

## Verification Guide

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## Overview

MX's instant account verification allows partners to retrieve the account and routing information for an end user in just a few simple steps. These steps are very similar to those for standard aggregation.

Verification requires requests to several APIs. Partners may optionally use the Connect widget to simplify their workflow. The Connect widget simplifies creating members and answering multi-factor authentication while providing a ready-made user interface for these verification steps.

The general workflows you'll follow depend on whether you decide to use the Connect widget or build your own UI that relies on our API.

For detailed information on requirements, errors, standards, and conventions for the various APIs and products involved in verification, please see the documentation for Nexus , Real Time, SSO, and MoneyMap.

### WORKFLOW WITH THE CONNECT WIDGET:

1. Creating a `user` with a request to the MDX Real Time API;
2. Loading the Connect widget in verification mode on your website or within a WebView;
  - MX also recommends loading Connect with the `wait_for_full_aggregation` option set to `true`; this delays the *member connected* postMessage until after the entire verification and data-gathering process has been completed;
3. End users create a `member`, launch a verification job, and respond to MFA within the Connect widget;
4. Getting an API token with the SSO API;
5. Getting a session token with the Nexus API;
6. Polling the member's verification status with the Nexus API;
  - A member with a complete, successful verification will have `"connection_status":"CONNECTED"` and `"is_being_aggregated":false`;
7. Once verification has completed, getting the verification data with another request to the Nexus API.

### WORKFLOW WITH APIS ONLY

1. Creating a `user` (MDX Real Time API);
2. Getting an API token for that `user` (SSO API);
3. Getting a session token for that `user` (Nexus API);
4. Getting institution information (Nexus API);
5. Get institution-required credentials (Nexus API);
6. Creating a `member` with the correct institution code and credentials required by that institution (Nexus API);
7. Calling the *verify* endpoint (Nexus API);
8. Polling the member's verification status (Nexus API);

9. Answering MFA if necessary (Nexus API);
10. Reading the member's `account_numbers` (Nexus API).

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# Connect widget implementation

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## 1. Create a user

**Real time base URL:** `https://int-live.moneydesktop.com/:client_id`

**Endpoint:** `POST /users`

**Example request:**

```
curl -i -X POST https://int-live.moneydesktop.com/:client_id/users.json \
-H "Content-Type: application/vnd.moneydesktop.mdx.v5+json" \
-H "Accept: application/vnd.moneydesktop.mdx.v5+json" \
-H "MD-API-KEY: :api_key" \
-d '{
  "user": {
    "birthdate": "1959-07-17",
    "credit_score": "718",
    "email": "walterwhite@example.com",
    "first_name": "Walter",
    "gender": "MALE",
    "id": "U-39XBF7",
    "last_name": "White",
    "metadata": "Additional Information",
    "phone": "5055551234",
    "zip_code": "87101"
  }
}'
```

**Example response:**

```
{
  "user": {
    "id": "U-39XBF7",
    "birthdate": "1959-07-17",
    "gender": "MALE",
    "first_name": "Walter",
    "guid": "USR-c4321d57a-9ae4-1fe3-6c4e-96a84fb92b50",
    "last_name": "White",
    "metadata": "Additional Information",
    "credit_score": 718,
    "email": "walterwhite@example.com",
    "phone": "(505) 555-1234",
    "zip_code": "87101",
    "is_disabled": false,
    "logged_in_at": null
  }
}
```

Further details

## 2. Load the Connect widget

There are two methods for loading the Connect widget: either getting a URL through the SSO API or using the widget loader script.

In either case, the Connect widget *must* be loaded with the `mode` configuration option set to `verification`.

Partners are also strongly encouraged to use the `wait_for_full_aggregation` option as well. This delays the *member connected* postMessage until after the verification process is totally complete. This makes it easier for partners to keep the widget open for the correct period of time with the minimum number of API calls.

Partners who choose not to use the `wait_for_full_aggregation` option will need to keep track of the member's state through API calls, and may need to re-load the Connect widget with a specific set of options in order to resolve an actionable member state.

## 2. Option A — Use the SSO API

**i** The endpoint described below also supports JSON encoding for both requests and responses.

`POST /users/:id/urls`

Example request

```
curl -i -X POST https://int-ssso.moneydesktop.com/:client_id/users/:id/urls.xml \
-H 'Content-Type: application/vnd.moneydesktop.sso.v3+xml' \
-H 'Accept: application/vnd.moneydesktop.sso.v3+xml' \
-H 'MD-API-KEY: :api_key' \
-d '<url>
  <type>connect_widget</type>
  <is_mobile_webview>true</is_mobile_webview>
  <mode>verification</mode>
</url>'
```

Example response

```
{
  "url": {
    "url": "https://int-widgets.moneydesktop.com/md/mobile_master/XXXXXX",
    "type": "connect_widget",
    "user_id": "USR-1234"
  }
}
```

```
<url>
<url>https://int-widgets.moneydesktop.com/md/mobile_master/XXXXXX</url>
<type>connect_widget</type>
<user_id>USR-1234</user_id>
</url>
```

This endpoint allows partners to get a URL by passing the widget type in the request body along with the desired configuration options. For instance, partners whose widget implementations require the use of mobile WebViews should set the `is_mobile_webview` option to `true`. This option allows partners to receive the WebView alternative to postMessages.

Options may be tied to a particular widget type; these are described in the table below.

Partners may also pass an optional `Accept-Language` header.

Note that this is a `POST` request.

