General instructions for application developers

Contents

This document describes guidelines for the implementation of the technical API of the Positive credit register from the system integration perspective. The message structures, processing rules and use of services are described in other documents:

- Request for a credit register extract – API description
- Reporting data on loan contracts – API description
- Checking loan data – API description
- API processing rules and error codes
- Message examples
- Content of message examples
- Schema descriptions
- Reporting data to the Positive credit register

The purpose of this document is to specify the guidelines for the technical implementation with a sufficient level of detail to allow the users to ensure that the technologies they choose meet the requirements of the Positive credit register's service API. The document is also of assistance when the parties specify and implement their own systems.

1. Description of data communications

1.1. Identification and right of access to API

A user calling the Positive credit register API is identified by a certificate. Separate instructions on how to acquire a certificate will be provided later.

When the user is calling an API, the certificate previously assigned to the user must be transmitted with the call. The party calling the API is identified by the certificate. The tool used for the identification is SSL/TLS client authentication. The certificate is valid for two years.

The Business ID specified in the certificate must be the same as the Business ID of the data notifier, i.e. each lender must have a certificate of its own.

The right of access to the APIs is granted when an organisation signs up as a loan contract notifier. Separate instructions will be provided on how to sign up (to be published later).

1.2. TLS encryption setting

Data is transmitted between the Positive credit register API and the client system on a HTTPS/TLS protected connection. To establish the connection, version 1.2 or 1.3 of the TLS protocol must be used.

The API user's system must support one of the following combinations of crypto algorithms (cipher suite) used in the TLS 1.2 or 1.3 protocol:

- TLS_AES_128_GCM_SHA256
- TLS_AES_256_GCM_SHA384
- TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

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- TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
- TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
- TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384

1.3. Protocols

The APIs comply with the general procedures of the HTTP protocol as regards the return codes, for example. The transmission protocol used is the HTTPS protocol. The POST method is always used in the APIs.

1.4. Connection time-out settings

The recommended setting for connection time-out in all APIs is 60 seconds.

1.5. Correct spelling of messages

The codeset used is UTF-8.

Request and response messages are usually in JSON format.

Further information about JSON format (json.org)

In the API user's messages, the spelling of the data field name is not relevant to receipt. For example, "IsPeerToPeerLoanBroker" and "ispeertoerloanbroker" are both acceptable.

In Boolean fields, the values "true" and "false" must always be written with a small initial letter.

In the messages returned by the system, the data field names are written in camel case format. In other words, the first letter of the field name is a small letter, but the other words used in the name begin with a capital letter: "isPeerToPeerLoanBroker".

