Xe Currency Data API
Specifications
Jan 2022

Contents

1   Overview

The Xe Currency Data API is a REST-ful (or REST-like, depending how strictly you interpret REST) web-services API.

1.1   Schema

- The API is accessed using the HTTPS protocol.
- The API is accessed from the domain xecdapi.xe.com.
- All data is sent and received in the JSON format by default.   You can optionally specify XML or CSV formats instead.

1.2   Caching Data

Caching of Xe Currency data is typically permitted at the 'Unlimited' package levels, unless you receive written permission from Xe. Caching permission is determined based on the intended use of the data. For more details please review the Xe Currency Data Feed API Agreement.

1.3   Authentication

All requests to the API must be authenticated via HTTP Basic Access Authentication, which requires that a properly constructed "Authorization" header be included in your HTTP request. This header will need to include your Xe Currency Data API account ID and API key in an encoded form. Your account ID and API key will be provided to you when you sign up for the service. You can get more information on Basic Access Authentication at: http://en.wikipedia.org/wiki/Basic_access_authentication

Most modern programming languages and tools support this authentication method natively and take care of the details for you.

1.3.1   Authentication Example Using the "curl" Utility

```
curl –i -u account_id:api_key "https://xecdapi.xe.com/v1/account_info/"
```

Authenticating with invalid credentials will return 401 Unauthorized:

```
curl –i –u bad_account_id:or_bad_api_key -i "https://xecdapi.xe.com/v1/account_info/"

HTTP/1.1 401 Unauthorized

{
  "code":1,
  "message": "Bad credentials",
  "documentation_url": "https://xecdapi.xe.com/docs/v1/"
}
```

1.3.2   Failed login limit

After detecting several requests that include your account ID but an invalid API key within a short period, the API will temporarily reject all authentication attempts from you (including ones with a valid API key) with the 403 Forbidden error message:

```
curl –i -u account_id:bad_api_key -i "https://xecdapi.xe.com/v1/account_info/"

HTTP/1.1 403 Forbidden

{
  "code":2,
  "message": "Maximum number of login attempts exceeded. Please try again later.",
  "documentation_url": "https://xecdapi.xe.com/docs/v1/"
}
```

1.4   Specifying the API Version

You specify the version of the API that you wish to access by including it in the URI as follows:

```
https://xecdapi.xe.com/v{version_no}/...
```

Where {version_no} is an integer that identifies the version number that you wish to access.

Example:

```
https://xecdapi.xe.com/v1/account_info/
```

1.5   Specifying the Data Format

By default, the API returns data in the JSON format. If you wish to explicitly specify the format, or request a different format, you can do so in the URI as follows:

```
https://xecdapi.xe.com/v1/{endpoint}{.format}/...
```

Where {endpoint} is the specific API endpoint (data) you are requesting and {.format} indicates the format in which you would like the data to be returned. Possible values for {.format} are ".json", ".xml", ".csv". Again, if you do not include {.format}, the data will be returned in the JSON format by default.

1.6   Timestamp (Date and Time) Format

All timestamps returned in the body of the API responses are in the following ISO 8601 format:

```
YYYY-MM-DDThh:mm:ssZ
```

The "Z" at the end indicates that this is a UTC time.

If you have a Daily package and you have specified a preferred Lock-In time and Time Zone in your agreement then the API will return data based on these settings in UTC time.

1.7   Package Limits

The number of API rate requests you get is based on the service package you selected at the time of sign up.

Lite package level: provides you with 10,000 API rate requests a month.
Best Value package level: provides you with 30,000 API rate requests a month.
Prime package level: provides you with 100,000 API rate requests a month.
Infinite package level: provides you with Unlimited API rate requests a month.

Each rate returned is considered one API request towards your monthly package limit. You can request multiple rates in a single query

For example: Convert $1,500 From USD to CAD and GBP will count as two rate requests towards your monthly package limit as it contains two counter currencies (CAD and GBP).

When you have used your monthly package allowance, your access will be blocked until your new monthly access period begins.

You can check your current package limit status by using the account_info API endpoint without impacting your API request count. See section 2.1.

