	Yes	Must contain the secure payment token produced by the wallet enabled application.

26.7 Response Fields

There are no additional response fields.

26.8 Digital Wallet Tokens

Digital Wallet payments operate the same as normal card payments, the main difference is that the card details are passed from the wallet application within an encrypted payment token. Once the Gateway has extracted the card details then it can use it with 3-D Secure and Fraud checking services as normal.

26.8.1 FPAN/DPAN tokens

Apple Pay, Android Pay and Google Pay (Mobile) payment tokens contain an EMV tokenised card number also known as a device-specific number (DPAN) rather than the Cardholder's actual card number (FPAN). With these tokens the expiry date is the date the DPAN expires rather than the value printed on the Cardholder's card. The card mask returned by the Gateway will be the masked DPAN, the Gateway is not able to return the last 4 digits of the FPAN. The card issuing details return should be the same as those of the original FPAN.

Google Pay (Web) payment tokens contain the Cardholder's original card number (FPAN) and expiry date. This means that the card mask and expiry date will be those of the original card.

26.8.2 AVS/CV2 Checking

Digital wallet payment tokens do not contain any address or CVV details. The Cardholder's billing address can be passed in the transaction along with the payment token so that address checking can be performed.

The Gateway and Acquirer will not perform CVV checks with these payment tokens effectively disabling CVV checks for the transaction disregarding your preferences.

26.8.3 3-D Secure Authentication

DPAN based tokens will usually contain 3-D Secure data and so the Gateway will send this data to the Acquirer to gain the benefits of an authenticated transaction without the need to challenge the Cardholder. This makes using the digital wallet a much simpler and frictionless method of payment.

FPAN based tokens can be passed to the Gateway's 3-D Secure processing and undergo the normal authentication journey as a manually entered card number.

26.8.4 Risk Checking

Both FPAN and DPAN based tokens can be used with risk checking via Kount in the same manner as a normal card transaction.

26.8.5 Transaction Lifecycle and Recurring Transactions

Both FPAN and DPAN based tokens will follow the standard transaction lifecycle and can be cancelled, captured, refunded or used as the basis of subsequent transactions in the same manner as a normal card transaction.

A-1 Response Codes

The Gateway will always issue a numeric **responseCode** to report the status of the transaction. These codes should be used rather than the **responseMessage** field to determine the outcome of a transaction.

Response codes are grouped; however, the groupings are for informational purposes only and not all codes in a group are used and some codes may exist for completeness or future use.

A zero responseCode always indicates a successful outcome.

A-1.1 Authorisation Response Codes

The Gateway uses a set of standard response codes to indicate the status of an authorisation request to the Acquirer. These response codes are based on the 2-character ISO 8583 response codes.

The full set of ISO 8583 codes used are given in the table below, however not all are applicable to transactions currently supported by the Gateway and therefore not used and documented for reference purposes only.

Some ISO-8583 codes are not numeric and therefore to ensure all Gateway response codes are numeric these codes are mapped to an equivalent numeric code greater than 99. This equivalent numeric code is shown in the table below along with the original 2 letter code in brackets.

Not all ISO-8583 codes are applicable to the types of transactions currently available via the Gateway and therefore unapplicable codes, although documented, may not currently be returned.

If the authorising Acquirer does not return a suitable ISO 8583 code, then the Gateway will attempt to map the Acquirers response to a suitable code.

The original Acquirer authorisation response code and response message will always be returned in the **acquirerResponseCode** and **acquirerResponseMessage** fields as detailed in section 18.

The original Acquirer authorisation response code may not be numeric and information on these codes will need to be requested from the Acquirer.

Acquirer Authorisation Response codes: 0 – 9999	
Code	Description
0	Successful approval/completion
1	Refer to card issuer
2	Refer to card issuer, special condition
3	Invalid merchant or service provider
4	Pickup card
5	Do not honor
6	Error
7	Pickup card, special condition (other than lost/stolen card)
8	Honor with identification
9	Request in progress
10	Approval for partial amount
11	Approved VIP
12	Invalid transaction
13	Invalid amount (currency conversion field overflow), or amount exceeds maximum for card program
14	Invalid card number/account number
15	No such issuer
16	Approved, Update Track 3
17	Customer cancellation
18	Customer dispute
19	Re-enter transaction
20	Invalid response/Acquirer error
21	No action taken (unable to back out prior transaction)
22	Suspected malfunction
23	Unacceptable transaction
24	File update impossible
25	Reference number cannot be found. Unable to locate record in file, or account number is missing from the inquiry

Acquirer Authorisation Response codes: 0 – 9999	
Code	Description
26	Duplicate reference number
27	Error in reference number
28	File is temporarily unavailable for update
29	File action failed/Contact acquirer
30	Format error
31	Bank not supported by Switch/Unknown acquirer account code
32	Complete partially
33	Pickup card (expired)
34	Pickup card (suspected fraud)
35	Pickup card (acceptor contact acquirer)
36	Pickup card (restricted card)
37	Pickup card (acceptor call acquirer security)
38	Pickup card (PIN tries exceeded)
39	No credit account
40	Function not supported
41	Pickup card (lost card)
42	No universal account
43	Pickup card (stolen card)
44	No investment account
45	Account closed
46	Identification required
47	Identification cross-check required
48	No from account
49	No to account
50	No account
51	Insufficient funds
52	No checking account

Acquirer Authorisation Response codes: 0 – 9999	
Code	Description
53	No savings account
54	Expired card
55	Incorrect PIN
56	Unknown card
57	Transaction not permitted to cardholder
58	Transaction not allowed at terminal
59	Suspected fraud
60	Contact acquirer
61	Exceeds withdrawal amount limit
62	Restricted card (for example, in Country Exclusion table)
63	Security violation
64	Amount higher than previous transaction
65	SCA Required (previously, Exceeds withdrawal limit)
66	Contact acquirer
67	Hard capture - ATM
68	Time out
69	Advice received too late
70	Contact card issuer
71	Message flow error
72	Authorization centre not available for 60 seconds.
73	Authorization centre not available for 300 seconds.
74	PIN entry necessary
75	Allowable number of PIN tries exceeded
76	Unable to locate previous message (no match on Retrieval Reference number)
77	Previous message located for a repeat or reversal, but repeat or reversal data are inconsistent with original message
78	Blocked, first used. The transaction is from a new cardholder, and the card has not been unblocked
79	Already reversed

Acquirer Authorisation Response codes: 0 – 9999	
Code	Description
80	Visa transactions: credit issuer unavailable. Private label and check acceptance: Invalid date
81	PIN cryptographic error found (error found by VIC security module during PIN decryption)
82	Negative CAM, dCVV, iCVV, or CVV results
83	STIP cannot approve
84	Pre-auth time too great
85	No reason to decline a request for account number verification, address verification, CVV2 verification, or a credit voucher or merchandise return
86	Unable to verify PIN
87	Purchase amount only, no cash back allowed
88	Unable to authorise
89	Ineligible to receive
90	Cut-off in progress
91	Issuer unavailable or switch inoperative (STIP not applicable or available for this transaction)
92	Destination cannot be found for routing
93	Transaction cannot be completed, violation of law
94	Duplicate transaction
95	Reconcile error
96	System malfunction
97	Security Breach
98	Date and time not plausible
99	Error in PAC encryption detected
497 (B1)	Surcharge amount not permitted on Visa cards (U.S. acquirers only)
498 (B2)	Surcharge not supported
928 (N0)	Unable to authorise
931 (N3)	Cash service not available
932 (N4)	Cashback request exceeds issuer limit
933 (N5)	Resubmitted transaction over max days limit
934 (N7)	Decline for CVV2 failure

Acquirer Authorisation Response codes: 0 – 9999	
Code	Description
935 (N8)	Transaction amount greater than pre-authorised approved amount
1002 (P2)	Invalid biller information
1005 (P5)	PIN Change/Unblock request declined
1006 (P6)	Unsafe PIN
1037 (Q1)	Card Authentication failed
1072 (R0)	Stop Payment Order
1073 (R1)	Revocation of Authorization Order
1074 (R3)	Revocation of All Authorizations Order
1144 (T0)	Approval, keep first check
1145 (T1)	Check OK, no conversion
1146 (T2)	Invalid RTTN
1147 (T3)	Amount greater than limit
1148 (T4)	Unpaid items, failed NEG
1149 (T5)	Duplicate check number
1150 (T6)	MICR error
1151 (T7)	Too many checks
1298 (XA)	Forward to issuer
1301 (XD)	Forward to issuer
1363 (Z3)	Unable to go online

A-1.2 Gateway Response Codes

The Gateway uses a set of enhanced response codes to indicate if there is an issue with the transaction which prevented any authorisation response being received from the Acquirer. These response codes start at 65536.

The responses are grouped into categories and the codes in the 'missing' and 'invalid' field categories are designed so that that invalid field code is exactly 256 greater than the corresponding missing field code. For example, the code of a missing **action** field is **66055** and the corresponding code for an invalid **action** field is **66311** (66055 + 256).

General Error Codes: 65536 - 65791	
Code	Description
65536	Transaction in progress. Contact customer support if this error occurs.
65537	A general error has occurred.
65538	Reserved for future use. Contact customer support if this error occurs.
65539	Invalid Credentials: merchantID is unknown or the signature doesn't match.
65540	Permission denied: caused by sending a request from an unauthorised IP address.
65541	Action not allowed: action is not supported by the Acquirer or allowed for the transaction.
65542	Request Mismatch: fields sent while completing a request do not match initially requested values. Usually due to sending different card details to those used to authorise the transaction when completing a 3-D Secure transaction or performing a REFUND_SALE transaction.
65543	Request Ambiguous: request could be misinterpreted due to inclusion of mutually exclusive fields.
65544	Request Malformed: could not parse the request data.
65545	Suspended Merchant account.
65546	Currency not supported by Merchant.
65547	Request Ambiguous, both taxValue and discountValue provided when should be one only.
65548	Database error.
65549	Payment processor communications error.
65550	Payment processor error.
65551	Internal Gateway communications error.
65552	Internal Gateway error.
65553	Encryption error.
65554	Duplicate request. Refer to Section 14.

General Error Codes: 65536 - 65791	
Code	Description
65555	Settlement error.
65556	AVS/CV2 Checks are not supported for this card (or Acquirer).
65557	IP Blocked: Request is from a banned IP address.
65558	Primary IP blocked: Request is not from one of the primary IP addresses configured for this Merchant Account.
65559	Secondary IP blocked: Request is not from one of the secondary IP addresses configured for this Merchant Account.
65560	Reserved for future use. Contact customer support if this error occurs.
65561	Unsupported Card Type: Request is for a card type that is not supported on this Merchant Account.
65562	Unsupported Authorisation: External authorisation code <code>authorisationCode</code> has been supplied and this is not supported for the transaction or by the Acquirer.
65563	Request not supported: The Gateway or Acquirer does not support the request.
65564	Request expired: The request cannot be completed as the information is too old.
65565	Request retry: The request can be retried later.
65566	Test Card Used: A test card was used on a live Merchant Account.
65567	Unsupported card issuing country: Request is for a card issuing country that is not supported on this Merchant Account.
65568	Masterpass processing error.
65569	Masterpass not supported.
65570	Masterpass checkout failure.
65571	Masterpass checkout success.
65572	Masterpass checkout is required.
65573	Amounts error. Provided transaction amounts to not tally.
65574	Reserved for future use. Contact customer support if this error occurs.
65575	No data was found that match the selection criteria.
65576	Request cancelled.

3-D Secure Error Codes: 65792 – 65823	
Code	Description
65792	3-D Secure processing in progress.

3-D Secure Error Codes: 65792 – 65823	
Code	Description
65793	3-D Secure processing error.
65794	3-D Secure processing is required. 3-D Secure ACS challenge must be displayed.
65795	3-D Secure processing is not required.
65796	3-D Secure processing is unavailable. Merchant account or Acquirer doesn't support 3-D Secure.
65797	Error occurred during 3-D Secure enrolment check
65798	Reserved for future use.
65799	Reserved for future use.
65800	Error occurred during 3-D Secure authentication check
65801	Reserved for future use.
65802	3-D Secure authentication is required.
65803	3-D Secure authentication results do not meet the Merchant's preferences.
65804	3-D Secure authentication was successful.

Remoted Checkout Processing Error Codes: 65824 – 65885	
Code	Description
65824	Remote checkout processing in progress.
65825	Remote checkout processing error.
65826	Remote checkout processing is required. Remote checkout must be displayed.
65827	Remote checkout processing is not required.
65828	Remote checkout processing is not supported.
65829	Remote checkout was successful.
65830	Remote checkout failed.

Risk Check Processing Error Codes: 65856 – 65887	
Code	Description
65856	Risk check processing in progress.
65857	Risk check processing error.
65858	Risk check processing required.

Risk Check Processing Error Codes: 65856 – 65887	
Code	Description
65859	Risk check processing is not required.
65860	Risk check processing is not supported.
65861	Risk check processor communication error.
65862	Risk check results do not meet the Merchant's preferences.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66048	Missing request. No data posted to integration URL.
66049	Missing merchantID field.
66050	Missing merchantPwd field.
66051	Reserved for internal use. Contact customer support if this error occurs.
66052	Reserved for internal use. Contact customer support if this error occurs.
66053	Reserved for internal use. Contact customer support if this error occurs.
66054	Reserved for internal use. Contact customer support if this error occurs.
66055	Missing action field.
66056	Missing amount field.
66057	Missing currencyCode field.
66058	Missing cardNumber field.
66059	Missing cardExpiryMonth field.
66060	Missing cardExpiryYear field.
66061	Missing <code>cardStartMonth</code> field. (Legacy field)
66062	Missing <code>cardStartYear</code> field. (Legacy field)
66063	Missing <code>cardIssueNumber</code> field. (Legacy field)
66064	Missing cardCVV field.
66065	Missing customerName field.
66066	Missing customerAddress field.
66067	Missing customerPostcode field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66068	Missing customerEmail field.
66069	Missing customerPhone field.
66070	Missing countryCode field.
66071	Missing transactionUnique field.
66072	Missing orderRef field.
66073	Missing remoteAddress field.
66074	Missing redirectURL field.
66075	Missing callbackURL field.
66076	Missing merchantData field.
66077	Reserved for internal use. Contact customer support if this error occurs.
66078	Missing duplicateDelay field.
66079	Missing itemQuantity field.
66080	Missing itemDescription field
66081	Missing itemAmount field.
66082	Missing taxAmount field.
66083	Missing discountAmount field.
66084	Missing discountReason field.
66085	Missing xref field.
66086	Missing type field.
66087	Missing signature field (field is required if message signing is enabled).
66088	Missing authorisationCode field.
66089	Missing transactionID field.
66090	Missing threeDSRequired field.
66091	Missing threeDSMD field.
66092	Missing threeDSPaRes field.
66093	Missing threeDSECI field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66094	Missing threeDSCAVV field.
66095	Missing threeDSXID field.
66096	Missing threeDSEnrolled field.
66097	Missing threeDSAuthenticated field.
66098	Missing threeDSCheckPref field.
66099	Missing cv2CheckPref field.
66100	Missing addressCheckPref field.
66101	Missing postcodeCheckPref field.
66102	Missing captureDelay field.
66103	Missing orderDate field.
66104	Missing grossAmount field.
66105	Missing netAmount field.
66106	Missing taxRate field.
66107	Missing taxReason field.
66108	Missing surchargeRules field.
66109	Reserved for internal use. Contact customer support if this error occurs.
66110	Missing statementNarrative1 field.
66111	Missing statementNarrative2 field.
66112	Missing merchantName field.
66113	Missing merchantCompany field.
66114	Missing merchantAddress field.
66115	Missing merchantTown field.
66116	Missing merchantPostcode field.
66117	Missing merchantCountryCode field.
66118	Missing merchantPhone field.
66119	Missing merchantMobile field.
66120	Missing merchantEmail field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66121	Missing merchantWebsite field.
66122	Missing merchantOrderRef field.
66123	Missing merchantCustomerRef field.
66124	Reserved for future use. Contact customer support if this error occurs.
66125	Missing merchantType field.
66126	Reserved for future use. Contact customer support if this error occurs.
66127	Missing merchantCategoryCode field.
66128	Missing supplierName field.
66129	Missing supplierCompany field.
66130	Missing supplierAddress field.
66131	Missing supplierTown field.
66132	Missing supplierPostcode field.
66133	Missing supplierCountryCode field.
66134	Missing supplierPhone field.
66135	Missing supplierMobile field.
66136	Missing supplierEmail field.
66137	Missing supplierCounty field.
66138	Missing customerCompany field.
66139	Missing customerTown field.
66140	Missing customerCountryCode field.
66141	Missing customerMobile field.
66142	Missing customerCounty field.
66143	Missing merchantCounty field.
66144	Missing customerOrderRef field.
66145	Missing customerMerchantRef field.
66146	Missing customerVatNumber field.
66147	Missing customerDateOfBirth field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66148	Missing deliveryName field.
66149	Missing deliveryCompany field.
66150	Missing deliveryAddress field.
66151	Missing deliveryTown field.
66152	Missing deliveryPostcode field.
66153	Missing deliveryCountryCode field.
66154	Missing deliveryPhone field.
66155	Missing deliveryMobile field.
66156	Missing deliveryEmail field.
66157	Reserved for future use. Contact customer support if this error occurs.
66158	Missing deliveryCounty field.
66159	Missing deliveryFax field.
66160	Missing cardExpiryDate field.
66161	Missing cardStartDate field. (Legacy field)
66162	Reserved for future use. Contact customer support if this error occurs.
66163	Reserved for future use. Contact customer support if this error occurs.
66164	Missing items field.
66165	Missing itemGrossAmount field.
66166	Missing itemNetAmount field.
66167	Missing itemProductCode field.
66168	Missing itemCommodityCode field.
66169	Missing itemUnitOfMeasure field.
66170	Missing itemUnitAmount field.
66171	Missing itemDiscountAmount field.
66172	Missing itemDiscountReason field.
66173	Missing itemTaxRate field.
66174	Missing itemTaxAmount field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66175	Missing itemTaxReason field.
66176	Missing shippingTrackingRef field.
66177	Missing shippingMethod field.
66178	Missing shippingAmount field.
66179	Missing shippingNetAmount field.
66180	Missing shippingGrossAmount field.
66181	Missing shippingTaxRate field.
66182	Missing shippingTaxAmount field.
66183	Missing shippingTaxReason field.
66184	Missing shippingDiscountAmount field.
66185	Missing shippingDiscoutReason field.
66186	Reserved for future use. Contact customer support if this error occurs.
66187	Reserved for future use. Contact customer support if this error occurs.
66188	Reserved for future use. Contact customer support if this error occurs.
66189	Reserved for future use. Contact customer support if this error occurs.
66190	Reserved for future use. Contact customer support if this error occurs.
66191	Reserved for future use. Contact customer support if this error occurs
66192	Missing walletID field.
66193	Missing walletName field.
66194	Missing walletDesc field.
66195	Missing walletData field.
66196	Missing cardID field.
66197	Missing cardName field.
66198	Missing cardDesc field.
66199	Missing cardData field.
66200	Missing customerAddressID field.
66201	Missing customerAddressName field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66202	Missing customerAddressDesc field.
66203	Missing customerAddressData field.
66204	Missing deliveryAddressID field.
66205	Missing deliveryAddressName field.
66206	Missing deliveryAddressDesc field.
66207	Missing deliveryAddressData field.
66208	Missing walletOwnerRef field.
66209	Missing cardToken field.
66210	Missing masterPassData field.
66211	Reserved for future use. Contact customer support if this error occurs.
66212	Missing masterPassCheckoutOptions field.
66213	Missing masterPassCallbackURL field.
66214	Missing masterPassCheckoutURL field.
66215	Missing masterPassToken field.
66216	Missing masterPassVerifier field.
66217	Missing masterPassResourceURL field.
66218	Missing masterPassStatus field.
66219	Missing masterPassWalletID field.
66220	Missing handlingAmount field.
66221	Missing insuranceAmount field.
66222	Missing paymentMethod field.
66223	Missing paymentToken field.
66256	Missing receiverName field.
66257	Missing receiverCompany field.
66258	Missing receiverAddress field.
66259	Missing receiverTown field.
66260	Missing receiverPostCode field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66261	Missing receiverCountryCode field.
66262	Missing receiverPhone field.
66263	Missing receiverMobile field.
66264	Missing receiverEmail field.
66265	Missing receiverDateOfBirth field.
66266	Missing receiverAccountNo field.
66267	Missing receiverCounty field.
66268	Missing receiverFax field.
66269	Missing customerFax field.
66270	Missing rtScheduleType field.
66271	Missing rtSchedule field.
66272	Missing rtID field.
66273	Missing rtName field.
66274	Missing rtDescription field.
66275	Missing rtPolicyRef field.
66276	Missing rtMerchantID field.
66277	Missing rtStartDate field.
66278	Missing rtInitialDate field.
66279	Missing rtInitialAmount field.
66280	Missing rtFinalDate field.
66281	Missing rtFinalAmount field.
66282	Missing rtCycleAmount field.
66283	Missing rtCycleDuration field.
66284	Missing rtCycleDurationUnit field.
66285	Missing rtCycleCount field.
66286	Missing rtMerchantData field.
66287	Missing rtCloneFields field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66288	Missing checkoutRef field.
66289	Missing checkoutRedirectURL field.
66290	Missing checkoutOptions field.
66291	Missing checkoutRequest field.
66292	Missing checkoutResponse field.
66293	Missing rtAgreementType field.
66294	Missing rtSequenceNumber field.
66295	Missing rtSequenceCount field.
66296	Missing itemProductURL field.
66297	Missing itemImageURL field.
66298	Missing itemSize field.
66299	Missing itemWeight field.
66300	Missing riskCheckPref field.
66301	Missing riskCheckOptions field.
66302	Missing cloneFields field.
66303	Missing customField field.
66560	Missing dccRef field.
66561	Missing dccProvider field.
66562	Missing dccRate field.
66563	Missing dccMargin field.
66564	Missing dccCommission field.
66565	Missing dccSource field.
66566	Missing dccCreated field.
66567	Missing dccExpires field.
66568	Missing dccCurrencyCode field.
66569	Missing dccAmount field.
66570	Missing dccAccepted field.

Missing Request Field Error Codes: 66048 – 66303 and 66560 – 66815	
Code	Description
66592	Missing threeDSRef field.
66593	Missing threeDSVersion field.
66594	Missing threeDSRedirectURL field.
66595	Missing threeDSOptions field.
66596	Missing threeDSDetails field.
66597	Missing threeDSURL field.
66598	Missing threeDSRequest field.
66599	Missing threeDSResponse field.
66600	Missing threeDSPolicy field.
66608	Missing scaExemption field.
66628	Missing riskCheckPref field.
66656	Missing deviceType field.
66657	Missing deviceChannel field.
66658	Missing deviceIdentity field.
66659	Missing deviceTimeZone field.
66660	Missing deviceCapabilities field.
66661	Missing deviceAcceptContent field.
66662	Missing deviceAcceptCharset field.
66663	Missing deviceAcceptEncoding field.
66664	Missing deviceAcceptLanguage field.
66665	Missing deviceScreenResolution field.
66666	Missing deviceOperatingSystem field.
66688	Missing initiator field.
66689	Missing acquirerOptions field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66304	Invalid request. No data posted to integration URL.
66305	Invalid merchantID field.
66306	Invalid merchantPwd field.
66307	Reserved for internal use. Contact customer support if this error occurs.
66308	Reserved for internal use. Contact customer support if this error occurs.
66309	Reserved for internal use. Contact customer support if this error occurs.
66310	Reserved for internal use. Contact customer support if this error occurs.
66311	Invalid action field.
66312	Invalid amount field.
66313	Invalid currencyCode field.
66314	Invalid cardNumber field.
66315	Invalid cardExpiryMonth field.
66316	Invalid cardExpiryYear field.
66317	Invalid <code>cardStartMonth</code> field. (Legacy field)
66318	Invalid <code>cardStartYear</code> field. (Legacy field)
66319	Invalid <code>cardIssueNumber</code> field. (Legacy field)
66320	Invalid cardCVV field.
66321	Invalid customerName field.
66322	Invalid customerAddress field.
66323	Invalid customerPostcode field.
66324	Invalid customerEmail field.
66325	Invalid customerPhone field.
66326	Invalid countyCode field.
66327	Invalid transactionUnique field.
66328	Invalid orderRef field.
66329	Invalid remoteAddress field.
66330	Invalid redirectURL field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66331	Invalid callbackURL field.
66332	Invalid merchantData field.
66333	Reserved for internal use. Contact customer support if this error occurs.
66334	Invalid duplicateDelay field.
66335	Invalid itemQuantity field.
66336	Invalid itemDescription field
66336	Invalid itemAmount field.
66338	Invalid taxAmount field.
66339	Invalid discountAmount field.
66340	Invalid discountReason field.
66341	Invalid xref field.
66342	Invalid type field.
66343	Invalid signature field (field is required if message signing is enabled).
66344	Invalid authorisationCode field.
66345	Invalid transactionID field.
66346	Invalid threeDSRequired field.
66347	Invalid threeDSMD field.
66348	Invalid threeDSPaRes field.
66349	Invalid threeDSECI field.
66350	Invalid threeDSCAVV field.
66351	Invalid threeDSXID field.
66352	Invalid threeDSEnrolled field.
66353	Invalid threeDSAuthenticated field.
66354	Invalid threeDSCheckPref field.
66355	Invalid cv2CheckPref field.
66356	Invalid addressCheckPref field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66357	Invalid postcodeCheckPref field.
66358	Invalid captureDelay field.
66359	Invalid orderDate field.
66360	Invalid grossAmount field.
66361	Invalid netAmount field.
66362	Invalid taxRate field.
66363	Invalid taxReason field.
66364	Invalid surchargeRules field.
66365	Reserved for internal use. Contact customer support if this error occurs.
66366	Invalid statementNarrative1 field.
66367	Invalid statementNarrative2 field.
66368	Invalid merchantName field.
66369	Invalid merchantCompany field.
66370	Invalid merchantAddress field.
66371	Invalid merchantTown field.
66372	Invalid merchantPostcode field.
66373	Invalid merchantCountryCode field.
66374	Invalid merchantPhone field.
66375	Invalid merchantMobile field.
66376	Invalid merchantEmail field.
66377	Invalid merchantWebsite field.
66378	Invalid merchantOrderRef field.
66379	Invalid merchantCustomerRef field.
66380	Reserved for internal use. Contact customer support if this error occurs.
66381	Invalid merchantType field.
66382	Reserved for internal use. Contact customer support if this error occurs
66383	Invalid merchantCategoryCode field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66384	Invalid supplierName field.
66385	Invalid supplierCompany field.
66386	Invalid supplierAddress field.
66387	Invalid supplierTown field.
66388	Invalid supplierPostcode field.
66389	Invalid supplierCountryCode field.
66390	Invalid supplierPhone field.
66391	Invalid supplierMobile field.
66392	Invalid supplierEmail field.
66393	Invalid supplierCounty field.
66394	Invalid customerCompany field.
66395	Invalid customerTown field.
66396	Invalid customerCountryCode field.
66397	Invalid customerMobile field.
66398	Invalid customerCounty field.
66399	Invalid merchantCounty field.
66400	Invalid customerOrderRef field.
66401	Invalid customerMerchantRef field.
66402	Invalid customerVatNumber field.
66403	Invalid customerDateOfBirth field.
66404	Invalid deliveryName field.
66405	Invalid deliveryCompany field.
66406	Invalid deliveryAddress field.
66407	Invalid deliveryTown field.
66408	Invalid deliveryPostcode field.
66409	Invalid deliveryCountryCode field.
66410	Invalid deliveryPhone field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66411	Invalid deliveryMobile field.
66412	Invalid deliveryEmail field.
66413	Reserved for future use. Contact customer support if this error occurs
66414	Invalid deliveryCounty field.
66415	Invalid deliveryFax field.
66416	Invalid cardExpiryDate field.
66417	Invalid cardStartDate field. (Legacy field)
66418	Invalid line items count, either too few or too many for processor.
66419	Invalid line items sequence, either not sequential or not 0 to 99.
66420	Invalid items field.
66421	Invalid itemGrossAmount field.
66422	Invalid itemNetAmount field.
66423	Invalid itemProductCode field.
66424	Invalid itemCommodityCode field.
66425	Invalid itemUnitOfMeasure field.
66426	Invalid itemUnitAmount field.
66427	Invalid itemDiscountAmount field.
66428	Invalid itemDiscountReason field.
66429	Invalid itemTaxRate field.
66430	Invalid itemTaxAmount field.
66431	Invalid itemTaxReason field.
66432	Invalid shippingTrackingRef field.
66433	Invalid shippingMethod field.
66434	Invalid shippingAmount field.
66435	Invalid shippingNetAmount field.
66436	Invalid shippingGrossAmount field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66437	Invalid shippingTaxRate field.
66438	Invalid shippingTaxAmount field.
66439	Invalid shippingTaxReason field.
66440	Invalid shippingDiscountAmount field.
66441	Invalid shippingDiscountReason field.
66442	Reserved for future use. Contact customer support if this error occurs.
66443	Reserved for future use. Contact customer support if this error occurs.
66444	Reserved for future use. Contact customer support if this error occurs.
66445	Reserved for future use. Contact customer support if this error occurs.
66446	Reserved for future use. Contact customer support if this error occurs.
66447	Reserved for future use. Contact customer support if this error occurs
66448	Invalid walletID field.
66449	Invalid walletName field.
66450	Invalid walletDesc field.
66451	Invalid walletData field.
66452	Invalid cardID field.
66453	Invalid cardName field.
66454	Invalid cardDesc field.
66455	Invalid cardData field.
66456	Invalid customerAddressID field.
66457	Invalid customerAddressName field.
66458	Invalid customerAddressDesc field.
66459	Invalid customerAddressData field.
66460	Invalid deliveryAddressID field.
66461	Invalid deliveryAddressName field.
66462	Invalid deliveryAddressDesc field.
66463	Invalid deliveryAddressData field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66464	Invalid walletOwnerRef field.
66465	Invalid cardToken field.
66466	Invalid masterPassData field.
66467	Reserved for future use. Contact customer support if this error occurs.
66468	Invalid masterPassCheckoutOptions field.
66469	Invalid masterPassCallbackURL field.
66470	Invalid masterPassCheckoutURL field.
66471	Invalid masterPassToken field.
66472	Invalid masterPassVerifier field.
66473	Invalid masterPassResourceURL field.
66474	Invalid masterPassStatus field.
66475	Invalid masterPassWalletID field.
66476	Invalid handlingAmount field.
66477	Invalid insuranceAmount field.
66478	Invalid paymentMethod field.
66479	Invalid paymentToken field.
66512	Invalid receiverName field.
66513	Invalid receiverCompany field.
66514	Invalid receiverAddress field.
66515	Invalid receiverTown field.
66516	Invalid receiverPostCode field.
66517	Invalid receiverCountryCode field.
66518	Invalid receiverPhone field.
66519	Invalid receiverMobile field.
66520	Invalid receiverEmail field.
66521	Invalid receiverDateOfBirth field.
66522	Invalid receiverAccountNo field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66523	Invalid receiverCounty field.
66524	Invalid receiverFax field.
66525	Invalid customerFax field.
66526	Invalid rtScheduleType field.
66527	Invalid rtSchedule field.
66528	Invalid rtID field.
66529	Invalid rtName field.
66530	Invalid rtDescription field.
66531	Invalid rtPolicyRef field.
66532	Invalid rtMerchantID field.
66533	Invalid rtStartDate field.
66534	Invalid rtInitialDate field.
66535	Invalid rtInitialAmount field.
66536	Invalid rtFinalDate field.
66537	Invalid rtFinalAmount field.
66538	Invalid rtCycleAmount field.
66539	Invalid rtCycleDuration field.
66540	Invalid rtCycleDurationUnit field.
66541	Invalid rtCycleCount field.
66542	Invalid rtMerchantData field.
66543	Invalid rtCloneFields field.
66544	Invalid checkoutRef field.
66545	Invalid checkoutRedirectURL field.
66546	Invalid checkoutOptions field.
66547	Invalid checkoutRequest field.
66548	Invalid checkoutResponse field.
66549	Invalid rtAgreementType field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66550	Invalid rtSequenceNumber field.
66551	Invalid rtSequenceCount field.
66552	Invalid itemProductURL field.
66553	Invalid itemImageURL field.
66554	Invalid itemSize field.
66555	Invalid itemWeight field.
66556	Invalid riskCheckPref field.
66557	Invalid riskCheckOptions field.
66558	Invalid cloneFields field.
66559	Invalid customField field.
66816	Invalid dccRef field.
66817	Invalid dccProvider field.
66818	Invalid dccRate field.
66819	Invalid dccMargin field.
66820	Invalid dccCommission field.
66821	Invalid dccSource field.
66822	Invalid dccCreated field.
66823	Invalid dccExpires field.
66824	Invalid dccCurrencyCode field.
66825	Invalid dccAmount field.
66826	Invalid dccAccepted field.
66848	Invalid threeDSRef field.
66849	Invalid threeDSVersion field.
66850	Invalid threeDSRedirectURL field.
66851	Invalid threeDSOptions field.
66852	Invalid threeDSDetails field.
66853	Invalid threeDSURL field.