#### CONFIGURATION OPTIONS

Configuration Option	Description	Type	Widget
<code>is_mobile_webview</code>	Renders the widget in a mobile WebView. Executes URL updates in place of the JavaScript event <code>postMessages</code> .	Boolean	All
<code>color_scheme</code>	Load the Connect widget in the specified <code>color_scheme</code> ; options are <code>light</code> and <code>dark</code> . Defaults to <code>light</code> .	String	Connect
<code>current_institution_code</code>	Load the widget into the credential view for the specified institution.	String	Connect
<code>current_institution_guid</code>	Load the widget into the credential view for the specified institution.	String	Connect
<code>current_member_guid</code>	Load to a specific member that contains an error or requires MFA from the most recent job. Members with no errors will return to search. <code>current_member_guid</code> takes precedence over <code>current_institution_code</code> .	String	Connect
<code>disable_institution_search</code>	When set to <code>true</code> , the institution search feature will be disabled and end users will not be able to navigate to it.	Boolean	Connect
<code>include_transactions</code>	When set to <code>false</code> while creating or updating a member, transaction data will not be automatically aggregated. Future manual or background aggregations will not be affected. Defaults to <code>true</code> .	Boolean	Connect
<code>mode</code>	Loads the Connect widget into a specified mode; options are <code>verification</code> and <code>aggregation</code> . Defaults to <code>aggregation</code> .	String	Connect
<code>ui_message_version</code>	Use this to specify which version of <code>postMessage</code> events are triggered. <i>All new implementations should use version 4. Prior versions are deprecated.</i>	Boolean	Connect
<code>update_credentials</code>	Loads widget to the update credential view of a current member. Optionally used with <code>current_member_guid</code> .	Boolean	Connect
<code>wait_for_full_aggregation</code>	Loads connect normally, waits until the aggregation job is complete in order to fire the <code>onSuccess</code> <code>postMessage</code> to allow clients to have transactional data by the time the widget is closed.	Boolean	Connect

#### CONFIGURATION SCENARIOS FOR THE CONNECT WIDGET

Below we list several scenarios which partners may wish to present to end users, along with the correct configuration settings for each situation.

Scenario	Settings
Answer MFA for a specific member	Set the <code>current_member_guid</code> to a member whose <code>connection_status</code> is <code>CHALLENGED</code> . Connect will load the MFA view so the end user can respond to the MFA challenge.
Disable search when loading a specific institution	Set <code>disable_institution_search</code> option to <code>true</code> and set the <code>current_institution_code</code> or <code>current_member_guid</code> option. Connect will load the login view for the specified institution, but will not allow the end user to navigate to the search view.

Scenario	Settings
Resolve a member's error(s)	Set the <code>current_member_guid</code> option to a member in an error state. Connect will load in the error view so the end user can resolve the error.
Run aggregation but exclude transactions	Set the <code>include_transactions</code> option to <code>false</code> when creating or updating a member. Connect will not automatically aggregate transaction data. Future manual or background aggregations will not be affected.
Run aggregation with a specific institution	Set the <code>current_institution_code</code> option to the desired institution's code, but do not set the <code>mode</code> option. Connect will load the login view for that institution.
Run verification with a specific institution	Set the <code>current_institution_code</code> option to the desired institution's code, and set the <code>mode</code> option to <code>verification</code> . Connect will load the login view for that institution.
Update a member's credentials	Set the <code>current_member_guid</code> to the desired member's GUID, and set the <code>update_credentials</code> option to <code>true</code> . Connect will load the update credentials view for the member.
Get <code>onSuccess</code> postMessage after aggregation is complete	Set <code>wait_for_full_aggregation</code> option to <code>true</code> and load connect normally. Connect will wait for the aggregation job to complete before sending the <code>memberAdded</code> postMessage that triggers the <code>onSuccess</code> postMessage. Ensuring that transactional data is available before moving on.

## 2. Option B — Use the widget loader

### GET A URL

First, get a URL as described in option A above.

### ADD THE WIDGET LOADER SCRIPT TO THE PAGE

```
<html>
<head>
  <title>My Web Page</title>
  <script type="text/javascript" src="https://widgets.moneydesktop.com/assets/mx-widgetloader.js"></script>
</head>
<body>
</body>
</html>
```

Our widgets are loaded onto the page through a custom javascript file we refer to as the "widget loader". This file can be placed anywhere on the page, but as we'll discuss in the next steps, it should be placed before any other code related to the widgets.

### ADD A WIDGET PLACEHOLDER ELEMENT

```
<html>
<head>
  <title>My Web Page</title>
  <script type="text/javascript" src="https://widgets.moneydesktop.com/assets/mx-widgetloader.js"></script>
</head>
<body>
  <div id="md-widget"></div>
</body>
</html>
```

Next, we need to add a placeholder element that our widget loader will use to embed an iframe containing the widget. The element must have an id of `md-widget`. Building upon our example in Step 1, your code should now look something like this:

LOAD THE WIDGET

```
<html>
<head>
  <title>My Web Page</title>
  <script type="text/javascript" src="https://widgets.moneydesktop.com/assets/mx-widgetloader.js"></script>
  <script type="text/javascript">
    var myWidget = new MoneyDesktopWidgetLoader({
      url: 'https://widgets.moneydesktop.com/md/connect/XXXXX',
      width: 850,
      height: 550
    });
  </script>
</head>
<body>
  <div id="md-widget"></div>
</body>
</html>
```

```
<html>
<head>
  <title>My Web Page</title>
  <script type="text/javascript" src="https://widgets.moneydesktop.com/assets/mx-widgetloader.js"></script>
  <script type="text/javascript">
    var myWidget = new MoneyDesktopWidgetLoader();
  </script>
</head>
<body>
  <div id="md-widget" class="md-widget-loaded">
    <iframe width="850" height="550" border="0" frame="0" frameborder="0" allowtransparency="true" src="https://widgets.moneydesktop.com/md/connect/XXXXX" r
  </div>
</body>
</html>
```

Next, we have to tell the widget loader to load the widget into the placeholder element. We do this by creating a new instance of the `MoneyDesktopWidgetLoader` class, which is defined in the widget loader script.

When you instantiate `MoneyDesktopWidgetLoader`, you must pass in an object with at least the required `url` parameter and possibly one or more optional parameters.