2. Practices of reporting data on loan contracts

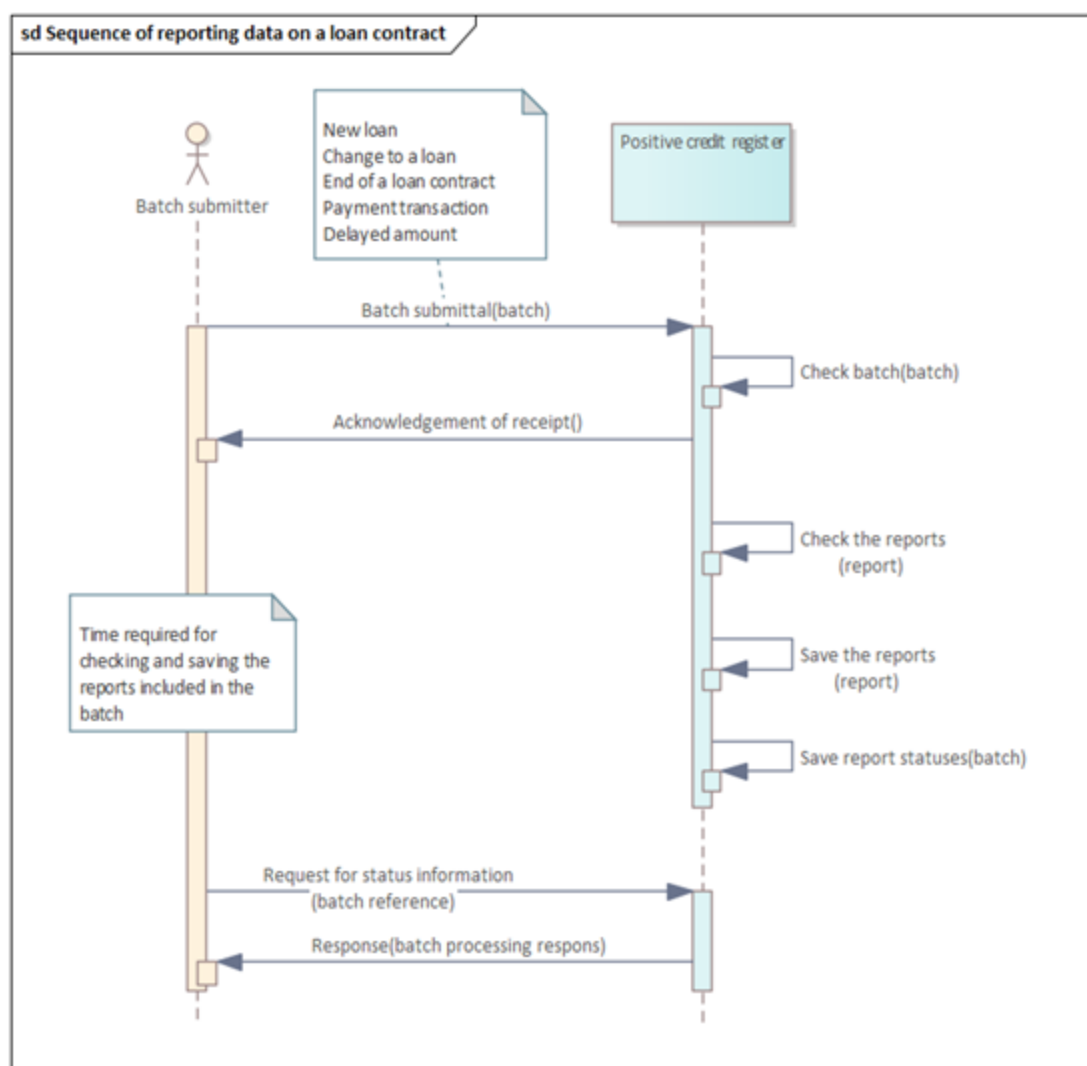The sequence of reporting data is depicted in Figure 1.

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Figure 1. Sequence of reporting data on loan contracts

2.1. General limitations relating to the reporting of loan data

Subject	Limitation	Comment
Number of reports included in a batch	1–10,000 reports	
Maximum batch size	50 MB	Does not concern batches with payment transactions
Maximum size of a batch with payment transactions	10 MB	

2.2. Reporting data on loan contracts

Loan contract data must be reported in batches. A batch may contain reports from only one lender (one Business ID). In addition, the batch may contain only one kind of reports. For example, it may contain reports on new loans or reports on payment transactions, but not both. The batch reference assigned to a batch must always be unique to the lender. In addition, the

report references assigned to reports must be unique within the batch. In other words, a batch may not contain several reports with the same report reference.

Instead of sending individual reports, the lender collects reports in batches and sends a recommended number of reports in one go. The recommended value is preliminary and may still change. The recommended value should therefore be parameterised, i.e. upper and lower limits should be set for the number of reports. In addition, the limits should be modifiable. If necessary, an individual report may also be submitted.

Preliminary recommendation for all report types:
As many reports as possible should be included in a batch. The maximum size of the batch is 10,000 reports.

Several batches can be sent in parallel. However, the order in which the batches sent in parallel are processed and saved cannot be guaranteed.

If the batch contains batch-level errors, the batch will be rejected upon receipt, and it will not be processed. An error is a batch-level error if, for example, the certificate identifier does not match with the lender's Business ID, the batch reference is not unique or the batch does not contain any reports. Because an invalid batch is not accepted for processing, the user cannot inquire the processing status of such a batch.

2.3. Batch status inquiry

The batch submitter must ensure that the Positive credit register has received and saved the data submitted. To do this, the submitter inquires the status of the batch. The submitter may not re-send the batch until after receiving a processing response indicating that the batch has been processed.

If some of the reports included in the batch are rejected, the submitter must correct the errors and then re-send the rejected reports in a new batch. A new batch reference (BatchReference) must be created for the new batch. The processing response contains a list of the report references of the approved and rejected reports.