Invalid Request Field Error Codes: 66304 – 66559 and 66816 – 67071	
Code	Description
66854	Invalid threeDSRequest field.
66855	Invalid threeDSResponse field.
66856	Invalid threeDSPolicy field.
66864	Invalid scaExemption field.
66880	Invalid riskCheckPref field.
66912	Invalid deviceType field.
66913	Invalid deviceChannel field.
66914	Invalid deviceIdentity field.
66915	Invalid deviceTimeZone field.
66916	Invalid deviceCapabilities field.
66917	Invalid deviceAcceptContent field.
66918	Invalid deviceAcceptCharset field.
66919	Invalid deviceAcceptEncoding field.
66920	Invalid deviceAcceptLanguage field.
66921	Invalid deviceScreenResolution field.
66922	Invalid deviceOperatingSystem field.
66944	Invalid initiator field.
66945	Invalid acquirerOptions field.

A-2 AVS / CV2 Check Response Codes

The AVS/CV2 Check Response Message field **avscv2ResponseMessage** is sent back in the raw form that is received from the Acquiring bank and can contain the following values:

Response	Description
ALL MATCH	AVS and CV2 match
SECURITY CODE MATCH ONLY	CV2 match only
ADDRESS MATCH ONLY	AVS match only
NO DATA MATCHES	No matches for AVS and CV2
DATA NOT CHECKED	Supplied data not checked
SECURITY CHECKS NOT SUPPORTED	Card scheme does not support checks

The AVS/CV2 Response Code **avscv2ResponseCode** is made up of six characters and is sent back in the raw form that is received from the Acquiring bank. The first 4 characters can be decoded as below, the remaining 2 characters are currently reserved for future use:

Position 1 Value	Description
0	No Additional information available.
1	CV2 not checked
2	CV2 matched.
4	CV2 not matched
8	Reserved

Position 2 Value	Description
0	No Additional information available.
1	Postcode not checked
2	Postcode matched.
4	Postcode not matched
8	Postcode partially matched

Position 3 Value	Description
0	No Additional Information
1	Address numeric not checked
2	Address numeric matched
4	Address numeric not matched
8	Address numeric partially matched

Position 4 Value	Description
0	Authorising entity not known
1	Authorising entity – merchant host
2	Authorising entity – acquirer host
4	Authorising entity – card scheme
8	Authorising entity – issuer

A-3 3-D Secure Authentication Data

The 3-D Secure system uses various data fields to report the authentication status of the Cardholder. Each 3-D Secure version may use slightly different terminology for the fields and have slightly different values but for ease of use the Gateway uses the terminology and values as described in this appendix.

The field's values would normally be populated by the Gateway's 3DS v1 Merchant Plugin Interface (MPI) or 3DS v2 3DS Server component¹, however you may choose to use your own MPI/3DS Server component and provide the values, as described in section 5.4.6.

A-3.1 3-D Secure Enrolment Status

The **threeDSEnrolled** field indicates if the card is enrolled in the 3-D Secure program.

For 3DS v1 the value is requested from the Directory Server for every transaction using a Verify Enrolment Request/Response (VEReq/VERes) message.

For 3DS v2 the value is determined if the card number is within one of the enrolled ranges downloaded daily from the Directory Server using a Preparation Request/Response (PReq/PRes) message.

The field can contain one of the following values:

- Y** – Enrolled. The card is enrolled in the 3-D Secure program and the payer is eligible for authentication processing.
- N** - Not Enrolled. The checked card is eligible for the 3-D Secure (it is within the card association's range of accepted cards) but the card issuing bank does not participate in the 3-D Secure program. If the Cardholder later disputes the purchase, the issuer may not submit a chargeback to you.
- U** - Unable To Verify Enrolment. The card associations were unable to verify whether the Cardholder is registered. As the card is ineligible for 3-D Secure, you can choose to accept the card nonetheless and precede the purchase as non-authenticated and submits authorisation with ECI 07. You and the Acquirer retain liability if the Cardholder later disputes making the purchase (3DS v1 only).
- E** - Error Verifying Enrolment. The Gateway encountered an error. This card is flagged as 3-D Secure ineligible. The card can be accepted for payment, yet you may not claim a liability shift on this transaction in case of a dispute with the Cardholder (3DS v1 only).

¹ The 3DS Server is the Gateway/Merchant component that provides the interface with the 3DS Directory Server.
V2.00

A-3.2 3DS Authentication Status

The **threeDSAuthenticated** field indicates if the cardholder has been authenticated by the 3-D Secure program.

For 3DS v1 the value is provided by the Authentication Control Server after a Cardholder challenge in the Payer Authentication Response (PARes) message.

For 3DS v2 the value is provided by the Directory Server either on requesting authentication in the Authentication Response (ARes) message, in the case of a frictionless flow, or after a Cardholder challenge in the Result Request (RReq) message, in the case of a challenge flow.

The field can contain one of the following values:

- Y** - Authentication Successful. The Issuer has authenticated the Cardholder by verifying the identity information or password. A CAVV and an ECI of 5 is returned. The card is accepted for payment.
- A** - Attempted Authentication. A proof of authentication attempt was generated. The Cardholder is not participating, but the attempt to authenticate was recorded. The card should be accepted for payment and authentication information passed to authorisation processing.
- N** - Not Authenticated. The Cardholder did not complete authentication and the card should not be accepted for payment.
- R** – Rejected By Issuer. The Issuer rejected the transaction and must not be accepted for payment (3DS v2 only).
- D** – Decoupled Challenge Required. Decoupled authentication confirmed (3DS v2 only).
- I** – Information Only. 3DS Requestor challenge preference acknowledged (3DS v2 only).
- U** - Unable To Authenticate. The authentication was not completed due to technical or another problem. A transmission error prevented authentication from completing. The card should be accepted for payment, but no authentication data will be passed on to authorisation processing and no liability shift will occur.
- E** - Error Checking Authentication. The Gateway encountered an error. The card should be accepted for payment, but no authentication information will be passed to authorisation processing and no liability shift will occur.

A-3.3 3-D Secure Transaction Identifier

The **threeDSXID** field provides a unique value to identify the transaction through the 3-D Secure system.

For 3DS v1 the value is referred to as the Transaction Identifier or XID and is a 28-character [Base-64](#) encode identifier.

For 3DS v2 the value is referred to as the 3DS Server Transaction ID and is a 36-character universally unique identifier (UUID) as defined in [IETF RFC 4122](#).

A-3.4 3DS Electronic Commerce Indicator

The **threeDSECI** field indicates the security status of the transaction after the Cardholder has been authenticated or attempted authentication.

For 3DS v1 the value is provided by the Authentication Control Server after a Cardholder challenge in the Payer Authentication Response (PARES) message.

For 3DS v2 the value is provided by the Directory Server either on requesting authentication in the Authentication Response (ARes) message, in the case of a frictionless flow, or after a Cardholder challenge in the Result Request (RReq) message, in the case of a challenge flow.

The value is always present if the **threeDSAuthenticated** field has a value of **Y** (successful authentication), or **A** (attempted authentication) but can be present at other times.

The field can contain one of the following 2-digit values¹:

- 05/02** - Both cardholder and card issuing bank are 3DS enabled. 3DS card authentication is successful.
- 06/01** - Either cardholder or card issuing bank is not 3DS enrolled. 3DS card authentication is unsuccessful, in sample situations as:
 1. 3DS cardholder not enrolled.
 2. Card issuing bank is not 3DS ready.
- 07/00** - Authentication is unsuccessful or not attempted. The card is either a non-3DS card or card issuing bank does not handle it as a 3DS transaction.

¹ The values are show as pairs, the first value is for Visa and other card schemes and the second for Mastercard only.

A-3.5 3DS Cardholder Authentication Verification Value

The **threeDSCAVV** field provides proof that the Cardholder has been authenticated or attempted authentication.

For 3DS v1 the value is provided by the Authentication Control Server after a Cardholder challenge in the Payer Authentication Response (PARES) message.

For 3DS v2 the value is provided by the Directory Server either on requesting authentication in the Authentication Response (ARes) message, in the case of a frictionless flow, or after a Cardholder challenge in the Result Request (RReq) message, in the case of a challenge flow.

The value is present if the **threeDSAuthenticated** field has a value of **Y** (successful authentication), or **A** (attempted authentication).

The field will contain a 28-character [Base-64](#) encoded value (32-characters for Mastercard).

A-4 3-D Secure Enrolment/Authentication Only

Usually, the Gateway will perform most of the 3-D Secure processing in the background leaving the only the actual contacting of the issuers Access Control Server (ACS) to the Merchant.

However, there may be times when you may wish to gain more control over the Enrolment and Authentication process. The following field allows the request processing to stop after the 3-D Secure enrolment check or authentication check and return;

Field Name	Mandatory?	Description
threeDSOnly	No	Complete the processing as far as the next 3-D Secure stage and then return with the appropriate response fields for that stage.

As this stop is requested then a **responseCode** is returned as **0 (Success)** however it will be recorded in the Merchant Management System (MMS) as **65792 (3DS IN PROGRESS)** indicating that the transaction has been prematurely halted expecting it to be continued to the next 3-D Secure stage when required. In order to continue the process, the **threeDSRef** field is returned together with any relevant 3-D Secure response fields suitable for that stage in the processing.

If this flag is used when 3-D Secure is not enabled on the account or after the 3-D Secure process has been completed for the request (ie when the authentication step has completed), then passing the flag will cause the transaction to abort with a **responseCode** of **65795 (3DS PROCESSING NOT REQUIRED)**. This ensures that the transaction doesn't go on to completion by accident while trying do 3-D Secure enrolment or authentication only.

3-D Secure Enrolment/Authentication Only is supported by the Direct Integration only.

A-5 3-D Secure Legacy API

A-5.1 Background

The 3-D Secure Legacy API was used for 3-D Secure integration prior to the introduction of 3-D Secure version 2. The API details are documented for backwards compatibility and should not be used for new integrations.

A-5.2 Direct Implementation

If your Merchant account is setup for 3-D Secure the Gateway will require further authentication details provided by the 3-D Secure system.

To ensure the Gateway uses the legacy 3-D Secure API you must not pass any of the following fields used by the current API:

- **threeDSRef**
- **threeDSRedirectURL**
- **threeDSURL**
- **threeDSRequest**
- **threeDSResponse**

The API versions must not be mixed between the initial and continuation requests otherwise an error will occur.

A-5.2.1 Initial Request (Direct Integration)

If no 3-D Secure authentication details are provided in the initial request the Gateway will determine whether the transaction is eligible for 3-D Secure by checking whether the card is enrolled in the 3-D Secure scheme.

If the Gateway determines that the transaction is not eligible for 3-D Secure, then it will continue and process it as normal transaction without 3-D Secure unless the **threeDSRequired** request field indicates that the transaction should be aborted instead.

If the Gateway determines that the transaction is eligible it will respond with a **responseCode** of **65802 (3DS AUTHENTICATION REQUIRED)** and included in the response will be a **threeDSACSURL** field containing the URL required to contact the ACS on and a **threeDSMD** and **threeDSPaReq** to send to the provided URL. The latter two values must be posted to the provided ACS URL as the fields **MD** and **PaReq** together with a **TermUrl** field provided by yourself which must contain the URL of a page on your server to return to when authentication has been completed.

A-5.2.2 Continuation Request (Direct Integration)

On completion of the 3-D Secure authentication the ACS will post the original **MD** together with a **PaRes** value to the **TermUrl** provided. These values should then be sent to the Gateway in the **threeDSMD** and **threeDSPaRes** fields of a new request. This new request will check the 3-D Secure authentication and then either complete or abort the transaction depending on the authentication result and your preferences, either sent in the **threeDSPref** field or set in the Merchant Management System (MMS).

If you would like an example of a 3-D Secure integration, please refer to our sample code appendix **A-23.2**.

A-5.3 Request Fields

A-5.3.1 Initial Request (Direct Integration)

These fields should be sent in addition to basic request fields in section 2.1.

Field Name	Mandatory?	Description
merchantName	No ¹	Merchant name to use on 3DS form.
merchantWebsite	No ¹	Merchant website to use on 3DS form. The website must be a fully qualified URL and include at least the scheme and host components.
threeDSRequired	No ²	Is 3DS required for this transaction? Possible values are: N – 3DS is not required. Y – Abort if 3DS is not enabled.
threeDSCheckPref	No ¹	List of threeDSCheck response values that are to be accepted, any other value will cause the transaction to be declined. Value is a comma separated list containing one or more of the following values: ' not known ', ' not checked ', ' not authenticated ', ' attempted authentication ', ' authenticated '.

¹ If the value is not supplied, then the default account preferences will be used.

² The default value is **Y** if 3-D Secure is enabled on the Merchant Account, otherwise **N**.

A-5.3.2 Continuation Request (Direct Integration)

These fields may be sent alone¹.

Field Name	Mandatory?	Description
threeDSMD	Yes	The value of the threeDSMD field in the initial Gateway response.
threeDSPaRes	Yes	The value of the PaRes field POSTed back from the Access Control Sever (ACS).

¹ It is only necessary to send the **threeDSMD** and the **threeDSPaRes** in the continuation request as the **threeDSMD** will identify the Merchant Account and initial request. The message does not need to be signed. However, you can send any of the normal request fields to modify or supplement the initial request. Any card details and transaction amount sent in the second request must match those used in the first request, or the second request will fail with a **responseCode** of **64442 (REQUEST MISMATCH)**.

A-5.4 Response Fields

A-5.4.1 Initial Response (Direct Integration)

These fields will be returned in addition to the request fields from section A-5.3.1 and the basic response fields in section 2.2.

Field Name	Returned?	Description
threeDSEnabled	Always	Is 3DS enabled for this Merchant Account? Possible values are: N – Merchant Account is not enabled. Y – Merchant Account is enabled.
threeDSXID	If 3DS enabled	The unique identifier for the transaction in the 3DS system.
threeDSVETimestamp	If 3DS enabled	The time the card was checked for 3DS enrolment.
threeDSEnrolled	If 3DS enabled	The 3DS enrolment status for the credit card. Refer to appendix A-3 for details. Possible values are: Y – Enrolled. N - Not Enrolled. U - Unable to Verify. <i>(v1 only)</i> E - Error Verifying Enrolment. <i>(v1 only)</i>
threeDSMD	If 3DS enabled	Value to return in the continuation request. Can be sent to the Access Control Server (ACS) in its MD field or stored locally by your server.
threeDSACSURL	If 3DS enrolled	The URL of the Access Control Server (ACS) to which the Payer Authentication Request (PaReq) should be sent.
threeDSPaReq	If 3DS enrolled	Payer Authentication Request (PaReq) that is sent to the Access Control Server (ACS) in order to verify the 3DS status of the credit card.

A-5.4.2 Continuation Response (Direct Integration)

These fields will be returned in addition to the request fields from section 5.5.1, the initial response fields in section 5.6.1 and the basic response fields in section 2.2.

Field Name	Returned?	Description
threeDSPaRes	If 3DS enrolled	Payer Authentication Response (PaRes) that is returned from the Access Control Server (ACS) determining the 3DS status of the credit card.
threeDSCATimestamp	If 3DS enrolled	The time the card was checked for 3DS authentication.
threeDSAuthenticated	If 3DS enrolled	<p>The 3DS authentication status for the credit card. Refer to appendix A-3 for details.</p> <p>Possible values are: Y - Authentication Successful. N - Not Authenticated. U - Unable to Authenticate. A - Attempted Authentication. E - Error Checking Authentication.</p>
threeDSECI	If 3DS authenticated	<p>This contains a two-digit Electronic Commerce Indicator (ECI) value. Refer to appendix A-3 for details.</p> <p>The data contained within this property is only valid if the threeDSAuthenticated value is Y or A.</p>
threeDSCAVV	If 3DS authenticated	<p>This contains a 28-character Base-64 encoded Cardholder Authentication Verification Value (CAVV). Refer to appendix A-3 for details.</p> <p>The data contained within this property is only valid if the threeDSAuthenticated value is Y or A.</p>
threeDSCAVVAlgorithm	If 3DS authenticated	<p>This contains the one-digit value that indicates the algorithm used by the Access Control Server (ACS) to generate the CAVV.</p> <p>The data contained within this property is only valid if the threeDSAuthenticated value is Y or A.</p>
threeDSErrorCode	If 3DS error	Any error response code returned by the Access Control Server (ACS) if there is an error in determining the card's 3DS status.
threeDSErrorDescription	If 3DS error	Any error response description returned by the Access Control Server (ACS) if there is an error in determining the card's 3DS status.

A-5.5 3-D Secure Enrolment/Authentication Only (Direct Only)

3-D Secure Enrolment/Authentication checks can be performed using the legacy 3-D Secure API as described in appendix A-4, except that the Gateway will return a **threeDSMD** field instead of a **threeDSRef** field. This field can be passed in the next request to continue the transaction.

A-6 Request Checking Only

Sometimes, you may wish to submit a request to the Gateway in order for it to be 'validated only' and not processed or sent to the Acquirer. In these cases, the following flag can be used that will stop the processing after the integrity verification has been performed:

Field Name	Mandatory?	Description
<code>checkOnly</code>	No	Check the request for syntax and field value errors only. Do not attempt to submit the transaction for honouring by the Merchant's financial institution.

If the request is OK, then a `responseCode` is returned as **0 (Success)**; otherwise, the code that would have prevented the request from completing is returned.

Note: *in these cases, the request is not stored by the Gateway and is not available within the Merchant Management System (MMS).*

A-7 Merchant Account Mapping

Merchant Accounts can be grouped together so that if a transaction is sent to an account that doesn't support either the requested card type or currency, then it can be automatically routed to another account in the same group that does support them.

For example, you can group a Merchant Account that only supports American Express cards with a Merchant Account that only supports Visa cards. Then, if a request using an American Express card is sent to the Visa only Merchant Account, the Gateway will automatically route it to the American Express Merchant Account.

This prevents you from needing to know the card type in advance in order to send the request to the correct Merchant Account. This is important when using the Hosted integration, because you don't know the card type at the time you send the request.

It is usual for you to have one master account to which you direct all requests and then group all your accounts together.

Any Gateway routing of the transaction can be seen from the following additional response fields:

Field Name	Returned?	Description
<code>requestMerchantID</code>	Always	ID of Merchant Account request was sent to (usually same as <code>merchantID</code>).
<code>processMerchantID</code>	Always	ID of Merchant Account request was processed by.

A-8 Velocity Control System (VCS)

The Gateway allows you to configure velocity controls using the Merchant Management System (MMS). These can be used to email you declined transactions automatically, where they exceed these controls.

For example, you can set up a control that stops a certain card number from being used more than twice in the space of a few minutes.

If one or more of these controls are broken by a transaction, then the following response fields will show the problem.

If a transaction is declined through breach of one or more of these rules, then a **responseCode** of **5 (VCS DECLINE)** will be returned.

Field Name	Returned?	Description
vcsResponseCode	Always	VCS error code. Normally 5 . Refer to appendix A-1 for details.
vcsResponseMessage	Always	Description of above response code or list of rules broken by this transaction.

A-9 Duplicate Transaction Checking

Duplicate transaction checking prevents transaction requests from accidentally processing more than once. This can happen if a Customer refreshes your checkout page or clicks a button that issues a new transaction request. While duplicate checking can help prevent repeat transactions from going through, we recommend talking with your developers to see whether changes can be made to your form to reduce the likelihood of this occurring (eg disabling the Submit button after it has been clicked).

To help prevent duplicate transactions, each transaction can specify a time window during which previous transactions will be checked to see whether they could be possible duplicates.

This time window is specified using the **duplicateDelay** field. The value for this field can range from 0 to 9999 seconds (approx. 2 ³/₄ hours).

If the transaction request does not include the **duplicateDelay** field or specifies a value of zero, then a default delay of 300 seconds (5 minutes) is used.

The following fields are used in transaction comparison and must be the same for a transaction to be regarded as a duplicate:

- **merchantID**
- **action**
- **type**
- **amount**
- **transactionUnique**
- **currencyCode**
- **xref** (if provided in lieu of card details)
- **cardNumber** (may be specified indirectly via cross reference)

If a transaction is regarded as being a duplicate, then a **responseCode** of **65554 (REQUEST DUPLICATE)** will be returned.

A-10 Capture Delay

Capture Delay enables you to specify a delay between the authorisation of a payment and its capture. This allows you time to verify the order and choose whether to fulfil it or cancel it. This can be very helpful in preventing chargebacks due to fraud.

When NOT using capture delay, payments are authorised and captured immediately - funds are automatically debited from the Customer's credit or debit card at that time.

When using capture delay, the payment is authorised only at the time of payment - funds are reserved against the credit or debit card and will not be debited until the payment is captured; or not at all if you cancel.

The Customer experience with capture delay is the same as when capture delay is not used. The Customer will not know whether you are using capture delay or not.

If you choose to use capture delay, you can use the **captureDelay** request field to specify the number of days for which capture is delayed, within a range of **0** to **30** days. Alternatively, you can use the value **-1** or **'never'** to specify that the Gateway should never automatically capture in which case you must manually capture.

The Gateway will automatically capture the transaction after any delay specified unless you manually cancel or capture the transaction, using either the Direct Integration or via the Merchant Management System (MMS).

Note that some cards require capture within 4 to 5 days - if payment is not automatically captured within that period, the transaction will expire, and the reserved funds will be released to the Customer.

Why Use Capture Delay?

Capture delay allows you to accept online orders normally but allows you to cancel any transactions that you cannot or will not fulfil, thereby reducing the risks of chargeback. If you receive an order that appears to be fraudulent or that you cannot or do not wish to fulfil, you can simply cancel the transaction.

Note: Cancelling a transaction may not always reverse the authorisation and release the funds back to the Customer. This is dependent on the Acquirer and in these cases the authorisation will never be settled and will be left to expire releasing any reserved funds. The time taken for this varies between cards.

*Some Acquirers do not support delayed capture, in which case the Hosted Integration will return a **responseCode** of **66358 (INVALID CAPTURE DELAY)**.*

A-11 Card Identification

The Gateway will attempt to identify the type of each card number provided along with the associated card scheme (network) and, when available, the issuing institution and issuing country¹.

The Gateway primarily supports Mastercard, Visa and American Express branded cards. Some Acquirers may support JCB, Discover and Diners Club cards. Not all Acquirers support all types.

The card type and scheme codes will be returned in the **cardTypeCode** and **cardSchemeCode** response fields. When available, the issuer details will be returned in the **cardIssuer** and **cardIssuerCountryCode** response fields.

If the Gateway is unable to identify the card, then a code of 'XX' will be returned.

The following fields are returned by the Gateway to indicate a cards identity.

Field Name	Description
cardTypeCode	Card type identification code, eg 'VD'.
cardType	Card type name, eg, 'Visa Debit'.
cardSchemeCode	Scheme identification code, eg 'VC'.
cardScheme	Scheme name, eg 'Visa'.
cardIssuer	Card Issuer's name, eg 'HSBC UK BANK PLC'.
cardIssuerCountryCode	Issuing country's ISO-3166 2-letter code, eg 'GB'.
cardIssuerCountry	Issuing country's name, eg 'United Kingdom'.
cardFlags	Bitmask of flags where each bit number indicates the following: 1 – debit (not credit) card. 2 – alternative debit (not credit) card. 3 – prepaid card. 4 – <i>not used</i> . 5 – corporate card (not consumer) card. 6 – <i>not used</i> . 7 – <i>not used</i> . 8 – tokenised card (DPAN not FPAN). 9 – ECOM use allowed. 10 – MOTO use allowed. 11 – EPOS use allowed. 12 – CA use allowed. 13 – LUHN conforming. 14 – 3-D Secure available (doesn't indicate the card is enrolled). 15 – Contactless available.

¹ Issuing institution and country are primarily available for Visa and Mastercard issued cards only.

The following is a list of primary card types supported by the Gateway.

Card Code	Scheme Code	Card Type
MC	MC	Mastercard Credit
MD	MC	Mastercard Debit
MA	MC	Mastercard International Maestro
MI	MC	Mastercard/Diners Club
MP	MC	Mastercard Purchasing
MU	MC	Mastercard Domestic Maestro (UK)
VC	VC	Visa Credit
VD	VC	Visa Debt
EL	VC	Visa Electron
VA	VC	Visa ATM
VP	VC	Visa Purchasing
AM	AM	American Express
JC	JC	JCB
DS	DS	Discover
DI	DI	Diners Club
DC	DI	Diners Club Carte Blanche
CU	CU	China UnionPay
CC	CU	China UnionPay Credit
CD	CU	China UnionPay Debit

The following is a list of secondary card types recognised by the Gateway. These cards may be returned in response to a card lookup, but they are either deprecated or most likely not supported by any current Acquirer.

Card Code	Scheme Code	Card Type
CF	CF	Clydesdale Financial Services
BC	BC	BankCard
DK	DK	Dankort
DE	DI	Diners Club Enroute
FC	FC	FlexCache
LS	LS	Laser
SO	SO	Solo
ST	ST	Style
SW	SW	Switch
TP	TP	Tempo Payments
IP	IP	InstaPayment

A-12 Integration Testing

You will be provided with unique test Merchant Account IDs during the onboarding process. Refer to section 1.6 for more information.

Test Merchant Accounts are not connected to our Simulator and not to an actual Acquirer. The Simulator will emulate the function of an Acquirer and provide simulated responses and authorisation codes.

A-12.1 Test Amounts

When testing the transaction **amount** can be used to trigger different authorisation and settlement outcomes as follows:

Min. Amount	Max. Amount	Authorisation response	Settlement outcome
100 (1.00)	2499 (24.99)	(0) AUTH CODE: XXXXXX	ACCEPTED
2500 (25.00)	4999 (49.99)	(0) AUTH CODE: XXXXXX	REJECTED
5000 (50.00)	7499 (74.99)	(1) CARD REFERRED (0) AUTH CODE: XXXXXX	ACCEPTED
7500 (75.00)	9999 (99.99)	(1) CARD REFERRED (0) AUTH CODE: XXXXXX	REJECTED
10000 (100.00)	14999 (49.99)	(5) CARD DECLINED	N/A
15000 (150.00)	19999 (199.99)	(4) CARD DECLINED – KEEP CARD	N/A
20000 (200.00)	24999 (249.99)	(65) CARD DECLINED - SCA REQUIRED (0) AUTH CODE: XXXXXX	ACCEPTED
25000 (250.00)	29999 (299.99)	(65) CARD DECLINED – SCA REQUIRED (5) CARD DECLINED	N/A

Any other amount will return a **responseCode** of **66311 (Invalid Test Amount)**.

The settlement outcome only applies to transactions which reach settlement due to being successfully authorised and captured and not cancelled. The amount captured is used when determining the settlement outcome rather than the amount authorised.

The range 5000 to 9999 can be used to test manual authorisations. If the transaction does not contain an **authorisationCode** request field, then the Simulator will return a **responseCode** of **1 (CARD REFERRED)**. If it does, then it will return a **responseCode** of **0 (SUCCESS)**, with an amount between 50000 and 7499 being accepted at settlement and an amount of 7500 to 9999 being rejected.

The range 20000 to 29999 can be used to test SCA soft declines. If the transaction is eligible¹ to request SCA then the Simulator will return a **responseCode** of **65 (SCA REQUIRED)**. If not, then it will return a **responseCode** of **0 (SUCCESS)** for the range 20000 to 24999 or **5 (DO NOT HONOR)** for the range 25000 to 29999. Successful transactions will be approved at settlement.

¹ A cardholder-initiated e-commerce sale or verify transaction that is enabled for 3-D Secure but is not already authenticated. SCA exemptions are not supported by the simulator and so cannot be used to request that SCA is not required.

A-12.2 Test Cards

The test accounts will only accept card numbers that are designated for test purposes. These test cards cannot be used on production accounts.

To test AVS and CV2 verification then the associated CVV and billing addresses are provided for each card. If a different value is used, then the Simulator will mark the responses as 'not matched'.

Unless stated otherwise an expiry date sometime in the near future should be used.

