Custom Pay API – EPX Payment Interface

Public - Security Level 0

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EPX Payment Interface Introduction

Overview

The API utilizes Representational state transfer (REST) to describe and standardize access to the EPX Payment Interface (EPI). The use of transport layer security (TLS) is enforced on all requests. All requests and responses will be in JSON (JavaScript Object Notation).

EPI Security

EPI Security

Security was designed into every layer of the API:

- Authentication
- Data integrity
- API access
- IP based restrictions
- EPI Endpoints

Authentication

Basic API authentication is done using an HTTP header named EPI-Id, plus a signature that is created with a secret key referred to as an EPIKey. The EPI-Id is the merchant's four part key identifier.

Data integrity

Data integrity is enforced through the use of a hash-based message authentication code (HMAC) of 256 bits and is required as part of the HTTP headers on each request. The hash is calculated by applying the EPIKey (shared secret) to a concatenation of the URL and JSON payload. The value is then sent in the HTTP header, named EPI-Signature, with the request. The response also includes an HMAC for the payload.

API Access

EPI Keys can be allowed to access specific API resources.

IP Based Restrictions

Each EPIKey can have IP restrictions applied. This can help reduce the possibility of unauthorized use of the API using your EPIKey. The API restrictions can be based off a single IP, an IP range, or from a specific domain.

HTTP Headers and Response Codes

Required HTTP Headers

Table 1: Required HTTP Headers

Name	Value	Description
Content-Type	Application/json	Content type of message. For most messages, this will be the default.
EPI-Id	111-222-333-444	Merchant four-part key
EPI-Signature	0123456789ABCDEF	HMAC of URL and payload

Optional HTTP Headers

Table 2: Optional HTTP Headers

Name	Value	Description
EPI-Trace	User defined	• Optional value that can be sent in with the request and will be echoed back with response. • Can be used as unique value to help identify transactions from merchant perspective. • Value is not persisted with transaction and is only good during the current request / response chain.

CRUD Matrix

Table 3: CRUD Matrix

Operation	HTTP Verb	Result	Example	Example Note
Create	POST	New record	/sale	Details will be in JSON

Read	GET	Read record(s)	/batch/123	Returns back JSON array of records
Update	PUT	Update record(s)	/void/0123456789012345678	Updates a record
Delete	DELETE	Remove record(s)	Unused	Unused

Common HTTP Response Codes

EPI uses HTTP response codes to indicate the success or failure of a request.

Table 4: Common HTTP Response Codes

Code	Description
200 OK	Request was successful
400 Bad Request	Bad request
401 Unauthorized	EPIKey is required
403 Forbidden	EPIKey provided doesn't have the right to perform the request
404 Not Found	Requested resource was not found
405 Method Not Allowed	HTTP method request is not allowed
500 Internal Server Error	Unexpected server error has occurred

Core Resources

- ACH: /ach
  - Automated Clearing House (ACH) transactions are transactions tied directly to a checking or savings account.
- AVS: /avs
  - Address Verification System (AVS) transactions verify the customer's address to prevent fraud.
- Batch: /batch
  - A Batch transaction will either close all or partial transactions based off ID provided (POST) or will give batch totals and details (GET).

- Ping: /ping
    - Performs a general ping into the IPS system to verify our system availability.
- Refund: /refund
    - A transaction used to return funds to an account previously acted upon by a sale or capture transaction.
- Reverse: /reverse
    - The Reversal transaction is used to reverse the authorization of funds on a credit card. This will release the funds that are being held at the issuing bank.
- Sale: /sale
    - An authorization and a capture within the same transaction, provided the authorization portion is approved and is otherwise able to settle.
- Storage: /storage
    - The Storage transaction presents the capability to create a new BRIC or update an existing one within the EPX system, without interaction with the card networks. This transaction type is available for both credit card (CC) and ACH.
- Void: /void
    - The Void transaction is used to stop a sale, capture, or refund transaction prior to settlement. If the transaction has already been settled, this function will no longer be available.

Configuration

EPI URLs

The IP endpoints will be provided by EPX when the client is ready to integrate.

- UAP: xxx.xxxxxx.com
- Certification: xxx.xxxxxx.com
- Production: xxx.xxxxxx.com

JSON Message Structure

The basic JSON payload will always contain three entities: reference for the transaction, data, and errors. The reference entity is the reference number for the transaction and will always be returned. Data will be returned under the data entity and errors will be returned under the error entity. Multiple data or errors can be returned, but only one of the entities will be returned per call. Only one of the two entities (data or errors) can be populated per call, but both could be null.