If all the reports included in the batch are rejected, the submitter must correct the errors and re-send the entire batch. Also in this case, a new batch reference (BatchReference) must be created for the batch.

After submittal, the batch submitter may inquire the status of the batch at 5-minute intervals after receiving the acknowledgement of receipt. The number of the queries made by the submitter is limited to 300 requests during 5 minutes. If the status returned by the system is 'Being processed' or if the system does not send a response at all, the submitter can inquire the status again after 5 minutes. The recommendation for the interval between the status inquiries may change, so the interval should be parameterised in the system from which the data is sent.

If after 2 hours of inquiries, the system still returns the status 'Being processed' or does not respond at all, the interval between the inquiries should be prolonged to 30 minutes, for example. In this situation, the user is also requested to submit an error report to the register through a channel that will be specified later.

The processing response is stored in the Positive credit register for a period of three months.

3.   Practices of requesting a credit register extract

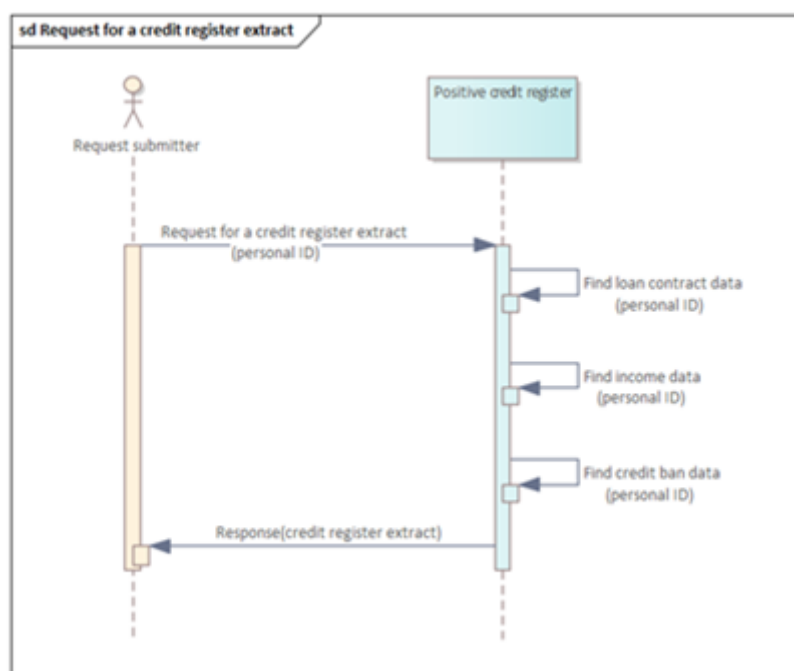The sequence of requesting a credit register extract is depicted in Figure 2.

Figure 2. Sequence depicting the request for a credit register extract

In a request message, the lender can request a credit register extract for one individual at a time. The lender can send several request messages in parallel, i.e. simultaneously. However, if the lender collects a lot of requests together over a certain period of time and makes, for example, hundreds of requests in one go, they may not all be sent to the Positive credit register simultaneously.

4.   Description of APIs

The data content format used in the calls is JSON. The data content of the requests and responses is described in greater detail in the API documentation.

4.1. APIs for reporting data on loan contracts

The loan data to be reported includes a new loan, changes to a loan, payment transactions, delayed amounts and the end of a loan contract. In all APIs, reports are submitted as a list. A batch may not contain several reports on the same loan. The data content of different APIs is described in greater detail in the document 'Reporting data on loan contracts – API description'.

New loan
A new loan is reported by sending a batch in JSON format to the HTTP API by using the POST method.