A-12.2.1 Visa Credit

Card Number	CVV	Address
4929421234600821	356	Flat 6 Primrose Rise 347 Lavender Road Northampton NN17 8YG
4543059999999982	110	76 Roseby Avenue Manchester M63X 7TH
4543059999999990	689	23 Rogerham Mansions 4578 Ermine Street Borehamwood WD54 8TH

A-12.2.2 Visa Debit

Card Number	CVV	Address
4539791001730106	289	Unit 5 Pickwick Walk 120 Uxbridge Road Hatch End Middlesex HA6 7HJ
4462000000000003	672	Mews 57 Ladybird Drive Denmark 65890

A-12.2.3 Electron

Card Number	CVV	Address
4917480000000008	009	5-6 Ross Avenue Birmingham B67 8UJ

A-12.2.4 Mastercard Credit

Card Number	CVV	Address
5301250070000191	419	25 The Larches Narborough Leicester LE10 2RT
5413339000001000	304	Pear Tree Cottage The Green Milton Keynes MK11 7UY
5434849999999951	470	34a Rubbery Close Cloisters Run Rugby CV21 8JT
5434849999999993	557	4-7 The Hay Market Grantham NG32 4HG

A-12.2.5 Mastercard Debit

Card Number	CVV	Address
5573 4712 3456 7898	159	Merevale Avenue Leicester LE10 2BU

A-12.2.6 UK Maestro

Card Number	CVV	Address
6759 0150 5012 3445 002	309	The Parkway 5258 Larches Approach Hull North Humberside HU10 5OP
6759 0168 0000 0120 097	701	The Manor Wolvey Road Middlesex TW7 9FF

A-12.2.7 JCB

Card Number	CVV	Address
3540599999991047	209	2 Middle Wallop Merideth-in-the-Wolds Lincolnshire LN2 8HG

A-12.2.8 American Express

Card Number	CVV	Address
374245455400001	4887	The Hunts Way Southampton SO18 1GW

A-12.2.9 Diners Club

Card Number	CVV Number	Address ¹
36432685260294	111	N/A

¹ Diners Club do not support the Address Verification Service (AVS). For testing purposes, we advise that a separate Merchant Account is used with AVS is turned off.

A-12.3 3-D Secure Testing

Your test accounts are connected to our 3-D Secure Product Integration Testing (PIT) system rather than to the production 3-D Secure servers.

You can use any of the test cards provided in section A-12.2 with this PIT system and can test various enrolment and authentication scenarios as follows.

A-12.3.10 3-D Secure version 1

For 3-D Secure v1 all the standard test card numbers will show as enrolled except for:

Card Number	Enrolment	Simulation
4012001038443335	N	Unenrolled card
4012001038488884	U	Unknown enrolment status
4012001036275556	E	Error due timeout communicating with the Directory Server
4012001036298889	E	Error due to corrupt response from the Directory Server

The desired authentication status (**threeDSAuthenticated**) can be selected on the challenge dialog shown by the PIT Access Control Server.

A-12.3.11 3-D Secure version 2

For 3-D Secure v2 all the standard test cards will show as enrolled, and the authentication status returned by the Directory Server (for frictionless flow simulation) can be selected using the value of the card expiry month as follows:

Card Expiry Month	Auth Status	Simulation (Frictionless)
01 - Jan	Y	Fully authenticated
02 - February	N	Not authenticated
03 - March	U	Unknown authentication status
04 - April	A	Attempted authentication
05 - May	D	Decoupled authentication
06 - June	R	Transaction rejected (do not attempt to send for authorisation)
07 - July	E	Unknown error performing 3-D Secure checks
08 - August	E	Error due to timeout communicating with the Directory Server
09 - September	E	Error due to corrupt response from the Directory Server.
10 - October	I	Information only
11 - November	U	Unknown authentication due to Cardholder not enrolled (error 13)
12 - December	C	Frictionless not possible, challenge Cardholder

An expiry month of 12 will simulate the non frictionless flow and desired authentication status (**threeDSAuthenticated**) can be selected on the challenge dialog shown by the PIT Access Control Server.

When using an expiry month from the above table please use a suitable expiry year to ensure the date is sometime in the near future.

A-12.4 PayPal Sandbox Accounts

Please contact customer support to have your own PayPal test Merchant account created that connects to your own PayPal sandbox account, thus enabling you to view the transactions as they are sent to PayPal.

A-12.5 Amazon Pay Sandbox Accounts

Please contact customer support to have your own Amazon Pay test Merchant account created that connects to your own Amazon Pay sandbox account, thus enabling you to view the transactions as they are sent to Amazon Pay.

A-13 Sample Signature Calculation

It is highly recommended that transactions are protected using message signing. The signing process offers a quick and simple way to ensure that the message came from an authorised source and has not been tampered with during transmission.

Signing, however, must be completed on your servers and never left for the Customer's browser to complete in JavaScript, as this would mean revealing your secret signature code to anyone who viewed the JavaScript code in the browser.

Signatures are especially important when a transaction is sent from a browser's payment form via the use of hidden form fields because the Customer can easily use tools built into their browser to modify these hidden fields and change items such as the amount they should be charged.

Care must be taken to ensure that fields are sorted before signing into ascending field name order according to their numeric ASCII value. Some languages natural sort routines do **NOT** use ASCII order by default and so need to be adjusted or alternative methods used.

Also, when signing requests with fields formatted as per the *record* format detailed in section 1.7.8, only the root integration field is included in any sorting as the sub-fields are part of the value and should not have their order changed. The sub-fields must then be sent in the same order as they were hashed if added as hidden fields in HTML forms etc.

The section below gives a step-by-step example of how to sign a transaction, complete with coding examples using the PHP language.

Example Signature Key:

```
$key = 'DontTellAnyone'
```

Example Transaction:

```
$tran = array (
    'merchantID' => '100001',
    'action' => 'SALE',
    'type' => '1',
    'currencyCode' => '826',
    'countryCode' => '826',
    'amount' => '2691',
    'transactionUnique' => '55f025add3c2',
    'orderRef' => 'Signature Test',
    'cardNumber' => '4929 4212 3460 0821',
    'cardExpiryDate' => '1213',
)
```

The transaction used for signature calculation must not include any 'signature' field as this will be added after signing when its value is known.

Step 1 - Sort transaction values by their field name

Transaction fields must be in ascending field name order according to their **numeric ASCII value**.

```
ksort($tran);
```

```
array ( 'action' => 'SALE', 'amount' => '2691', 'cardExpiryDate' => '1213',  
'cardNumber' => '4929 4212 3460 0821', 'countryCode' => '826', 'currencyCode' => '826',  
'merchantID' => '100001', 'orderRef' => 'Signature Test', 'transactionUnique' =>  
'55f025add3c2', 'type' => '1' )
```

Step 2 - Create url encoded string from sorted fields

Use RFC 1738 and the application/x-www-form-urlencoded media type, which implies that spaces are encoded as plus (+) signs.

```
$str = http_build_query($tran, '', '&');
```

```
action=SALE&amount=2691&cardExpiryDate=1213&cardNumber=4929+4212+3460+0821&countryCode=  
826&currencyCode=826&merchantID=100001&orderRef=Signature+Test&transactionUnique=55f025  
add3c2&type=1
```

Step 3 - Normalise all line endings in the url encoded string

Convert all CR NL, NL CR, CR character sequences to a single NL character.

```
$str = str_replace(array('%0D%0A', '%0A%0D', '%0D'), '%0A', $str);
```

```
action=SALE&amount=2691&cardExpiryDate=1213&cardNumber=4929+4212+3460+0821&countryCode=  
826&currencyCode=826&merchantID=100001&orderRef=Signature+Test&transactionUnique=55f025  
add3c2&type=1
```

Step 4 - Append your signature key to the normalised string

The signature key is appended to the normalised string with no separator characters.

```
$str .= 'DontTellAnyone'
```

```
action=SALE&amount=2691&cardExpiryDate=1213&cardNumber=4929+4212+3460+0821&countryCode=  
826&currencyCode=826&merchantID=100001&orderRef=Signature+Test&transactionUnique=55f025  
add3c2&type=1DontTellAnyone
```

Step 5 - Hash the string using the SHA-512 algorithm

The normalised string is hashed to a more compact value using the secure SHA-512 hashing algorithm.

```
$signature = hash('SHA512', $str);
```

```
da0acd2c404945365d0e7ae74ad32d57c561e9b942f6bdb7e3dda49a08fcddf74fe6af6b23b8481b8dc8895  
c12fc21c72c69d60f137fdf574720363e33d94097
```

Step 6 - Add the signature to the transaction form or post data

The signature should be sent as part of the transaction in a field called 'signature'.

```
<input type="hidden" name="signature" value="<?=$signature?>">
```

or

```
$tran['signature'] = $signature;
```

A-14 Transaction Life cycle

Each transaction received by the Gateway follows a pre-determined life cycle from receipt to completion. The stages in the life cycle are determined by the type of transaction and its success or failure at different stages in its life.

A-14.1 Authorise, Capture and Settlement

The key stages in the transaction's life cycle can be grouped into the Authorisation, Capture and Settlement stages as follows:

A-14.1.1 Authorisation

An authorisation places a hold on the transaction amount in the Cardholder's issuing bank. No money actually changes hands yet. For example, let's say that you are going to ship a physical product from your website. First, you authorise the amount of the transaction; then you ship the product. You only capture the transaction after the product is shipped.

A-14.1.2 Capture

A capture essentially marks a transaction as ready for settlement. As soon as the product is shipped, you can capture an amount up to the amount of the authorisation. Usually, the full amount is captured. An example of a situation in which the whole amount is not captured is where the Customer ordered multiple items and one of them is unavailable.

The Gateway will normally automatically capture all authorisations as soon as they are approved, freeing up you from having to do this.

However, it is usually more desirable to delay the capture either for a period of time or indefinitely. The **captureDelay** field can be used for this purpose and will allow you to state the number of days to delay any automatic capture or never to automatically capture. For more details on delayed capture, refer to appendix A-9.

A-14.1.3 Settlement

Within 24 hours, the Gateway will instruct your Acquirer to settle the captured transaction. The Acquirer then transfers the funds between the Cardholder's and your accounts.

A-14.2 Transaction States

At any time during the transaction's life cycle, it is in one of a number of states as follows:

A-14.2.1 Received

The transaction has been received by the Gateway and stored away. This is the first stage. The Gateway will examine the transaction and pass it on to the next stage, as appropriate.

A-14.2.2 Approved

The transaction has been sent to the Acquirer for authorisation and the Acquirer has approved it and is holding the Cardholder's funds.

This is an intermediate state and follows the **received** state.

A-14.2.3 Verified

The transaction has been sent to the Acquirer for verification and the Acquirer has confirmed that the account is valid.

This is a terminal state and follows the **received** state. The transaction will never be settled and no funds will ever be transferred

A-14.2.4 Declined

The transaction has been sent to the Acquirer for authorisation and the Acquirer declined it. The Acquirer will not usually give any reason for a decline and will not have held any funds.

The transaction has now completed its life cycle and no more processing will be done on it.

This is a terminal state and follows the **received** state. The transaction will never be settled and no funds will ever be transferred. The transaction **responseCode** will be **5 (Declined)**.

A-14.2.5 Referred

The transaction has been sent to the Acquirer for authorisation and the Acquirer referred it for verbal approval.

You can choose not to seek verbal approval and treat these transactions the same as a normal 'declined' authorisation.

To seek verbal approval, you must phone the Acquirer and ask for an authorisation code. They will probably ask for more information about the transaction and might require you to gather other forms of identification from the Cardholder. If an authorisation code is provided, then a new transaction can be sent to the Gateway specifying the **xref** of this transaction and the received **authorisationCode**. This new request will not be sent for authorisation and will be in the 'approved' state ready for capture and settlement.

This is a terminal state and follows the **received** state. The transaction will never be settled and no funds will ever be transferred. The transaction **responseCode** will be **2 (Referred)**.

A-14.2.6 Reversed

The transaction was sent to the Acquirer for authorisation and the Acquirer approved it. However, the transaction has been voided and the approval reversed. The Acquirer will have been asked to reverse any approval previously received, effectively cancelling the authorisation and returning any held funds back to the Cardholder.

The gateway will reverse an authorisation if it declines the transaction post authorisation due to any AVS/CV checking. The PREAUTH action will also automatically reverse an authorisation before return.

This is a terminal state and follows the **approved** state. The transaction will never be settled and no funds will ever be transferred.

If the transaction was reversed due to AVS/CV2 checking, then the transaction **responseCode** will be **5 (AVS/CV2 Declined)**.

A-14.2.7 Captured

The transaction has been captured and the Acquirer will be asked to capture the approved held funds when the settling process next runs. The settling process usually runs each evening but the Acquirer may take up to 3 days to transfer the funds.

The **capture** state can either be entered automatically if the transaction requested an immediate or delayed capture; or it can be manually requested by sending a CAPTURE request. You are free to change the amount to be captured to a value less than that initially approved by issuing one or more CAPTURE commands. When captured, there is no way to un-capture a transaction. If not explicitly cancelled, it will be sent for settlement at the next opportunity.

This is an intermediate state and follows the **approved** state.

A-14.2.8 Tendered

The transaction has been sent to the Acquirer for settlement by the settling process and is awaiting confirmation that it has been accepted.

At this point, the transaction can no longer be cancelled or re-captured.

This is an intermediate state and follows the **captured** state.

A-14.2.9 Deferred

The transaction could not be settled due to some temporary problem such as a communications loss. It will be attempted again the next time the settling process runs – usually first thing the next day.

This is an intermediate state and follows the **tendered** state. It will normally be accompanied by a transaction response that indicates why the settlement process could not settle the transaction.

A-14.2.10 Accepted

The transaction has been accepted for settlement by the Acquirer. The held funds will be transferred between the Merchant and Cardholder in due course.

The transaction has now completed its life cycle and no more processing will be done on it, unless it is subject to a rejection while the Acquirer is settling it.

This is a terminal state and follows the **tendered** state.

A-14.2.11 Rejected

The transaction has been rejected for settlement by the Acquirer. The held funds will not be transferred between the Merchant and Cardholder.

Only a few Acquirers inform the Gateway that they have rejected a transaction: they usually inform you directly. Therefore, a transaction may show as **accepted** even if was ultimately rejected or it may change from **accepted** to **rejected** if the Acquirer does inform the Gateway.

The transaction has now completed its life cycle and no more processing will be done on it.

This is a terminal state and follows the **tendered** or **accepted** states. The transaction response will normally indicate the reason the transaction was rejected.

A-14.2.12 Canceled

The transaction has been cancelled by the Merchant by sending a cancellation request to the Gateway either using the CANCEL action or via the Merchant Management System (MMS).

You can cancel any transaction that is not in a terminal state or in the 'tendered' state. When cancelled, any further processing that would have normally taken place will be halted. Cancelling a transaction may or may not release any funds held on the Cardholder's card, depending on support from the Acquirer and card scheme. Note: the state is spelt American style, with a single 'l' as **canceled**.

This is a terminal state and follows any non-terminal state that occurs before the transaction reaches the **tendered** state.

A-14.2.13 Finished

The transaction has finished and reached the end of its lifespan but did not reach one of the other terminal states. Usually this indicates that a problem has occurred with the transaction that prevents it continuing with its normal life cycle.

This is a terminal state and can follow any other state. The transaction response will normally indicate the reason that the transaction failed.

A-15 Transaction types

The Gateway only supports card not present (CNP) types of transactions, made where the Cardholder does not or cannot physically present the card for your visual examination at the time that an order is placed and payment effected.

The type of transaction required is specified using the **type** request field when performing a new payment transaction.

A-15.1 E-commerce (ECOM)

E-commerce transactions are supported by the Gateway by using a transaction **type** of **1**. They are designed for you to accept payments via a website, such as a shopping cart payment. E-commerce transactions can use advance fraud detection, such as 3-D Secure.

In accordance with Mastercard stipulations, the Gateway will not allow Maestro cards to be used for new e-commerce transactions without the use of 3-D Secure.

A-15.2 Mail Order/Telephone Order (MOTO)

Mail Order/Telephone Order transactions are supported by the Gateway by using a transaction **type** of **2**. They are designed for you to build your own virtual terminal system to enter remote order details. MOTO transactions cannot use 3-D Secure as the cardholder is not able to perform the challenge.

Your Acquirer may need to enable MOTO capabilities on your main acquiring account, or they provide a separate acquiring account which will be available through its own Gateway Merchant Account.

A-15.3 Continuous Authority (CA)

Continuous Authority transactions are supported by the Gateway by using a transaction **type** of **9**. They are designed for you to make subscription transactions. For further details on how to use Continuous Authority transactions, please refer to section **Error! Reference source not found..**

Your Acquirer may need to enable Continuous Authority capabilities on your main acquiring account, or they provide a separate acquiring account which will be available through its own Gateway Merchant Account.

The Gateway offers a means of automating the taking of regular CA transactions using Recurring Transaction Agreements (RTA) as detailed in section 12.

A-16 Payment Tokenisation

All new transactions stored by the gateway are assigned a unique reference number that is referred to as the cross reference and returned in the **xref** response field. This cross reference is displayed on the Merchant Management System (MMS) and used whenever a reference to a previous transaction is required.

The cross reference can be sent as part of a transaction request, in the **xref** request field, to tell the Gateway to perform an action on an existing transaction. This is usually for management actions such as **CANCEL** or **CAPTURE**.

The cross reference can also be sent with new transactions such as **PREAUTH**, **SALE**, and **REFUND** actions, to request that the Gateway uses the values from the existing transaction if they have not been specified in the new request. For more information on how the existing values are used, please refer to appendix A-17. This allows an existing transaction to be effectively repeated without your needing to know the original card number. The only exception to this is the card's security code (CVV) which the Gateway cannot store, due to PCI DSS restrictions. Accordingly, it will have to be supplied in the new request (unless the new request is a Continuous Authority transaction, refer to appendix A-15.3).

The use of cross references to perform repeat transactions is referred to as Payment Tokenisation and should not be confused with Card Tokenisation which is a separate service offered by the Gateway.

Refer to section 12 for details on how to instruct the Gateway to repeat a payment automatically.

The way each action handles any supplied **xref** is as follows:

A-16.1 **PREAUTH, SALE, REFUND, VERIFY** requests

These requests will always create a new transaction.

The **xref** field can be provided to reference an existing transaction, which will be used to complete any missing fields in the current transaction. The previous transaction will not be modified. For more information on how the existing values are used, please refer to appendix A-17. If the existing transaction cannot be found, then an error will be returned and recorded against the new transaction

The request is expected to contain any transaction information required.

The **xref** will only be used to complete any missing card and order details, relieving you from having to store card details and reducing your PCI requirements.

A-16.2 REFUND_SALE requests

These requests will always create a new transaction.

The **xref** field can be provided to reference an existing transaction that is going to be refunded. This existing transaction will be marked as have been fully or partially refunded and the amounts will be tallied to ensure that you cannot refund more than the original amount of this existing transaction. If the existing transaction cannot be found, then an error will be returned and recorded against the new transaction.

The request is expected to contain any transaction information required.

The **xref** will not only be used to find the transaction to be refunded: additionally, that transaction will be used to complete any missing card and order details, relieving you from having to store card details and reducing your PCI requirements.

A-16.3 CANCEL or CAPTURE requests

These requests will always modify an existing transaction.

The **xref** field must be provided to reference an existing transaction, which will be modified to the desired state. If the existing transaction cannot be found, then an error is returned but no record of the error will be recorded against any transaction.

The request must not contain any new transaction information any attempt to send any new transaction information will result in an error. The exception is that a CAPTURE request can send in a new lesser **amount** field when a lesser amount, than originally authorised, must be settled.

A-16.4 QUERY requests

These requests will not create or modify any transaction.

The **xref** field must be provided to reference an existing transaction, which will be returned as if it had just been performed. If the existing transaction cannot be found, then an error is returned but no record of the error will be recorded against any transaction.

The request must not contain any new transaction information and any attempt to send any new transaction information will result in an error.

A-16.5 SALE or REFUND Referred Authorisation requests

These will always create a new transaction.

The **xref** field must be provided to reference an existing transaction, which must be of the same request type and be in the **referred** state. A new transaction will be created based upon this transaction. If the existing transaction cannot be found or is not in the **referred** state, then an error will be returned and recorded against the new transaction.

The new transaction will be put in the **approved** state and captured when specified by the existing or new transaction details. It will not be sent for authorisation again first.

The request may contain new transaction details, but any card details or order amount must be the same as the existing transaction. Any attempt to send different card details or order details will result in an error.

NB: This usage is very similar to a normal SALE or REFUND request sent with an **authorisationCode** included. The difference is that the **xref** must refer to an existing **referred** transaction whose full details are used if required and not simply an existing transaction whose card details are used if required.

This means it is not possible to create a pre-authorised SALE or REFUND request and use a **xref** (ie to use the card and order details from an existing transaction). As soon as the **xref** field is seen, the Gateway identifies that it is a **referred** transaction that you wish to authorise.

A-17 Transaction Cloning

If a new transaction request is received with the Cross Reference (**xref**) of an existing transaction, then the values of certain fields in the existing transaction will be used to initialise the new transaction where new values have not been provided in the new request. This copying of fields from a base transaction is termed 'transaction cloning', and the copied-over value is termed the 'cloned value'.

Appendix A-17.1 shows all the fields whose values can be copied over from the existing transaction. To allow for easy addition of future fields, the fields are grouped into logical groupings and each group is given a name, given in brackets after the group title.

Certain groups of fields, such as address fields, can only be copied as a whole entity and any new value provided in the new request will prevent the whole group from being copied from the existing transaction. These fields are marked with an asterisk after the field name. This is explained in appendix A-17.2.1.

By default, the values of all the fields listed in appendix A-17.1 are copied from the existing transaction where appropriate. However, you can control exactly which fields are copied using the **cloneFields** field in the new request. The value of **cloneFields** should be a comma separated list of field names or group names that should be copied over. Alternatively, if you wish to specify a list of fields not to copy, then prefix the list with a single exclamation mark (!).

Field Name	Mandatory?	Description
cloneFields	N	Comma separated list of field names or group names whose values should be cloned.

Examples

To copy over only the value of **customerName** and any values for the fields in the **customerAddressFields** group:

```
cloneFields="customerName, customerAddressFields"
```

To copy over the values of all supported fields apart from the value of **customerName** and **merchantName**:

```
cloneFields="!customerName,merchantName"
```


A-17.1 Cloned Fields

Transaction fields currently cloned are as follows:

- Order Details Fields (**orderFields**)
 - type
 - countryCode
 - currencyCode
 - amount
 - grossAmount
 - netAmount
 - taxRate
 - taxAmount
 - taxReason
 - discountAmount
 - discountReason
 - handlingAmount
 - insuranceAmount
 - surchargeAmount
- Order Reference Fields (**orderRefFields**)
 - transactionUnique
 - orderRef
 - orderDate
- Card Fields (**cardFields**)
 - paymentMethod
 - paymentToken
 - cardToken
 - cardNumber
 - cardExpiryDate*
 - cardExpiryMonth*
 - cardExpiryYear*
 - cardStartDate*
 - cardStartMonth*
 - cardStartYear*
 - cardIssueNumber
- Cardholder Fields (**cardholderFields**)
 - customerName
 - customerAddress
 - customerPostcode
 - customerEmail
 - customerPhone
- Purchase Fields (**purchaseFields**)
 - items
- Statement Narrative Fields (**narrativeFields**)
 - statementNarrative1
 - statementNarrative2
- AVS/CV2 Fields (**avscv2Fields**)
 - avscv2Required
 - cv2CheckPref
 - addressCheckPref
 - postcodeCheckPref
 - customerAddress
 - customerPostcode

- Risk Check Fields (**riskCheckFields**)
 - riskCheckRequired
 - riskCheckPref
 - riskCheckOptions
- 3-D Secure Fields (**threedsFields**)¹
 - threeDSRequired
 - threeDSPolicy
 - threeDSCheckPref
 - threeDSRedirectURL
 - threeDSOptions
 - scaExemption
- Merchant Email Notification Fields (**notifyFields**)
 - notifyEmailRequired
 - notifyEmail
- Customer Receipt Fields (**cReceiptFields**)
 - customerReceiptsRequired
 - customerEmail
- Merchant Information Fields (**merchantFields**)
 - merchantName
 - merchantCompany
 - merchantAddress*
 - merchantTown*
 - merchantCounty*
 - merchantPostcode*
 - merchantCountryCode*
 - merchantPhone
 - merchantMobile
 - merchantFax
 - merchantEmail
 - merchantWebsite
 - merchantData
 - merchantOrderRef
 - merchantCustomerRef
 - merchantTaxRef
 - merchantOriginalOrderRef
 - merchantCategoryCode
 - merchantAccountNo
 - merchantType

Customer Information Fields (**customerFields**)

- customerName
- customerCompany
- customerAddress*
- customerTown*
- customerCounty*
- customerPostcode*
- customerCountryCode*
- customerPhone
- customerMobile
- customerFax
- customerEmail
- customerDateOfBirth
- customerOrderRef
- customerMerchantRef
- customerTaxRef

¹ 3-D Secure fields are only cloned if both the existing and new transaction support 3-D Secure.

Supplier Information Fields (**supplierFields**)

- **supplierName**
- **supplierCompany**
- **supplierAddress***
- **supplierTown***
- **supplierCounty***
- **supplierPostcode***
- **supplierCountryCode***
- **supplierPhone**
- **supplierMobile**
- **supplierFax**
- **supplierEmail**
- **supplierOrderRef**
- **supplierAccountNo**

• Receiver Information Fields (**receiverFields**)

- **receiverName**
- **receiverCompany**
- **receiverAddress***
- **receiverTown***
- **receiverCounty***
- **receiverPostcode***
- **receiverCountryCode***
- **receiverPhone**
- **receiverMobile**
- **receiverFax**
- **receiverEmail**
- **receiverAccountNo**
- **receiverDateOfBirth**

• Delivery Information Fields (**deliveryFields**)

- **deliveryName**
- **deliveryCompany**
- **deliveryAddress***
- **deliveryTown***
- **deliveryCounty***
- **deliveryPostcode***
- **deliveryCountryCode***
- **deliveryPhone**
- **deliveryMobile**
- **deliveryFax**
- **deliveryEmail**

• Shipping Information Fields (**shippingFields**)

- **shippingMethod**
- **shippingTrackingRef**
- **shippingAmount**
- **shippingGrossAmount**
- **shippingNetAmount**
- **shippingTaxRate**
- **shippingTaxAmount**
- **shippingTaxReason**
- **shippingDiscountAmount**
- **shippingDiscountReason**

• MCC 6012 Additional Authorisation Data (**mcc6012Fields**)

- **receiverName**
- **receiverPostcode**
- **receiverAccountNo**
- **receiverDateOfBirth**

- Payment Facilitator Data (**facilitatorFields**)¹
 - **subMerchantID**
 - **facilitatorID**
 - **facilitatorName**
 - **isoID**
- Surcharge Data (**surchargeFields**)
 - **surchargeRequired**
 - **surchargeAmount**
 - **surchargeRules**
- Device Data (**deviceFields**)
 - **deviceType**
 - **deviceChannel**
 - **deviceIdentity**
 - **deviceTimeZone**
 - **deviceCapabilities**
 - **deviceAcceptContent**
 - **deviceAcceptCharset**
 - **deviceAcceptEncoding**
 - **deviceAcceptLanguage**
 - **deviceScreenResolution**
 - **deviceOperatingSystem**
- Acquirer Data (**acquirerFields**)
 - **acquirerOptions**

¹ Payment facilitator fields are only cloned if the existing transaction uses the same **merchantID** as the new transaction.
V2.00

A-17.2 Cloned Groups

To allow for easy future addition of new fields, the existing fields are grouped into logic groupings. Each group is given a name (as shown in brackets after the group title). It is recommended that this group name be used in any `cloneFields` value instead of listing all the fields separately.

A-17.2.1 Compound Groups

To help maintain transaction integrity, certain groups of fields, such as address fields, can only be copied as a whole entity and any new value provided in the new request will prevent the whole group from being copied from the existing transaction.

These compound fields are marked with an asterisk in appendix A-17.1 and can be referred to in `cloneFields` as logical groups using the following group names; ***merchantAddressFields***, ***customerAddressFields***, ***deliveryAddressFields***, ***supplierAddressFields*** and ***receiverAddressFields***.

A-17.2.2 Line-Item Data

Any line-item data (`items`) is copied over in its entirety and there is no way to merge the line item from an existing transaction with any sent in a new transaction.

A-17.2.3 Amount Consistency

The Gateway does not validate that the various sub-amount fields, such as `netAmount`, `grossAmount`, all add up to the actual requested `amount`. Therefore, these fields are currently not treated as a compound group.

If a new `amount` value is passed that is different from the value in the existing transaction, then the following fields should also be passed so that they tally with the new amount.

- `grossAmount`
- `netAmount`
- `taxRate`
- `discountAmount`

A-18 Credentials on File Matrix

The following table provides a quick reference for the correct flagging for the different credentials on file scenarios.

Scenario	CIT	CNP	COF	SCA	initiator	type	rtAgreementType	xref
Cardholder opts to store their card details on Merchant's website.	CIT	Ecom	Initial	Required	consumer	1	cardonfile	(Optional for cloning)
Cardholder opts to store their card details provided to Merchant via mail or telephone.	CIT	MoTo	Initial	Exempt	consumer	2	cardonfile	(Optional for cloning)
Cardholder pays using a card they previously stored on the Merchant's website.	CIT	Ecom	Subsequent	Required	consumer	1	cardonfile	Reference to transaction that initially stored the card
Cardholder provides their card details to sign up to a subscription on the Merchant's website.	CIT	Ecom	Initial or Subsequent	Required	consumer	1	recurring	(Optional for cloning or using previous stored card)
Cardholder provides their card details when agreeing to purchase by instalments on The Merchant's website.	CIT	Ecom	Initial or Subsequent	Required	consumer	1	instalment	(Optional for cloning or using previous stored card)
Cardholder provides their card details to sign up to a subscription via mail or telephone to the Merchant.	CIT	MoTo	Initial or Subsequent	Exempt	consumer	2	recurring	(Optional for cloning or using previous stored card)
Cardholder provides their card details when agreeing to purchase by instalments via mail or telephone to the Merchant.	CIT	MoTo	Initial or Subsequent	Exempt	consumer	2	instalment	(Optional for cloning or using previous stored card)
Merchant/Gateway takes an automatic subscription payment at the interval agreed to by the Cardholder.	MIT	CNP	Subsequent	Exempt	merchant	9	recurring	Reference to initial or previous recurring payment
Merchant/Gateway makes an automatic instalment payment at the interval agreed to by the Cardholder.	MIT	CNP	Subsequent	Exempt	merchant	9	instalment	Reference to initial or previous instalment payment
Merchant makes an unscheduled transaction, such as an account top-up, as previously agreed with the Cardholder when they stored their card details.	MIT	CNP	Subsequent	Exempt	merchant	2	unscheduled	Reference to transaction that initially stored the card
Merchant resubmits a payment where the initial payment was declined due to insufficient funds, but the goods have already been provided to the Cardholder.	MIT	CNP	N/A	Exempt	merchant	2	resubmission	Reference to initial payment that was declined

Scenario	CIT	CNP	COF	SCA	initiator	type	rtAgreementType	xref
Merchant reauthorises a payment when the completion or fulfilment of the original order or service extends beyond the authorization validity limit set by the card scheme.	MIT	CNP	N/A	Exempt	merchant	2	reauthorisation	Reference to payment that is to be reauthorised
Merchant makes a payment to process a supplemental account charge after original services have been rendered and respective payment has been processed.	MIT	CNP	N/A	Exempt	merchant	2	delayedcharges	Reference to original payment to which the delayed charges relate
Merchant makes a payment to charge the Cardholder a penalty according to the merchant's reservation cancellation policy.	MIT	CNP	N/A	Exempt	merchant	2	noshow	Reference to an initial CIT payment or account verification payment made by Cardholder at time of booking

A-19 PSD2 SCA Compliance

Strong Customer Authentication (SCA) is a requirement of the second Payment Services Directive (PSD2) in the European Economic Area (EEA), Monaco, and the United Kingdom¹. It aims to add extra layers of security to e-commerce payments by requiring banks to perform additional checks when Customers make payments.