Basic Structure

Figure 1: Basic JSON Structure

```
{  "data": null,
  "errors": null,
  "reference": {
    "bric": "0123456789012345678"
  }
}
```

Data returned

Figure 2: Data Returned

```
{  "data": [
    {
      "dateCreated": "2019-04-29",
      "description": "Something created",
      "documentId": 123
    }
  ],
  "errors": null
}
```

Error returned

Figure 3: Error Returned

```
{
  "data": null,
  "errors": [
    {
      "code": 0,
      "text": "batchNumber not found"
    }
  ]
}
```

TLV Data

TLV overview

EPX requires Money Transfer (Visa) and MoneySend (MasterCard) data to be presented in tag-length-value (TLV) format, which is a method of encoding information in a single string, versus multiple EPX tags.

TLV_SETS tag

Each request must contain the tag **TLV_SETS**. This tag can contain multiple TLV sets, which are concatenated together. The maximum length for the **TLV_SETS** value is 4000 bytes.

A logical simplification for the **TLV_SETS** tag is as follows (with spaces added for readability):

Figure 4: TLV_SETS tag example

```
TLV_SETS = "set_length TLVset . . . set_length TLVsetN"
```

Where:

- **set_length** is the 4-digit byte count for the length of the referenced TLV set. For example, if a TLV set contains two TLV elements with lengths of 25 and 30, the TLV set length is 0055.
- **TLVset** is the set of TLV elements. A TLV set will contain at least two TLV elements. The TLV elements can be presented in any order within a set.

Note: For MoneySend Payment and Funding transactions, the TLV_SETS tag must always include a "RECEIVER" and "SENDER" TLV set, in addition to any other desired TLV set.

TLV elements

As previously described, a TLV set consists of two or more TLV elements. A TLV element itself consists of three sub-elements:

- Tag: A 3-digit tag number such as 012 or 000 to describe the type of data. The tag has significance within the context of its parent TLV set. Thus, a tag 001 in a TRAN_DATA TLV set has a different meaning than 001 in a RECEIVER TLV set.
- Length: A 3-digit number representing the byte count for the value associated with the element
- Value: A variable alpha-numeric field

For example, the TLV element **003005Jones** in the TLV set "SENDER" is parsed as follows:

- 003: Identifies the element as a Last Name object
- 005: Specifies that the length that follows (Jones) is 5 bytes
- Jones: Provides the value for Last Name

EPX TLV Elements for Money Transfer (Visa) and MoneySend (MasterCard) Funding / Payment

Table 5 through Table 21 provide the mandatory and optional tags to include with Visa Funding (AFT) / MasterCard MoneySend and Payment (OCT) TLV fields.

The **CARD_ID** should be included in the transaction request to identify whether the cardholder is present.

NOTE: TLV elements can be presented in any order within a TLV set.

Identification Type Codes - MasterCard

Table 5 provides values for the Identification Type Codes for use with the "RECEIVER" and "SENDER" TLV sets for MasterCard transactions.

Table 5: Identification Type Code values - MasterCard

Value	Definition
01	Passport
02	National Identification Card
03	Driver's License
04	Government Issued
05	Other

TLV set – "RECEIVER"

NOTE: The RECEIVER TLV set is mandatory for all Money Transfer Payment and Funding transactions.

Table 6: TLV tag properties for TLV set "RECEIVER" - Visa

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "RECEIVER"	8	Alpha	Mandatory	Mandatory

Table 7: TLV tag properties for TLV set "RECEIVER" - MasterCard

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "RECEIVER"	8	Alpha	Mandatory	Mandatory
001	First Name	35	Alphanumeric	Optional	Conditional
002	Middle Name	1	Alphanumeric	Optional	Optional
003	Last Name	35	Alphanumeric	Optional	Conditional
004	Street Address	50	Alphanumeric	Optional	Optional
005	City	25	Alphanumeric	Optional	Optional
006	State/Province Code	3	Alphanumeric	Optional	Optional
007	Country	3	Alphanumeric	Optional	Optional
008	Zip/Postal Code	10	Alphanumeric	Optional	Optional
009	Phone Number	20	Numeric	Optional	Optional
010	Date of Birth	8	Numeric	Optional	Optional
011	Account Number	20	Numeric	Optional	Optional
013	Identification Type Examples: 01 = Passport 03 = Government Issued	2	Numeric	Optional	Optional
014	Identification Number	25	Alphanumeric	Optional	Optional

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
015	Identification Country Code	3	Alphanumeric	Optional	Optional
016	Identification Expiration Data	8	Numeric	Optional	Optional
017	Nationality	3	Alphanumeric	Optional	Optional
018	Country of Birth	3	Alphanumeric	Optional	Optional

TLV set – "SENDER"

NOTE: The SENDER TLV set is mandatory for all Money Transfer Payment and Funding transactions.