The widget loader will wait until the page has been loaded and then load the widget into the placeholder element. The resulting HTML on the page will look similar to the example on the right.

Parameter		Default Value	Description
autoload	optional	<code>true</code>	Determines if the widget should load automatically (see Loading widgets at different times).
config	optional		This contains an object in which you can pass several configuration options specific to a given widget type, such as <code>mode</code> and <code>is_mobile_webview</code> .
height	optional	<code>600</code>	The height (in pixels or percentage) of the widget.
id	optional	<code>'md-wi dget'</code>	Tells the widget loader what element to place the widget in (see Loading more than one widget).

Parameter	Default Value	Description
width	optional <code>'100%'</code>	The width (in pixels or percentage) of the widget.
url	required	The URL of the widget, received through an SSO request.

### 3. End users enter credentials and launch verification job

The connect widget handles the creation of a `member` as well as the verification and MFA processes.

Partners need to listen for a *member updated* postMessage event from the Connect widget which will provide both the necessary `member_guid` and the current `connection_status`. If your implementation uses WebViews, you'll need to listen for our postMessage alternative for WebViews.

When the `connection_status` value is `CONNECTED`, you can move on to step 4.

Or, alternatively, if the end user closes the Connect widget early or some other problem occurs before you see a `CONNECTED` status, you can simply use the `member_guid` to immediately check the member's verification status via Nexus as in step 4.

You may also choose to set up a member webhook which will deliver the information you need as the member's state changes.

### 4. Get an API token

**SSO base URL:** `https://int-sso.moneydesktop.com/:client_id`

**Endpoint:** `GET /users/:id/api_token`

**Example request:**

```
curl -i https://int-sso.moneydesktop.com/:client_id/users/:user_id/api_token.xml \
-H "Accept: application/vnd.moneydesktop.sso.v3+xml" \
-H "MD-API-KEY: :api_key"
```

**Example response:**

```
{
  "api_token": {
    "token": "XXXXXX"
  }
}
```

This endpoint returns an `api_token` which can then be used to open a Nexus session. The `user_id` must match the `id` specified when creating a the `user`.

Each `api_token` is one-time use and expires in ten minutes. A fresh `api_token` must be requested each time a Nexus session is initiated.



## 5. Open a Nexus session

**Nexus base URL:** `https://int-data.moneydesktop.com`

**Endpoint:** `POST /sessions`

**Example request:**

```
curl -i -X POST https://int-data.moneydesktop.com/sessions \
-H 'MD-API-TOKEN: VVCFDQY3Iig30DM3LTmNDItMmY10S03NDZhLWNTcwNDc2NGRiNXwzZjg1MTQ4YzAyMThkZjI2OTI2ZjFjYmJhNmY1MzU2MTI0MThiNTIyOGVjYjg4YTRjNjlljODJhYTQ3MMwM' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json' \
-d '{"session":{"skip_aggregation":true}}'
```

**Example response:**

```
{
  "session":{
    "token":"de2uS4jEwSYN7W0eoF_ZiLJQ7rtQaDbA9NkCZr_U4gujctbMw_WZYz7u6q3NMDlTYCSSR703ec1f0P2wArN0g"
  }
}
```

Use this endpoint to get a session token. This session token must be sent as a header with each Nexus request. Each Nexus session is opened in the context of a single user associated with that session token.

When using the verification endpoints the *create session* request body should contain `"skip_aggregation":true`, as shown in the example below. This will prevent automatic aggregation being initiated for the user's existing members when the session is opened. Partners can then choose to aggregate the existing member, or to proceed directly to the *verify member* endpoint.

## 6. Check the member's verification status

`GET /members/:member_guid`

**Example request:**

```
curl -i https://int-data.moneydesktop.com/members/MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b \
-H 'MD-SESSION-TOKEN: CWforZl1Vn2vC_v6H4rnQRT1DwPpDouJAV-_5TBmiQRAAtA8rs0G_BoajTi0SsL0A3bd-bmHXlA-eQzc9ywItKg' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

**Example response:**

```
{
  "member":{
    "aggregated_at": "2015-04-13T12:01:23-06:00",
    "connection_status": "CONNECTED",
    "connection_status_id": 6,
    "connection_status_message": "Connected to Wells Fargo Bank",
    "external_guid": null,
    "guid": "MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b",
    "institution_guid": "INS-33a533a9-9ead-540c-d17d-bdc92c96be17",
    "is_being_aggregated": false,
  }
}
```