PSD2 is for banks, not for merchants. This means that to comply with the law in their home country, banks must refuse non-compliant payments. To avoid the risk of the bank declining your payment, you as a merchant need to ensure that your payments comply with PSD2 SCA regulations.

You can comply by obtaining additional authentication to verify the Customer's identity or by providing a valid reason for the payment to be exempt from SCA. Any authentication must use at least two of the following three elements:

1. Something the Customer knows (eg password)
2. Something the Customer has (eg phone)
3. Something the Customer is (eg fingerprint)

¹ PSD2 countries are: Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the UK.

A-19.1 Obtaining Strong Customer Authentication

Strong Customer Authentication applies to Customer entered online transactions (ECOM). Mail Order/Telephone Order (MOTO) transactions and recurring transactions are considered Merchant entered transactions and do not require strong authentication.

Currently, the most common way of authenticating an online card payment is to use 3-D Secure as covered in section 5. Both 3-D Secure version 1 and version 2 are accepted as a means of obtaining Cardholder authentication for the purposes of SCA.

Other card-based payment method such as Apple Pay and some Google Pay payments already support payment flows with a built-in layer of strong authentication (biometric or password). These can be a great way for you to offer a frictionless checkout experience while meeting the new requirements.

We also expect many alternative European payment methods such as PayPal, Amazon Pay, iDEAL, etc. to follow the new SCA rules without any major changes to their user experience.

A-19.2 SCA Soft-Declines

There are two main types of card transaction declines: hard declines and soft declines.

Hard declines happen when the issuing bank rejects the transaction. Examples include attempting to use a card that has been reported lost or stolen, or the card has expired. Hard declines are permanent, so the payment should not be retried.

Soft declines are temporary authorisation failures. Around 80% to 90% of all declines fall into this category. They occur for a host of reasons including the need to authenticate the Cardholder further or because there are issues with the technical infrastructures that process the transaction. Soft declines are temporary, meaning you can process the transaction again after meeting the requirements that led to the decline the first time around.

If you do not obtain SCA on an eligible payment the issuer may soft decline the payment insisting that SCA be obtained. In which case a **responseCode** of **65** will be returned by the Gateway¹ and you can choose to resubmit the payment with SCA if required.

Refer to appendix A-19.4 for details on how you can use 3-D Secure to obtain SCA and automatically retry payments that have been soft declined for this reason. If 3-D Secure has been used to provide SCA and the issuer still declines insisting that SCA be obtained, then the Gateway will return a normal decline **responseCode** of **5** to prevent an infinite loop of obtaining SCA and then being declined for lack of SCA.

¹ Mastercard will return an ISO-8583 code of **65**, Visa/Diners/Discover and others will return an ISO-8583 code of **1A**. The Gateway will normalise these and always return a **responseCode** of **65**.

A-19.3 Exemptions to Strong Customer Authentication

There are some e-commerce transactions which are out of scope of the regulation, and others that may be exempt.

Obtaining Strong Customer Authentication can add friction and increase Customer drop-off and therefore you should make use of exemptions to reduce the number of times you will need to authenticate a Customer.

However, the bank has the right to refuse any requested exemption and decline the payment insisting that SCA be obtained. Refer to appendix A-19.2 for further information on this soft decline.

The following exemptions are available:

A-19.3.4 Mail Order / Telephone Order Payments

Card details collected via mail or over the phone (MOTO) fall outside of the scope of SCA and do not require authentication.

You can flag such payments by passing a value of **'2'** in the **type** request field.

A-19.3.5 Merchant Initiated Transactions (including recurring transactions)

Payments made with saved cards when the Customer is not present in the payment flow may qualify as Merchant Initiated Transactions (12.3). These payments fall outside of the scope of SCA however it is still up to the bank to decide whether authentication is needed for the payment.

The initial payment that saved the card will still need to have obtained SCA or be exempt and agreement must be obtained from the Customer to charge their card at a later point.

You can flag such payments by passing a value of **'9'** (Continuous Authority) in the **type** request field or using an **rtAgreementType** that signifies the transaction as being Merchant Initiated.

A-19.3.6 Low Value Exemption

Payments below €30 are considered low value and are generally exempt from authentication. However, if the Customer initiates more than five consecutive low value payments or if the total payments value exceeds €100) then SCA will be required.

You can request this exemption by passing a value of **'lowvalue'** in the **scaExemption** request field, or it may be automatically applied by the Issuer.

A-19.3.7 Trusted Beneficiary Exemption

The Customer can opt to trust you as a Merchant during their first authentication, then subsequent payments with you are likely to be exempt from future SCA.

You can request this exemption by passing a value of **'trusted'** in the **scaExemption** request field to allow this trust to be taken into consideration.

A-19.3.8 Trusted Risk Analysis (TRA) Exemption

If the payment provider, having in place effective risk analysis tools, assesses that the fraud risk associated with the payment is low then they can allow this exemption.

You can request this exemption by passing a value of **'risk'** in the **scaExemption** request field if agreed to by the payment provider.

A-19.3.9 Secured Corporate Payment Exemption

Payments initiated by a business rather than a Consumer and processed through a secured dedicated payment protocol can be exempt from SCA provided alternative controls are sufficiently secure.

You can request this exemption by passing a value of **'corporate'** in the **scaExemption** request field to indicate such a secure transaction.

A-19.3.10 Delegated Authentication Exemption

If you already require your Customers to perform sufficient authentication on your website, such as secure account logins etc., then you can use this exemption to request that further SCA is not required.

You can request this exemption by passing a value of **'delegated'** in the **scaExemption** request field to indicate such a secure transaction.

A-19.4 SCA Using 3-D Secure

3-D Secure can be used to provide the necessary Strong Customer Authentication. However, 3-D Secure is normally always performed before authorisation to gain the liability shift but this might not be desirable if it is only being used as means of obtaining SCA and you initially want to attempt the payment with an exemption instead of adding the friction of obtaining SCA up front.

You therefore have a choice of how and when to use 3-D Secure to satisfy SCA as follows:

Authentication Before Authorisation

You submit payments using 3-D Secure for authentication up front so that the authorisation will be submitted to the Acquirer with the appropriate authentication data showing that SCA was sought. You may pass an exemption indicator¹ causing the Gateway to automatically request a frictionless flow² if using 3-D Secure version 2. The authorisation may also be eligible for the 3-D Secure liability shift.

Authentication After Authorisation, when requested by the Issuer (Bypass)

You submit payments without 3-D Secure authentication but with an exemption indicator¹, if required, and the authorisation will be submitted to the Acquirer with no authentication data. If the Issuer approves the authorisation, then no further additional authentication is needed. However, if the Issuer refuses the authorisation due to SCA being required³ then transaction can be repeated but this time using 3-D Secure⁴ and no exception indicator. The initial authorisation will not be eligible for the 3-D Secure liability shift but the second authorisation may be.

The Gateway can support both choices and in the case of the second choice it can automatically perform the repeat the transaction on your behalf.

The choice of how and when authentication is performed is indicating by select a 3-D Secure Policy in the Merchant Management System or by sending the **threeDSPolicy** field in the request.

The policies available are:

1. Authenticate Before Authorisation or When Issuer Requests (Default)
2. Authenticate Before Authorisation Only
3. Authenticate When Issuer Requests Only (Bypass)
4. Authenticate Before Authorisation or When Issuer Requests [PSD2]
5. Authenticate Before Authorisation Only [PSD2]
6. Authenticate When Issuer Requests Only [PSD2] (Bypass)

The [PSD2] policies will perform 3-D Secure authentication only if the transaction falls within the jurisdiction of the European Union's Payment Services Directive 2, otherwise it will behave as if 3-D Secure had not been required.

¹ An exemption can be explicitly requested using the **scaExemption** field, refer to appendix A-19.3.

² The Gateway will use the correct '**requestorChallengeIndicator**' unless overridden by any value passed in the request.

³ The issuer will soft decline the transaction indicating SCA is required, refer to appendix A-19.2.

⁴ You are advised to send a **threeDSOptions** '**requestorChallengeIndicator**' value of 4 to mandate a challenge.

A-20 Hosted Payment Page Options

You can customise the appearance of the Hosted Payment Page by sending additional fields in the request.

You can control which payment methods are displayed and the default or initial value to display in the input fields.

You can also state which fields you require to be mandatory, in which case the payment form may not be submitted until the Cardholder has complete all the mandatory fields. On the standard modal Hosted Payment Page, the mandatory requirement can also control whether the field needs to be displayed. A value of 'Y' or 'N' means the field must be displayed, 'Y' indicates that a value must be supplied, while 'N' indicates the value can be blank. Omitting the request field means that the field need not be displayed if the form can provide a better user experience without it.

Not all fields may be supported if you have a customised Hosted Payment Page.

Field Name	Mandatory?	Description
cardNumber	No ¹	Default value for the Card number field.
cardCVV	No ²	Default value for the Card security number field.
cardExpiryMonth	No	Default value for the Card expiry month field.
cardExpiryYear	No	Default value for the Card expiry year field.
cardExpiryDate	No	Alternative to cardExpiryMonth/cardExpiryYear
customerName	No	Default value for the Cardholder's name field.
customerAddress	No	Default value for the Cardholder's address field.
customerTown	No	Default value for the Cardholder's town field.
customerCounty	No	Default value for the Cardholder's county field.
customerPostcode	No	Default value for the Cardholder's postcode field.
customerCountryCode	No	Default value for the Cardholder's country field.
customerEmail	No	Default value for the Cardholder's email field.
customerPhone	No	Default value for the Cardholder's phone number field.
receiverDateOfBirth	No	Default value for the Cardholder's date of birth field.
cardCVVMandatory	No	Card security number field requirements (Y or N).
customerNameMandatory	No	Cardholder's name field requirements (Y or N).
customerFullNameMandatory	No ³	Cardholder's name field requirements (Y or N).
customerAddressMandatory	No	Cardholder's address field requirements (Y or N).
customerTownMandatory	No	Cardholder's town field requirements (Y or N).

Field Name	Mandatory?	Description
customerCountyMandatory	No	Cardholder's county field requirements (Y or N).
customerPostcodeMandatory	No	Cardholder's postcode field requirements (Y or N).
customerCountryCodeMandatory	No	Cardholder's country field requirements (Y or N).
customerPostcodeMandatory	No	Cardholder's postcode field requirements (Y or N).
customerEmailMandatory	No	Cardholder's email field requirements (Y or N).
customerPhoneMandatory	No	Cardholder's phone field requirements (Y or N).
receiverDateOfBirthMandatory	No	Cardholder's date of birth requirements (Y or N).
formAmountEditable	No	Enables the payment amount to be edited by the consumer thus allowing the consumer to choose the amount they wish to pay.
formResponsive	No	Request the Hosted Payment Page adjust its layout according to the browser display size etc. (Y or N).
formAllowCancel	No	Request the Hosted Payment Page show a cancel button to allow the payment to be cancelled resulting in a transaction responseCode of 65576 (REQUEST CANCELLED) .
paymentMethod	No	Request the Hosted Payment Page invoke an alternative payment method on display without the need for the Customer to select it.
allowedPaymentMethods	No	Comma separated list of paymentMethods supported by the Merchant to show on Hosted Payment Page where supported.

¹ This should only be used by Merchants who are storing Card numbers as per PCI DSS requirements.

² This should only be used for test purposed as Merchants are not allowed to store Card CVV numbers.

³ Same as **customerNameMandatory** only the name must be provided as at least two words of two or more characters.

A-21 Integration Libraries

We can provide a range of libraries to help you to integrate with the Gateway.

These libraries include simple sever-side classes in many popular programming languages through to client-side scripts to help with the integration of the Hosted Payment Page or Hosted Payment Fields.

The server-side libraries can be obtained by contacting customer support.

The client-side libraries can be downloaded directly from the Gateway server.

A-21.1 Gateway Integration Library

A simple server-side integration library is available to simplify the preparation and transmission of Hosted and Direct Integration requests.

The library is available in many popular programming languages and is based around a single class: the **Gateway** class.

The Gateway integration library does not currently support the preparation and transmission of Batch Integration requests.

A-21.1.1 Library Namespace

To avoid polluting the global namespace, the library uses the 'P3/SDK' namespace where supported by the language.

A-21.1.2 Gateway Configuration

Before you can use the **Gateway** class, you will need to configure the following properties to match your integration parameters explained in section 1.6 and authentication parameters documented in section 1.8.

Property Name	Type	Description
hostedURL	string	Absolute URL provided for the Hosted Integration.
directURL	string	Absolute URL provided for the Direct Integration.
merchantID	string	Your unique Merchant ID to be passed in the merchantID integration field.
merchantPwd	string	Any password configured on your Merchant Account as per section 1.8.1.
merchantSecret	string	Any secret configured on your Merchant Account as per section 1.8.2.
proxyUr1	string	Absolute URL to any proxy required for connections. (eg https://www.proxy.com:3128)
debug	boolean	True to enable debugging output.

A-21.1.3 Gateway Methods

The follow methods are made available by the **Gateway** class:

string hostedRequest(mixed[] request, string[] options)

Return an HTML fragment that can be included in your webpage to render a <form> which will send the provided request data to the Gateway's Hosted Integration when submitted.

The **request** parameter should be an associative array containing the request fields required to be sent. The request fields are not validated.

The following class properties are used unless alternative values are provided in the **request** array: **directUrl**, **merchantID**, **merchantPwd**, **merchantSecret**.

The **options** parameter is an optional associative array containing options that can be used to modify the returned HTML fragment as follows:

- **formAttrs** – string containing additional attributes to include in the form tag.
- **submitAttrs** – string containing additional attributes to include in the submit button tag.
- **submitImage** – string containing the URL to use as the submit button.
- **submitHtml** – string containing HTML to use as the label on the submit <button>.
- **submitText** – string containing text to use as the label on the submit <input>.

The **submitImage**, **submitHtml** and **submitText** options are mutually exclusive and will be checked for in that order. If none is provided, then a **submitText** value of 'Pay Now' is assumed.

If a **merchantSecret** is provided, then the method will add the correct **signature** field to the request.

An exception is thrown if the HTML fragment cannot be composed.

The **verifyResponse()** method can be used to validate and decode any response POSTed back to your website.

Please refer to appendix A-24.1.1 for an example of how to use this method.

Returns a string containing the HTML fragment if successful; throws an exception otherwise.

mixed[] directRequest(mixed[] request, string[] options)

Return the response received when sending the provided request to the Gateway's Direct Integration.

The **request** parameter should be an associative array containing the request fields required to be sent. The request fields are not validated.

The following class properties are used unless alternative values are provided in the **request** array: **directUrl**, **merchantID**, **merchantPwd**, **merchantSecret**.

The **options** parameter is not used and reserved for future use.

If a **merchantSecret** is provided, then the method will add the correct **signature** field to the request and check the **signature** field on the response.

An exception is thrown if the request cannot be sent; or the response cannot be received; or if the response's **signature** is incorrect.

Please refer to appendix A-24.1.2 for an example of how to use this method.

Returns an associative array containing the received response fields; otherwise, throws an exception.

```
void prepareRequest(mixed[] &request, string[] &options,  
                  string &secret, string &direct_url, string &hosted_url)
```

Prepare a request for sending to the Gateway's Direct Integration.

The **request** parameter should be a reference to an associative array containing the request fields required to be sent. The request fields are not validated.

The **merchantSecret**, **directUrl** and **hostedUrl** configuration properties will be returned in the **secret**, **direct_url** and **hosted_url** method parameters. These properties can be overridden by providing them in the **request**, in which case they will be extracted and removed from the request.

The **merchantID** and **merchantPwd** configuration properties will be added to the **request**.

A few known Gateway response fields will be removed from the request, if present, to avoid confusion, notably the **responseCode**, **responseMessage**, **responseStatus**, **state** fields.

An exception will be thrown if the request does not contain an action element or a merchantID element (and none could be inserted).

```
void verifyResponse(mixed[] &response, string secret)
```

Verify a response received from the Gateway's Hosted or Direct Integration.

The **response** parameter should be a reference to an associative array containing the response received from the Gateway, either from the Direct Integration or as POSTed from the Hosted Integration.

The **secret** parameter should be any Merchant secret to use when checking the response's **signature** element. If not provided, then the value of the **merchantSecret** property is used.

Any **signature** element is removed from the **response**.

An exception is thrown if the response is not valid, does not contain a **responseCode** element or its **signature** is incorrect.

Please refer to appendix A-24.1.1 for an example of how to use this method.

```
string sign(mixed[] request, string secret, mixed partial = false)
```

Return the signature for the provided request data.

The **request** parameter should be a reference to an associative array containing the request fields required to be sent. The request fields are not validated.

The **secret** parameter should be the Merchant secret to use when signing the request.

The **partial** parameter should be either the boolean **false** or comma separated string; or an array of strings containing the names of the request elements to sign.

Returns a string containing the correct signature for the request.

A-21.2 Hosted Payment Page Library

A simple client-side script is available to simplify the displaying of the Hosted Payment Page in a lightbox overlaying your website.

The library is available as a JavaScript script and is based around a single class: the **Form** class. The script is compatible with most modern web browsers.

The script can be loaded directly from our Gateway server as follows¹.

```
1. <script src="https://gateway.example.com/sdk/web/v1/js/hostedforms.min.js"></script>
```

If the script detects the presence of the jQuery API, then it will extend the jQuery object with its own plugin method. However, jQuery is not needed in order to use the script.

A-21.2.1 Hosted Payment Pages

Hosted Payment Pages are a prebuilt webpage residing on our server that you can use to collect sensitive payment details without those details' touching your server. The standard Hosted Payment Page is designed so that it can be displayed in a transparent overlay over your website, thus making the Customer feel as though they never left your shopping cart.

The standard Hosted Integration examples redirect the Customer's browser to the Hosted Payment Page, resulting it appearing on a new browser page and not overlaying your website. The Hosted Payment Page library provides the scripting necessary to result in the redirection, causing the Hosted Payment Page to appear in an overlay and not a new browser page, without your having to make any modifications to your website. The library can also simplify the creation of the Hosted Integration redirection FORM if required.

A-21.2.2 Library Namespace

To avoid polluting the global namespace, the library extends the global window object with a **hostedForms** object containing the following properties:

- **forms** – array containing all the instantiated **Form** objects.
- **classes** – array containing all the instantiable classes.
 - **form** – **Form** class prototype.

¹ Please use the correct hostname as explained in section 1.6.

A-21.2.3 Form Construction

The construction method can be used to build and prepare a HTML FORM element for use with the modal Hosted Payment Page; or to prepare an existing element. The method signature is as follows:

Form(element, data)

The **element** parameter should be either the id or DOM node of an existing FORM or DIV DOM element.

If the **element** is a DIV node, then the data is used to create a new FORM node within the **element**.

If the **element** is a FORM node, then the data is used to modify the existing FORM **element**.

The **data** parameter should be an object containing construction details and can contain the following optional properties:

- **id** – string containing the value to use as the FORM tag's id attribute.
- **url** – string containing the URL to use as the FORM tag's src attribute.
- **attrs** – object whose properties are added as additional attributes on the FORM tag.
- **modal** – boolean indicating that the HPP should open in a modal overlay.
- **data** – object whose properties are added as hidden input elements in the FORM.
- **submit** – object containing details for a submit button that should be added to the FORM.
 - **type** – type of submit button, either 'auto', 'image', 'button', 'input'
 - **id** – string containing the value to use as the submit button's id attribute.
 - **attrs** – object whose properties are added as additional attributes on the submit button.
 - **label** – string containing button label (or 'alt' attribute for 'image' buttons)
 - **src** – string containing image URL for 'image' buttons.

The constructor will submit the FORM immediately after preparation if the **data.submit.type** property is 'auto'; or if the existing FORM **element** has a `data-hostedform-autosubmit` attribute. Otherwise, an event handler will be attached to the submit button to disable it automatically when clicked, to help prevent your Customer from clicking it twice.

The constructor will prepare the FORM so that the Hosted Payment Page (HPP) will be opened in a modal overlay if the **data.modal** property is true; or if the existing FORM **element** has a `data-hostedform-modal` attribute; or has an `action` attribute containing the string 'modal/' or ending in the string 'modal'.

The modal overlay is automatically created as a semi-opaque IFRAME element that fills the browser display. The Hosted Payment Page is then loaded into this IFRAME and being semi-opaque, your shopping cart will remain visible beneath, but greyed out and noninteractive. When the Customer closes the Hosted Payment Page, then their browser will be redirected to the URL you provided using the **redirectURL** parameter. This will cause the original page and IFRAME to be replaced by your new page.

A-21.2.4 Form Methods

The follow methods are made available by the **Form** class:

void destroy()

Destroys the **Form**, reverting its **element** back to its original state.

A-21.2.5 jQuery Plugin

If the jQuery API has been loaded into the browser before the script, then it will extend the jQuery object with its own plugin method.

Construction and destruction can then be done as follows:

```
$(element).hostedForm(data);  
$(element).hostedForm('destroy');
```


A-21.3 Hosted Payment Fields Library

A simple client-side script is available to support the displaying of Hosted Payment Fields in your payment form.

The library is available as a JavaScript script and is based around two classes: the **Form** and **Field** classes. The script is compatible with most modern web browsers.

The script can be loaded directly from our Gateway server as follows¹:

```
1. <script src="https://gateway.example.com/sdk/web/v1/js/hostedfields.min.js"></script>
```

The script requires the jQuery API, which must be loaded prior to the script.

A-21.3.1 Hosted Payment Fields

Hosted Payment Fields are a set of prebuilt JavaScript UI components that can be used by your website's HTML payment form to collect sensitive payment details without those details touching your server. They provide you with the PCI benefits of using a Hosted Payment Page, while allowing you the ability to design and implement your own payment forms.

There are 6 predefined Hosted Payment Fields available as follows:

- **cardNumber** – collects the card number.
- **cardCVV** – collects the card cvv.
- **cardExpiryDate** – collects the card expiry month and year.
- **cardStartDate** – collects the card start/issue month and year.
- **cardIssueNumber** – collects the card issue number.
- **cardDetails** – collects the card number, expiry date and cvv in a single field.

The **cardNumber** field is designed to collect a card number, including an icon used to display the card type. The field will only accept digits and spaces and validate that any entered value is a correctly formatted card number and insert spaces at the correct positions for the card type as the number is typed.

The **cardCVV** field is designed to collect a card CVV. The field will only accept digits and will validate that any entered value is a correctly formatted CVV, taking into account the card type as determined by an associated **cardNumber** field.

The **cardExpiryDate** and **cardStartDate** fields are designed to collect a card expiry date and card issue date respectively. The fields can render as a pair of select controls containing the months and a suitable range of years; or as an input control that will only allow digits to be entered and automatically formatted as a month / year entry. The field will validate that any entered value is a valid month and year combination.

The **cardIssueNumber** field is designed to collect a card issue number. The field will only accept digits and will validate that any entered value is a correctly formatted issue number.

¹ Please use the correct hostname as explained in section 1.6.

The **cardDetails** field is designed to collect all of the essential card details. It combines the **cardNumber**, **cardExpiryDate** and **cardCVV** fields into a single line compound field design to allow easy entry of the card details and to complement the look of your checkout.

These hosted fields can be used on your payment form alongside any standard HTML form fields, for example, any collecting the Cardholder's billing or delivery addresses and any other order information you require.

The field type is either: passed as the value of the **type** option the **Field** construction, provided by the HTML element's meta data; or provided via the HTML element's type attribute (prefixed with the 'hostedfield:' name space).

The following example shows all three approaches to specifying the field type:

```
1. <input type="hostedfield:cardNumber" name="card-number">
2. <div class="hostedfield" data-hostedfield-type="cardExpiryDate"></div>
3. <input data-hostedfield="{"type":"cardCVV"}">
```

It is highly recommended that you adopt a single approach as above and don't mix and match.

Each field type has its own additional configuration options, as detailed in section A-21.3.6.

A-21.3.2 Library Namespace

To avoid polluting the global namespace, the library extends the global window object with a **hostedFields** object containing the following properties:

- **forms** – array containing all the instantiated **Form** objects.
- **classes** – array containing all the instantiable classes.
 - **form** – **Form** class prototype.

A-21.3.3 Form Construction

The construction method can be used to prepare a HTML FORM for use with Hosted Payment Field components. The method signature is as follows:

Form(element, options)

The **element** parameter should be the DOM node of an existing FORM tag.

The **options** parameter should be object containing one of more of the following optional properties:

- **autoSetup** – boolean indicating whether setup should be handled automatically.
- **autoSubmit** – boolean indicating whether submission should be handled automatically.
- **merchantID** – string containing the **merchantID** the payment request is for.
- **stylesheet** – string containing DOM selector for any stylesheets to be used.
- **tokenise** – string/array/object specifying fields whose values should be tokenised.
- **fields** – object containing field configuration by field type.
- **locale** – string containing the desired locale.
- **classes** – object containing names of extra CSS classes to use.
- **submitOnEnter** – boolean indicating whether the enter key should cause the form to submit.
- **nativeEvents** – boolean indicating that native browser events should be fired.

Any **options** parameter will be merged with those provided via meta data supplied, using data-hostedfield and/or data-hostedfield-*<option>* attributes; or via existing attributes or properties of the **element**.

The **autoSetup** option can be used to disable the automatic creation of **Field** objects for the FORM child controls by calling the **autoSetup()** method during the **Form** construction. If automatic setup is disabled, then you must manually instantiate **Field** objects and attach them to the **Form** as required, using the **addField()** method. This option or manually calling the **autoSetup()** method minimises the amount of JavaScript you have to write. Automatic operation is good if you don't need to customise the operation or can't customise it by reacting to the **Form** or **Field** events. The option defaults to true and cannot be changed once the **Form** has been created.

The **autoSubmit** option can be used to disable the automatic handling of the FORM submission via the **autoSubmit()** method. If automatic submission is disabled, then you must manually retrieve the sensitive payment details by calling **getPaymentDetails()** and include them in the form submission data. This option or manually calling the **autoSubmit()** method minimises the amount of JavaScript you have to write. Automatic operation is good if you don't need to customise the operation or can't customise it by reacting to the **Form** or **Field** events. The option defaults to true and cannot be changed once the **Form** has been created.

The **merchantID** option can be used to specify the **merchantID** with which the final **paymentToken** will be used. The option defaults to the value of any child INPUT node whose name is 'merchantID' and can be changed at runtime by calling the **setMerchantID()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **stylesheet** option can be used to specify a DOM selector used to locate stylesheets that should be parsed for styles related to the Hosted Payment Fields. Refer to section A-21.3.10 for

how to style the Hosted Payment Fields using CSS stylesheets. The option defaults to the DOM selector string 'link.hostedfield[rel=stylesheet], style.hostedfield' and can be changed at runtime by calling the **setStylesheet()** method; or by altering the options using the jQuery **hostedForm()** plugin method.

The **tokenise** option can be used to specify addition FORM controls whose values, as returned by the **jQuery.val()** method, should be included in the final **paymentToken**.

The option's value must be either:

- A string containing a DOM selector used to select one or more controls.
- An array containing values used to **jQuery.filter()** down to one or more controls.
- An object whose properties are the name of fields to tokenise and whose values are objects containing a **selector** property used to select a control.

For the first two, the tokenised field's name will be taken from the controls **data-hostedfield-tokenise** attribute or **name** attribute. For the third, the name is property name in the **tokenise** object. If the field's name is of the format 'paymentToken[<name>]', then only the '<name>' part is used. The option defaults to the DOM selector string 'INPUT.hostedfield-tokenise:not(:disabled), INPUT[data-hostedfield-tokenise]:not(:disabled), INPUT[name^="paymentToken["]:not(:disabled)' and cannot be changed once the **Form** has been created.

The **fields** options can be used to specify default options for the different types of Hosted Payment Fields. The option's value should be an object whose properties are the fields type or the wildcard type 'any' and whose values are objects whose properties are the default options for fields of that type. The values can also contain a **selector** property containing a DOM selector that is used during the automatic setup stage to select a FORM's child element to add as a **Field** of the specified type automatically. The option has no default value and cannot be changed once the **Form** has been created.

The **locale** option can be used to specify the language that should be used by the Hosted Payment Fields attached to this **Form**. The option defaults to the value provided by any **lang** attribute on the **element** or closest ancestor and cannot be changed once the **Form** has been created.

The **classes** options can be used to specify additional CSS class names to add in addition to the default classes documented in section A-21.3.9. The value is an object whose properties are the default class name and whose values are a string containing the additional class name(s) to use. The option has no default and cannot be changed once the **Form** has been created.

The **submitOnEnter** option can be used to specify if pressing the enter key when typing a **Field** value should cause the **Form** to submit. The option defaults to false and cannot be changed once the **Form** has been created.

The **nativeEvents** option can be used to specify that any associated native event should be fired when a 'hostedField:' prefixed **Field** event is fired (as documented in section A-21.3.8). For example, when enabled if the 'hostedfield:mouseover' event is fired, then the native 'mouseover' event is also fired. The option defaults to false and cannot be changed once the **Form** has been created.

If not explicitly constructed, a **Form** object will be automatically instantiated and attached to the FORM DOM node as soon as any **Field** object is instantiated on a child DOM node.