Table 8: TLV tag properties for TLV set "SENDER" - Visa

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "SENDER"	6	Alpha	Mandatory	Mandatory
001	First Name	30	Alphanumeric	Optional	Optional
002	Middle Name	1	Alphanumeric	Optional	Optional
003	Last Name	30	Alphanumeric	Optional	Mandatory
004	Street Address	35	Alphanumeric	Optional	Mandatory
005	City	25	Alphanumeric	Optional	Mandatory
006	State/Province Code	2	Alphanumeric	Optional	Mandatory
007	Country ISO code	3	Alphanumeric	Optional	Mandatory
011	Account Number	34	Alphanumeric	Optional	Mandatory

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
012	Reference Number	16	Alphanumeric	Optional	Mandatory

Table 9: TLV tag properties for TLV set "SENDER" - MasterCard

TLV Tag	TLV Data	TLV Max Length	Type	Funding	Payment
000	Always use the value "SENDER"	6	Alpha	Mandatory	Mandatory
001	First Name	35	Alphanumeric	Optional	Mandatory
002	Middle Name	1	Alphanumeric	Optional	Optional
003	Last Name	35	Alphanumeric	Optional	Mandatory
004	Street Address	50	Alphanumeric	Optional	Mandatory
005	City	25	Alphanumeric	Optional	Mandatory
006	State/Province Code	3	Alphanumeric	Optional	Mandatory
007	Country	3	Alphanumeric	Optional	Mandatory
008	ZIP / Postal Code	10	Alphanumeric	Optional	Mandatory
009	Phone Number	20	Numeric	Optional	Optional
010	Date of Birth	8	Numeric	Optional	Optional
011	Account Number	34	Alphanumeric	Optional	Mandatory
013	Identification Type Examples: 01 = Passport	2	Numeric	Optional	Optional

TLV Tag	TLV Data	TLV Max Length	Type	Funding	Payment
	03 = Government Issued				
014	Identification Number	25	Alphanumeric	Optional	Optional
015	Identification Country Code	3	Alphanumeric	Optional	Optional
016	Identification Expiration Data	8	Numeric	Optional	Optional
017	Nationality	3	Alphanumeric	Optional	Optional
018	Country of Birth	3	Alphanumeric	Optional	Optional

TLV set – "TRAN_DATA"

Table 10: TLV tag properties for TLV set "TRAN_DATA" - Visa

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "TRAN_DATA"	9	Alpha	Mandatory	Mandatory
001	Funding Source Examples: V1 = Visa Credit V2 = Visa Debit	2	Alphanumeric	Optional	Mandatory
005	Business Application Identifier	2		Mandatory	Mandatory

Table 11: TLV tag properties for TLV set "TRAN_DATA" - MasterCard

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "TRAN_DATA"	9	Alpha	Mandatory	Mandatory
001	Funding Source Examples: 01 = Credit 02 = Debit	2	Alphanumeric	Optional	Mandatory
002	Additional Message	65	Alphanumeric	Optional	Optional
003	Participant ID	30	Alphanumeric	Optional	Optional
004	Transaction Purpose Examples: 01 = Family Support 03 = Travel & Tourism	2	Numeric	Optional	Optional

Transaction Purpose

Table 12 provides Transaction Purpose values for use with the "TRAN_DATA" TLV set.

Table 12: Transaction Purpose values - MasterCard

Value	Definition
01	Family Support
02	Regular Labor Transfers (expatriates)
03	Travel & Tourism
04	Education
05	Hospitalization & Medical Treatment
06	Emergency Need

Value	Definition
07	Savings
08	Gifts
09	Others

TLV set – "LANG_DATA"

Table 13: TLV tag properties for TLV set "LANG_DATA" - Visa

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "LANG_DATA"	9	Alpha	Optional	Optional

Table 14: TLV tag properties for TLV set "LANG_DATA" - MasterCard

TLV Tag	TLV Data	TLV Max Length	Type	AFT (Funding)	OCT (Payment)
000	Always use the value "LANG_DATA"	9	Alpha	Optional	Optional
001	Language Identification	3	Alphanumeric	Conditional	Conditional
002	Language Data	100	Alphanumeric	Optional	Optional

Funding Source Codes

Table 15 provides values for the Funding Source Codes.