```

    "is_managed_by_user": true,
    "is_manual": false,
    "is_oauth": false,
    "is_user_created": true,
    "metadata": "Additional information",
    "most_recent_job_guid": "J0B-cc7ac3f1-351a-667f-be7c-93a484df6ebf",
    "name": "Wells Fargo Bank",
    "needs_updated_credentials": false,
    "revision": 42,
    "successfully_aggregated_at": "2015-04-13T12:01:23-06:00",
    "user_guid": "USR-d2219ed6-7d5d-2fad-c332-17fb9bafcefa"
  }
}

```

Several fields on the `member` give important information about the state of the verification including `connection_status`, `is_being_aggregated`, `successfully_aggregated_at`. These fields are also used for standard aggregation jobs, hence the reference in their names.

A connection status of `CONNECTED` means that the `member` was successfully authenticated and verification has begun. The `is_being_aggregated` field will tell you whether the verification job has completed; the field will be `true` while verification is taking place and returns to `false` when verification is complete. The `successfully_aggregated_at` field will tell you the exact time that the verification job has completed.

You may need to repeatedly poll this endpoint until either an end state or an actionable state is reached.

Further details.

Depending on the exact state of the member, partners may need to re-load the Connect widget with a specific set of options in order to resolve an actionable member state.

#### MEMBER CONNECTION STATES

Integer value	Status	Definition	Next steps	End-user message
null	null	The member exists but does not have credentials. A member that does not aggregate (e.g., a manual member) will always have this status.	None.	None.
0	CREATED	The member is new and has not yet been aggregated.	Aggregate the member once the end user logs in; poll for a status update.	<code>Connecting to {...}</code> <code>...</code>
1	PREVENTED	MX is preventing aggregation until the member's credentials have been updated.	Display end-user message; after end user has updated their credentials, aggregate again.	<code>The last 3 attempts to connect have failed. Please re-enter your credentials to continue importing data.</code>
2	DENIED	The credentials provided for the member were invalid.	Display end-user message; after end user has updated their credentials, aggregate again.	<code>The credentials entered do not match your credentials at this institution. Please re-enter your credentials to continue importing data.</code>

Integer value	Status	Definition	Next steps	End-user message
3	CHALLENGED	The member has been challenged by multi-factor authentication.	Display end-user message; follow MFA pathway; after the user answers MFA, poll for a status update.	To authenticate your connection to {...}, please answer the following challenge(s).
4	REJECTED	An MFA challenge was answered incorrectly.	Display end-user message; another challenge may follow or aggregation may need to be restarted.	The answer or answers provided were incorrect. Please try again.
5	LOCKED	The financial institution is preventing authentication. The end user must contact the financial institution.	Display end-user message.	Your account is locked. Please log in to the appropriate website for {...} and follow the steps to resolve the issue.
6	CONNECTED	The member was successfully authenticated and data is now aggregating.	Display the account as having been connected.	Connected to [...] ...
7	IMPEDED	The end user's attention is required at their online banking institution, e.g., there is a marketing message that must be viewed, terms and conditions that must be accepted, etc.	Display end-user message.	Your attention is needed at this institution's website. Please log in to the appropriate website for {...} and follow the steps to resolve the issue.
8	RECONNECTED	The member has been migrated to a new data source and aggregation is likely to trigger one-time password MFA. MX will not perform background aggregation in order to avoid unnecessarily disruptive texts, emails, etc. The member must be re-aggregated in the foreground with the end user present.	Aggregate the member once the end user logs in; poll for a status update.	Reconnecting to [...] ...
9	DEGRADED	Aggregation has failed at least three times within a short period of time.	Display end-user message.	We are upgrading this connection. Please try again later.
10	DISCONNECTED	Aggregation has failed at least three times and has not succeeded for at least two weeks.	Display end-user message.	It looks like your data from [...] cannot be imported. We are working to resolve the issue.
11	DISCONTINUED	The connection to this financial institution is no longer available.	Display end-user message.	Connections to this institution are no longer supported. You may create a manual account and use manual transactions to track data for this account.

Integer value	Status	Definition	Next steps	End-user message
12	CLOSED	The end user, MX, the client, or a partner has marked the member as closed.	Display end-user message.	<u>This connection has been closed. You may track this account manually. If reopened, you may connect the institution again.</u>
13	DELAYED	Aggregating the member has taken longer than expected and it has not yet been connected.	Display end-user message; poll for a status update.	<u>Importing your data from {...} may take a while. Please check back later.</u>
14	FAILED	Aggregation failed without being connected.	Display end-user message; try aggregating again later.	<u>There was a problem validating your credentials with {...}. Please try again later.</u>
15	UPDATED	The member has been updated — i.e., credentials have been updated — but it has not yet been connected.	Aggregate the member once the end user logs in; poll for a status update.	<u>Connecting to {...}</u> ...
16	DISABLED	Aggregation has been momentarily paused, but the member is still connected.	Display end-user message.	<u>Importing data from this institution has been disabled. Please contact us if you believe it has been disabled in error.</u>
17	IMPORTED	MX does not have credentials and will not try to aggregate the member until the end user provides credentials.	Display end-user message; re-aggregate after the end user updates credentials.	<u>You must re-authenticate before your data can be imported. Please enter your credentials for {...}.</u>
18	RESUMED	The answer to an MFA challenge was received, but it is not yet clear whether it was correct.	Poll for a status update.	<u>Connecting to {...}</u> ...
19	EXPIRED	The MFA answer was not provided within the time allotted by the financial institution.	Display end-user message; re-aggregate the member if the end user initiates it.	<u>The answer or answers were not provided in time. Please try again.</u>
20	IMPAIRED	The member is missing some or all credentials needed in order to connect.	Display end-user message; re-aggregate after the end user updates credentials.	<u>You must re-authenticate before your data can be imported. Please enter your credentials for {...}.</u>

Integer value	Status	Definition	Next steps	End-user message
21	PENDING	The member is using OAuth to authenticate credentials and still needs to go through the financial institution's OAuth process. A <b>PENDING</b> status will appear only on members less than one hour old with <code>is_oauth: true</code> . Members that stay <b>PENDING</b> longer than one hour will be deleted by MX.	Redirect the end user to the <code>oauth_window_uri</code> provided in the <i>create member</i> response, or request one through the <i>generate OAuth window URI</i> endpoint.	None.

## 7. Read the account numbers

GET `/members/:member_guid/account_numbers`

### Example request:

```
curl -i https://int-data.moneydesktop.com/members/MBR-c6536f4c-61dc-a047-5c45-ee38b8ba812a/account_numbers \
-H 'MD-SESSION-TOKEN: :session_token' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

### Example response:

```
{
  "account_numbers": [
    {
      "account_guid": "ACT-15f3a4de-cb45-d892-4480-6d05576011a8",
      "account_number": "10001",
      "institution_number": "null",
      "routing_number": "68899990000000",
      "transit_number": "null",
      "member_guid": "MBR-c6536f4c-61dc-a047-5c45-ee38b8ba812a",
      "user_guid": "USR-11141024-90b3-1bce-cac9-c06ced52ab4c"
    }
  ]
}
```

If MX has *both an account number and a routing number* for at least one of the member's accounts, that information will be returned when calling *read account numbers*. No information will be returned for accounts that are missing a value for one or both of these fields.