Once you hit your package limit you will receive an error response:

```
HTTP/1.1 403 Forbidden
Status: 403 Forbidden
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1372700873

{
  "code":3,
  "message": "API package limit reached.",
  "documentation_url": "https://xecdapi.xe.com/docs/v1/"
}
```

1.7.1   Package Limit Alerts

When you are nearing your package limit for the current month Xe will attempt to send you email alerts. Emails will be sent once you've reached 75%, 90% and 100% of your monthly package allowance.

1.8   Usage Restriction

All requests made to the API are limited over a time period known as the usage restriction window. This is done to ensure reasonable usage and to potentially prevent excessive requests on the network due to technical errors.

You can check the returned HTTP headers of any API request to see your current usage restriction status:

```
curl –i -u account_id:api_key -i
"https://xecdapi.xe.com/v1/convert_to.json/?to=USD&from=CAD&amount=1000.00"

HTTP/1.1 200 OK
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1372700873
```

The headers tell you everything you need to know about your current rate limit status:

Header Name	Description
X-RateLimit-Limit	The maximum number of requests that you are permitted to make per usage restriction window.
X-RateLimit-Remaining	The number of requests remaining in the current usage restriction window.
X-RateLimit-Reset	The time at which the current usage restriction window resets in UTC epoch seconds.

If you need the time in a different format, any modern programming language can get the job done. For example, if you open up the console on your web browser, you can easily get the reset time as a JavaScript Date object.

```
new Date(1372700873 * 1000) // => Mon Jul 01 2013 13:47:53 GMT-0400 (EDT)
```

Once you go over the rate limit you will receive an error response:

```
HTTP/1.1 429 Too Many Requests
Status: 429 Too Many Requests
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 0
X-RateLimit-Reset: 1377013266

{
  "code":4,
  "message": "API request rate limit exceeded.",
  "documentation_url": "https://xecdapi.xe.com/docs/v1/"
}
```

1.9   Conditional requests

Most responses return an `ETag` header. Many responses also return a `Last-Modified` header. You can use the values of these headers to make subsequent requests to those resources using the `If-None-Match` and `If-Modified-Since` headers, respectively. If the resource has not changed, the server will return a `304 Not Modified`.

Note: Making a conditional request and receiving a 304 response does not count against your API request count so we encourage you to use it whenever possible.

```
curl -i "https://xecdapi.xe.com/v1/convert_from/?to=*"
HTTP/1.1 200 OK Cache-Control: private, max-age=60
ETag: "644b5b0155e6404a9cc4bd9d8b1ae730"
Last-Modified: Thu, 05 Jul 2012 15:31:30 GMT
Status: 200 OK
Vary: Accept, Authorization, Cookie
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1372700873

curl -i "https://xecdapi.xe.com/v1/convert_from/?to=*" -H if-None-Match:
"644b5b0155e6404a9cc4bd9d8b1ae730""
HTTP/1.1 304 Not Modified
Cache-Control: private, max-age=60
ETag: "644b5b0155e6404a9cc4bd9d8b1ae730"
Last-Modified: Thu, 05 Jul 2012 15:31:30 GMT
Status: 304 Not Modified
Vary: Accept, Authorization, Cookie
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1372700873
```

2   API Endpoints

This section outlines the different endpoints that are available. You can think of an endpoint as a function or a resource that allows you to request information about a particular type of data.

2.1   Account information

2.1.1   Get Single Account Information

This endpoint will return basic information for a specific account.

```
GET /v1/account_info{.format}
```

2.1.2   Response

```
Status: 200 OK
X-RateLimit-Limit: 5000
X-RateLimit-Remaining: 4456
X-RateLimit-Reset: 1350085394
{
    "id": "E1EABC7B-A9C6-97EB-C5C9-E14E501A06E9",
    "organization": "Acme Inc.",
    "package": "enterprise",
     service_start_timestamp": "2013-01-23T13:27Z",
    "package_limit_duration": "1 month"
    "package_limit": 10000,
    "package_limit_remaining": 8347,
    "package-limit_reset": "2014-11-23T00:00Z"
}
```

2.2   Currencies

This endpoint will return a list of all currencies, active and obsolete, available via the Xe Currency Data API.

```
GET /v1/currencies{.type}/?{obsolete=true}{&language=en}{&iso=XXX…}
```

If the obsolete optional parameter is included, then the list will contain both active and obsolete currencies.