Example **Form** construction is as follows:

```

1.  var form = new window.hostedFields.classes.Form(document.forms[0],{
2.    // Auto setup the form creating all hosted fields (default)
3.    autoSetup: true,
4.
5.    // Auto validate, tokenise and submit the form (default)
6.    autoSubmit: true,
7.
8.    // Additional fields to tokenise
9.    tokenise: '.add-to-token',
10.
11.   // Stylesheet selection
12.   stylesheets: '#hostedfield-stylesheet',
13.
14.   // Optional field configuration (by type)
15.   fields: {
16.     any: {
17.       nativeEvents: true
18.     },
19.     cardNumber: {
20.       selector: $('#form2-card-number'),
21.       stylesheet: $('style.hostedform, style.hostedform-card-number')
22.     }
23.   },
24.
25.   // Additional CSS classes
26.   classes: {
27.     invalid: 'error'
28.   }
29. });

```

Or using meta data on the HTML FORM element:

```

1.  <form data-hostedfields='{"autoSetup":true,"autoSubmit":true,"tokenise":\".add-to-
    token,"stylesheets":\"#hostedfield-
    stylesheet,"fields":{"any":{"nativeEvents":true},"cardNumber":{"selector":\"#form2-card-
    number,"stylesheet":\"style.hostedform, style.hostedform-card-
    number"}},"classes":{"invalid":\"error"}}' method="post" novalidate="novalidate" lang="en">
2.  <script>
3.  var form = new window.hostedFields.classes.Form(document.forms[0]);
4.  </script>

```

A-21.3.4 Form Methods

The follow methods are made available by the **Form** class:

void autoSetup()

Automatically setup the form by scanning the Form element for child nodes to control as Hosted Payment Fields. Child nodes are selected if they:

- have a `type` attribute with a `hostedfield:<type>` value (*INPUT nodes only*).
- have a `data` attribute with a `hostedfield.<type>` property.
- match a DOM selector provided by the `fields.<type>.selector` option.

If multiple selection criteria are present, then they must all specify the same **Field** type or an exception is thrown.

This method is called during the **Form** construction unless the **autoSetup** option is false.

void autoSubmit()

Automatically handles any attempted FORM submission by checking the FORM's controls are valid by calling the **validate()** method; and then requesting the **paymentToken** using the **getPaymentDetails()** method; and finally adding the token to the forms fields using the **addPaymentToken()** method. Failure to validate or request the payment token will cause the form submission to be stopped.

You can affect the automatic submission stages by listening for events and preventing their default actions. The full list of events is documented in section A-21.3.5.

This method is attached to the FORM submit event during the **Form** construction unless the **autoSubmit** option is false, or the **autoSubmit** option is null and the **autoSetup** option is false.

If automatic submission is disabled, then you must react to the FORM's submit event and then request the **paymentToken** using the **getPaymentDetails()** method and ensure that the token is sent as part of the form's data.

boolean addField(Field f)

Add a hosted **Field** to the Form.

Returns true if successful, false otherwise.

boolean delField(Field f)

Remove a hosted **Field** from the **Form**.

Returns true if successful, false otherwise.

promise validate(boolean submitting)

Validate all **Field** values on the **Form**, either during submission or not.

Returns a promise that will be resolved when the validation is complete.

object[] getInvalidElements()

Get details about all invalid FORM controls (not just invalid hosted **Field** elements).

Returns an array of objects containing the following properties:

- **element** – DOM element.
- **message** – DOM elements `validationMessage` property or 'Invalid value'.
- **label** – associated LABEL text.
- **field** – **Field** instance (if DOM element is a hosted **Field**).

object getValidationErrors()

Get the validation errors for all invalid FORM controls (not just invalid hosted **Field** elements).

Returns an object whose properties are the associated labels, names or id of the invalid FORM controls and whose values are the error message for that control.

promise getPaymentDetails(object tokenData, boolean validate)

Gets the payment details, generating a **paymentToken** containing the hosted Field values; any values specified by the **tokenise** option; and any passed **tokenData**. The Form will be validated first if required.

Returns a promise that will be resolved when the payment details have been obtained, passing the details as an object containing the following properties:

- **success** – boolean true if successful, false otherwise.
- **message** – string containing message to display if not successful.
- **errors** – object containing details about invalid payment data.
- **invalid** – object as returned by **getValidationErrors()** method.
- **paymentToken** – string containing generated **paymentToken**.

void addPaymentToken(string token)

Add the payment token as the value of a Form child INPUT whose name is 'paymentToken', creating the control if needed. Any created control will be given a type of 'hidden'.

void setMerchantID(string merchantID)

Set the **merchantID** used by the payment form.

void setStylesheet(string selector)

Set the DOM selector used to select the stylesheet(s) used by the **Form**.

object defaultFieldOptions(string type)

Get any default field options specified via the **fields** option, resulting from the merger of its optional **any** and **<type>** properties.

Returns an object whose properties are the default options.

void forceSubmit()

Forcefully submit the FORM **element** as if a child submit button had been clicked.

void reset()

Reset all the **Form**, setting all **Field** values back to their initial values.

void destroy()

Destroys the **Form**, reverting its **element** back to its original state.

A-21.3.5 Form Events

The following events may be fired by the **Form** object and you can use these to hook into and modify the object's behaviour:

Event Name ¹	Description
create	Fired when a Form has been created.
destroy	Fired when a Form has been destroyed.
presubmit	Fired by the autoSubmit() method prior to handling the submission. You can prevent the handling of the submission and handle it yourself by calling the Events preventDefault() method.
valid	Fired by the autoSubmit() method if the FORM contains valid data prior to requesting the payment details. You can prevent the continued handling of the submission and handle it yourself by calling the Events preventDefault() method or by invalidating the FORM.
submit-invalid	Fired by the autoSubmit() method if the FORM contains invalid data prior to displaying the validity using the DOM reportValidity() method. You can prevent the reportValidity() call and display the validity yourself by calling the Events preventDefault() method.
submit	Fired by the autoSubmit() method prior to submitting the FORM. You can prevent the FORM from submitting by calling the Events preventDefault() method.
error	Fired by the autoSubmit() method if an exception is caught prior to displaying the error, using the JavaScript alert() function. You can prevent the alert() call and display the error yourself by calling the Events preventDefault() method.

¹ Event names are prefixed with the 'hostedform:' namespace not shown in the table.

The **presubmit**, **valid**, **submit-invalid**, **submit** and **error** events fired by the **autoSubmit()** method the payload is an object with the following properties:

- **success** – boolean false.
- **message** – error message if **error** otherwise null.
- **invalid** – result of **getValidationErrors()** method if **Form** invalid.
- **submitting** – boolean true.

A-21.3.6 Field Construction

The construction method can be used to prepare a HTML INPUT control as a Hosted Payment Field or to create a new field in HTML DIV container. The method signature is as follows:

Field(element, options)

The **element** parameter should be the DOM node of an existing INPUT or DIV tag.

The **options** parameter should be object containing one of more of the following optional properties:

- **type** – string containing the desired field type.
- **value** – string containing the initial value.
- **placeholder** – string containing any placeholder text.
- **style** – string containing any inline CSS styles.
- **stylesheet** – string containing DOM selector for any stylesheets to be used.
- **disabled** – boolean indicating if initially disabled.
- **required** – boolean indicating if the value is required.
- **readOnly** – boolean indicating if initially read only.
- **validity** – boolean or string indicating the initial validity.
- **locale** – string containing the desired locale.
- **classes** – object containing names of extra CSS classes to use.
- **submitOnEnter** – boolean indicating if the enter key should cause the form to submit.
- **nativeEvents** – boolean indicating that native browser events should be fired.
- **validationMessages** – object containing alternative validation messages.
 - **required** – string containing validation message to use when a value is required.
 - **invalid** – string containing validation message to use when a value is invalid.
- **format** – string containing select option format for date fields.
- **minYear** – integer containing minimum year (relative to current year) for date fields.
- **maxYear** – integer containing maximum year (relative to current year) for date fields.

Any **options** parameter will be merged with those provided via meta data supplied using data-hostedfield and/or data-hostedfield-*<option>* attributes, or via existing attributes or properties of the **element** or provided via the **getDefaultOptions()** method of the parent **Form**.

The **type** option can be used to specify the type of Hosted Payment Field required. It defaults to the value provided by any type attribute on the **element** (prefixed with the 'hostedfield:' namespace). The option cannot be changed once the **Field** has been created. Valid types are **cardDetails**, **cardNumber**, **cardCVV**, **cardExpiryDate**, **cardStartDate**, **cardIssueNumber**.

The **value** option can be used to specify any initial value that should be used by the **Field**. It defaults to the value provided by any value attribute or property on the **element**. Obviously, due to the purpose of the Hosted Payment Fields, any initial value is not wise for card number and CVV fields. The option can be changed at runtime by calling the **setValue()** method.

The **placeholder** option can be used to specify any initial text that should be used as a placeholder by the **Field**. It defaults to the value provided by any **placeholder** attribute or property on the **element**. When used with the **CardDetails** type **Field** the placeholder contains three parts separated by a pipe character, the first part contains the **cardNumber** placeholder, the second part contains the **cardExpiry** placeholder, and the third part contains the **cardCVV** placeholder. The option can be changed at runtime by calling the **setPlaceholder()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **style** option can be used to specify any initial inline CSS style that should be used by the **Field**. It defaults to the value provided by any **style** attribute or property on the **element**. The option can be changed at runtime by calling the **setStyle()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **stylesheet** option can be used to specify a DOM selector used to locate stylesheets that should be parsed for styles related to this **Field**. Refer to section on styling fields. The option can be changed at runtime by calling the **setStylesheet()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **disabled** option can be used to specify if the **Field** should be initially disabled. It defaults to the value provided by any **disabled** attribute or property on the **element**. The option can be changed at runtime by calling the **setDisabled()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **required** option can be used to specify if the **Field** value is required. It defaults to the value provided by any **required** attribute or property on the **element**. The option can be changed at runtime by calling the **setRequired()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **readOnly** option can be used to specify if the **Field** should be initially read-only. It defaults to the value provided by any **readOnly** attribute or property on the **element**. The option can be changed at runtime by calling the **setReadOnly()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **validity** option can be used to specify if the **Field** should be initially marked as invalid. It defaults to the value provided by any **validity** property on the **element**. The option can be changed at runtime by calling the **setValidity()** method or by altering the options using the jQuery **hostedForm()** plugin method.

The **locale** option can be used to specify the language that should be used by the **Field**. It defaults to the value provided by any **lang** attribute or property on the **element** or closest ancestor. The option cannot be changed once the **Field** has been created.

The **classes** options can be used to specify additional CSS class names to add in addition to the default classes documented in section A-21.3.9. The value is an object whose properties are the default class name and whose values are a string containing the additional class name(s) to use. This option will be merged with any **classes** option provided to the **Form** constructor. The option cannot be changed once the **Form** has been created.

The **submitOnEnter** option can be used to specify if pressing the enter key when typing the **Field** value should cause the **Form** to submit. The option defaults to false and cannot be changed once the **Field** has been created.

The **nativeEvents** option can be used to specify that any associated native event should be fired when a 'hostedfield:' prefixed event is fired. Events are documented in section A-21.3.8. For example, when enabled if the 'hostedfield:mouseover' event is fired then the native 'mouseover' event is also fired. The option defaults to false and cannot be changed once the **Field** has been created.

The **validationMessages** option can be used to specify alternative validation messages that should be displayed when a value is required or invalid. The option defaults to suitable messages depending on the locale and cannot be changed once the **Field** has been created.

The **dropdown** option can be used to specify that a **cardStartDate** or **cardExpiryDate Field** should be displayed as a pair of select controls to select the month and year, otherwise the month and year are entered via a formatted input box instead. The option defaults to false and cannot be changed once the **Field** has been created.

The **format** option can be used in conjunction with the **dropdown** option to specify the format used to display the month and year in the dropdowns. The month and year parts of the format are separated by a pipe character. The option defaults to 'N – M | Y' (eg '01 – January | 2020') and cannot be changed once the **Field** has been created.

The following formatting characters are understood:

- **n** – month number (no zero prefixing).
- **N** – month number (zero prefixed to two digits when required).
- **m** – short month name (eg Jan, Feb, Mar)
- **M** – long month name (eg January, February, March)
- **y** – two digit year number.
- **Y** – four digit year number.

The **minYear** and **maxYear** options can be used in conjunction with the **dropdown** option to specify the minimum and maximum years that are included in the year dropdown. The option defaults to minus 20 to zero for a **cardStartDate Field** or zero to plus 20 for a **cardExpiryDate Field** and cannot be changed once the **Field** has been created.

Example **Field** construction is as follows:

```
1. var field = new window.hostedFields.classes.Field(document.forms[0].elements[0], {  
2.     // Field type  
3.     type: 'cardNumber',  
4.  
5.     // Stylesheet selection  
6.     stylesheets: '#hostedfield-stylesheet',  
7.  
8.     // Additional CSS classes  
9.     classes: {  
10.         invalid: 'error'  
11.     }  
12. });
```

Or using meta data on the HTML INPUT element:

```
1. <input type="hostedfield:cardNumber" data-hostedfields='{ "stylesheet": "style.hostedform, style.hostedform-card-  
   number"}', "classes": {"invalid": "error"} }'>  
2. <script>  
3.   var field = new window.hostedFields.classes.Field(document.forms[0].elements[0]);  
4. </script>
```

A-21.3.7 Field Methods

The follow methods are made available by the **Field** class:

promise validate()

Validate the **Field** value. This will normally be called automatically when the **Field** loses focus or the form is submitted, or when an invalid value is modified.

Returns a promise that will be resolved when the validation is complete.

boolean isEmpty()

Check if the **Field** has a value.

Returns true if the field has a value, false otherwise.

boolean isComplete()

Check if the **Field** has a complete, but not necessarily valid, value. This is mainly used by compound fields such as **cardDetails**, **cardExpiryDate**, **cardStartDate**, which contain multiple input controls and are deemed complete when all their required input controls have values.

Returns true if the value is complete, false otherwise.

void setStyle() / string getStyle()

Set or gets the field's inline CSS style data.

Returns void when setting, or a CSS style string when getting.

void setStylesheet(string selector) / string getStylesheet()

Sets or gets the DOM selector used to select the stylesheet(s) used by the **Field**. When setting, the stylesheets are parsed and applied to the **Field**.

Returns void when setting, or a DOM selector string when getting.

void setPlaceholder(string text) / string getPlaceholder()

Sets or gets the placeholder text to be shown when the **Field** has no value.

When used with the **CardDetails** type **Field** the placeholder contains three parts separated by a pipe character, the first part contains the **cardNumber** placeholder, the second part contains the **cardExpiry** placeholder, and the third part contains the **cardCVV** placeholder.

Returns void when setting, or a text string when getting.

void setDisabled(boolean disabled) / string getDisabled()

Sets or gets the disabled state of the **Field**. When disabled, the field will be greyed out and not be focusable and thus will not react to any input events.

A disabled **Field** will have the 'hf-disabled' class added otherwise the 'hf-enabled' class is added.

Returns void when setting, or a boolean representing the state when getting.

void setRequired(boolean required) / string getRequired()

Sets or gets the required state of the **Field**. When required, the field will be invalid if it contains no value or a blank value.

A required **Field** will have the 'hf-required' class added otherwise the 'hf-optional' class is added.

Returns void when setting, or a boolean representing the state when getting.

void setReadOnly(boolean read_only) / string getRequired()

Sets or gets the read-only state of the **Field**. When read-only, the field will be not be focusable and thus will not react to any input events.

A read-only **Field** will have the 'hf-readonly' class added otherwise the 'hf-readwrite' class is added.

Returns void when setting, or a boolean representing the state when getting.

void setFocused(boolean focused)

Moves the browser's focus to the **Field**. When focused, the field will react input events.

A focused **Field** will have the 'hf-focus' class added otherwise the 'hf-blur' class is added.

Returns void when setting, or a boolean representing the state when getting.

void setValidity(string validity) / string getValidity()

Sets or gets the validity of the **Field**. When valid, the validity will be true or a blank string. When invalid, the validity will be an error message explaining the reason the value is invalid.

When used with the **CardDetails** type **Field** the error message contains three parts separated by a pipe character, the first part contains the **cardNumber** value, the second part contains the **cardExpiry** value, and the third part contains the **cardCVV** value.

A valid **Field** will have the 'hf-valid' and 'hf-user-valid' classes added otherwise the 'hf-invalid' and 'hf-user-invalid' classes are added.

Returns void when setting, or an error message string when getting.

void setValue() / string getValue()

Set or gets the **Field** value. Because Hosted Payment Fields are designed for the entry of sensitive payment details, then these methods are not normally used. There is no means to retrieve the actual sensitive data and so any returned value will be an empty string if the field has no value or a single asterisk if the field has a value.

When used with the **CardDetails** type **Field** the value contains three parts separated by a pipe character, the first part contains the **cardNumber** value, the second part contains the **cardExpiry** value, and the third part contains the **cardCVV** value.

Returns void when setting, or a mask string when getting.

void getState()

Get the current state of the **Field** as an object with the following boolean properties:

- **isReady** – the **Field** has been created, initialised and is ready for use.
- **isValid** – the value is valid (refer to the **setValidity()** method).
- **isEmpty** – the value is empty (refer to the **isEmpty()** method).
- **isComplete** – the value is complete (refer to the **isComplete()** method).
- **isDisabled** – the value is complete (refer to the **setDisabled()** method).
- **isRequired** – the value is complete (refer to the **setRequired()** method).
- **isReadOnly** – the value is complete (refer to the **setReadOnly()** method).

Returns an object containing the states.

void reset()

Reset **Field** value back to the initial value.

void destroy()

Destroys the **Form**, reverting its **element** back to its original state.

Note: A field's options or properties cannot be changed while a field is initialising, that is between construction and firing of the 'ready' event. Attempts to change field options or properties before this will be ignored.

A-21.3.8 Field Events

The following events may be fired by the **Field** object, and you can use these to hook into and modify the object's behaviour:

Event Name ¹	Description
create	Fired when a Field has been created.
destroy	Fired when a Field has been destroyed.
ready	Fired when a Field style is has finished initialising and is ready.
style	Fired when a Field style is changed.
autofill	Fired when a Field has a value auto filled by the browser.
autofillcancel	Fired when a Field has an auto filled value removed.
valid	Fired when a Field is checked for validity and passes the check.
invalid	Fired when a Field is checked for validity and fails the check.
uservalid	Fired when the valid event is fired but only after user interaction has occurred, such as focusing a Field , leaving a Field or attempting to submit a Form .
userinvalid	Fired when the invalid event is fired but only after user interaction has occurred, such as focusing a Field , leaving a Field or attempting to submit a Form .
disabled	Fired when a Field changes to disabled.
enabled	Fired when a Field changes from disabled.
required	Fired when a Field changes to required.
optional	Fired when a Field changes from required.
readonly	Fired when a Field changes to read-only.
readwrite	Fired when a Field changed from read-only.
focus	Fired when a Field receives focus.
blur	Fired when a Field loses focus.
mouseenter	Fired when a pointing device is moved into the Field .
mouseleave	Fired when a pointing device is moved out of the Field .
mouseover	Fired when a pointing device is moved into the Field .
mouseout	Fired when a pointing device is moved out of the Field .
mousemove	Fired when a pointing device is moved over the Field .
keydown	Fired when a key is pressed in the Field .
keyup	Fired when a key is released in a Field .

Event Name ¹	Description
keypress	Fired when a key except Shift, Fn, CapsLock is in a pressed position in a Field .
change	Fired when an alteration to the value of a Field is committed by the user.
input	Fired when the value of a Field is changed.

¹ Event names are prefixed with the 'hostedfield:' namespace not shown in the table.

A-21.3.9 Field CSS Classes

The following CSS class names will be added to a **Field** object depending on its state and you can use these to style the object as required:

Event Name	Description
hostedfield	Present on all Field elements.
hf-autofill	Present when the value was auto filled by the browser.
hf-invalid	Present when in the invalid state.
hf-valid	Present when in the valid state.
hf-user-invalid	Present when in the invalid state and user interaction has occurred, such as focusing a Field , leaving a Field or attempting to submit a Form .
hf-user-valid	Present when in the valid state and user interaction has occurred, such as focusing a Field , leaving a Field or attempting to submit a Form .
hf-disabled	Present when in the disabled state.
hf-enabled	Present when not in the disabled state.
hf-required	Present when in the required state.
hf-optional	Present when not in the required state.
hf-readonly	Present when in the read-only state.
hf-readwrite	Present when not in the read-only state.
hf-focus	Present when in the focused state.
hf-blur	Present when not in the focused state.
hf-empty	Present when in the empty state.
hf-complete	Present when in the complete state.
hf-hover	Present when a pointing device is over the Field .
hf-placeholder-shown	Present when the placeholder text is displayed.

In addition to these class names, the **Field** will add any corresponding class names provided by the **classes** option provided when the **Field** is constructed.

For example, if the **Field** is constructed with a **classes** option as follows `{disabled: 'text-blur text-grey', enabled: 'text-normal'}`, then the 'text-blur' and 'text-grey' class names will be present whenever the 'hf-disabled' class is present and the 'text-normal' class name will be present whenever the 'hf-enabled' class name is present.

A-21.3.10 Field Styling

The Hosted Payment Fields are styled using CSS as normal.

However, styles have to be transferred from your website to the controls served from our website, therefore styles must be isolated and easily identifiable. To aid with identification, all styles intended for a **Field** must contain the 'hostedfield' class name in their selector or '-hostedfield' extension on any id in the selector.

As a website may contain lots of stylesheets, a **Field** cannot be expected to parse every stylesheet present on the page and therefore it only parses those selected using the stylesheets construction option or using the **setStylesheet()** method. By default, this is any stylesheet referenced via a <link> tag or <style> tag with the 'hostedfield' class name: ie any HTML node that matches the following DOM selector 'link.hostedfield[rel=stylesheet], style.hostedfield'.

CSS styles using the **Field** state classes, pseudo classes and pseudo elements are supported as follows:

- | | | |
|----------------|--------------------|-------------------------------|
| • :focus | • .hf-user-valid | • :placeholder-shown |
| • .hf-focus | • :user-invalid | • .hf-placeholder-shown |
| • :hover | • .hf-user-invalid | • :readonly |
| • .hf-hover | • :required | • .hf-readonly |
| • :enabled | • .hf-required | • :readwrite |
| • .hf-enabled | • :optional | • .hf-readwrite |
| • :disabled | • .hf-optional | • :-webkit-auto-fill |
| • .hf-disabled | • :empty | • .hf-icon |
| • :valid | • .hf-empty | • ::placeholder |
| • .hf-valid | • :complete | • ::-moz-placeholder |
| • :invalid | • .hf-complete | • ::-webkit-input-placeholder |
| • .hf-invalid | • :autofill | • ::-ms-input-placeholder |
| • :user-valid | • .hf-autofill | |

The styles can contain any valid CSS rules and will be used to style both the public elements and internal private elements. For security only, styles that relate to the textual representation of the **Field** are passed to the internal private elements. This includes styles such as colours, font weights and text decorations. At present, it is not possible to specify custom fonts as they would require the font files to be available on our servers.

The following styles can be used to style the **Field** internal private elements:

- | | | |
|--------------------------|---------------------------|-------------------------|
| • caret-color | • font-size | • font-variant-numeric |
| • color | • font-size-adjust | • font-variant-position |
| • cursor | • font-smooth | • font-weight |
| • direction | • font-stretch | • letter-spacing |
| • fill | • font-style | • line-height |
| • filter | • font-synthesis | • stroke |
| • font | • font-variant | • text-align |
| • font-family | • font-variant-alternates | • text-decoration |
| • font-feature-settings | • font-variant-caps | • text-decoration-color |
| • font-kerning | • font-variant-east-asian | • text-decoration-line |
| • font-language-override | • font-variant-ligatures | • text-decoration-style |

- text-emphasis
- text-emphasis-color
- text-emphasis-position
- text-emphasis-style
- text-indent
- text-rendering
- text-shadow
- text-transform
- text-underline-position
- -moz-osx-font-smoothing
- -webkit-font-smoothing
- -webkit-text-fill-color

The '.hf-icon' class name can be used to target the icon sub element in a **cardDetails Field**.

Individual controls can be targeted by using DOM ids, which will have a '-hostedfield' extension added to the DOM id of the original **element**.

It is advisable to keep CSS selectors and rules as simple as possible to avoid styling errors caused by a failure to parse and filter the rules.

The following list are the best web safe fonts for use with any 'font' or 'font-family' style as these fonts should be available on most web browsers:

- Arial (sans-serif)
- Verdana (sans-serif)
- Helvetica (sans-serif)
- Tahoma (sans-serif)
- Trebuchet MS (sans-serif)
- Times New Roman (serif)
- Georgia (serif)
- Garamond (serif)
- Courier New (monospace)
- Brush Script MT (cursive)

Example stylesheet:

```

1. <style class="hostedfield">
2.     /*
3.      * Style hosted field internals
4.      * - only accept font, foreground and background styling
5.      */
6.
7.     /* Copy of Bootstrap styles */
8.     .hostedfield:disabled {
9.         cursor: not-allowed;
10.        background-color: #eee;
11.        opacity: 1;
12.    }
13.
14.    /* Change text to red when invalid */
15.    .form-control:invalid,
16.    .hostedfield:invalid {
17.        border-color: #a94442 !important;
18.        color: #a94442 !important;
19.    }
20.
21.    /* Change text to light grey when readonly */
22.    .form-control:readonly,
23.    .hostedfield:readonly {
24.        color: lightgrey !important;
25.    }
26.
27.    /* Emulate webkit auto fill style */
28.    .form-control.hf-autofill,
29.    .hostedfield.hf-autofill {
30.        background-color: rgb(250, 255, 189) !important;
31.        background-image: none !important;
32.        color: rgb(0, 0, 0) !important;
33.    }
34.
35.    /* Add pink placeholder */
36.    .form-control::placeholder,
37.    .hostedfield::placeholder {
38.        color: pink;
39.    }
40.
41.    /* Show hovering over the control */
42.    .form-control.hf-hover,
43.    .hostedfield.hf-hover {
44.        font-style: italic;
45.    }
46.
47.    /* Style by id (hosted field will have '-hostedfield' appended to the id) */
48.    #form1-card-details.hostedfield, #form1-card-details-hostedfield {
49.        color: blue;
50.    }
51.
52. </style>

```

A-21.3.11 jQuery Plugin

The script will extend the jQuery object with its own plugin methods to allow easy access to **Form** and **Field** objects attached to an **element** as follows:

```
$(element).hostedForm(options);
$(element).hostedForm('instance');
$(element).hostedForm('options', options);
$(element).hostedForm(method, parameters);
$(element).hostedForm('destroy');

$(element).hostedField(options);
$(element).hostedField('instance');
$(element).hostedField('options', options);
$(element).hostedField(method, parameters);
$(element).hostedField('destroy');
```

The script will also add a ':hostedfield' pseudo selector allowing **Field** elements to be selected using the following example notation:

```
$( 'INPUT:hostedfield' )
```

:

A-22 Example HTTP Requests

A-22.1 Hosted Integration

A-22.1.1 Transaction Request HTTP Headers

The following HTTP headers are sent for transaction request:

HTTP Header	Mandatory	Description
content-type	Y	Content type of the request. This must be 'application/x-www-form-urlencoded', A charset parameter is optional and any non UTF-8 request will be converted to UTF-8.

A-22.1.2 Transaction Response HTTP Headers

The following HTTP headers are received for a transaction response:

HTTP header	Description
Status	HTTP status header. Possible value are: 200 – Transaction request processed 500 – Internal Server Error 503 – Service Temporarily Unavailable
content-type	Content type of the response. This will be 'application/x-www-form-urlencoded'

A-22.1.3 Submission Example

The following shows an example of a transaction request:

```
1. HTTP/1.1 200 OK
2. POST /hosted/ HTTP/1.1
3. Host: gateway.example.com
4. Accept: */*
5. Content-Length: 314
6. Content-Type: application/x-www-form-urlencoded
7.
8. merchantID=100001&action=SALE&type=1&currencyCode=826&countryCode=826&amount=680&transactionUnique=5de651c7c537
9&orderRef=Test+Transaction&redirectURL=https%3A%2F%2Fmyshop.com&signature=ba12b0766a3412782448f154be15e8f61eea
390387b1b23d4688c82c9f28f81df593de5890426546cca365943cc7b5c4897c9721b663a0e17680e1e796f1ad55
```

The following shows an example of a transaction response:

```
1. HTTP/1.1 200 OK
2. Date: Tue, 01 Jan 2019 09:30:45 GMT
3. Server: Apache/2.4.23 (Win64) OpenSSL/1.0.2k-fips PHP/5.4.12
4. Vary: Host
5. X-Powered-By: PHP/5.4.12
6. Expires: Thu, 19 Nov 1981 08:52:00 GMT
7. Cache-Control: no-store, no-cache, must-revalidate, post-check=0, pre-check=0
8. Pragma: no-cache
9. Content-Length: 4129
10. Content-Type: text/html
11.
12. <!DOCTYPE html>
13. <html>
14. --- Hosted Payment Page HTML Removed ---
15. </html>
```

A-22.2 Direct Integration

A-22.2.1 Transaction Request HTTP Headers

The following HTTP headers are sent for transaction request:

HTTP Header	Mandatory	Description
content-type	Y	Content type of the request. This must be 'application/x-www-form-urlencoded', A charset parameter is optional and any none UTF-8 request will be converted to UTF-8.