# API-only implementation

## 1. Create a user

**Real time base URL:** `https://int-live.moneydesktop.com/:client_id`

**Endpoint:** `POST /users`

**Example request:**

```
curl -i -X POST https://int-live.moneydesktop.com/:client_id/users.json \
-H "Content-Type: application/vnd.moneydesktop.mdx.v5+json" \
-H "Accept: application/vnd.moneydesktop.mdx.v5+json" \
-H "MD-API-KEY: :api_key" \
-d '{
  "user": {
    "birthdate": "1959-07-17",
    "credit_score": "718",
    "email": "walterwhite@example.com",
    "first_name": "Walter",
    "gender": "MALE",
    "id": "U-39XBF7",
    "last_name": "White",
    "metadata": "Additional Information",
    "phone": "5055551234",
    "zip_code": "87101"
  }
}'
```

**Example response:**

```
{
  "user": {
    "id": "U-39XBF7",
    "birthdate": "1959-07-17",
    "gender": "MALE",
    "first_name": "Walter",
    "guid": "USR-c4321d57a-9ae4-1fe3-6c4e-96a84fb92b50",
    "last_name": "White",
    "metadata": "Additional Information",
    "credit_score": 718,
    "email": "walterwhite@example.com",
    "phone": "(505) 555-1234",
    "zip_code": "87101",
    "is_disabled": false,
    "logged_in_at": null
  }
}
```

Further details

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## 2. Get an API token

**SSO base URL:** `https://int-sso.moneydesktop.com/:client_id`

**Endpoint:** `GET /users/:id/api_token`

**Example request:**

```
curl -i https://int-sso.moneydesktop.com/:client_id/users/:user_id/api_token.xml \
-H "Accept: application/vnd.moneydesktop.sso.v3+xml" \
-H "MD-API-KEY: :api_key"
```

**Example response:**

```
{
  "api_token": {
    "token": "XXXXXX"
  }
}
```

This endpoint returns an `api_token` which can then be used to open a Nexus session. The `user_id` must match the `id` specified when creating a the `user`.

Each `api_token` is one-time use and expires in ten minutes. A fresh `api_token` must be requested each time a Nexus session is initiated.

### 3. Open a Nexus session

**Nexus base URL:** `https://int-data.moneydesktop.com`

**Endpoint:** `POST /sessions`

**Example request:**

```
curl -i -X POST https://int-data.moneydesktop.com/sessions \
-H 'MD-API-TOKEN: VVCFDQY3Iig30DM3LTlmNDItMmY10S03NDZhLWIwNTcwNDc2NGRiNXwzZjg1MTQ4YzAyMThkZjI2OTI2ZjFjYmJhNmY1MzU2MTI0MThiNTIyOGVjYjg4YTRjNjIjODJhYTQ3MmMwMT' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json' \
-d '{"session":{"skip_aggregation":true}}'
```

**Example response:**

```
{
  "session":{
    "token":"de2uS4jEwSYN7W0eoF_ZiLJQ7rtQaDbA9NkCZr_U4gujctbMw_WZYz7u6q3NMDlTYC SSR703ec1f0P2wArN0g"
  }
}
```

Use this endpoint to get a session token. This session token must be sent as a header with each Nexus request. Each Nexus session is opened in the context of a single user associated with that session token.

When using the verification endpoints the *create session* request body should contain `"skip_aggregation":true`, as shown in the example below. This will prevent automatic aggregation being initiated for the user's existing members when the session is opened. Partners can then choose to aggregate the existing member, or to proceed directly to the *verify member* endpoint.

### 4. Get institution information

**Endpoint:** `POST /institutions/search`

**Example request:**

```
curl -i -X POST 'https://int-data.moneydesktop.com/institutions/search?records_per_page=2&page=1' \
-H 'MD-SESSION-TOKEN: YYYY' \
```

```
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json' \
-d '{
  "institution":{
    "name":"Wells Fargo"
  }
}'
```

### Example response:

```
{
  "pagination_data":{
    "total_records_found":31,
    "total_pages":1,
    "current_page":1,
    "records_on_current_page":2
  },
  "institutions":[
    {
      "created_at":"2010-11-19T12:14:32-07:00",
      "guid":"INS-17222afe-eeb3-9ea6-5dac-649af0bebafe",
      "has_checking_accounts":true,
      "has_credit_card_accounts":false,
      "has_investment_accounts":false,
      "has_line_of_credit_accounts":false,
      "has_loan_accounts":false,
      "has_mortgage_accounts":false,
      "has_savings_accounts":true,
      "is_hidden":false,
      "name":"Wells Fargo",
      "popularity":172,
      "supports_account_identification": true,
      "supports_account_verification": true,
      "updated_at":"2013-06-06T10:51:58-06:00",
      "url":"https://www.wellsfargo.com"
    },
    {
      "created_at":"2010-11-19T11:57:58-07:00",
      "guid":"INS-8a70cc20-2244-a7e5-0e7c-e90a0d545ebd",
      "has_checking_accounts":true,
      "has_credit_card_accounts":false,
      "has_investment_accounts":false,
      "has_line_of_credit_accounts":false,
      "has_loan_accounts":false,
      "has_mortgage_accounts":false,
      "has_savings_accounts":false,
      "is_hidden":false,
      "name":"Wells Fargo Private Bank",
      "popularity":4,
      "supports_account_identification": true,
      "supports_account_verification": true,
      "updated_at":"2013-03-04T10:40:22-07:00",
      "url":"https://www.wellsfargo.com"
    }
  ]
}
```

Information about available institutions can be found in several ways. This example uses the search method.

Search criteria is specified in the request body; pagination is specified by appending it to the request URL.

Either a `name` or `url` must be sent in the request body for this endpoint to work properly. An empty request body will result in a `400` error.



Further details.

### URL string parameters

Field name	Required	Data Type	Description
page	no	integer	Results are returned in paginated sets, this is the page of the results you would like to view. Defaults to page 1 if no page is specified.
records_per_page	no	integer	See Pagination for additional information.