Example:
```
curl –i -u account_id:api_key
"https://xecdapi.xe.com/v1/currencies.json/?obsolete=true"
```

2.2.1   Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1350085394
ETag: "a0s049ba79152f03380d34652f2cb612"
{
    "terms":"http://www.xe.com/legal/dfs.php",
    "privacy":"http://www.xe.com/privacy.php",
    "currencies": [
        {
          "iso": "CAD",
          "currency_name": "Canadian Dollar",
          "is_obsolete": false
        },
        {
          "iso": "FRF",
          "currency_name": "France Francs",
          "is_obsolete": true,
          "superseded_by": "EUR"
        }
. . .
    ]
}
```

2.2.2   Parameter

Name	Type	Description
language	String	OPTIONAL – parameter used to specify the language in which you would like the currency names to be provided. Specified as an RFC-1766-compliant language tag. Currently supported languages include "ar", "de", "en", "es", "fr", "it", "ja", "pt", "sv", "zh-CN", and "zh-HK". If not specified, "en" is used.
iso	String	OPTIONAL – Comma separated list of ISO 4217 codes. This will limit the data returned to only those currencies that are specified. If this parameter is omitted, this endpoint will return results for all currencies.

Name	Type	Description
		It is a prefix match; you can provide it with one, two, or three characters and it will return a list of all the currencies with ISO 4217 codes that match. A list of acceptable ISO 4217 currency codes can be found here: http://www.xe.com/iso4217.php
obsolete	String	OPTIONAL – If 'true' then endpoint will display currencies that are obsolete but for which historical data is available.
additionalInfo	String	OPTIONAL - If 'symbol' then returns 'currency_symbol' and 'currency_symbol_on_right' in response
crypto	String	OPTIONAL – If 'true' then this endpoint will return data for the following crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

2.3   Convert From Exchange Rates

Convert from a currency amount to multiple other currencies using the exchange rates appropriate to your purchased level of service (Daily or Live).

For example, if you have $110.23 USD, how much CAD will that get you.

Note:
Daily – will return last rate at your preferred lock-in time.
Live – will return latest exchange rate.

```
GET /v1/convert_from{.format}/?{from=XXX}{&to=XXX…}{&amount=n}
```

- From should be a three-character ISO 4217 code.
- To should be comma delimited ISO 4217 code.

Example:
```
curl –i -u account_id:api_key
"https://xecdapi.xe.com/v1/convert_from.json/?from=USD&to=CAD,EUR
&amount=110.23"
```

2.3.1 Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1350085394
ETag: "a0s049ba79152f03380d34652f2cb612"
{
   "terms":"http://www.xe.com/legal/dfs.php",
   "privacy":"http://www.xe.com/privacy.php",
   "from": "USD",
   "amount":110.23,
   "timestamp": "2014-04-23T14:20:00Z",
   "to": [
   {
      "quotecurrency": "CAD",
      "mid": 121.7363552834
   },
   {
      "quotecurrency": "EUR",
       "mid": 79.6584009775
   }
   ]
}
```

2.3.2 Parameters

Name	Type	Description
from	String	OPTIONAL - Currency you want to convert from ISO code. Note if this parameter is omitted, USD is assumed.
to	String	Comma separated list of to currencies ISO 4217 codes. This will limit the data returned to only those currencies that are specified. Use an asterisk * to convert all currencies. Note: Obsolete currencies are replaced by their successor currency.
amount	Number	OPTIONAL – This parameter can be used to specify the amount you want to convert, if an amount is not specified then 1 is assumed.
obsolete	String	OPTIONAL – If 'true' then endpoint will display rates for currencies that are obsolete. If 'false' then obsolete currencies are replaced by their successor currency.
inverse	String	If 'true' then endpoint will include inverse rates. An inverse rate is a quote for which the base currency and counter currency are switched. An inverse is calculated by dividing one by the exchange rate. Example: If the exchange rate for $1 USD to EUR = 0.874852, then the inverse rate would be 1/0.874852 = 1.14305, meaning that US$1.14305 would buy 1 euro.
decimal_places	Number	OPTIONAL – This parameter can be used to specify the number of decimal places included in the output. The default is 10 decimal places, and maximum is 20 decimal places. Example 1 USD to EUR = 0.874852 with decimal_places=3, the output returned will be EUR = 0.875

Name	Type	Description
margin	Number	OPTIONAL – This parameter can be used to add a margin (-/+) to Xe's mid-market rate. Example: add margin=2.05 parameter to the endpoint and the API will return our mid-market rates plus the margin of 2.05 percent.
crypto	String	OPTIONAL – If 'true' then this endpoint will return data for the following crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

2.4 Convert To Exchange Rates

Convert to a currency amount from multiple other currencies using the exchange rates appropriate to your purchased level of service (Daily or Live).