A-22.2.2 Transaction Response HTTP Headers

The following HTTP headers are received for a transaction response:

HTTP header	Description
Status	HTTP status header. Possible value are: 200 – Hosted Payment Form returned 500 – Internal Server Error 503 – Service Temporarily Unavailable
content-type	Content type of the response. This will be 'text/html'

A-22.2.3 Submission Example

The following shows an example of a transaction request:

```
1. POST /direct/ HTTP/1.1
2. Host: gateway.example.com
3. Accept: */*
4. Content-Length: 397
5. Content-Type: application/x-www-form-urlencoded
6.
7. merchantID=100001&action=SALE&type=1&currencyCode=826&countryCode=826&amount=680&transactionUnique=5de65b552499e&orderRef=Test+Transaction&cardNumber=4929+4212+3460+0821&cardCVV=356&cardExpiryDate=1219&threeDSRequired=N&avscv2CheckRequired=N&duplicateDelay=0&signature=06b01e06c8fc761943d676d5f3aa2e9264758fed72e7bcb058a2a35cf23e8e45403099537bb0363054d6bc8ea951ce1ad86e582dbf0b435855b9c97507fcf844
```

The following shows an example of a transaction response:

```
1. HTTP/1.1 200 OK
2. Date: Tue, 01 Jan 2019 09:30:45 GMT
3. Server: Apache/2.4.23 (Win64) OpenSSL/1.0.2k-fips PHP/5.4.12
4. Vary: Host
5. X-Powered-By: PHP/5.4.12
6. Content-Length: 2449
7. Content-Type: text/html
8.
9. merchantID=100001&threeDSEnabled=Y&avscv2CheckEnabled=Y&riskCheckEnabled=N&caEnabled=Y&rtsEnabled=Y&cftEnabled=Y&threeDSCheckPref=not+known%2Cnot+checked%2Cauthenticated%2Cattempted+authentication&cv2CheckPref=matched&addressCheckPref=not+known%2Cnot+checked%2Cmatched%2Cpartially+matched&postcodeCheckPref=not+known%2Cnot+checked%2Cmatched%2Cpartially+matched&cardCVVMandatory=Y&riskCheckPref=not+known%3Dfinished%2Cnot+checked%3Ddecline%2Caprove%3Dcontinue%2Cdecline%3Ddecline%1%2Creview%3Ddecline%2%2Cescalate%3Dfinished&notifyEmail=an.operator%40merchant.com&customerReceiptsRequired=Y&merchantCategoryCode=6013&surchargeEnabled=Y&surchargeRequired=N&surchargeRules%5B0%5D%5BcardType%5D=CC&surchargeRules%5B0%5D%5Bsurcharge%5D=10.1235&surchargeRules%5B1%5D%5BcardType%5D=CC&surchargeRules%5B1%5D%5Bcurrency%5D=GBP&surchargeRules%5B1%5D%5Bsurcharge%5D=2.5000&surchargeRules%5B2%5D%5BcardType%5D=VC&surchargeRules%5B2%5D%5Bsurcharge%5D=3.5000&surchargeRules%5B3%5D%5BcardType%5D=VC&surchargeRules%5B3%5D%5Bcurrency%5D=GBP&surchargeRules%5B3%5D%5Bsurcharge%5D=4.5000&surchargeRules%5B4%5D%5BcardType%5D=DD&surchargeRules%5B4%5D%5Bsurcharge%5D=5.5000&action=SALE&type=1&cyCode=826&countryCode=826&amount=680&transactionUnique=5de65b552499e&orderRef=Test+Transaction&cardExpiryDate=1219&threeDSRequired=N&avscv2CheckRequired=N&duplicateDelay=0&requestID=5de65b562496f&responseCode=0&responseMessage=AUTHCODE%3A347414&state=captured&requestMerchantID=100001&processMerchantID=100001&paymentMethod=card&cardType=Visa+Credit&cardTypeCode=VC&cardScheme=Visa+cardSchemeCode=VC&cardIssuer=BARCLAYS+BANK+PLC&cardIssuerCountry=United+Kingdom&cardIssuerCountryCode=GBR&cardFlags=8323072&cardNumberMask=492942%2A%2A%2A%2A%2A%2A0821&cardNumberValid=Y&xref=19120312NG55CM51QH35JRL&cardExpiryMonth=12&cardExpiryYear=19&authorisationCode=347414&transactionID=10018201&responseStatus=0&tamp=2019-12-03+12%3A55%3A52&amountApproved=680&amountReceived=680&amountRetained=680&avscv2ResponseCode=244100&avscv2ResponseMessage=SECURITY+CODE+MATCH+ONLY&avscv2AuthEntity=merchant+host&cv2Check=matched&addressCheck=not+matched&postcodeCheck=not+matched&notifyEmailResponseCode=0&notifyEmailResponseMessage=Email+successfully+queued&vcsResponseCode=0&vcsResponseMessage=Success+-+no+velocity+check+rules+applied&currencyExponent=2&signature=e5c65e5d0340e0ec0de8782affcb6caba2e4d202a6873a1677ddb6415cb1dd52cc597e43c758b233afd121367d300a57d0faade7abf6b4b88a1a1b974e55d33
```

A-22.3 Batch Integration

A-22.3.1 Submission Request HTTP Headers

The following HTTP headers are sent for batch submission request:

HTTP Header	Mandatory	Description
content-type	Y	Content type of the batch request. This must be 'multipart/mixed' and contain a boundary parameter to separate each transaction request. A charset parameter is optional and any none UTF-8 request will be converted to UTF-8.
content-encoding	N	Optional content encoding applied to the request. The value should be a comma separated list of one or more: x-gzip , gzip , base64 .
authorization	N	Optional username and password to authenticate the submitter

The following HTTP headers are sent on each individual part request:

HTTP Header	Mandatory	Description
content-type	Y	Content type of the individual request. This must be 'application/x-www-form-urlencoded', A charset parameter is optional and any none UTF-8 request will be converted to UTF-8.
content-encoding	N	Optional content encoding applied to the request. The value should be a comma separated list of one or more: x-gzip , gzip , base64 .
content-id	N	Optional identifier for each individual transaction with the batch. The Gateway will return this identifier in the submission response. If not sent, the Gateway will generate a unique identifier for each transaction.

A-22.3.2 Submission Response HTTP Headers

The following HTTP headers are received for batch submission response:

HTTP header	Description
status	HTTP status header. Possible value are: 200 – Batch submission status response ok 201 – Batch submission received and stored 400 – Batch submission invalid 401 – Unauthorised (none or incorrect credentials) 405 – HTTP method was not POST/PUT or GET 500 – Internal Gateway error
location	URL to use to monitor the status of the batch. A unique batch reference number will be provided in the URL in the format: XXXX-XXXX-XXXX-XXXX (eg 1A23-B4C5-DEF6-G7HI) This reference number is used to request information about the status of a batch via HTTP GET requests to the URL endpoint as outlined in section 1.3.3.
x-p3-token	If user authentication was sent in the initial request, this header will contain a token that can be used for future requests for the status of the batch instead of having to use a username/password.
content-type	Content type of the HTTP batch request. This will be 'multipart/mixed' and contain a boundary parameter to separate each transaction request.

The following HTTP headers are received on each individual part response:

HTTP header	Description
content-type	Content type of the individual request. This will be 'application/x-www-form-urlencoded', A charset parameter is optional and any none UTF-8 request will be converted to UTF-8.
content-id	The content ID sent in the initial request as outlined in A-22.3.1. If no content-id header was sent, the Gateway will return a unique content ID per transaction.
x-transaction-id	The Gateway transaction ID. This will be empty if the transaction is currently pending in this stage.
x-transaction-response	A message containing the current status of the transaction. Possible value are: skipped – insufficient permissions to view transaction pending – queued for processing success – (Response Message) failure – (Response Message)

A-22.3.3 Status Request HTTP Headers

The following HTTP headers are used during a batch status request:

HTTP Header	Mandatory	Description
authorization	Y	Mandatory username and password to authenticate the submitter

A-22.3.4 Status Response HTTP Headers

The batch status response is identical to the submission status response as documented in section A-22.3.2.

A-22.3.5 Submission Example

The following shows an example of a batch submission request:

```

1. PUT /batch/?validate=0 HTTP/1.1
2. Authorization: Basic bmljay50dXJuZXI6dGVzdGluZzI=
3. Host: gateway.example.com
4. Accept: */*
5. Content-type: multipart/mixed; charset=UTF-8; boundary=5de63a42507a9
6. Content-length: 1404
7.
8. --5de63a42507a9
9. Content-Id: TX5de63a42507ac
10. Content-Type: application/x-www-form-urlencoded; charset=UTF-8
11.
12. merchantID=100001&action=SALE&type=1&currencyCode=826&countryCode=826&amount=680&transactionUnique=5de63a42507a
   c&orderRef=Test+Transaction&cardNumber=4929+4212+3460+0821&cardExpiryDate=1219&duplicateDelay=0&signature=3cd68
   6fdd40449ef33534baa62732c95fc127ff591fae3b5b611ccb38573ad921d199396e27cffd14faa4f46df8dde310252920fd1b33607b029
   b9b6ff669e2b
13.
14. --5de63a42507a9
15. Content-Id: TX5de63a42af062
16. Content-Type: application/x-www-form-urlencoded; charset=UTF-8
17.
18. merchantID=100001&action=SALE&type=1&currencyCode=826&countryCode=826&amount=681&transactionUnique=5de63a42af06
   2&orderRef=Test+Transaction&cardNumber=4929+4212+3460+0821&cardExpiryDate=1219&duplicateDelay=0&signature=55f41
   1d40954be7f7089e84fe489438f09fc1b37c0964e46b0fab8bdc44e13ed3ea11b9deb9da89a6d7b45133709a126bd3581f6329bf888b83
   231184597231
19.
20. --5de63a42507a9
21. Content-Id: TX5de63a42ca9cd
22. Content-Type: application/x-www-form-urlencoded; charset=UTF-8
23.
24. merchantID=100001&action=SALE&type=1&currencyCode=826&countryCode=826&amount=682&transactionUnique=5de63a42ca9c
   d&orderRef=Test+Transaction&cardNumber=4929+4212+3460+0821&cardExpiryDate=1219&duplicateDelay=0&signature=c2962
   66cb9bc8082957c700da9651d98add176dd8bd62eb3b7098566c7d8e23a3426b776de815e99149c6681978b1addedac762339563732d8a4
   49b6cca3a3c2
25.
26. --5de63a42507a9--

```

The following shows an example of a batch submission response:

```

1. HTTP/1.1 201 Created
2. Date: Tue, 01 Jan 2019 09:30:45 GMT
3. Server: Apache/2.4.23 (Win64) OpenSSL/1.0.2k-fips PHP/5.4.12
4. X-Powered-By: PHP/5.4.12
5. x-p3-token: YTo1OntzOjc6InZlcnNpb24iO3M6ODoiUDNUSy8yLjAiO3M6NzoicHVycG9zZSI7czo0OiJhdXRoIjtzOjc6ImNyZWFi0b3IiO3M6NToiQkFUQ0giO3M6NzoiY3JlYXRlZCI7aToxNTc1MzY5Mjg1O3M6NzoiZXhwaXJlcyI7aToxNTc1MzcyODg1O30.czo0OiI2MjkiOw.zdfxxXYtC2Wc4yyk-lEos-wZ99pEJtPGYpXR4KCiWw_56nmOysarOaMucrWPIt-NzwFzgq3-7u4Ud6uYkQcWBQ
6. Location: /batch/2D6D-AC2C-BF55-2A8C
7. Content-disposition: attachment; filename="batch-2D6D-AC2C-BF55-2A8C"
8. Content-Length: 1857
9. Content-Type: multipart/mixed; charset=UTF-8; boundary=5de63a5c1a071
10.
11. Transaction 'TX5de63a42507ac' - pending - queued for processing
12. Transaction 'TX5de63a42af062' - pending - queued for processing
13. Transaction 'TX5de63a42ca9cd' - pending - queued for processing
14.
15. --5de63a5c1a071
16. Content-Id: TX5de63a42507ac
17. Content-Type: application/x-www-form-urlencoded; charset=UTF-8
18. X-Transaction-ID:
19. X-Transaction-Response: pending - queued for processing
20.
21. merchantID=100001&action=SALE&type=1&cyCode=826&countryCode=826&amount=680&transactionUnique=5de63a42507ac&orderRef=Test+Transaction&cardNumber=492942%2A%2A%2A%2A%2A%2A0821&cardExpiryDate=1219&duplicateDelay=0&signature=0384bbf6ca0fc153e1e27a0cfc51f3b1cd1c2cfff7a49aa4e9439bba38262183e9ac7d156f218eba1ef8d04f9e6a7fa6fbc9c2b3ab990c70e06dc7c6923e5b27b
22.
23. --5de63a5c1a071
24. Content-Id: TX5de63a42af062
25. Content-Type: application/x-www-form-urlencoded; charset=UTF-8
26. X-Transaction-ID:
27. X-Transaction-Response: pending - queued for processing
28.
29. merchantID=100001&action=SALE&type=1&cyCode=826&countryCode=826&amount=681&transactionUnique=5de63a42af062&orderRef=Test+Transaction&cardNumber=492942%2A%2A%2A%2A%2A%2A0821&cardExpiryDate=1219&duplicateDelay=0&signature=1e13e23c2b90a30f4403d604ac20302b5504b886b0b5c9ace0764fc8d966d120f5a1beca975805292780c22953b4e6ca71f67f499804f19d2718518463a598c4
30.
31. --5de63a5c1a071
32. Content-Id: TX5de63a42ca9cd
33. Content-Type: application/x-www-form-urlencoded; charset=UTF-8
34. X-Transaction-ID:
35. X-Transaction-Response: pending - queued for processing
36.
37. merchantID=100001&action=SALE&type=1&cyCode=826&countryCode=826&amount=682&transactionUnique=5de63a42ca9cd&orderRef=Test+Transaction&cardNumber=492942%2A%2A%2A%2A%2A%2A0821&cardExpiryDate=1219&duplicateDelay=0&signature=c456aa211f8e3e568a40051bfd38406be02566fcd72d3bb1547f4d43e75db1d069eaa4158aa035337cac084633df945a13471db6b1a3fcd6c0749626d9bc0044
38.
39. --5de63a5c1a071--

```


A-23 Example Integration Code

The follow section provides samples of how to integrate with the Gateway using the PHP scripting language to communicate directly with the API without the use of any our SDKs.

A-23.1 Hosted Integration

A-23.1.1 Sale Transaction

The following example PHP code shows how to send a SALE transaction:

```

1.  <?PHP
2.
3.  // Signature key entered on MMS. The demo account is fixed to this value,
4.  $key = 'Circle4Take40Idea';
5.
6.  // Gateway URL
7.  $url = 'https://gateway.example.com/hosted/';
8.
9.
10. if (!isset($_POST['responseCode'])) {
11.     // Send request to gateway
12.
13.     // Request
14.     $req = array(
15.         'merchantID' => '100001',
16.         'action' => 'SALE',
17.         'type' => 1,
18.         'countryCode' => 826,
19.         'currencyCode' => 826,
20.         'amount' => 1001,
21.         'orderRef' => 'Test purchase',
22.         'transactionUnique' => uniqid(),
23.         'redirectURL' => ($_SERVER['HTTPS'] == 'on' ? 'https' : 'http') . '://' . $_SERVER['HTTP_HOST'] . $_SER
VER['REQUEST_URI'],
24.     );
25.
26.     // Create the signature using the function called below.
27.     $req['signature'] = createSignature($req, $key);
28.
29.     echo '<form action="' . htmlentities($url) . '" method="post">' . PHP_EOL;
30.
31.     foreach ($req as $field => $value) {
32.         echo '    <input type="hidden" name="' . $field . '" value="' . htmlentities($value) . '">' . PHP_EOL;
33.     }
34.
35.     echo '    <input type="submit" value="Pay Now">' . PHP_EOL;
36.     echo '</form>' . PHP_EOL;
37.
38. // Check the return signature
39. if (!$signature || $signature !== createSignature($res, $key)) {
40.     // You should exit gracefully
41.     die('Sorry, the signature check failed');
42. }
43.
44. // Check the response code
45. if ($res['responseCode'] === "0") {
46.     echo "<p>Thank you for your payment.</p>";
47. } else {
48.     echo "<p>Failed to take payment: " . htmlentities($res['responseMessage']) . "</p>";
49. }
50.
51. }
52.
53. // Function to create a message signature

```

```
54. function createSignature(array $data, $key) {
55.     // Sort by field name
56.     ksort($data);
57.
58.     // Create the URL encoded signature string
59.     $ret = http_build_query($data, '', '&');
60.
61.     // Normalise all line endings (CRNL|NLCR|NL|CR) to just NL (%0A)
62.     $ret = str_replace(array('%0D%0A', '%0A%0D', '%0D'), '%0A', $ret);
63.
64.     // Hash the signature string and the key together
65.     return hash('SHA512', $ret . $key);
66. }
67.
68. ?>
```

A-23.2 Direct Integration

A-23.2.1 Sale Transaction (with 3-D Secure)

The following example PHP code shows how to send a SALE transaction with support for 3-D Secure:

```

1.  <?PHP
2.
3.  // Signature key entered on MMS. The demo account is fixed to this value,
4.  $key = 'Circle4Take40Idea';
5.
6.  // Gateway URL
7.  $url = 'https://gateway.example.com/direct/';
8.
9.  // Setup PHP session as use it to store data between 3DS steps
10. if (isset($_GET['sid'])) {
11.     session_id($_GET['sid']);
12. }
13.
14. session_start();
15.
16. // Compose current page URL (removing any sid and acs parameters)
17. $pageUrl = ((isset($_SERVER['HTTPS']) && $_SERVER['HTTPS'] == 'on') ? 'https://' : 'http://')
18.     . $_SERVER['SERVER_NAME'] . ($_SERVER['SERVER_PORT'] != '80' ? ':' . $_SERVER['SERVER_PORT'] : '')
19.     . preg_replace('/(sid=[^&]+)|(acs=1&?)/', '', $_SERVER['REQUEST_URI']);
20.
21. // Add back the correct sid parameter (used as session cookie may not be passed when the page is redirected from an IFRAME)
22. $pageUrl .= (strpos($pageUrl, '?') === false ? '?' : '&') . 'sid=' . urlencode(session_id());
23.
24.
25. // If ACS response into the IFRAME then redirect back to parent window
26. if (!empty($_GET['acs'])) {
27.     echo silentPost($pageUrl, array('threeDSResponse' => $_POST), '_parent');
28.     exit();
29. }
30.
31. if (!isset($_POST['threeDSResponse'])) {
32.     // Initial request
33.
34.     // Gather browser info - can be done at any time prior to the checkout
35.     if (!isset($_POST['browserInfo'])) {
36.         echo collectBrowserInfo();
37.         exit();
38.     }
39.
40.     // Direct Request
41.     $req = array(
42.         'merchantID' => 100001,
43.         'action' => 'SALE',
44.         'type' => 1,
45.         'currencyCode' => 826,
46.         'countryCode' => 826,
47.         'amount' => 1001,
48.         'cardNumber' => '4012001037141112',
49.         'cardExpiryMonth' => 12,
50.         'cardExpiryYear' => 15,
51.         'cardCVV' => '083',
52.         'customerName' => 'Test Customer',
53.         'customerEmail' => 'test@testcustomer.com',
54.         'customerAddress' => '16 Test Street',
55.         'customerPostCode' => 'TE15 5ST',
56.         'orderRef' => 'Test purchase',
57.
58.         // The following fields are mandatory for 3DS v2

```

```

59.         'remoteAddress' => $_SERVER['REMOTE_ADDR'],
60.         'threeDSRedirectURL' => $pageUrl . '&acs=1',
61.
62.         // The following field allows options to be passed for 3DS v2
63.         // and the values here are for demonstration purposes only
64.         'threeDSOptions' => array(
65.             'paymentAccountAge' => '20190601',
66.             'paymentAccountAgeIndicator' => '05',
67.         ),
68.     );
69.
70.     // Add the browser info as it is mandatory for 3DS v2
71.     $req += $_POST['browserInfo'];
72.
73. } else {
74.     // 3DS continuation request
75.     $req = array(
76.         'threeDSRef' => $_SESSION['threeDSRef'],
77.         'threeDSResponse' => $_POST['threeDSResponse'],
78.     );
79.
80. }
81.
82. // Create the signature using the function called below.
83. $req['signature'] = createSignature($req, $key);
84.
85. // Initiate and set curl options to post to the gateway
86. $ch = curl_init($url);
87. curl_setopt($ch, CURLOPT_POST, true);
88. curl_setopt($ch, CURLOPT_POSTFIELDS, http_build_query($req));
89. curl_setopt($ch, CURLOPT_HEADER, false);
90. curl_setopt($ch, CURLOPT_FOLLOWLOCATION, true);
91. curl_setopt($ch, CURLOPT_RETURNTRANSFER, true);
92.
93. // Send the request and parse the response
94. if (($res = curl_exec($ch)) === false) {
95.     // You should exit gracefully
96.     die('Sorry, the request could not be sent: ' . curl_error($ch));
97. }
98.
99. parse_str($res, $res);
100.
101. // Close the connection to the gateway
102. curl_close($ch);
103.
104. // Extract the return signature as this isn't hashed
105. $signature = null;
106. if (isset($res['signature'])) {
107.     $signature = $res['signature'];
108.     unset($res['signature']);
109. }
110.
111. // Check the return signature
112. if (!$signature || $signature !== createSignature($res, $key)) {
113.     // You should exit gracefully
114.     die('Sorry, the signature check failed');
115. }
116.
117. // Check the response code
118. if ((int)$res['responseCode'] === 65802) {
119.     // Send request to the ACS server displaying response in an IFRAME
120.
121.     // Render an IFRAME to show the ACS challenge (hidden for fingerprint method)
122.     $style = (isset($res['threeDSRequest']['threeDSMethodData'])) ? 'display: none;' : '';
123.     echo "<iframe name='threads_acs' style='height:420px; width:420px; {$style}'></iframe>\n";
124.
125.     // Silently POST the 3DS request to the ACS in the IFRAME

```

```

126.     echo silentPost($res['threeDSURL'], $res['threeDSRequest'], 'threeds_acs');
127.
128.     // Remember the threeDSRef as need it when the ACS responds
129.     $_SESSION['threeDSRef'] = $res['threeDSRef'];
130.
131. } else if ((int)$res['responseCode'] === 0) {
132.     echo "<p>Thank you for your payment.</p>";
133. } else {
134.     echo "<p>Failed to take payment: " . htmlentities($res['responseMessage']) . "</p>";
135. }
136.
137. // Function to create a message signature
138. function createSignature(array $data, $key) {
139.     // Sort by field name
140.     ksort($data);
141.
142.     // Create the URL encoded signature string
143.     $ret = http_build_query($data, '', '&');
144.
145.     // Normalise all line endings (CRNL|NLCR|NL|CR) to just NL (%0A)
146.     $ret = str_replace(array('%0D%0A', '%0A%0D', '%0D'), '%0A', $ret);
147.
148.     // Hash the signature string and the key together
149.     return hash('SHA512', $ret . $key);
150. }
151.
152. // Return HTML to render a hidden form used to collect some browser details
153. function collectBrowserInfo(array $options = null) {
154.
155.     $form_attrs = 'id="collectBrowserInfo" method="post" action="?"';
156.
157.     if (isset($options['formAttrs'])) {
158.         $form_attrs .= $options['formAttrs'];
159.     }
160.
161.     $device_data = array(
162.         'deviceChannel'           => 'browser',
163.         'deviceIdentity'          => (isset($_SERVER['HTTP_USER_AGENT']) ? htmlentities($_SERVER['HTTP_USER_
AGENT']) : null),
164.         'deviceTimeZone'         => '0',
165.         'deviceCapabilities'     => '',
166.         'deviceScreenResolution' => '1x1x1',
167.         'deviceAcceptContent'    => (isset($_SERVER['HTTP_ACCEPT']) ? htmlentities($_SERVER['HTTP_ACCEPT'])
: null),
168.         'deviceAcceptEncoding'   => (isset($_SERVER['HTTP_ACCEPT_ENCODING']) ? htmlentities($_SERVER['HTTP_
ACCEPT_ENCODING']) : null),
169.         'deviceAcceptLanguage'   => (isset($_SERVER['HTTP_ACCEPT_LANGUAGE']) ? htmlentities($_SERVER['HTTP_
ACCEPT_LANGUAGE']) : null),
170.         'deviceAcceptCharset'    => (isset($_SERVER['HTTP_ACCEPT_CHARSET']) ? htmlentities($_SERVER['HTTP_A
CCEPT_CHARSET']) : null),
171.     );
172.
173.     $form_fields = fieldToHtml('browserInfo', $device_data);
174.
175.     if (isset($options['formData'])) {
176.         foreach ((array)$options['formData'] as $name => $value) {
177.             $form_fields .= fieldToHtml($name, $value);
178.         }
179.     }
180.
181.     $ret = <<<EOS
182.         <form {$form_attrs}>
183.             {$form_fields}
184.         </form>
185.         <script>
186.             var screen_width = (window && window.screen ? window.screen.width : '0');
187.             var screen_height = (window && window.screen ? window.screen.height : '0');

```

```

188.         var screen_depth = (window && window.screen ? window.screen.colorDepth : '0');
189.         var identity = (window && window.navigator ? window.navigator.userAgent : '');
190.         var language = (window && window.navigator ? (window.navigator.language ? window.navigator.language : window.navigator.browserLanguage) : '');
191.         var timezone = (new Date()).getTimezoneOffset();
192.         var java = (window && window.navigator ? navigator.javaEnabled() : false);
193.         var fields = document.forms.collectBrowserInfo.elements;
194.         fields['browserInfo[deviceIdentity]'].value = identity;
195.         fields['browserInfo[deviceTimeZone]'].value = timezone;
196.         fields['browserInfo[deviceCapabilities]'].value = 'javascript' + (java ? ',java' : '');
197.         fields['browserInfo[deviceAcceptLanguage]'].value = language;
198.         fields['browserInfo[deviceScreenResolution]'].value = screen_width + 'x' + screen_height + 'x' + screen_depth;
199.         window.setTimeout('document.forms.collectBrowserInfo.submit()', 0);
200.     </script>
201. EOS;
202.
203.     return $ret;
204. }
205.
206. // Render HTML to silently POST data to URL in target browser window
207. function silentPost($url = '?', array $post = null, $target = '_self') {
208.
209.     $url = htmlentities($url);
210.     $target = htmlentities($target);
211.     $fields = '';
212.
213.     if ($post) {
214.         foreach ($post as $name => $value) {
215.             $fields .= fieldToHtml($name, $value);
216.         }
217.     }
218.
219.     $ret = "
220.         <form id=\"silentPost\" action=\"{$url}\" method=\"post\" target=\"{$target}\">
221.             {$fields}
222.             <noscript><input type=\"submit\" value=\"Continue\"></noscript>
223.         </form>
224.         <script>
225.             window.setTimeout('document.forms.silentPost.submit()', 0);
226.         </script>
227.     ";
228.
229.     return $ret;
230. }
231.
232. // Return a value as hidden HTML FORM fields
233. function fieldToHtml($name, $value) {
234.     $ret = '';
235.     if (is_array($value)) {
236.         foreach ($value as $n => $v) {
237.             $ret .= fieldToHtml($name . '[' . $n . ']', $v);
238.         }
239.     } else {
240.         // Convert all applicable characters or none printable characters to HTML entities
241.         $value = preg_replace_callback('/[\\x00-\\x1f]/', function($matches) { return '&#'. ord($matches[0]) . ';'}, htmlentities($value, ENT_COMPAT, 'UTF-8', true));
242.         $ret = "<input type=\"hidden\" name=\"{$name}\" value=\"{$value}\" /\>\n";
243.     }
244.
245.     return $ret;
246. }
247.
248.
249. ?>

```

A-23.2.2 Sale Transaction (without 3-D Secure)

The following sample PHP code shows how to send a SALE transaction without support for 3-D Secure:

```
1.  <?PHP
2.
3.  // Signature key entered on MMS. The demo account is fixed to this value,
4.  $key = 'Circle4Take40Idea';
5.
6.  // Gateway URL
7.  $url = 'https://gateway.example.com/direct/';
8.
9.  // Request
10. $req = array(
11.     'merchantID' => '100001',
12.     'action' => 'SALE',
13.     'type' => 1,
14.     'countryCode' => 826,
15.     'currencyCode' => 826,
16.     'amount' => 1001,
17.     'cardNumber' => '4012001037141112',
18.     'cardExpiryMonth' => 12,
19.     'cardExpiryYear' => 15,
20.     'cardCVV' => '083',
21.     'customerName' => 'Test Customer',
22.     'customerEmail' => 'test@testcustomer.com',
23.     'customerPhone' => '+44 (0) 123 45 67 890',
24.     'customerAddress' => '16 Test Street',
25.     'customerPostCode' => 'TE15 5ST',
26.     'orderRef' => 'Test purchase',
27.     'transactionUnique' => uniqid(),
28. );
29.
30. // Create the signature using the function called below.
31. $req['signature'] = createSignature($req, $key);
32.
33. // Initiate and set curl options to post to the gateway
34. $ch = curl_init($url);
35. curl_setopt($ch, CURLOPT_POST, true);
36. curl_setopt($ch, CURLOPT_POSTFIELDS, http_build_query($req));
37. curl_setopt($ch, CURLOPT_HEADER, false);
38. curl_setopt($ch, CURLOPT_FOLLOWLOCATION, true);
39. curl_setopt($ch, CURLOPT_RETURNTRANSFER, true);
40.
41. // Send the request and parse the response
42. parse_str(curl_exec($ch), $res);
43.
44. // Close the connection to the gateway
45. curl_close($ch);
46.
47. // Extract the return signature as this isn't hashed
48. $signature = null;
49. if (isset($res['signature'])) {
50.     $signature = $res['signature'];
51.     unset($res['signature']);
52. }
53.
54. // Check the return signature
55. if (!$signature || $signature !== createSignature($res, $key)) {
56.     // You should exit gracefully
57.     die('Sorry, the signature check failed');
58. }
59.
60. // Check the response code
61. if ($res['responseCode'] === "0") {
62.     echo "<p>Thank you for your payment.</p>";
```

```
63. } else {
64.     echo "<p>Failed to take payment: " . htmlentities($res['responseMessage']) . "</p>";
65. }
66.
67. // Function to create a message signature
68. function createSignature(array $data, $key) {
69.     // Sort by field name
70.     ksort($data);
71.
72.     // Create the URL encoded signature string
73.     $ret = http_build_query($data, '', '&');
74.
75.     // Normalise all line endings (CRNL|NLCR|NL|CR) to just NL (%0A)
76.     $ret = str_replace(array('%0D%0A', '%0A%0D', '%0D'), '%0A', $ret);
77.
78.     // Hash the signature string and the key together
79.     return hash('SHA512', $ret . $key);
80. }
81.
82. ?>
```


A-23.3 Batch Integration

A-23.3.1 Batch Submission

The following example PHP code shows how to send a batch request containing three SALE transactions:

```
1. <?PHP
2.
3. // Signature key entered on MMS. The demo account is fixed to this value,
4. $key = 'Circle4Take40Idea';
5.
6. // Gateway URL
7. $url = 'https://gateway.example.com/batch/';
8.
9. // Create a unique multipart boundary
10. $boundary = uniqid();
11.
12. // Requests
13. $reqs = array(
14.     array(
15.         'merchantID' => 100001,
16.         'action' => 'SALE',
17.         'type' => 1,
18.         'currencyCode' => 826,
19.         'countryCode' => 826,
20.         'amount' => 1001,
21.         'cardNumber' => '4012001037141112',
22.         'cardExpiryMonth' => 12,
23.         'cardExpiryYear' => 15,
24.         'cardCVV' => '083',
25.         'customerName' => 'Test Customer',
26.         'customerEmail' => 'test@testcustomer.com',
27.         'customerAddress' => '16 Test Street',
28.         'customerPostCode' => 'TE15 5ST',
29.         'orderRef' => 'Test purchase',
30.         'transactionUnique' => uniqid(),
31.         'threeDSRequired' => 'N',
32.         'avscv2CheckRequired' => 'N',
33.     ),
34.     array(
35.         'merchantID' => 100001,
36.         'action' => 'SALE',
37.         'type' => 1,
38.         'currencyCode' => 826,
39.         'countryCode' => 826,
40.         'amount' => 2002,
41.         'cardNumber' => '4012001037141112',
42.         'cardExpiryMonth' => 12,
43.         'cardExpiryYear' => 15,
44.         'cardCVV' => '083',
45.         'customerName' => 'Test Customer',
46.         'customerEmail' => 'test@testcustomer.com',
47.         'customerAddress' => '16 Test Street',
48.         'customerPostCode' => 'TE15 5ST',
49.         'orderRef' => 'Test purchase',
50.         'transactionUnique' => uniqid(),
51.         'threeDSRequired' => 'N',
52.         'avscv2CheckRequired' => 'N',
53.     ),
54.     array(
55.         'merchantID' => 100001,
56.         'action' => 'SALE',
57.         'type' => 1,
58.         'currencyCode' => 826,
59.         'countryCode' => 826,
```

```

60.         'amount' => 3003,
61.         'cardNumber' => '4012001037141112',
62.         'cardExpiryMonth' => 12,
63.         'cardExpiryYear' => 15,
64.         'cardCVV' => '083',
65.         'customerName' => 'Test Customer',
66.         'customerEmail' => 'test@testcustomer.com',
67.         'customerAddress' => '16 Test Street',
68.         'customerPostCode' => 'TE15 5ST',
69.         'orderRef' => 'Test purchase',
70.         'transactionUnique' => uniqid(),
71.         'threeDSRequired' => 'N',
72.         'avscv2CheckRequired' => 'N',
73.     ),
74. );
75.
76. // Create the batch parts
77. $parts = array();
78. foreach ($reqs as $req) {
79.
80.     // Create the signature using the function called below.
81.     $req['signature'] = createSignature($req, $key);
82.
83.     $parts[] =
84.         "Content-Id: TX{$req['transactionUnique']}\r\n" .
85.         "Content-Type: application/x-www-form-urlencoded; charset=\"UTF-8\"\r\n" .
86.         "\r\n" .
87.         http_build_query($req);
88. }
89.
90. // Join the parts together separated by the boundary string
91. $post = "\r\n--{$boundary}\r\n" . join("\r\n--{$boundary}\r\n", $parts) . "\r\n--{$boundary}--\r\n";
92.
93. // Initiate and set curl options to post to the gateway
94. $ch = curl_init($url);
95. curl_setopt($ch, CURLOPT_POST, true);
96. curl_setopt($ch, CURLOPT_POSTFIELDS, $post);
97. curl_setopt($ch, CURLOPT_HEADER, true);
98. curl_setopt($ch, CURLOPT_FOLLOWLOCATION, true);
99. curl_setopt($ch, CURLOPT_RETURNTRANSFER, true);
100. curl_setopt($ch, CURLOPT_HTTPHEADER, array(
101.     'Content-type: multipart/mixed; charset="UTF-8"; boundary=' . $boundary,
102.     'Content-length: ' . strlen($post),
103. ));
104.
105. // Send the request
106. $res = curl_exec($ch);
107.
108. // Normally would process the response here, but for this example just echo it out
109. header('Content-Type: text/plain');
110. echo $res . PHP_EOL;
111.
112. // Close the connection to the gateway
113. curl_close($ch);
114.
115. // Function to create a message signature
116. function createSignature(array $data, $key) {
117.     // Sort by field name
118.     ksort($data);
119.
120.     // Create the URL encoded signature string
121.     $ret = http_build_query($data, '', '&');
122.
123.     // Normalise all line endings (CRNL|NL|CR) to just NL (%0A)
124.     $ret = str_replace(array('%0D%0A', '%0A%0D', '%0D'), '%0A', $ret);
125.
126.     // Hash the signature string and the key together

```

```
127.     return hash('SHA512', $ret . $key);  
128. }  
129.  
130. ?>
```

A-24 Example Library Code

The follow section provides samples of how to integrate with the Gateway using our integration libraries as documented in section A-21.1.