### Search arameters

Field name	Required	Description
name	no	Name of the financial institution.
url	no	Login url for the financial institution.

## 5. Get the institution's required credentials using the institution GUID

```
GET /institutions/:institution_guid/credentials
```

### Example request:

```
curl -i https://int-data.moneydesktop.com/institutions/INS-1572a04c-912b-59bf-5841-332c7dfafaef/credentials \
-H 'MD-SESSION-TOKEN: CWforZl1Vn2vC_v6H4rnQRT1DoWpDouJAV-_5TBmiQRAtA8rs0G_BoajTi0SsL0A3bd-bmHXLA-eQzc9ywItKg' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

### Example response:

```
{
  "credentials":[
    {
      "field_type_name":"LOGIN",
      "answer_field_type":null,
      "created_at":"2016-09-21T16:08:59-06:00",
      "display_name":null,
      "display_order":1,
      "editable":true,
      "escaped":null,
      "field_name":"LOGIN",
      "field_type":3,
      "guid":"CRD-9f61fb4c-912c-bd1e-b175-ccc7f0275cc1",
      "institution_guid":"INS-1572a04c-912b-59bf-5841-332c7dfafaef",
      "label":"Username",
      "max_length":null,
      "meta_data":null,
      "mfa":false,
      "optional":false,
      "optional_mfa":null,
      "size":null,
      "updated_at":"2016-09-21T16:08:59-06:00",
      "value_identifier":null,
      "value_mask":null,
      "options":[]
    }
  ]
}
```

```

    },
    {
      "field_type_name": "PASSWORD",
      "answer_field_type": null,
      "created_at": "2016-09-21T16:08:59-06:00",
      "display_name": null,
      "display_order": 2,
      "editable": true,
      "escaped": null,
      "field_name": "PASSWORD",
      "field_type": 1,
      "guid": "CRD-e3d7ea81-aac7-05e9-fbdd-4b493c6e474d",
      "institution_guid": "INS-1572a04c-912b-59bf-5841-332c7dfafaef",
      "label": "Password",
      "max_length": null,
      "meta_data": null,
      "mfa": false,
      "optional": false,
      "optional_mfa": null,
      "size": null,
      "updated_at": "2016-09-21T16:08:59-06:00",
      "value_identifier": null,
      "value_mask": null,
      "options": []
    }
  ]
}

```

This endpoint returns information about what type of credentials the institution requires for authentication.

## 6. Create a member using institution GUID and required credentials

POST /members

### Example request:

```

curl -i -X POST https://int-data.moneydesktop.com/members \
-H 'MD-SESSION-TOKEN: YYYY' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json' \
-d '{
  "member": {
    "credentials": [
      {
        "credential_guid": "CRD-af37bbfa-7fc7-f607-692c-2d2592fb25a3",
        "value": "Username123"
      },
      {
        "credential_guid": "CRD-2045d3f6-206a-b0ef-c42d-6ebc8835f898",
        "value": "Password123"
      }
    ],
    "institution_guid": "INS-a4b1697f-f956-e651-5f8e-e4072166408c",
    "metadata": "Additional information",
    "skip_aggregation": true
  }
}'

```

### Example response:

```
{
  "member": {
    "aggregated_at": null,
    "connection_status": "CREATED",
    "connection_status_id": 0,
    "connection_status_message": "Connecting to Wells Fargo Bank...",
    "external_guid": null,
    "guid": "MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b",
    "institution_guid": "INS-33a533a9-9ead-540c-d17d-bdc92c96be17",
    "is_being_aggregated": false,
    "is_managed_by_user": false,
    "is_manual": false,
    "is_user_created": false,
    "metadata": "Additional information",
    "most_recent_job_guid": "JOB-cc7ac3f1-351a-667f-be7c-93a484df6ebf",
    "name": "Wells Fargo Bank",
    "needs_updated_credentials": false,
    "revision": 0,
    "successfully_aggregated_at": null,
    "user_guid": "USR-d2219ed6-7d5d-2fad-c332-17fb9bafcefa"
  }
}
```

Creating a `member` automatically starts a standard aggregation which is not necessary for verification. To prevent this unnecessary aggregation, set the `skip_aggregation` parameter to `true` when making your request.

Further details.

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## 7. Verify a member

`POST /members/:member_guid/verify`

**Example request:**

```
curl -i -X POST https://int-data.moneydesktop.com/members/MBR-c6536f4c-61dc-a047-5c45-ee38b8ba812a/verify \
-H 'MD-SESSION-TOKEN: :session_token' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

**Example response:**

Status: 200 OK

```
{
  "member": {
    "aggregated_at": null,
    "connection_status": "CREATED",
    "connection_status_id": 0,
    "connection_status_message": "Connecting to Wells Fargo Bank...",
    "external_guid": null,
    "guid": "MBR-c6536f4c-61dc-a047-5c45-ee38b8ba812a",
    "institution_guid": "INS-a4b1697f-f956-e651-5f8e-e4072166408c",
    "is_being_aggregated": true,
    "is_managed_by_user": false,
    "is_manual": false,
    "is_user_created": false,
    "metadata": "Additional information",
    "most_recent_job_guid": "JOB-7f321d2b-399e-2fb4-d2b1-eaea87ec29d7",
  }
}
```

```

    "name": "Wells Fargo Bank",
    "needs_updated_credentials": false,
    "revision": 2,
    "successfully_aggregated_at": null,
    "user_guid": "USR-11141024-90b3-1bce-cac9-c06ced52ab4c"
  }
}

```

The *verify member* endpoint begins a verification process for an already-existing `member`. Use this endpoint when normal aggregation does not return account and routing numbers for the `member`.

The verification workflow is similar to that shown above: Start the verification, poll the member, answer MFA if necessary by using the *list member MFA challenges* endpoint and the *update member* endpoint, poll the status again, then read the member's account numbers.