For example, how much USD and EUR do you need to get $1000 CAD.

Note:
Daily – will return last rate at your preferred lock-in time.
Live – will return latest exchange rate.

```
GET /v1/convert_to{.format}/?{to=XXX}{&from=XXX…}{&amount=n}
```

- To should be a three-character ISO 4217 code.
- From should be comma delimited ISO 4217 code.

Example:

```
curl –i -u account_id:api_key
"https://xecdapi.xe.com/v1/convert_to.json/?to=CAD&from=USD,EUR&amount=1000.00"
```

2.4.1   Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1350085394
ETag: "a0s049ba79152f03380d34652f2cb612"
{
    "terms":"http://www.xe.com/legal/dfs.php",
    "privacy":"http://www.xe.com/privacy.php",
    "to": "CAD",
    "amount":1000.00,
    "timestamp": "2014-04-23T14:24:00Z",
    "from": [
    {
        "quotecurrency": "USD",
        "mid": 905.4803114341
    },
    {
        "quotecurrency": "EUR",
         "mid": 656.7101615851
    }
    ]
}
```

2.4.2   Parameters

Name	Type	Description
from	String	Comma separated list of to currencies ISO codes. This will limit the data returned to only those currencies that are specified. Use an asterisk * to convert all currencies. Note: Obsolete currencies are replaced by their successor currency.
to	String	OPTIONAL - Currency you want to convert to ISO code. Note if this parameter is omitted, USD is assumed.
amount	Number	OPTIONAL – This parameter can be used to specify the amount you want to convert, if an amount is not specified then 1 is assumed.
obsolete	String	OPTIONAL – If 'true' then endpoint will display rates for currencies that are obsolete. If 'false' then obsolete currencies are replaced by their successor currency.
inverse	String	OPTIONAL – If 'true' then endpoint will include inverse rates.
decimal_places	Number	OPTIONAL – This parameter can be used to specify the number of decimal places included in the output. The default is 10 decimal places, and maximum is 20 decimal places. Example 1 USD to EUR = 0.874852 with decimal_places=3, the output returned will be EUR = 0.875
margin	Number	OPTIONAL – This parameter can be used to add a margin (-/+) to Xe's mid-market rate. Example: add margin=2.05 parameter to the endpoint and the API will return our mid-market rates plus the margin of 2.05 percent.
crypto	String	OPTIONAL – If 'true' then this endpoint will return data for the following

Name	Type	Description
		crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

2.5   Historic Rate

Returns the historic rate for a single base currency and one or more counter currencies.

```
GET /v1/historic_rate.{format}/{?from=XXX}{&to=XXX…}{&date=yyyy-mm
dd}{&time=hh:mm}(&amount=n}
```

Example:
```
curl –i -u account_id:api_key
"https://xecdapi.xe.com/v1/historic_rate.json/?from=USD&date=2011-03-05&to=CAD,JPY"
```

2.5.1   Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 861
X-RateLimit-Reset: 1350085394

{
    "terms":"http://www.xe.com/legal/dfs.php",
    "privacy":"http://www.xe.com/privacy.php",
    "from": "USD",
    "amount":1.0,
    "timestamp": "2011-03-05T17:00:00Z",
    "to": [
    {
        "quotecurrency":"CAD",
        "mid":0.9727929102
    },
    {
        "quotecurrency":"JPY",
        "mid":82.3000430273
    }]
}
```

2.5.2   Parameters

Name	Type	Description
from	String	OPTIONAL - Currency you want to convert from ISO code. Note if this parameter is omitted, USD is assumed.
to	String	Comma separated list of to currencies ISO 4217 codes. This will limit the data returned to only those currencies that are specified. Use an asterisk * to specify all currencies. Note: Obsolete currencies are replaced by their precursor or successor currency.