A-24.1 Gateway Integration Library

A-24.1.1 Hosted Sale Transaction

The following example PHP code shows how to send a SALE transaction using the Gateway library:

```

1.  <?PHP
2.  require('gateway.php');
3.
4.  use \P3\SDK\Gateway;
5.
6.  // Signature key entered on MMS. The demo account is fixed to this value,
7.  Gateway::$merchantSecret = 'Circle4Take40Idea';
8.
9.  // Gateway URL
10. Gateway::$hostedUrl = 'https://gateway.example.com/hosted/';
11.
12. if (!isset($_POST['responseCode'])) {
13.     // Send request to gateway
14.     $req = array(
15.         'merchantID' => 100001,
16.         'action' => 'SALE',
17.         'type' => 1,
18.         'currencyCode' => 826,
19.         'countryCode' => 826,
20.         'amount' => 1001,
21.         'orderRef' => 'Test purchase',
22.         'redirectURL' => ($_SERVER['HTTPS'] == 'on' ? 'https' : 'http') . '://' . $_SERVER['HTTP_HOST'] . $_SER
VER['REQUEST_URI'],
23.     );
24.
25.     try {
26.         echo Gateway::hostedRequest($req);
27.     } catch (\Exception $e) {
28.         // You should exit gracefully
29.         die('Sorry, the request could not be sent: ' . $e);
30.     }
31.
32. } else {
33.     // Received response from gateway
34.     try {
35.         Gateway::verifyResponse($_POST);
36.     } catch (\Exception $e) {
37.         // You should exit gracefully
38.         die('Sorry, the request could not be sent: ' . $e);
39.     }
40.
41.     // Check the response code
42.     if ($_POST['responseCode'] === 0) {
43.         echo "<p>Thank you for your payment.</p>";
44.     } else {
45.         echo "<p>Failed to take payment: " . htmlentities($_POST['responseMessage']) . "</p>";
46.     }
47. }
48.
49. ?>

```

A-24.1.2 Direct Sale Transaction (with 3-D Secure)

The following example PHP code shows how to send a SALE transaction with support for 3-D Secure using the Gateway library:

```
1. <?PHP
2.
3. require('gateway.php');
4.
5. use \P3\SDK\Gateway;
6.
7. // Signature key entered on MMS. The demo account is fixed to this value,
8. Gateway::$merchantSecret = 'Circle4Take40Idea';
9.
10. // Gateway URL
11. Gateway::$directUrl = 'https://gateway.example.com/direct/';
12.
13. // Setup PHP session as use it to store data between 3DS steps
14. if (isset($_GET['sid'])) {
15.     session_id($_GET['sid']);
16. }
17.
18. session_start();
19.
20. // Compose current page URL (removing any sid and acs parameters)
21. $pageUrl = ((isset($_SERVER['HTTPS']) && $_SERVER['HTTPS'] == 'on') ? 'https://' : 'http://')
22.     . $_SERVER['SERVER_NAME'] . ($_SERVER['SERVER_PORT'] != '80' ? ':' . $_SERVER['SERVER_PORT'] : '')
23.     . preg_replace('/(sid=[^&]+&?)(acs=1&?)/', '', $_SERVER['REQUEST_URI']);
24.
25. // Add back the correct sid parameter (used as session cookie may not be passed when the page is redirected from an IFRAME)
26. $pageUrl .= (strpos($pageUrl, '?') === false ? '?' : '&') . 'sid=' . urlencode(session_id());
27.
28.
29. // If ACS response into the IFRAME then redirect back to parent window
30. if (!empty($_GET['acs'])) {
31.     echo silentPost($pageUrl, array('threeDSResponse' => $_POST), '_parent');
32.     exit();
33. }
34.
35. if (!isset($_POST['threeDSResponse'])) {
36.     // Initial request
37.
38.     // Gather browser info - can be done at any time prior to the checkout
39.     if (!isset($_POST['browserInfo'])) {
40.         echo Gateway::collectBrowserInfo();
41.         exit();
42.     }
43.
44.     // Direct Request
45.     $req = array(
46.         'merchantID' => 100001,
47.         'action' => 'SALE',
48.         'type' => 1,
49.         'currencyCode' => 826,
50.         'countryCode' => 826,
51.         'amount' => 1001,
52.         'cardNumber' => '4012001037141112',
53.         'cardExpiryMonth' => 12,
54.         'cardExpiryYear' => 15,
55.         'cardCVV' => '083',
56.         'customerName' => 'Test Customer',
57.         'customerEmail' => 'test@testcustomer.com',
58.         'customerAddress' => '16 Test Street',
59.         'customerPostCode' => 'TE15 5ST',
60.         'orderRef' => 'Test purchase',
61.     );
```

```

62.
63.     // The following fields are mandatory for 3DS v2
64.     'remoteAddress' => $_SERVER['REMOTE_ADDR'],
65.     'threeDSRedirectURL' => $pageUrl . '&acs=1',
66.
67.     // The following field allows options to be passed for 3DS v2
68.     // and the values here are for demonstration purposes only
69.     'threeDSOptions' => array(
70.         'paymentAccountAge' => '20190601',
71.         'paymentAccountAgeIndicator' => '05',
72.     ),
73. );
74.
75. // Add the browser info as it is mandatory for 3DS v2
76. $req += $_POST['browserInfo'];
77.
78. } else {
79.     // 3DS continuation request
80.     $req = array(
81.         // The following field are only required for the benefit of the SDK
82.         'merchantID' => 100001,
83.         'action' => 'SALE',
84.
85.         // The following field must be passed to continue the 3DS request
86.         'threeDSRef' => $_SESSION['threeDSRef'],
87.         'threeDSResponse' => $_POST['threeDSResponse'],
88.     );
89.
90. }
91.
92.
93. try {
94.     $res = Gateway::directRequest($req);
95. } catch (\Exception $e) {
96.     // You should exit gracefully
97.     die('Sorry, the request could not be sent: ' . $e);
98. }
99.
100. // Check the response code
101. if ($res['responseCode'] === Gateway::RC_3DS_AUTHENTICATION_REQUIRED) {
102.     // Send request to the ACS server displaying response in an IFRAME
103.
104.     // Render an IFRAME to show the ACS challenge (hidden for fingerprint method)
105.     $style = (isset($res['threeDSRequest']['threeDSMethodData']) ? 'display: none;' : '');
106.     echo "<iframe name='threeDS_acs' style='height:420px; width:420px; {$style}'></iframe>\n";
107.
108.     // Silently POST the 3DS request to the ACS in the IFRAME
109.     echo silentPost($res['threeDSURL'], $res['threeDSRequest'], 'threeDS_acs');
110.
111.     // Remember the threeDSRef as need it when the ACS responds
112.     $_SESSION['threeDSRef'] = $res['threeDSRef'];
113.
114. } else if ($res['responseCode'] === Gateway::RC_SUCCESS) {
115.     echo "<p>Thank you for your payment.</p>";
116. } else {
117.     echo "<p>Failed to take payment: " . htmlentities($res['responseMessage']) . "</p>";
118. }
119.
120.
121.
122. // Render HTML to silently POST data to URL in target browser window
123. function silentPost($url = '?', array $post = null, $target = '_self') {
124.
125.     $url = htmlentities($url);
126.     $target = htmlentities($target);
127.     $fields = '';
128.

```

```

129.   if ($post) {
130.       foreach ($post as $name => $value) {
131.           $fields .= Gateway::fieldToHtml($name, $value);
132.       }
133.   }
134.
135.   $ret = "
136.       <form id=\"silentPost\" action=\"{$url}\" method=\"post\" target=\"{$target}\">
137.           {$fields}
138.           <noscript><input type=\"submit\" value=\"Continue\"></noscript>
139.       </form>
140.       <script>
141.           window.setTimeout('document.forms.silentPost.submit()', 0);
142.       </script>
143.   ";
144.
145.   return $ret;
146. }
147.
148. ?>

```

A-24.2 Hosted Payment Page Library

A-24.2.1 Hosted Sale Transaction

The following example code shows how to prepare a payment form to open the Hosted Payment Page in a lightbox style overlay on your website using the Hosted Payment Page library:

```
1. <html>
2.   <head>
3.     <!-- Load the Hosted Payment Page library -->
4.     <script src="https://gateway.example.com/sdk/web/v1/js/hostedforms.min.js"></script>
5.   </head>
6.   <body>
7.     <!--
8.       Hosted Payment <form> as created by the Gateway Integration Library hostedRequest() method
9.       with addition of 'data-hostedforms-modal' attribute to signify a modal form is required.
10.    -->
11.    <form name="payment-form" method="post" action="https://gateway.example.com/hosted/" data-hostedforms-
    modal>
12.      <input type="hidden" name="merchantID" value="100001" />
13.      <input type="hidden" name="action" value="SALE" />
14.      <input type="hidden" name="type" value="1" />
15.      <input type="hidden" name="currencyCode" value="826" />
16.      <input type="hidden" name="countryCode" value="826" />
17.      <input type="hidden" name="amount" value="1001" />
18.      <input type="hidden" name="orderRef" value="Test purchase" />
19.      <input type="hidden" name="redirectURL" value="https://www.merchant.com/payment/" />
20.      <input type="hidden" name="signature" value="07599ef4cdb2e26cb2bf34a9c65190a7ce82494bc1df144c3bb0d20ee265
    5d8278dc663b2b0421ef12b8f081e821151bb4c644277c5d65b5523a96539b53b5aa" />
21.      <input type="submit" value="Pay Now">
22.    </form>
23.    <script>
24.      // Create a new Hosted Form object which will cause the above <form> to load into a modal
25.      // overlay over this page.
26.      var form = new window.hostedForms.classes.Form(document.forms[0]);
27.    </script>
28.  </body>
29. </html>
```


A-24.2.2 Hosted Sale Transaction (jQuery)

The following example code shows how to prepare a payment form to open the Hosted Payment Page in a lightbox style overlay on your website using the Hosted Payment Page and jQuery libraries:

```
1.<html>
2.  <head>
3.    <!-- Load the jQuery library -->
4.    <script src="https://code.jquery.com/jquery-3.4.1.min.js" integrity="sha256-
      CSXorXvZcTkaix6Yvo6Hppc2GetbYMGWSF1Bw8HFCJo=" crossorigin="anonymous"></script>
5.
6.    <!-- Load the Hosted Payment Page library -->
7.    <script src="https://gateway.example.com/sdk/web/v1/js/hostedforms.min.js"></script>
8.  </head>
9.  <body>
10.    <!--
11.      Hosted Payment <form> as created by the Gateway Integration Library hostedRequest() method
12.      with addition of 'data-hostedforms-modal' attribute to signify a modal form is required.
13.    -->
14.    <form name="payment-form" method="post" action="https://gateway.example.com/hosted/" data-hostedforms-
      modal>
15.      <input type="hidden" name="merchantID" value="100001" />
16.      <input type="hidden" name="action" value="SALE" />
17.      <input type="hidden" name="type" value="1" />
18.      <input type="hidden" name="currencyCode" value="826" />
19.      <input type="hidden" name="countryCode" value="826" />
20.      <input type="hidden" name="amount" value="1001" />
21.      <input type="hidden" name="orderRef" value="Test purchase" />
22.      <input type="hidden" name="redirectURL" value="https://www.merchant.com/payment/" />
23.      <input type="hidden" name="signature" value="07599ef4cdb2e26cb2bf34a9c65190a7ce82494bc1df144c3bb0d20ee265
      5d8278dc663b2b0421ef12b8f081e821151bb4c644277c5d65b5523a96539b53b5aa" />
24.      <input type="submit" value="Pay Now">
25.    </form>
26.    <script>
27.      // Create a new Hosted Form object which will cause the above <form> to load into a modal
28.      // overlay over this page.
29.      var form = $(document.forms[0]).hostedForm();
30.    </script>
31.  </body>
32.</html>
```

A-24.2.3 Hosted Sale Transaction #2

The following example code shows how to create a payment form to open the Hosted Payment Page in a lightbox style overlay on your website using the Hosted Payment Page library:

```
1. <html>
2.   <head>
3.     <!-- Load the Hosted Payment Page library -->
4.     <script src="https://gateway.example.com/sdk/web/v1/js/hostedforms.min.js"></script>
5.   </head>
6.   <body>
7.     <!-- Pay button placeholder -->
8.     <div id="paynow"></div>
9.     <script>
10.      // Create a new Hosted Form object which will render a payment button which will load
11.      // the Hosted Payment Page into a modal overlay over this page.
12.
13.      // The request can be provided from your server.
14.      var req = {
15.        merchantID: '100001',
16.        action: 'SALE',
17.        type: '1',
18.        currencyCode: '826',
19.        countryCode: '826',
20.        amount: '1001',
21.        orderRef: 'Test purchase',
22.        redirectURL: 'https://www.merchant.com/payment/',
23.        signature: '07599ef4cdb2e26cb2bf34a9c65190a7ce82494bc1df144c3bb0d20ee2655d8278dc663b2b0421ef12b8f081e
821151bb4c644277c5d65b5523a96539b53b5aa',
24.      };
25.
26.      var data = {
27.        id: 'my-payment-form',
28.        url: 'https://gateway.example.com/hosted/modal/',
29.        modal: true,
30.        data: req,
31.        submit: {
32.          type: 'button',
33.          label: 'Pay <i>Now</i>'
34.        }
35.      };
36.
37.      var form = new window.hostedForms.classes.Form('paynow', data);
38.    </script>
39.  </body>
40. </html>
```

A-24.2.4 Hosted Sale Transaction #2 (jQuery)

The following example code shows how to create a payment form to open the Hosted Payment Page in a lightbox style overlay on your website using the Hosted Payment Page and jQuery libraries:

```
1. <html>
2.   <head>
3.     <!-- Load the jQuery library -->
4.     <script src="https://code.jquery.com/jquery-3.4.1.min.js" integrity="sha256-
      CSXorXvZcTkaix6Yvo6HppcZGetbYMGWSF1Bw8HfCJo=" crossorigin="anonymous"></script>
5.
6.     <!-- Load the Hosted Payment Page library -->
7.     <script src="https://gateway.example.com/sdk/web/v1/js/hostedforms.min.js"></script>
8.   </head>
9.   <body>
10.    <!-- Pay button placeholder -->
11.    <div id="paynow"></div>
12.    <script>
13.      // Create a new Hosted Form object which will render a payment button which will load
14.      // the Hosted Payment Pageo load into a modal overlay over this page.
15.
16.      // The request can be provided from your server.
17.      var req = {
18.        merchantID: '100001',
19.        action: 'SALE',
20.        type: '1',
21.        currencyCode: '826',
22.        countryCode: '826',
23.        amount: '1001',
24.        orderRef: 'Test purchase',
25.        redirectURL: 'https://www.merchant.com/payment/',
26.        signature: '07599ef4cdb2e26cb2bf34a9c65190a7ce82494bc1df144c3bb0d20ee2655d8278dc663b2b0421ef12b8f081e
      821151bb4c644277c5d65b5523a96539b53b5aa',
27.      };
28.
29.      var data = {
30.        id: 'my-payment-form',
31.        url: 'https://gateway.example.com/hosted/modal/',
32.        modal: true,
33.        data: req,
34.        submit: {
35.          type: 'button',
36.          label: 'Pay <i>Now</i>'
37.        }
38.      };
39.
40.      var form = $('#paynow').hostedForm(data);
41.    </script>
42.  </body>
43. </html>
```

A-24.3 Hosted Payment Fields Library

The following example code shows how to create and manage Hosted Payment Fields using the Hosted Payment Field library.

The example shows how to style fields using an inline stylesheet and how to listen and react to the field's events.

The example also shows how to set up the payment form both automatically and manually and integrate with the jQuery validator plugin. You should choose the set-up method best suited for your needs and whatever validation plugin or functions you are familiar with.

*Note: The example code demonstrates including the static transaction information, such as the **merchantID** and **amount**, in hidden form fields and POSTing the form directly to the Gateway's Direct Integration using partial message signing. We would however recommend that you capture just the information you require and then POST this data to your own website where you can use it to build a new fully signed request to send to the Gateway's Direct Integration as a server-to-server request.*

```

1. <html>
2.   <head>
3.     <!-- Load the jQuery library -->
4.     <script src="https://code.jquery.com/jquery-3.4.1.min.js" integrity="sha256-
      CSXorXvZcTkaix6Yvo6HppcZGetbYMGWSFlBw8HfCJo=" crossorigin="anonymous"></script>
5.
6.     <!-- Load the jQuery Validator plugin -->
7.     <script src="https://cdn.jsdelivr.net/npm/jquery-validation@1.19.1/dist/jquery.validate.min.js"></script>
8.
9.     <!-- Load the Hosted Payment Field library -->
10.    <script src="https://gateway.example.com/sdk/web/v1/js/hostedfields.min.js"></script>
11.
12.    <!-- General styles -->
13.    <style>
14.      body {
15.        font-size: 14px;
16.      }
17.
18.      .form-group {
19.        margin: 4px 0 15px 0;
20.      }
21.
22.      .form-group LABEL {
23.        display: inline-block;
24.        max-width: 100%;
25.        margin-bottom: 5px;
26.        font-weight: bold;
27.      }
28.
29.      .form-control {
30.        display: block;
31.        box-sizing: border-box;
32.        height: 34px;
33.        width: 400px;
34.        padding: 6px 12px;
35.        font-size: 14px;
36.        color: #555;
37.        background-color: #fff;
38.        background-image: none;
39.        border: 1px solid #ccc;
40.        border-radius: 4px;
41.        -webkit-box-shadow: inset 0 1px 1px rgba(0, 0, 0, .075);

```

V2.00

```

42.     box-shadow: inset 0 1px 1px rgba(0, 0, 0, .075);
43.     -webkit-transition: border-color ease-in-out .15s, -webkit-box-shadow ease-in-out .15s;
44.     -o-transition: border-color ease-in-out .15s, box-shadow ease-in-out .15s;
45.     transition: border-color ease-in-out .15s, box-shadow ease-in-out .15s;
46. }
47.
48. .form-control.hf-focus {
49.     border-color: #66afe9;
50.     outline: 0;
51.     -webkit-box-shadow: inset 0 1px 1px rgba(0,0,0,.075), 0 0 8px rgba(102,175,233,.6);
52.     box-shadow: inset 0 1px 1px rgba(0,0,0,.075), 0 0 8px rgba(102,175,233,.6);
53. }
54.
55. .has-error .form-control.hf-focus {
56.     border-color: #843534;
57.     -webkit-box-shadow: inset 0 1px 1px rgba(0,0,0,.075), 0 0 6px #ce8483;
58.     box-shadow: inset 0 1px 1px rgba(0,0,0,.075), 0 0 6px #ce8483;
59. }
60. </style>
61.
62. <!-- Hosted Field internal styles -->
63. <style class="hostedfield">
64.     /* Grey out when disabled */
65.     .hostedfield:disabled {
66.         cursor: not-allowed;
67.         background-color: #eee;
68.         opacity: 1;
69.     }
70.
71.     /* Change border and text to green when valid */
72.     .form-control:valid,
73.     .hostedfield:valid {
74.         border-color: #28a745 !important;
75.         color: #28a745 !important;
76.     }
77.
78.     /* Change border and text to red when invalid */
79.     .form-control:invalid,
80.     .hostedfield:invalid {
81.         border-color: #a94442 !important;
82.         color: #a94442 !important;
83.     }
84.
85.     /* Change text to light grey when readonly */
86.     .form-control:readonly,
87.     .hostedfield:readonly {
88.         color: lightgrey !important;
89.     }
90.
91.     /* Emulate webkit auto fill style */
92.     .form-control.hf-autofill,
93.     .hostedfield.hf-autofill {
94.         background-color: rgb(250, 255, 189) !important;
95.         background-image: none !important;
96.         color: rgb(0, 0, 0) !important;
97.     }
98.
99.     /* Add light blue placeholder */
100.    .form-control::placeholder,
101.    .hostedfield::placeholder {
102.        color: lightblue;
103.    }
104.
105.    /* Show hovering over the control */
106.    .form-control:hover,
107.    .hostedfield:hover {
108.        font-style: italic;

```

```

109.     }
110.
111.     /* Style by id (hosted field will have '-hostedfield' appended to the id) */
112.     #form-card-number, #form-card-number-hostedfield {
113.         color: darkcyan;
114.     }
115.
116. </style>
117.
118. <!-- Hosted Field card-number internal styles -->
119. <style class="card-number">
120.
121.     .hostedfield::placeholder {
122.         color: orange;
123.     }
124.
125. </style>
126. </head>
127.
128. <body>
129. <!-- tokenise payment data and send directly to the Gateway -->
130. <form id="form" method="POST" novalidate="novalidate" lang="en"
131.     action="https://gateway.example.com/direct/"
132.     data-hostedform-tokenize='{ "#form-customer-name": "customerName"}'>
133.     <input type="hidden" name="merchantID" value="10001">
134.     <input type="hidden" name="action" value="SALE">
135.     <input type="hidden" name="type" value="1">
136.     <input type="hidden" name="countryCode" value="826">
137.     <input type="hidden" name="currencyCode" value="826">
138.     <input type="hidden" name="amount" value="1001">
139.     <input type="hidden" name="orderRef" value="Test purchase">
140.     <input type="hidden" name="transactionUnique" value="1234">
141.     <input type="hidden" name="redirectURL" value="https://www.merchant.com/payment/">
142.     <input type="hidden" name="signature" value="5a0dd6fed71ef68bb3f20175b6a04bbd9d1c904d32ae3f160bd3b8f55740
143.         207e5d1e8de57e9960b136407e7454b82e428b8378003aa0146df3efa91a3e61b17|merchantID,action,type,countryCode,currenc
144.         yCode,amount,orderRef,transactionUnique,redirectURL">
145.     <input type="hidden" name="paymentToken" value="">
146.
147.     <div class="form-group">
148.         <label for="form-customer-name">Name on card:</label>
149.         <input id="form-customer-name" type="text" name="paymentToken[customerName]" autocomplete="cc-
150.             name" class="form-control form-control-native hostedfield-tokenise" placeholder="Firstname Surname" required>
151.     </div>
152.
153.     <div class="form-group">
154.         <label for="form-card-number">Card Number:</label>
155.         <input id="form-card-number" type="hostedfield:cardNumber" name="card-number" autocomplete="cc-
156.             number" class="form-control form-control-
157.             hosted" style="background: #f2f8fb;" placeholder="**** * required>
158.     </div>
159.
160.     <div class="form-group">
161.         <label for="form-card-expiry-date">Card Expiry Date:</label>
162.         <input id="form-card-expiry-date" type="hostedfield:cardExpiryDate" name="card-expiry-
163.             date" autocomplete="cc-exp" class="form-control form-control-hosted" required>
164.     </div>
165.
166.     <div class="form-group">
167.         <label for="form-card-start-date">Card Issue Date:</label>
168.         <input id="form-card-start-date" type="hostedfield:cardStartDate" name="card-start-
169.             date" autocomplete="cc-iss" class="form-control form-control-hosted" data-hostedfield='{ "dropdown":true}' data-
170.             hostedfield-format="N - m | y" data-hostedfield-min-date="-40" data-hostedfield-max-date="0">
171.     </div>
172.
173.     <div class="form-group">
174.         <label for="form-card-cvv">CVV:</label>

```

```

167.     <input id="form-card-cvv" type="hostedfield:cardCVV" name="card-cvv" autocomplete="cc-csc" class="form-
control form-control-hosted" required>
168.     </div>
169.
170.     <button id="form-submit" type="submit">Pay <span>></span></button>
171. </form>
172.
173. <script>
174.     // This example demonstrates both automatic and manual form setup
175.     var automatic_setup = true;
176.
177.     $(document).ready(function () {
178.
179.         var $form = $('#form');
180.
181.         // Listen for events on the form to see those sent from the Hosted Payment Fields
182.         // (For demonstration purposes only)
183.         $form.on(events);
184.
185.         if (automatic_setup) {
186.             //////////////////////////////////////
187.             // FORM AUTOMATIC SETUP
188.             //////////////////////////////////////
189.
190.             var opts = {
191.                 // Auto setup the form creating all hosted fields (default)
192.                 autoSetup: true,
193.
194.                 // Auto validate, tokenise and submit the form (default)
195.                 autoSubmit: true,
196.
197.                 // Optional field configuration (by type)
198.                 fields: {
199.                     any: {
200.                         nativeEvents: true,
201.                     },
202.                     cardNumber: {
203.                         selector: $('#form-card-number'),
204.                         style: 'text-decoration: green wavy underline;',
205.                         stylesheet: $('style.hostedfields, style.card-number')
206.                     }
207.                 }
208.             };
209.
210.             try {
211.                 // Create form, automatically creating all child Hosted Payment Fields
212.                 $form.hostedForm(opts);
213.             } catch(e) {
214.                 showError('Failed to create hosted form: ' + e);
215.                 throw e; // Can't continue with this script
216.             }
217.
218.             // Listen for some events from the form thrown by the auto methods
219.             $form.on({
220.                 // Let jQuery Validator check the form on submission
221.                 'hostedform:presubmit': function (event) {
222.                     console.log('Form submitting');
223.                     return $form.valid();
224.                 },
225.
226.                 // Show form is valid
227.                 'hostedform:valid': function (event) {
228.                     console.log('Form valid');
229.                     return true;
230.                 },
231.             },
232.
233.             // Show any validation errors

```

```

233.         'hostedform:invalid': function (event, details) {
234.             console.log('Form invalid');
235.             showFieldErrors(details.invalid);
236.             return true;
237.         },
238.
239.         // Show general error
240.         'hostedform:error': function (event, details) {
241.             showError(details.message);
242.             return true;
243.         }
244.     });
245.
246.     // Use jQuery validator to validate the form
247.     $form.validate();
248.
249.     // End of form automatic setup
250.
251. } else {
252.     ///////////////////////////////////////////////////
253.     // FORM MANUAL SETUP
254.     ///////////////////////////////////////////////////
255.
256.     try {
257.         // Create the card number field with custom options
258.         $('#form-card-number').hostedField({
259.             nativeEvents: true,
260.             style: 'text-decoration: green wavy underline;',
261.             stylesheet: $('style.hostedfields, style.card-number')
262.         });
263.
264.         // Create the remaining hosted fields
265.         $('.form-control-hosted:input', $form).hostedField({nativeEvents: true});
266.
267.     } catch (e) {
268.         showError('Failed to create hosted fields: ' + e);
269.         throw e; // Can't continue with this script
270.     }
271.
272.     $form.validate({
273.         // Get the hosted form widget for the submitted form (Form1 only)
274.         submitHandler: function () {
275.             try {
276.                 console.log('getPaymentToken');
277.
278.                 // Check we have some enabled fields to submit
279.                 if ($($form[0].elements).filter(':enabled:not([type="hidden"])').length === 0) {
280.                     showError('You must enable some fields');
281.                     return false;
282.                 }
283.
284.                 var hostedform = $form.hostedForm('instance');
285.
286.                 var also = {
287.                     customerName: $('#form-customer-name').val()
288.                 };
289.
290.                 hostedform.getPaymentDetails(also, true).then(
291.
292.                     // Success validating the form and requesting a payment token
293.                     function (details) {
294.                         if (details.success) {
295.                             $form[0].elements['paymentToken'].value = details.paymentToken;
296.                             $form[0].submit();
297.                         } else if (details.invalid) {
298.                             $form.valid();
299.                             showFieldErrors(details.invalid);