Table 15: Funding Source Code values - Visa

Value	Definition
04	Cash
05	DDA Account
06	Mobile Money Account

Value	Definition
V1	Visa Credit
V2	Visa Debit
V3	Visa Prepaid

Table 16: Funding Source Code values - MasterCard

Value	Definition
01	Credit (Non Visa)
02	Debit (Non Visa)
03	Prepaid (Non Visa)
04	Cash
05	DDA Account
06	Mobile Money Account

Business Application Identifiers

Table 17 provides applicable OCT values for the Business Application Identifiers.

Table 17: Applicable OCT Business Application Identifier values - Visa

Value	Definition
AA	Account to Account / Sender and Recipient are the same person
BA	I Value Description
BB	Business to Business
BI	Money transfer—bank-initiated
BP	Non-card bill payment
CP	Card bill payment*
FD	Funds disbursement*
GD	Government disbursement
GP	Gambling payout (other than online gambling)

Value	Definition
LO	Loyalty and offers
MD	Merchant disbursement*
MI	Money transfer—merchant-initiated
OG	Online gambling payout
PD	Payroll/pension disbursement
PP	Person to Person / Sender and Recipient are not the same person
TU	Top-Up for enhanced prepaid loads*
WT	Wallet transfer (digital wallet)

Note: Additional business application identifiers may be supported by the EPX platform, please confirm with your relationship manager or integration specialist.

Table 18 provides the applicable AFT values for the Business Application Identifiers.

Table 18: Applicable AFT Business Application Identifier values - Visa

Value	Definition
AA	Account to Account / Sender and Recipient are the same person
BI	I Value Description
PP	Business to Business
TO	Money transfer—bank-initiated
WT	Non-card bill payment

Card ID

Table 19 provides Card ID values.

Table 19: Card ID values - Visa

Card ID	Types	Definition
0	Funding / Payment	Cardholder Present
1	Funding / Payment	Cardholder Not Present

Card ID	Types	Definition
M	Funding / Payment	Cardholder Present (card not readable)

TLV set – "NETWORK"

NOTE: The NETWORK TLV set is reserved for internal MasterCard use to request additional network response elements.

If the NETWORK TLV set is included in the request, the response will contain:

- The System Trace Audit Number (STAN), if a value of "Y" is included with TLV tag 001 in the request. A STAN response is a maximum of 6 bytes, alphanumeric.
- The Retrieval Reference Number (RRN), if a value of "Y" is included with TLV tag 002 in the request. A RRN response is a maximum of 12 bytes, alphanumeric.

Table 20: TLV element properties for TLV set "NETWORK" - MasterCard

TLV Tag	TLV Data	TLV Max Length	Type	Funding	Payment
000	Always use the value "NETWORK"	7	Alpha	Mandatory	Mandatory
001	STAN (System Trace Audit Number) Always set to "Y" to receive a response	1	Alphanumeric	Optional	Optional
002	RRN (Retrieval Reference Number) Always set to "Y" to receive a response	1	Alphanumeric	Optional	Optional

Examples

The request from the merchant Point of Sale (POS) software interface needs to be sent as an HTTP POST with an XML payload. Required fields are the transaction type and requested amount.

Example Endpoint

Figure 5: Example Endpoint

```
https://xxx.xxx.com/sale/
```

Example JSON Request

Figure 6: Example JSON Request

```
{
 "account": "4111111111111111",
 "amount": 127.99,
 "transaction": 123,
 "taxAmount": 7.99,
 "taxExempt": N
}
```

Example JSON Response

Figure 7: Example JSON Response

```
{
      "data": {
   "authorization": "015758",
   "response": "00",
   "text": "APPROVAL 015758"
 },
 "errors": null,
 "reference": {
   "bric": "00DGZHXGTN0KV88A00A",
   "timestamp": "2019-05-24T17:07:21Z"
 }
```

Rest Architecture

API Semantic Versioning

Versioning is built into the HTTP header. If a specific version is required, it is included in the header. If the version is not included, the versioning defaults to the latest version.

Figure 8: Versioning example

```
EPI-Version: 1.0
```