Name	Type	Description
date	String	UTC date should be in the form of YYYY-MM-DD, up to 1995-11-16. If your account is registered for a *Daily* package your endpoint will return rates at your preferred daily lock-in time. If your account is registered for a *Live* package your endpoint will return Xe's rate at 00:00 UTC unless you specify a time parameter in your rate request.
time	String	OPTIONAL – Time parameter is applicable to *Live package only* – UTC time is in format of HH:MM Time option is only available for the last 24 hours, if time is not specified, only one table is returned using the Xe mid-day rates (As returned in http://www.xe.com/currencytables/)
amount	Number	OPTIONAL – This parameter can be used to specify the amount you want to convert, if an amount is not specified then 1 is assumed.
obsolete	String	OPTIONAL – If 'true' then endpoint will display rates for currencies that are obsolete. If 'false' then obsolete currencies are replaced by their successor currency.
inverse	String	OPTIONAL – If 'true' then endpoint will include inverse rates.
decimal_places	Number	OPTIONAL – This parameter can be used to specify the number of decimal places included in the output. The default is 10 decimal places, and maximum is 20 decimal places. Example 1 USD to EUR = 0.874852 with decimal_places=3, the output returned will be EUR = 0.875
margin	Number	OPTIONAL – This parameter can be used to add a margin (-/+) to Xe's mid-market rate. Example: add margin=2.05 parameter to the endpoint and the API will return our mid-market rates plus the margin of 2.05 percent.
crypto	String	OPTIONAL – If 'true' then this endpoint will return data for the following crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

2.6   Historic Rate period

Returns a daily historic rate for a single base currency and one or more counter currencies over a period of time.

```
GET
/v1/historic_rate/period{.type}/{?from=XXX}{&to=XXX…}{&start_timestamp=YYYY-
MM-DD}{&end_timestamp=YYYY-MM-DD}{&amount=n}
```

Example:

```
curl -i -u account_id:api_key
"https://xecdapi.xe.com/v1/historic_rate/period/?from=USD&to=CAD
&start_timestamp=2011-02-11T12:00&end_timestamp=2011-06-02T12:00"
```

2.6.1 Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 851
X-RateLimit-Reset: 1350085394
ETag: "a0s049ba79152f03380d34652f2cb612"
{
    "terms":"http://www.xe.com/legal/dfs.php",
    "privacy":"http://www.xe.com/privacy.php",
    "from": "USD",
    "amount":1.0,
    "to": [
        "CAD": [
        {
          "mid":0.9933549894,
          "timestamp":"2013-01-01T17:00:00Z
        },
        {
          "mid":0.9860217910,
          "timestamp":"2013-01-02T17:00:00Z
        }]
    ]
}
```

2.6.2 Parameters

Name	Type	Description
from	String	OPTIONAL - Currency you want to convert from ISO code. Note if this parameter is omitted, USD is assumed.
to	String	Comma separated list of to currencies based on ISO 4217 codes. This will limit the data returned to only those currencies that are specified.
amount	Number	OPTIONAL – This parameter can be used to specify the amount you want to convert, if an amount is not specified then 1 is assumed.
start_timestamp	String	OPTIONAL – ISO 8601 timestamp in the format yyyy-mm-ddThh:mm giving the UTC date and time of the start of the period for which you would like rates returned. If your account is registered for a *Daily* package your endpoint will return rates at your preferred daily lock-in time starting on the date specified in your request. If your account does not have a preferred daily lock-in time then rates will return as of 00:00 UTC. If your account is registered for a *Live* package your endpoint will return rates starting at 00:00 UTC if no time portion is specified.

`end_timestamp`	String	OPTIONAL – ISO 8601 timestamp in the format yyyy-mm-ddThh:mm giving the UTC date and time of the end of the period for which you would like rates returned. If a time in the future is specified, the current time will be used. If no end_time is specified, the time specified in the "start_timestamp" paramenter will also be used for the end_timestamp." If your account is registered for a *Daily* package your endpoint will return rates at your preferred daily lock-in time ending on the date specified in your request. If your account does not have a preferred daily lock-in time then rates will return as of 00:00 UTC. If your account is registered for a *Live* package your endpoint will return rates at 00:00 UTC unless you specify a time parameter in your rate request.
`interval`	String	OPTIONAL – Interval is applicable to *Live* packages only. Using one of the interval values below in your rate request will return rates for that specific interval within the time period specified. Example: adding the interval of "hourly" will return rates for every hour in the time period you specified. <table><tr><td>"daily"</td><td>Returns one rate for the days specified in your time period.</td></tr><tr><td>"hourly"</td><td>Returns rates for every hour in the time period you specify.</td></tr></table> If omitted, "daily" is used. This parameter is only used if both the "start_timestamp" and "end_timestamp" parameters have been specified.
`page`	Number	OPTIONAL – You can specify the page number you want to request. Note that page numbering is 1-based (the first page being page 1). Omitting this parameter will return the first page.
`per_page`	Number	OPTIONAL – You can specify the number of results per page. The default is 30 results per page with a maximum of 500 results per page.
`obsolete`	String	OPTIONAL – If 'true' then endpoint will display rates for currencies that are obsolete. If 'false' then obsolete currencies are replaced by their successor currency.
`inverse`	String	OPTIONAL – If 'true' then endpoint will include inverse rates.
`decimal_places`	Number	OPTIONAL – This parameter can be used to specify the number of decimal places included in the output. The default is 10 decimal places, and maximum is 20 decimal places. Example 1 USD to EUR = 0.874852 with decimal_places=3, the output returned will be EUR = 0.875

margin	Number	OPTIONAL – This parameter can be used to add a margin (-/+) to Xe's mid-market rate. Example: add margin=2.05 parameter to the endpoint and the API will return our mid-market rates plus the margin of 2.05 percent.
crypto	String	OPTIONAL – If 'true' then this endpoint will return data for the following crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

2.7   Monthly Average

Returns monthly average rates for a single base currency and one or more counter currencies for a year and optionally month. The monthly average is calculated by taking the 00:00 UTC rate for each day in the month/year you specify in your query.