## 8. Check the member's verification status

GET /members/:member\_guid

**Example request:**

```

curl -i https://int-data.moneydesktop.com/members/MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b \
-H 'MD-SESSION-TOKEN: CWforZl1Vn2vC_v6H4rnQRT1DoWpDouJAV-_5TBmiQRAtA8rs0G_BoajtI0SsL0A3bd-bmHXLA-eQzc9ywItKg' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json'

```

**Example response:**

```

{
  "member": {
    "aggregated_at": "2015-04-13T12:01:23-06:00",
    "connection_status": "CONNECTED",
    "connection_status_id": 6,
    "connection_status_message": "Connected to Wells Fargo Bank",
    "external_guid": null,
    "guid": "MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b",
    "institution_guid": "INS-33a533a9-9ead-540c-d17d-bdc92c96be17",
    "is_being_aggregated": false,
    "is_managed_by_user": true,
    "is_manual": false,
    "is_oauth": false,
    "is_user_created": true,
    "metadata": "Additional information",
    "most_recent_job_guid": "JOB-cc7ac3f1-351a-667f-be7c-93a484df6ebf",
    "name": "Wells Fargo Bank",
    "needs_updated_credentials": false,
    "revision": 42,
    "successfully_aggregated_at": "2015-04-13T12:01:23-06:00",
    "user_guid": "USR-d2219ed6-7d5d-2fad-c332-17fb9bafcefa"
  }
}

```

Several fields on the `member` give important information about the state of the verification including `connection_status`, `is_being_aggregated`, `successfully_aggregated_at`. These fields are also used for standard aggregation jobs, hence the reference in their names.

A connection status of `CONNECTED` means that the `member` was successfully authenticated and verification has begun. The `is_being_aggregated` field will tell you whether the verification job has completed; the field will be `true` while verification is taking place and

returns to `false` when verification is complete. The `successfully_aggregated_at` field will tell you the exact time that the verification job has completed.

You may need to repeatedly poll this endpoint until either an end state or an actionable state is reached.

Further details.

#### MEMBER CONNECTION STATUSES

Integer value	Status	Definition	Next steps	End-user message
null	null	The member exists but does not have credentials. A member that does not aggregate (e.g., a manual member) will always have this status.	None.	None.
0	CREATED	The member is new and has not yet been aggregated.	Aggregate the member once the end user logs in; poll for a status update.	Connecting to {...}
1	PREVENTED	MX is preventing aggregation until the member's credentials have been updated.	Display end-user message; after end user has updated their credentials, aggregate again.	The last 3 attempts to connect have failed. Please re-enter your credentials to continue importing data.
2	DENIED	The credentials provided for the member were invalid.	Display end-user message; after end user has updated their credentials, aggregate again.	The credentials entered do not match your credentials at this institution. Please re-enter your credentials to continue importing data.
3	CHALLENGED	The member has been challenged by multi-factor authentication.	Display end-user message; follow MFA pathway; after the user answers MFA, poll for a status update.	To authenticate your connection to {...}, please answer the following challenge(s).
4	REJECTED	An MFA challenge was answered incorrectly.	Display end-user message; another challenge may follow or aggregation may need to be restarted.	The answer or answers provided were incorrect. Please try again.
5	LOCKED	The financial institution is preventing authentication. The end user must contact the financial institution.	Display end-user message.	Your account is locked. Please log in to the appropriate website for {...} and follow the steps to resolve the issue.
6	CONNECTED	The member was successfully authenticated and data is now aggregating.	Display the account as having been connected.	Connected to [...]

Integer value	Status	Definition	Next steps	End-user message
7	IMPEDED	The end user's attention is required at their online banking institution, e.g., there is a marketing message that must be viewed, terms and conditions that must be accepted, etc.	Display end-user message.	Your attention is needed at this institution's website. Please log in to the appropriate website for {...} and follow the steps to resolve the issue.
8	RECONNECTED	The member has been migrated to a new data source and aggregation is likely to trigger one-time password MFA. MX will not perform background aggregation in order to avoid unnecessarily disruptive texts, emails, etc. The member must be re-aggregated in the foreground with the end user present.	Aggregate the member once the end user logs in; poll for a status update.	Reconnecting to {...} ...
9	DEGRADED	Aggregation has failed at least three times within a short period of time.	Display end-user message.	We are upgrading this connection. Please try again later.
10	DISCONNECTED	Aggregation has failed at least three times and has not succeeded for at least two weeks.	Display end-user message.	It looks like your data from {...} cannot be imported. We are working to resolve the issue.
11	DISCONTINUED	The connection to this financial institution is no longer available.	Display end-user message.	Connections to this institution are no longer supported. You may create a manual account and use manual transactions to track data for this account.
12	CLOSED	The end user, MX, the client, or a partner has marked the member as closed.	Display end-user message.	This connection has been closed. You may track this account manually. If reopened, you may connect the institution again.
13	DELAYED	Aggregating the member has taken longer than expected and it has not yet been connected.	Display end-user message; poll for a status update.	Importing your data from {...} may take a while. Please check back later.
14	FAILED	Aggregation failed without being connected.	Display end-user message; try aggregating again later.	There was a problem validating your credentials with {...}. Please try again later.
15	UPDATED	The member has been updated — i.e., credentials have been updated — but it has not yet been connected.	Aggregate the member once the end user logs in; poll for a status update.	Connecting to {...} ...