You can check the processing status of the batch by making an API call described later in this document. If errors are detected in the processing of the batch, the API returns an error message. If no errors are detected, the API returns a success message.
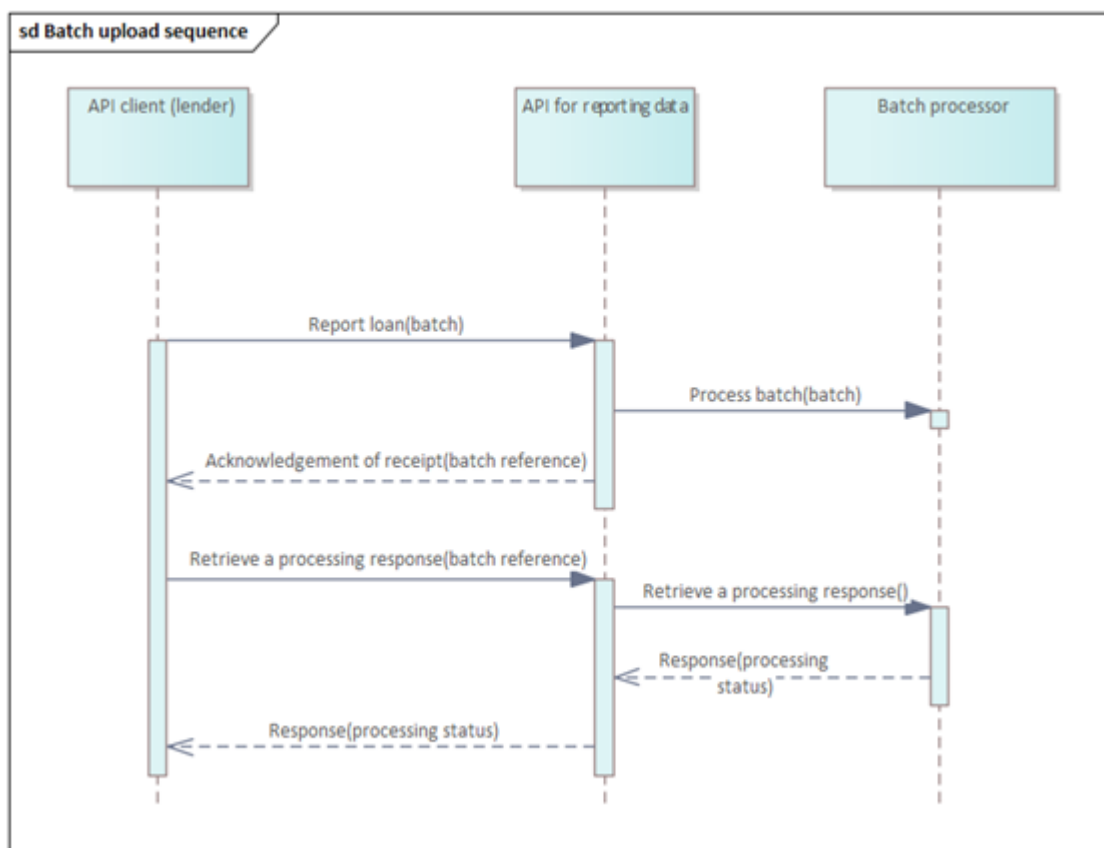

Figure 3. Batch upload sequence

Changes to loan contract information
When changes to loan contract information are reported, the data content used is almost identical to that of new loan contracts. When information is changed, the following rules are followed:

1. If the loan number changes, both the current loan number and the new loan number must be reported.
2. In addition to the changed data, any previously submitted data that remains unchanged must also be submitted.