```
GET
/v1/monthly_average{.type}/{?from=XXX}{&to=XXX…}{&year=YYYY}{&month=M}{&amount
=n}
```

Example:
```
curl –i -u account_id:api_key "https://xecdapi.xe.com/v1/
monthly_average/?from=USD&to=EUR&year=2015&month=6"
```

2.7.1   Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 899
X-RateLimit-Reset: 1472579220
ETag: "a0s049ba79152f03380d34652f2cb612"
{
    "terms":"http://www.xe.com/legal/dfs.php",
    "privacy":"http://www.xe.com/privacy.php",
    "from": "USD",
    "amount":1,
    "year":2015,
    "to": {
        "CAD": [
        {
          "monthlyAverage":1.2354042806,
          "month":6,
          "daysInMonth":30
        }]
    }
}
```

2.7.2 Parameters

Name	Type	Description
`from`	String	OPTIONAL - Currency you want to convert from ISO code. Note if this parameter is omitted, USD is assumed.
`to`	String	Comma separated list of to currencies based on ISO 4217 codes. This will limit the data returned to only those currencies that are specified.
`amount`	Number	OPTIONAL – This parameter can be used to specify the amount you want to convert, if an amount is not specified then 1 is assumed.
`year`	String	OPTIONAL – This parameter specifies the year to calculate average monthly rates.
`month`	String	OPTIONAL – This parameter specifies the month in the given year to return average monthly rates. This is a numeric value from 1 to 12 where 1 is for January and 12 is for December. If no month is provided, then all months for the given year are returned.
`obsolete`	String	OPTIONAL – If 'true' then endpoint will display rates for currencies that are obsolete. If 'false' then obsolete currencies are replaced by their successor currency.
`inverse`	String	OPTIONAL – If 'true' then endpoint will include inverse rates.
`decimal_places`	Number	OPTIONAL – This parameter can be used to specify the number of decimal places included in the output. The default is 10 decimal places, and maximum is 20 decimal places. Example 1 USD to EUR = 0.874852 with decimal_places=3, the output returned will be EUR = 0.875
`crypto`	String	OPTIONAL – If 'true' then this endpoint will return data for the following crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

2.8 Stats

Volatility measures the fluctuation in the exchange rate of a currency pair over a specific period, represented in a percentage. At Xe, volatility is measured by applying the standard deviation of the logarithmic daily returns, expressed in a percentage score.

Daily returns are the gain or loss of a currency pair in a particular period. We take the values of two consecutive days at 00:00 UTC. That is why we call it daily return. Then, we apply a logarithm to the ratio between those two values. It is a common way to measure change in the financial industry.