```



```

300.         } else {
301.             showError('There was a problem fetching the payment token. Please seek assistance.');
```

```

302.         }
303.     },
304.
305.     // Failure either validating the form or requesting the payment details
306.     function (e) {
307.         showError('There was a problem fetching the payment token. Please seek assistance.');
```

```

308.     }
309. );
310.
311. } catch (e) {
312.     showError('There was a problem fetching the payment token. Please seek assistance.');
```

```

313. }
314. }
315. });
316.
317. // End of form manual setup
318.
319. }
320.
321. // Hide errors once all fields are valid
322. $('#form :input').on('valid', function () {
323.     if ($(this.form).find(':invalid').length === 0) {
324.         hideError($(this.form));
325.     }
326. })
327.
328. // Listen for some events on the none Hosted Fields
329. $('.form-control-native').on('invalid', bsMarkInvalid);
330. $('.form-control-native').on('valid', bsMarkValid);
331.
332. // Check we can see the Hosted Fields via their new class
333. // (For demonstration purposes only)
334. console.log($('.form-control-hosted.hostedfield-element'));
335.
336. // Check we can see the Hosted Fields via the psuedo element
337. // (For demonstration purposes only)
338. console.log($('.form-control:hostedfield'));
339.
340. });
341.
342. ///////////////////////////////////////////////////
343. // Supporting functions
344. ///////////////////////////////////////////////////
345.
346. // Display events that are passed from hosted field
347. var events = {
348.     'hostedfield:create.example'           : showEvent,
349.     'hostedfield:destroy.example'          : showEvent,
350.     'hostedfield:ready.example'            : showEvent,
351.     'hostedfield:style.example'            : showEvent,
352.     'hostedfield:placeholder.example'      : showEvent,
353.     'hostedfield:invalid.example invalid.example' : showEvent,
354.     'hostedfield:userinvalid.example userinvalid.example' : showEvent,
355.     'hostedfield:valid.example valid.example' : showEvent,
356.     'hostedfield:uservalid.example uservalid.example' : showEvent,
357.     'hostedfield:disabled.example disabled.example' : showEvent,
358.     'hostedfield:enabled.example enabled.example' : showEvent,
359.     'hostedfield:required.example required.example' : showEvent,
360.     'hostedfield:optional.example optional.example' : showEvent,
361.     'hostedfield:readonly.example readonly.example' : showEvent,
362.     'hostedfield:readwrite.example readwrite.example' : showEvent,
363.     'hostedfield:focus.example focus.example' : showEvent,
364.     'hostedfield:blur.example blur.example' : showEvent,
365.     'hostedfield:mouseenter.example mouseenter.example' : showEvent,
366.     'hostedfield:mouseleave.example mouseleave.example' : showEvent,
```

```

367.         'hostedfield:mouseover.example mouseover.example'      : showEvent,
368.         'hostedfield:mouseout.example mouseout.example'         : showEvent,
369.         'hostedfield:mousemove.example mousemove.example'       : showEvent,
370.         'hostedfield:keydown.example keydown.example'           : showEvent,
371.         'hostedfield:keypress.example keypress.example'          : showEvent,
372.         'hostedfield:keyup.example keyup.example'                : showEvent,
373.         'hostedfield:change.example change.example'              : showEvent,
374.         'hostedfield:input.example input.example'                 : showEvent,
375.
376.         'hostedfield:invalid.example invalid.example'            : bsMarkInvalid,
377.         'hostedfield:valid.example valid.example'                 : bsMarkValid,
378.         'hostedfield:valid.example valid.example'                 : hideError,
379.     };
380.
381.     function isValid(element) {
382.         return !element[0].checkValidity();
383.     }
384.
385.     function showError(msg) {
386.         $('#error-info').html(msg).show();
387.     }
388.
389.     function hideError($form, msg) {
390.         $('#error-info', $form).hide();
391.     }
392.
393.     function showFieldErrors(errors) {
394.         var msg = '<h5>Error</h5><p>The following fields are invalid:</p><ul>';
395.         for (var p in errors) {
396.             msg += '<li><b>' + p + ':</b>' + errors[p] + '</li>';
397.         }
398.         msg += '</ul>';
399.         showError(msg);
400.     }
401.
402.     function bsMarkInvalid(e) {
403.         var element = (e instanceof $.Event ? this : e);
404.         $(element).closest('.form-group').addClass('has-error');
405.     }
406.
407.     function bsMarkValid(e) {
408.         var element = (e instanceof $.Event ? this : e);
409.         $(element).closest('.form-group').removeClass('has-error');
410.     }
411.
412.     function showEvent(event) {
413.         console.log(event);
414.         console.log('Field ' + event.type + ' event: ', this, arguments);
415.     }
416.
417.     jQuery.validator.setDefaults({
418.         ignore: [],
419.         rules: {
420.             'customer-name': {
421.                 checkValidity: true,
422.                 required: false
423.             },
424.             'card-details': {
425.                 checkValidity: true,
426.                 required: false
427.             },
428.             'card-number': {
429.                 checkValidity: true,
430.                 required: false
431.             },
432.             'card-expiry-date': {
433.                 checkValidity: true,

```

```

434.         required: false
435.     },
436.     'card-start-date': {
437.         checkValidity: true,
438.         required: false
439.     },
440.     'card-issue-number': {
441.         checkValidity: true,
442.         required: false
443.     },
444.     'card-cvv': {
445.         checkValidity: true,
446.         required: false
447.     }
448. },
449. keyup: null, // Don't validate on keyup
450. showErrors: function (errorMap, errorList) {
451.     if (errorList && errorList.length) {
452.         var errors = {};
453.         for (var i = 0, max_i = errorList.length; i < max_i; i++) {
454.             var label = $('label[for="' + errorList[i].element.id + '"]:not(".error")').text();
455.             errors[label] = errorList[i].message;
456.         }
457.         showFieldErrors(errors);
458.     }
459.     this.defaultShowErrors(errorMap, errorList);
460. },
461. highlight: bsMarkInvalid,
462. unhighlight: bsMarkValid,
463. errorPlacement: function (error, element) {
464.     $(element).closest('.form-control:not(".hostedfield-element")').after(error);
465. }
466. });
467.
468. $.validator.addMethod('checkValidity',
469.     function (value, element, params, message) {
470.         element.checkValidity();
471.         var valid = (element.validationMessage === '');
472.         $(element).attr('aria-invalid', !valid);
473.         return valid;
474.     },
475.     function (params, element) {
476.         return element.validationMessage;
477.     }
478. );
479.
480. </script>
481.
482. </body>
483. </html>

```

A-25 Frequently Asked Questions

1. I'm getting Invalid Credentials. What do I do?

- Check your Merchant Account ID in your integration is correct. Our Gateway Merchant Account IDs typically begin with 1 and are currently 6 digits long, eg 100001.

2. I'm getting an invalid signature error message. How do I fix it?

- Check that you are using the correct method for calculating the signature and the correct secret signature key for the Merchant Account used.
- Make sure that you are not using an image form submit button because that will add fields to the post that cannot be removed and will render the signature useless.

Refer to appendix A-13 for a step-by-step guide to creating a signature. If you use the same values as in the example, you can check if your signature generation routine produces the same results.

This test step by step generator is available from the Gateway at the following address¹;

<https://gateway.example.com/devtools/sigtest.php>

3. I have more than one Merchant Account - how do I use more than one?

- You have a couple of options here. You can set up separate integrations for each Merchant Account, which can be a bit inconvenient. Your other option is to request they are connected together. Please contact our support team to get your Merchant Accounts connected and you will then only need to use one.

4. I receive a 'Bad Testcard Usage' error message. Why?

- If you receive this error message, you are using test cards on a live Merchant Account. Please only use live cards on live Merchant Accounts. Our test cards will only work on the test Merchant Account provided when you sign up with us.

¹ Please use the correct hostname as explained in section 1.6.

INDEX

1	Gateway Integration	4
1.1	ABOUT THIS GUIDE	4
1.2	TERMINOLOGY.....	5
1.3	INTEGRATION METHODS	6
1.3.1	<i>Hosted Integration</i>	6
1.3.2	<i>Direct Integration</i>	7
1.3.3	<i>Batch Integration</i>	7
1.4	INTEGRATION LIBRARIES.....	8
1.5	SECURITY AND COMPLIANCE	9
1.6	PREREQUISITES	10
1.7	INTEGRATION DETAILS	11
1.7.1	<i>HTTP Requests</i>	11
1.7.2	<i>Hosted HTTP Requests</i>	12
1.7.3	<i>Direct HTTP Requests</i>	12
1.7.4	<i>Batch HTTP Requests</i>	13
1.7.5	<i>Handling Errors</i>	15
1.7.6	<i>Redirect URL</i>	16
1.7.7	<i>Callback URL</i>	16
1.7.8	<i>Field Formats</i>	17
1.8	AUTHENTICATION	18
1.8.1	<i>Password Authentication</i>	18
1.8.2	<i>Message signing</i>	18
1.8.3	<i>Allowed IP addresses</i>	18
1.9	SUPPORTED ACTIONS.....	19
1.9.1	<i>SALE</i>	19
1.9.2	<i>VERIFY</i>	19
1.9.3	<i>PREAUTH</i>	19
1.9.4	<i>REFUND SALE</i>	20
1.9.5	<i>REFUND</i>	20
1.9.6	<i>CAPTURE</i>	20
1.9.7	<i>CANCEL</i>	21
1.9.8	<i>QUERY</i>	21
2	New Transactions	22
2.1	REQUEST FIELDS	22
2.2	RESPONSE FIELDS.....	24
3	Management Requests.....	26
3.1	REQUEST FIELDS	26
3.2	RESPONSE FIELDS.....	27
4	AVS/CV2 Checking	28
4.1	BACKGROUND	28
4.1.1	<i>AVS Checking</i>	28
4.1.2	<i>CV2 Checking</i>	28
4.2	BENEFITS AND LIMITATIONS.....	29
4.2.1	<i>Benefits</i>	29
4.2.2	<i>Limitations</i>	29
4.3	REQUEST FIELDS	30
4.4	RESPONSE FIELDS.....	31
5	3-D Secure Authentication.....	32
5.1	BACKGROUND	32
5.2	BENEFITS AND LIMITATIONS.....	33
5.2.1	<i>Benefits</i>	33
5.2.2	<i>Limitations</i>	33
5.3	HOSTED IMPLEMENTATION	34
5.4	DIRECT IMPLEMENTATION.....	35
5.4.1	<i>Initial Request (Verify Enrolment)</i>	36

5.4.2	Continuation Request (Check Authentication and Authorise)	36
5.4.3	Multiple Challenges and Frictionless Flow	36
5.4.4	Cardholder Challenge	37
5.4.5	Device Fingerprinting Challenge	37
5.4.6	External Authentication Request	37
5.5	REQUEST FIELDS	38
5.5.1	Initial Request (Hosted and Direct Integration)	38
5.5.2	External Authentication Request (Direct Integration)	39
5.5.3	Continuation Request (Direct Integration)	40
5.5.4	3-D Secure 2 Options (Hosted and Direct Integration)	41
5.6	RESPONSE FIELDS	52
5.6.1	Challenge Response (Direct Integration)	52
5.6.2	Final Response (Hosted and Direct Integration)	53
5.6.3	External Authentication Response (Direct Integration)	55
5.6.4	Cardholder Information (Hosted and Direct Integration)	55
5.7	ADVANCED FEATURES	56
5.7.1	Fallback to Version 1	56
5.7.2	PSD2 Strong Customer Authentication	56
6	Risk Checking	57
6.1	BACKGROUND	57
6.2	BENEFITS AND LIMITATIONS	58
6.2.1	Benefits	58
6.2.2	Limitations	58
6.3	IMPLEMENTATION	59
6.4	REQUEST FIELDS	60
6.4.1	Request Fields	60
6.4.2	Risk Check Options	61
6.5	RESPONSE FIELDS	64
7	Payment Facilitators	65
7.1	BACKGROUND	65
7.2	REQUEST FIELDS	66
8	UK MCC 6012 Merchants	67
8.1	BACKGROUND	67
8.2	REQUEST FIELDS	68
9	Billing Descriptor	69
9.1	BACKGROUND	69
9.1.1	Static Descriptor	69
9.1.2	Dynamic Descriptor	69
9.2	REQUEST FIELDS	70
10	Surcharges	71
10.1	BACKGROUND	71
10.2	IMPLEMENTATION	72
10.2.1	Surcharge Rules	72
10.2.2	Surcharge Amounts	72
10.3	REQUEST FIELDS	73
10.4	RESPONSE FIELDS	74
11	Receipts and Notifications	75
11.1	BACKGROUND	75
11.2	CUSTOMER EMAIL RECEIPTS	76
11.2.1	Merchant Email Notifications	76
11.3	REQUEST FIELDS	77
11.4	RESPONSE FIELDS	78
12	Credentials on File	79
12.1	BACKGROUND	79
12.2	CONSUMER INITIATED TRANSACTIONS (CIT)	80
12.3	MERCHANT INITIATED TRANSACTIONS (MIT)	81
12.3.1	Standing Instruction MITs	81
12.3.2	Industry-Specific Business Practice MIT	82

12.4	REQUEST FIELDS	84
13	Recurring Transaction Agreements	85
13.1	BACKGROUND	85
13.2	SCHEDULING	86
13.2.1	<i>Fixed Scheduling</i>	<i>86</i>
13.2.2	<i>Variable Scheduling</i>	<i>86</i>
13.3	REQUEST FIELDS	87
13.4	RESPONSE FIELDS.....	88
14	Dynamic Currency Conversion	89
14.1	BACKGROUND	89
14.2	BENEFITS AND LIMITATIONS.....	90
14.2.1	<i>Benefits</i>	<i>90</i>
14.2.2	<i>Limitations.....</i>	<i>90</i>
14.3	HOSTED IMPLEMENTATION	91
14.4	DIRECT IMPLEMENTATION.....	92
14.4.1	<i>Initial Request (Fetch DCC Conversion details)</i>	<i>92</i>
14.4.2	<i>Continuation Request (Accept/Refuse DCC offer)</i>	<i>92</i>
14.4.3	<i>External Authentication Request.....</i>	<i>92</i>
14.5	REQUEST FIELDS	93
14.5.1	<i>Initial Request (Hosted and Direct Integration)</i>	<i>93</i>
14.5.2	<i>Continuation Request (Direct Integration).....</i>	<i>93</i>
14.5.3	<i>External Authentication Request (Direct Integration).....</i>	<i>94</i>
14.6	RESPONSE FIELDS.....	95
14.6.1	<i>Initial Response (Direct Integration)</i>	<i>95</i>
14.6.2	<i>Continuation Response (Direct Integration)</i>	<i>96</i>
14.6.3	<i>External Authentication Response (Direct Integration)</i>	<i>96</i>
15	Purchase Data	97
15.1	BACKGROUND	97
15.1.1	<i>American Express Purchases.....</i>	<i>97</i>
15.1.2	<i>Purchase Orders.....</i>	<i>97</i>
15.2	REQUEST FIELDS	98
16	Custom Data.....	100
16.6	REQUEST FIELDS	100
17	Advanced Data	101
17.1	CUSTOMER REQUEST FIELDS	101
17.2	MERCHANT REQUEST FIELDS.....	102
17.3	SUPPLIER REQUEST FIELDS	103
17.4	DELIVERY REQUEST FIELDS	104
17.5	RECEIVER REQUEST FIELDS	105
17.6	SHIPPING REQUEST FIELDS.....	106
17.7	DEVICE INFORMATION FIELDS	107
18	Acquirer Data	109
18.1	REQUEST FIELDS	110
18.2	RESPONSE FIELDS.....	110
19	Gateway Wallet	111
19.1	BACKGROUND	111
19.2	BENEFITS AND LIMITATIONS.....	112
19.2.1	<i>Benefits</i>	<i>112</i>
19.2.2	<i>Limitations.....</i>	<i>112</i>
19.3	HOSTED IMPLEMENTATION	113
19.4	DIRECT IMPLEMENTATION.....	114
19.5	REQUEST FIELDS	115
19.6	RESPONSE FIELDS.....	117
20	Masterpass Wallet	118
20.1	BACKGROUND	118
20.2	BENEFITS AND LIMITATIONS.....	119
20.2.1	<i>Benefits</i>	<i>119</i>
20.2.2	<i>Limitations.....</i>	<i>119</i>

20.3	HOSTED IMPLEMENTATION	120
20.4	DIRECT IMPLEMENTATION.....	121
20.4.1	<i>Initial Request (Checkout Preparation)</i>	121
20.4.2	<i>Continuation Request (Checkout Details and Authorise)</i>	121
20.4.3	<i>Separate Checkout Details and Authorisation Requests</i>	122
20.5	REQUEST FIELDS	123
20.5.1	<i>Initial Request (Hosted and Direct Integrations)</i>	123
20.5.2	<i>Continuation Request (Direct Integration)</i>	123
20.5.3	<i>Wallet Options (Hosted and Direct Integrations)</i>	124
20.5.4	<i>Purchase details (Hosted and Direct Integrations)</i>	126
20.6	RESPONSE FIELDS.....	127
20.6.1	<i>Initial Response (Direct Integration)</i>	127
20.6.2	<i>Continuation Response (Direct Integration)</i>	128
21	PayPal Transactions.....	129
21.1	BACKGROUND	129
21.2	BENEFITS AND LIMITATIONS.....	130
21.2.1	<i>Benefits</i>	130
21.2.2	<i>Limitations</i>	130
21.3	HOSTED IMPLEMENTATION	131
21.4	DIRECT IMPLEMENTATION.....	132
21.4.1	<i>Initial Request (Checkout Preparation)</i>	132
21.4.2	<i>Continuation Request (Checkout Details and Authorise)</i>	133
21.4.3	<i>Separate Checkout Details and Authorisation Requests</i>	133
21.5	REQUEST FIELDS	134
21.5.1	<i>Initial Request (Hosted and Direct Integrations)</i>	134
21.5.2	<i>Continuation Request (Direct Integration)</i>	134
21.5.3	<i>Checkout Options (Hosted and Direct Integrations)</i>	135
21.5.4	<i>Purchase details (Hosted and Direct Integrations)</i>	140
21.6	RESPONSE FIELDS.....	141
21.6.1	<i>Initial Response (Direct Integration)</i>	141
21.6.2	<i>Continuation Response (Direct Integration)</i>	142
21.6.3	<i>Checkout Details (Hosted and Direct Integration)</i>	143
21.7	TRANSACTION LIFECYCLE.....	151
21.7.1	<i>Order</i>	151
21.7.2	<i>Authorise</i>	151
21.7.3	<i>Sale</i>	151
21.7.4	<i>Capture</i>	151
21.7.5	<i>Refund</i>	152
21.7.6	<i>Cancel</i>	152
21.7.7	<i>Pending Payments</i>	152
21.8	REFERENCE TRANSACTIONS	153
22	Amazon Pay Transaction	154
22.1	BACKGROUND	154
22.2	BENEFITS AND LIMITATIONS.....	155
22.2.1	<i>Benefits</i>	155
22.2.2	<i>Limitations</i>	155
22.3	HOSTED IMPLEMENTATION	156
22.4	DIRECT IMPLEMENTATION.....	157
22.4.1	<i>Initial Request (Checkout Preparation)</i>	158
22.4.2	<i>Continuation Request (Checkout Details and Authorise)</i>	158
22.4.3	<i>Separate Checkout Details and Authorisation Requests</i>	158
22.5	REQUEST FIELDS	159
22.5.1	<i>Initial Request (Hosted and Direct Integration)</i>	159
22.5.2	<i>Continuation Request (Direct Integration)</i>	159
22.5.3	<i>Checkout Options (Hosted and Direct Integration)</i>	160
22.5.4	<i>Response Fields</i>	161
22.5.5	<i>Initial Response (Direct Integration)</i>	161
22.5.6	<i>Continuation Response (Direct Integration)</i>	162

22.5.7	Checkout Details (Hosted and Direct Integration)	163
22.6	TRANSACTION LIFECYCLE	164
22.6.1	Capture	164
22.6.2	Refund Sale	164
22.7	REFERENCE TRANSACTIONS	165
23	PPRO Transactions	166
23.1	BACKGROUND	166
23.2	BENEFITS AND LIMITATIONS	167
23.2.1	Benefits	167
23.2.2	Limitations	167
23.3	HOSTED IMPLEMENTATION	168
23.4	DIRECT IMPLEMENTATION	169
23.4.1	Payment Request	169
23.4.2	Payment Specific Fields	170
23.4.3	Payment Method Tags	170
23.5	REQUEST FIELDS	175
23.5.1	Initial Request (Hosted and Direct Integration)	175
23.5.2	Checkout Options (Hosted and Direct Integration)	176
23.6	RESPONSE FIELDS	177
23.6.1	Initial Response (Direct Integration)	177
23.6.2	Completion Response (Hosted and Direct Integration)	177
23.6.3	Notifications and "Tendered" Payments	178
24	Pay by Bank app (PBBA) Transactions	179
24.1	BACKGROUND	179
24.2	BENEFITS AND LIMITATIONS	180
24.2.1	Benefits	180
24.2.2	Limitations	180
24.3	HOSTED IMPLEMENTATION	181
24.4	DIRECT IMPLEMENTATION	182
24.4.1	Payment Request	182
24.5	REQUEST FIELDS	183
24.5.1	Payment Request (Hosted and Direct Integration)	183
24.5.2	Checkout Options (Direct Integration)	184
24.6	RESPONSE FIELDS	185
24.6.1	Payment Response (Hosted Integration)	185
24.6.2	Payment Response (Direct Integration)	185
24.6.3	Checkout Details (Direct Integration)	185
24.6.4	Refunds (Direct Integration)	186
25	SecurePlus Transactions	187
25.1	BACKGROUND	187
25.2	BENEFITS AND LIMITATIONS	188
25.2.1	Benefits	188
25.2.2	Limitations	188
25.3	HOSTED IMPLEMENTATION	189
25.4	DIRECT IMPLEMENTATION	190
25.5	REQUEST FIELDS	190
25.6	RESPONSE FIELDS	190
26	Digital Wallet Transactions	191
26.1	BACKGROUND	191
26.2	BENEFITS AND LIMITATIONS	192
26.2.1	Benefits	192
26.2.2	Limitations	192
26.3	CONFIGURATION	193
26.3.1	Apple Pay configuration	193
26.3.2	Android Pay configuration	193
26.3.3	Google Pay configuration	193
26.4	HOSTED IMPLEMENTATION	194
26.5	DIRECT IMPLEMENTATION	195

26.6	REQUEST FIELDS	195
26.7	RESPONSE FIELDS.....	195
26.8	DIGITAL WALLET TOKENS	196
26.8.1	FPAN/DPAN tokens	196
26.8.2	AVS/CV2 Checking	196
26.8.3	3-D Secure Authentication	196
26.8.4	Risk Checking	196
26.8.5	Transaction Lifecycle and Recurring Transactions.....	196
A-1	Response Codes.....	197
A-1.1	AUTHORISATION RESPONSE CODES.....	197
A-1.2	GATEWAY RESPONSE CODES.....	203
A-2	AVS / CV2 Check Response Codes	226
A-3	3-D Secure Authentication Data	228
A-3.1	3-D SECURE ENROLMENT STATUS	228
A-3.2	3DS AUTHENTICATION STATUS	229
A-3.3	3-D SECURE TRANSACTION IDENTIFIER.....	229
A-3.4	3DS ELECTRONIC COMMERCE INDICATOR.....	230
A-3.5	3DS CARDHOLDER AUTHENTICATION VERIFICATION VALUE	230
A-4	3-D Secure Enrolment/Authentication Only	231
A-5	3-D Secure Legacy API.....	232
A-5.1	BACKGROUND.....	232
A-5.2	DIRECT IMPLEMENTATION	232
A-5.2.1	Initial Request (Direct Integration)	233
A-5.2.2	Continuation Request (Direct Integration)	233
A-5.3	REQUEST FIELDS.....	234
A-5.3.1	Initial Request (Direct Integration)	234
A-5.3.2	Continuation Request (Direct Integration)	234
A-5.4	RESPONSE FIELDS	235
A-5.4.1	Initial Response (Direct Integration)	235
A-5.4.2	Continuation Response (Direct Integration)	236
A-5.5	3-D SECURE ENROLMENT/AUTHENTICATION ONLY (DIRECT ONLY)	237
A-6	Request Checking Only	238
A-7	Merchant Account Mapping.....	239
A-8	Velocity Control System (VCS)	240
A-9	Duplicate Transaction Checking	241
A-10	Capture Delay.....	242
A-11	Card Identification	243
A-12	Integration Testing	246
A-12.1	TEST AMOUNTS.....	246
A-12.2	TEST CARDS.....	248
A-12.2.1	Visa Credit.....	248
A-12.2.2	Visa Debit	248
A-12.2.3	Electron	248
A-12.2.4	Mastercard Credit.....	249
A-12.2.5	Mastercard Debit	249
A-12.2.6	UK Maestro	249
A-12.2.7	JCB.....	250
A-12.2.8	American Express	250
A-12.2.9	Diners Club.....	250
A-12.3	3-D SECURE TESTING.....	251
A-12.3.10	3-D Secure version 1	251
A-12.3.11	3-D Secure version 2.....	252
A-12.4	PAYPAL SANDBOX ACCOUNTS	253
A-12.5	AMAZON PAY SANDBOX ACCOUNTS.....	253
A-13	Sample Signature Calculation	254
A-14	Transaction Life cycle	256
A-14.1	AUTHORISE, CAPTURE AND SETTLEMENT	256
A-14.1.1	Authorisation	256
A-14.1.2	Capture	256

A-14.1.3 Settlement	256
A-14.2 TRANSACTION STATES	257
A-14.2.1 Received	257
A-14.2.2 Approved	257
A-14.2.3 Verified	257
A-14.2.4 Declined	257
A-14.2.5 Referred	257
A-14.2.6 Reversed	258
A-14.2.7 Captured	258
A-14.2.8 Tendered	258
A-14.2.9 Deferred	258
A-14.2.10 Accepted	259
A-14.2.11 Rejected	259
A-14.2.12 Canceled	259
A-14.2.13 Finished	259
A-15 Transaction types	260
A-15.1 E-COMMERCE (ECOM)	260
A-15.2 MAIL ORDER/TELEPHONE ORDER (MOTO)	260
A-15.3 CONTINUOUS AUTHORITY (CA)	260
A-16 Payment Tokenisation	261
A-16.1 PREAUTH, SALE, REFUND, VERIFY REQUESTS	261
A-16.2 REFUND_SALE REQUESTS	262
A-16.3 CANCEL OR CAPTURE REQUESTS	262
A-16.4 QUERY REQUESTS	262
A-16.5 SALE OR REFUND REFERRED AUTHORISATION REQUESTS	263
A-17 Transaction Cloning	264
A-17.1 CLONED FIELDS	265
A-17.2 CLONED GROUPS	269
A-17.2.1 Compound Groups	269
A-17.2.2 Line-Item Data	269
A-17.2.3 Amount Consistency	269
A-18 Credentials on File Matrix	270
A-19 PSD2 SCA Compliance	272
A-19.1 OBTAINING STRONG CUSTOMER AUTHENTICATION	273
A-19.2 SCA SOFT-DECLINES	273
A-19.3 EXEMPTIONS TO STRONG CUSTOMER AUTHENTICATION	274
A-19.3.4 Mail Order / Telephone Order Payments	274
A-19.3.5 Merchant Initiated Transactions (including recurring transactions)	274
A-19.3.6 Low Value Exemption	274
A-19.3.7 Trusted Beneficiary Exemption	274
A-19.3.8 Trusted Risk Analysis (TRA) Exemption	275
A-19.3.9 Secured Corporate Payment Exemption	275
A-19.3.10 Delegated Authentication Exemption	275
A-19.4 SCA USING 3-D SECURE	276
A-20 Hosted Payment Page Options	277
A-21 Integration Libraries	279
A-21.1 GATEWAY INTEGRATION LIBRARY	280
A-21.1.1 Library Namespace	280
A-21.1.2 Gateway Configuration	280
A-21.1.3 Gateway Methods	281
A-21.2 HOSTED PAYMENT PAGE LIBRARY	285
A-21.2.1 Hosted Payment Pages	285
A-21.2.2 Library Namespace	285
A-21.2.3 Form Construction	286
A-21.2.4 Form Methods	287
A-21.2.5 jQuery Plugin	288
A-21.3 HOSTED PAYMENT FIELDS LIBRARY	289
A-21.3.1 Hosted Payment Fields	289

<i>A-21.3.2 Library Namespace</i>	290
<i>A-21.3.3 Form Construction</i>	291
<i>A-21.3.4 Form Methods</i>	294
<i>A-21.3.5 Form Events</i>	297
<i>A-21.3.6 Field Construction</i>	298
<i>A-21.3.7 Field Methods</i>	302
<i>A-21.3.8 Field Events</i>	306
<i>A-21.3.9 Field CSS Classes</i>	308
<i>A-21.3.10 Field Styling</i>	309
<i>A-21.3.11 jQuery Plugin</i>	312
A-22 Example HTTP Requests	313
A-22.1 HOSTED INTEGRATION	313
<i>A-22.1.1 Transaction Request HTTP Headers</i>	313
<i>A-22.1.2 Transaction Response HTTP Headers</i>	313
<i>A-22.1.3 Submission Example</i>	314
A-22.2 DIRECT INTEGRATION.....	315
<i>A-22.2.1 Transaction Request HTTP Headers</i>	315
<i>A-22.2.2 Transaction Response HTTP Headers</i>	315
<i>A-22.2.3 Submission Example</i>	316
A-22.3 BATCH INTEGRATION.....	317
<i>A-22.3.1 Submission Request HTTP Headers</i>	317
<i>A-22.3.2 Submission Response HTTP Headers</i>	318
<i>A-22.3.3 Status Request HTTP Headers</i>	319
<i>A-22.3.4 Status Response HTTP Headers</i>	319
<i>A-22.3.5 Submission Example</i>	319
A-23 Example Integration Code	321
A-23.1 HOSTED INTEGRATION	321
<i>A-23.1.1 Sale Transaction</i>	321
A-23.2 DIRECT INTEGRATION.....	323
<i>A-23.2.1 Sale Transaction (with 3-D Secure)</i>	323
<i>A-23.2.2 Sale Transaction (without 3-D Secure)</i>	327
A-23.3 BATCH INTEGRATION.....	329
<i>A-23.3.1 Batch Submission</i>	329
A-24 Example Library Code	332
A-24.1 GATEWAY INTEGRATION LIBRARY.....	332
<i>A-24.1.1 Hosted Sale Transaction</i>	332
<i>A-24.1.2 Direct Sale Transaction (with 3-D Secure)</i>	333
A-24.2 HOSTED PAYMENT PAGE LIBRARY	336
<i>A-24.2.1 Hosted Sale Transaction</i>	336
<i>A-24.2.2 Hosted Sale Transaction (jQuery)</i>	337
<i>A-24.2.3 Hosted Sale Transaction #2</i>	338
<i>A-24.2.4 Hosted Sale Transaction #2 (jQuery)</i>	339
A-24.3 HOSTED PAYMENT FIELDS LIBRARY	340
A-25 Frequently Asked Questions	348
INDEX	349