End of a loan contract
Information about the end of a loan and about the transfer of a loan to another lender are reported by using the same data content. Whether some data fields are required or not depends on whether the end or transfer of a loan contract is reported.
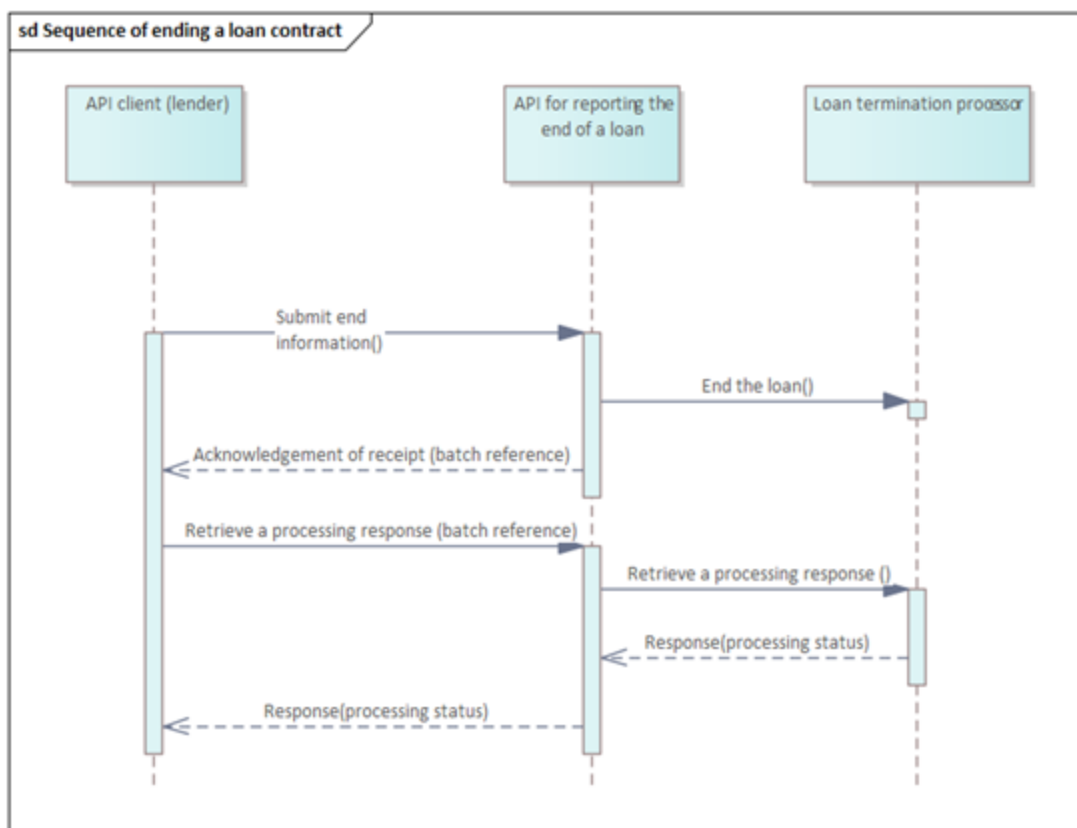
Figure 4. Sequence of ending a loan contract

Payment transaction
The lender may not report a new payment transaction for a loan until after receiving a processing response showing that the previously submitted payment transaction has been successfully processed.

Delayed amount
Delayed amounts related to an active loan are reported with the POST method in accordance with the API description.

Batch status inquiry
You can check the status of a batch by making an API call with the POST method. The system will return a list of successfully processed reports and invalid reports. If errors were detected in the batch, the system will also return the errors. Read more about correcting the errors detected in a report in section 6 of these instructions.

4.2. API for requesting a credit register extract

The lender sends a request for a credit register extract to the Positive credit register. The register processes the request and sends a response message containing the person's credit data, income data and information about a valid ban on credits, if a ban has been set. The data content is described in greater detail in the document 'Request for a credit register extract – API description'.
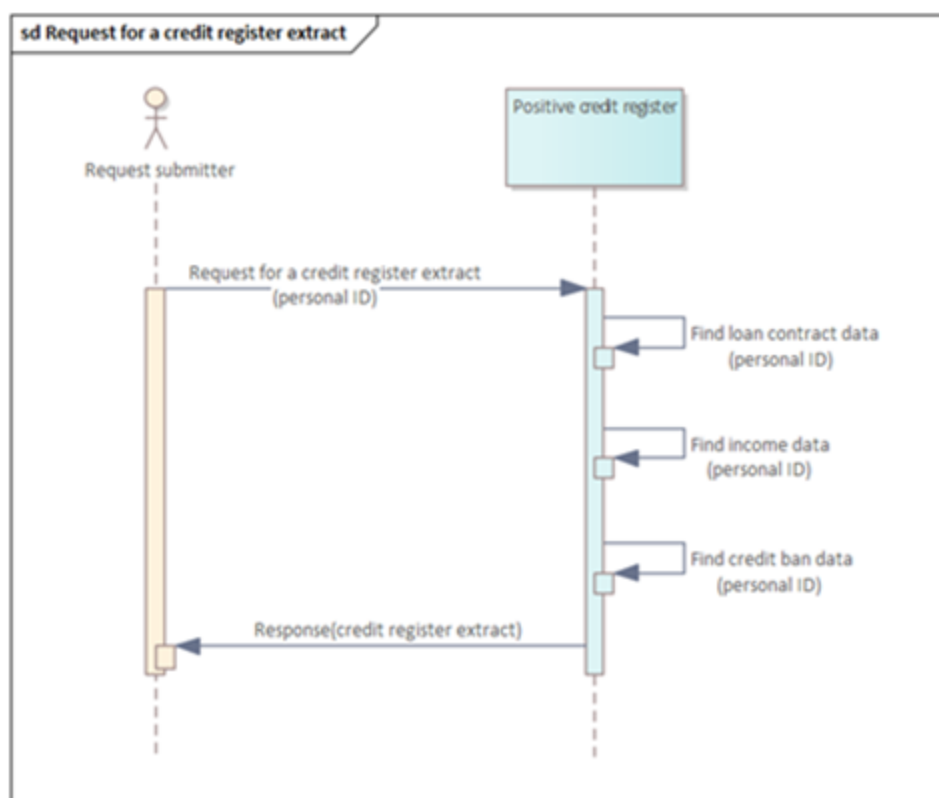
Figure 5. Sequence depicting the request for a credit register extract