Ex: ln (valueDay2 / valueDay1) is the logarithmic return between day2 and day1. We have a value that tells us if the currency pair has moved a lot or not.

In statistics, the standard deviation is a measure that is used to quantify the amount of variation of a set of data values. A low standard deviation indicates that the data points tend to be close to the mean of the set, while a high standard deviation indicates that the data points are spread out over a wider range of value.

We apply this standard deviation to the daily logarithmic returns we calculated during a given time period (30 days, 90 days etc.).

Expressing a value in a percentage score means we multiply it by 100 before showing it to you.

```
GET /v1/stats{.format}/{?from=XXX}{&to=XXX…}{&start_date=yyyy-mm
dd}{&end_date=yyyy-mm dd}{&daysInPeriod=n}
```

Example:
```
curl –i -u account_id:api_key "https://xecdapi.xe.com/v1/
stats?from=USD&to=EUR&start_date=2016-01-01&end_date=2017-01-01"
```

2.8.1   Response

```
Status: 200 OK
X-RateLimit-Limit: 900
X-RateLimit-Remaining: 899
X-RateLimit-Reset: 1472579220
ETag: "a0s049ba79152f03380d34652f2cb612"
{
   "terms":"http://www.xe.com/legal/dfs.php",
   "privacy":"http://www.xe.com/privacy.php",
   "startDate":"2016-01-01T00:00:00Z",
   "endDate":"2017-01-01T00:00:00Z",
   "from": "USD",
   "stats": [
       {
         "to": "EUR",
         "high": "0.96241958842401",
         "low": "0.86778524440646",
         "average": "0.9040496695395371",
         "standardDeviation": "0.02093481087412211",
         "volatility": "0.4383874561564132",
         "highTimestamp": "2016-12-21T00:00:00Z",
         "lowTimestamp": "2016-15-03T00:00:00Z",
         "dataPoints": "367"
       }]
}
```

2.8.2   Parameters

Name	Type	Description
`from`	String	OPTIONAL - Currency you want to convert from ISO code. Note if this parameter is omitted, USD is assumed.
`to`	String	Comma separated list of to currencies based on ISO 4217 codes. This will limit the data returned to only those currencies that are specified.
`start_date`	String	OPTIONAL – ISO 8601 timestamp in the format yyyy-mm-dd giving the UTC date of the start of the period for which you would like to compute the volatility from. Note if this parameter is omitted, the start date will default to today.
`end_date`	String	OPTIONAL – ISO 8601 timestamp in the format yyyy-mm-dd giving the UTC date of the end of the period for which you would like to compute the volatility to. Note if this parameter is omitted, the end date will default to today.
`obsolete`	String	OPTIONAL – If 'true' then endpoint will display rates for currencies that are obsolete. If 'false' then obsolete currencies are replaced by their successor currency.
`decimal_places`	Number	OPTIONAL -This parameter can be used to specify the number of decimal places included in the output. The default is 10 decimal places, and maximum is 20 decimal places. Example 1 USD to EUR = 0.874852 with decimal_places=3, the output returned will be EUR = 0.875
`crypto`	String	OPTIONAL – If 'true' then this endpoint will return data for the following crypto currencies: ADA, BCH, DOGE, DOT, ETH, LINK, LTC, LUNA, UNI, XLM and XRP

3   Appendix 1 – API Alerts

This table outlines the various alerts that you could potentially encounter.

SCENARIO	DETAILS	MESSAGE
General Server error	XECD API will return HTTP Status Code 500 Internal Server Error.	{"code": 0, "message": "An unexpected error occurred", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}
Authentication Invalid Credentials	XECD API will return 401 Unauthorized Message.	{"code": 1, "message": "Bad credentials", "documentation_url": "https://xecdapi.xe.com/docs/v1/"
Failed login Limit	After detecting several requests that include your account ID but an invalid API key within a short period, the API will temporarily reject all authentication attempts you make (including ones with a valid API key) with 403 Forbidden error message.	{"code": 2, "message": "Maximum number of login attempts exceeded. Please try again later.", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}
Monthly Rate Request Limit Exceeded	Occurs when the account has exceeded allotted rate requests for the month.	{"code": 3, "message": "Monthly rate limit exceeded.", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}
Usage Restriction (Throttling)	All requests made to the API are limited over a time period known as the usage restriction window (Throttling). Once you go over the limit you will receive an error message.	{"code": 4, "message": "Current interval rate limit exceeded.", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}
No Access to Historic Rate	Occurs for free trial accounts that attempt to get historic rates over 30 days prior to free trial start date.	{"code": 5, "message": "Not authorized to access rates for date {0}", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}, where {0} is the requested date
User Error	XECD API will return HTTP Status Code 400 Bad Request.	{"code":6, "message": "An unexpected error occurred", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}

No Rates for Requested Currency and Date	Occurs when a valid currency is not found at the requested date/time	{"code": 7, "message": "No {0} found on {1}", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}, where {0} is the currency and {1} is the date/time in the format yyyy-MM-dd'T'HH:mmZ
Rates Not Available	This alert will be returned when there are no rates available for the requested date/time.	{"code": 8, "message": "Rates not available on requested date {0}", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}, where {0} is replaced by the date/time in the format yyyy-MM-dd'T'HH:mmZ
Free Trial Ended	Occurs when a user attempts to access XECD API with an account where the free trial period has ended	{"code": 9, "message": "Free trial ended", "documentation_url": "https://xecdapi.xe.com/docs/v1/"}
No Rates Available on requested dates	This alert will be returned when there are no rates available for the requested range of date/times.	{"code":10,"message":"No rates available between {0} and {1}","documentation_url":"https://xecdapi.xe.com/docs/v1/"}, where {0} and {1} are replaced by the start and end date/times in the format yyyy-MM-dd'T'HH:mmZ
Future Date	This alert will be returned when the date/time requested occurs in the future.	{"code":11,"message":"Date {0} is in future","documentation_url":"https://xecdapi.xe.com/docs/v1/"}, where {0} is replaced by the date/time in the format yyyy-MM-dd'T'HH:mmZ
Invalid Date Range	This alert will be returned when the start date/time occurs after the end date/time.	{"code":12,"message":"Date range error: start date {0} is after end date {0}","documentation_url":"https://xecdapi.xe.com/docs/v1/"}, where {0} and {1} are replaced by the start and end date/times in the format yyyy-MM-dd'T'HH:mmZ
Results Requested Exceeds Per Page Limit	This alert will be returned when number of results per page requested exceeds the limit.	{"code":13,"message":"Number of results per page requested {0} exceeds maximum per page of {1}","documentation_url":"https://xecdapi.xe.com/docs/v1/"}, where {0} is replaced by the requested number of rates per page and {1} is replaced by the maximum number of rates per page.
Invalid Year	Occurs when an invalid year is specified.	{"code":14,"message":"Year {0} is invalid","documentation_url":"https://xecdapi.xe.com/docs/v1/"}
Invalid Month	This alert will be returned when an invalid month is requested.	{"code":15,"message":"Month {0} in the year {1} is invalid","documentation_url":"https://xecdapi.xe.com/docs/v1/"}

Unauthorized Access	Occurs for any accounts that attempt to access an endpoint that is currently for internal use only.	{"code":16,"message":"Not authorized to access this endpoint","documentation_url":"https://xecdapi.xe.com/docs/v1/"}
Invalid Currency	Occurs when an invalid currency code is specified	{"code":17,"message":"{0} is an invalid currency. Please, use /currencies for valid list of currencies","documentation_url":"https://xecdapi.xe.com/docs/v1/"}
Invalid Days In Period	Occurs when an invalid number of days in a period is specified in the stats endpoint	{"code":18,"message":"Days in period {0} is invalid","documentation_url":"https://xecdapi.xe.com/docs/v1/"}
Stats Start Date and End Date Limit	Occurs when stats endpoint is called with start date and end date more than 1 year apart	{"code":19,"message":"Start date and end date cannot be more than 1 year apart","documentation_url":"https://xecdapi.xe.com/docs/v1/"}
Package Limit Alerts	This alert is sent via Email to the email address we have on file. When you are nearing your package limit for the current month Xe will attempt to send you email alerts. Emails will be sent once you've reached 75%, 90% and 100% of your authorized API request count.	Please note that your account, identified by account key [Account ID] assigned to [Company Name], has used [75%], or more, of your XE Currency Data monthly package allowance. Once you reach 100% you will no longer be able to access the API until your monthly request count resets. Your request count will reset on [XX,XX,XXXX]. Should you need more information or wish to review the suitability of your current subscription plan for your needs please contact us.