4.3. API for checking loan data

The lender can check the data on an individual loan with the POST method through the API for checking loan data. In the check request, the loan is identified by the loan number. The system returns the basic loan data reported to the register, information on the borrower, type of loan and collateral, the latest payment transaction, any delayed payments and information on the end of the loan contract. The more detailed data content of the request message and the response message are described in the document 'Checking loan data – API description'.
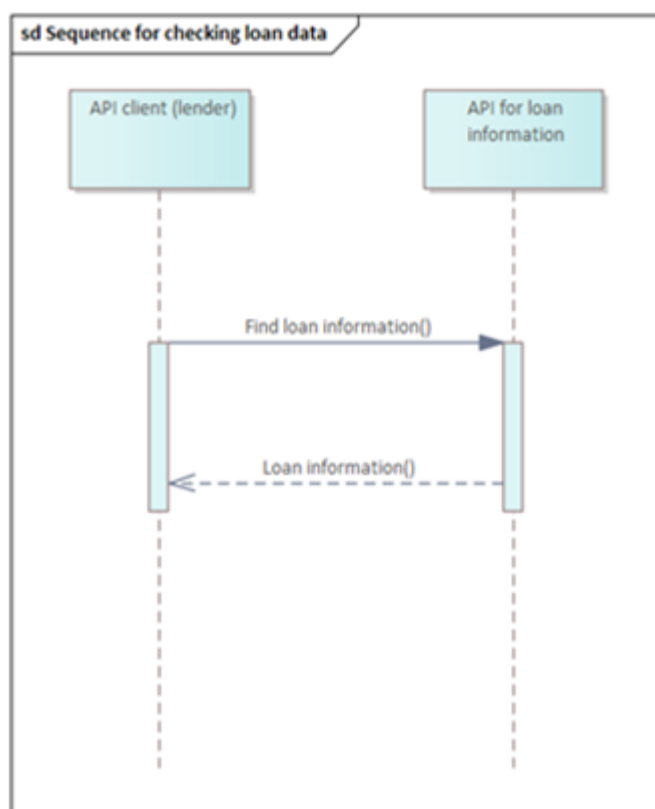
Figure 6. Sequence for checking loan data

5. Errors

5.1. HTTP API error codes

Errors detected in HTTP APIs are returned to the caller <u>in accordance with the standard HTTP status codes</u>.

In general, the API uses the standard HTTP status code classification:
2xx: request has been received and accepted
4xx: error regarding access right or content in the request
5xx: server failed to fulfil the request.

The typical status codes used are:

Status code	Description
200	The request succeeded.
202	The batch was accepted for processing.
400	The batch reference is missing from the Header, or the reference is not in the correct form.
403	The batch submitter does not have the right to use the API, or the certificate used in the API is wrong.
403	The certificate has been revoked. The batch submitter does not have the right to use the API.
404	The item requested is not found.
409	The batch reference is not unique.

413	The batch size is too large.
422	The data content of the batch is missing.
429	Too many requests.
500	System error
502	Connection error
503	Connection error, service not available

During service breaks, the API returns HTTP status code 503.

5.2. Errors in receipt of a batch

If errors are detected in the batch during receipt, the system immediately returns an error status and error message. Such errors include, for example, an incorrect or outdated certificate, too large batch size or errors in batch data.

5.3. Errors in processing of a batch

If errors are detected in the received batch during processing, the errors are listed in the processing response.

6. Ways of use

This section describes the use of the Positive credit register's APIs for different purposes. The APIs are described in greater detail in the API documentation.

6.1. Loan life cycle

New loans must be submitted to the register through the API for new loans. After this, the lender can report payment transactions, delayed amounts or changes for the loan. When the loan relationship ends, the lender reports the end or transfer of the loan.

No delayed amounts can be reported for a loan that has ended. In necessary, however, the lender can re-activate the loan, after which delayed amounts can again be reported.

It is recommended to submit the last payment transaction of the loan before the loan is reported as ended. Technically, it is possible to report payment transactions even after the loan has ended. This may be necessary if the lender has reported a payment transaction and the end of the loan in succession within a short period of time, and the report on the end of the loan is processed before the payment transaction.

6.2. Reporting a new loan

A new loan is reported through the API with an HTTP POST call. The batch submitted through the API must contain information on at least one loan contract. During the transmission of the batch, some check routines are run on the batch and the call. Based on the result of the checks, either the call is rejected, or the batch is accepted for processing.

During the processing, the batch is checked in greater detail. You can check the processing status by submitting a batch status inquiry. The API's response message will indicate any errors detected in the batch.

During data submittal, two APIs will be called in accordance with the sequence described below.
1. Send the batch.
2. Check the acknowledgement of receipt for any errors.
3. Retrieve the processing response. If the processing is still ongoing, you must retrieve the processing response again until the response indicates that the processing is finished.
4. Check the processing response to see if the processing is finished or if errors were detected in the batch.
5. If errors are indicated in the processing response, the reports in question must be corrected and sent again with a new batch reference. In that case, do not use the report type 'error correction'.

6.3. Changes to loan contract information

Changes to loan contract information are reported in the same way as new loans. The data content is the same as when new loans are reported, with the exception of the following rules:
1. The loan number must be the same as the previously reported loan number. If the loan number changes, both the current loan number and the new loan number must be reported.
2. In addition to changed data, data that has not changed must also be submitted in the same report.

6.4. Reporting a payment transaction

Payment transactions related to loans are reported with an HTTP POST call. The call comprises a list with data on the payment transactions and necessary information on the related loans. Several reports on payment transactions related to the same loan cannot be sent in the same batch.

Payment transactions relating to the same loan and made during a single day can be collected in the same report in such a way that the payment amounts are added together and only one payment transaction report is submitted on the loan in question.

The register does not organise payment transactions relating to the same loan based on the payment date indicated in the report. When the lender submits a payment transaction report, a time of report creation (timestamp) is generated for the report. On the basis of the timestamp, the register can organise the payment transactions relating to the same loan, if needed. Where lump-sum loans are concerned, the data given in the most recent payment transaction report (has the most recent timestamp) remains valid. If you leave a field for certain data blank in the report, it will replace the previously submitted data. Payment transactions related to a running-account loan, on the other hand, can be submitted on separate occasions without that a field for interest or other expense left blank would replace the previously submitted data. In other words, the most recently reported data about each interest or other expense remains valid.

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6.5. Reporting a delayed amount

Delayed amounts related to loans are reported with an HTTP POST call. The call comprises a list with data on the delayed amounts and necessary information on the related loans.

6.6. Reporting the end of a loan

The end of a loan contract is reported with an HTTP POST call. The end of more than one loan can be reported in the same call.

6.7. Reporting the transfer of a loan

The transfer of a loan to another lender is reported in the same way as the end of a loan, with the exception that information on the reassignee is required.

6.8. Checking loan data

The lender can check the data on an individual loan through the API for checking loan data. The Checking loan data API is designed for spot checks and investigation of suspected errors, and it is not used for checking data on each loan granted by an individual lender, for example.

6.9. Correcting errors

If the processing response indicates that there are errors in the submitted batch, the lender must correct the invalid reports and re-submit them with a new batch reference. Because the invalid reports were not stored in the register, the lender does not separately state that it is correcting errors.

If the lender detects errors in the data of reports already submitted, it can correct the errors by selecting 'error correction' as the report type.