Integer value	Status	Definition	Next steps	End-user message
16	DISABLED	Aggregation has been momentarily paused, but the member is still connected.	Display end-user message.	Importing data from this institution has been disabled. Please contact us if you believe it has been disabled in error.
17	IMPORTED	MX does not have credentials and will not try to aggregate the member until the end user provides credentials.	Display end-user message; re-aggregate after the end user updates credentials.	You must re-authenticate before your data can be imported. Please enter your credentials for {...}.
18	RESUMED	The answer to an MFA challenge was received, but it is not yet clear whether it was correct.	Poll for a status update.	Connecting to {...}...
19	EXPIRED	The MFA answer was not provided within the time allotted by the financial institution.	Display end-user message; re-aggregate the member if the end user initiates it.	The answer or answers were not provided in time. Please try again.
20	IMPAIRED	The member is missing some or all credentials needed in order to connect.	Display end-user message; re-aggregate after the end user updates credentials.	You must re-authenticate before your data can be imported. Please enter your credentials for {...}.
21	PENDING	The member is using OAuth to authenticate credentials and still needs to go through the financial institution's OAuth process. A <code>PENDING</code> status will appear only on members less than one hour old with <code>is_oauth: true</code> . Members that stay <code>PENDING</code> longer than one hour will be deleted by MX.	Redirect the end user to the <code>oauth_window_uri</code> provided in the <i>create member</i> response, or request one through the <i>generate OAuth window URI</i> endpoint.	None.

## 9. Answer MFA, if necessary

If the `connection_status` returns as `CHALLENGED` during polling, it will be necessary to answer multi-factor authentication in order to continue. This requires calling the *MFA credentials* endpoint, the *update member* endpoint, and then polling the `member` again. Aggregation should resume automatically after updating the `member`.

Further details: <https://developer.mx.com/includes/nexus/v1/endpoints/#jobs>,  
<https://developer.mx.com/includes/nexus/v1/endpoints/#update-member>

### 9.1 GET MFA CHALLENGES

```
GET /members/:member_guid/challenges
```

**Example request:**

```
curl -i https://int-data.moneydesktop.com/members/MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b/challenges \
-H 'MD-SESSION-TOKEN: CWforZl1Vn2vC_v6H4rnQRT1DoWpDouJAV-_5TBmiQRAtA8rs0G_BoajTi0SsL0A3bd-bmHXLA-eQzc9ywItKg' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

### Example response:

```
{
  "challenges": [
    {
      "type": "TEXT",
      "field_name": "What city were you born in?",
      "guid": "CRD-22f1b144-dde6-4c80-9d98-ca3c4900d173",
      "label": "What city were you born in?"
    }
  ]
}
```

## 9.2 UPDATE MEMBER WITH ANSWERS TO CHALLENGES

PUT /members/:member\_guid

### Example request:

```
curl -i -X PUT https://int-data.moneydesktop.com/members/MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b \
-H 'MD-SESSION-TOKEN: CWforZl1Vn2vC_v6H4rnQRT1DoWpDouJAV-_5TBmiQRAtA8rs0G_BoajTi0SsL0A3bd-bmHXLA-eQzc9ywItKg' \
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \
-H 'Accept: application/vnd.mx.nexus.v1+json' \
-d '{
  "member": {
    "credentials": [
      {
        "credential_guid": "CRD-18cd14ce-2628-5eb6-ae17-b11f89d0b667",
        "value": "user-entered-value"
      }
    ],
    "metadata": "Additional information",
    "skip_aggregation": true
  }
}'
```

### Example response:

```
{
  "member": {
    "aggregated_at": "null",
    "connection_status": "UPDATED",
    "connection_status_id": 15,
    "connection_status_message": "Connecting to Wells Fargo Bank...",
    "external_guid": null,
    "guid": "MBR-7aa13bdb-2966-ba39-b326-d9fb32269f9b",
    "institution_guid": "INS-33a533a9-9ead-540c-d17d-bdc92c96be17",
    "is_being_aggregated": true,
    "is_managed_by_user": false,
    "is_manual": false,
    "is_user_created": true,
    "metadata": "Additional information",
    "most_recent_job_guid": "JOB-cc7ac3f1-351a-667f-be7c-93a494df6ebf",
    "name": "Wells Fargo Bank",
    "needs_updated_credentials": false,
    "revision": 2,
    "successfully_aggregated_at": "null",
    "user_guid": "USR-d2219ed6-7d5d-2fad-c332-17fb9bafcefa"
  }
}
```



```
}  
}
```

Updating a `member` will kick off an automatic standard aggregation. Set the `skip_aggregation` parameter to `true` in your request body to prevent this.

### 9.3 CHECK THE MEMBER STATUS AGAIN FOR COMPLETION

`GET /members/:member_guid`

#### Example request:

```
curl -i https://int-data.moneydesktop.com/members/MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b \  
-H 'MD-SESSION-TOKEN: CWforZl1Vn2vC_v6H4rnQRT1D0WpDouJAV-_5TBmiQRATa8rs0G_BoajTi0SsL0A3bd-bmHXLA-eQzc9ywItKg' \  
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \  
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

#### Example response:

```
{  
  "member": {  
    "aggregated_at": "2015-04-13T12:01:23-06:00",  
    "connection_status": "CONNECTED",  
    "connection_status_id": 6,  
    "connection_status_message": "Connected to Wells Fargo Bank",  
    "external_guid": null,  
    "guid": "MBR-7aa13bdb-2866-ba38-b326-d9fb32268f9b",  
    "institution_guid": "INS-33a533a9-9ead-540c-d17d-bdc92c96be17",  
    "is_being_aggregated": false,  
    "is_managed_by_user": true,  
    "is_manual": false,  
    "is_oauth": false,  
    "is_user_created": true,  
    "metadata": "Additional information",  
    "most_recent_job_guid": "JOB-cc7ac3f1-351a-667f-be7c-93a484df6ebf",  
    "name": "Wells Fargo Bank",  
    "needs_updated_credentials": false,  
    "revision": 42,  
    "successfully_aggregated_at": "2015-04-13T12:01:23-06:00",  
    "user_guid": "USR-d2219ed6-7d5d-2fad-c332-17fb9bafcefa"  
  }  
}
```

## 10. Read the member's account numbers

`GET /members/:member_guid/account_numbers`

#### Example request:

```
curl -i https://int-data.moneydesktop.com/members/MBR-c6536f4c-61dc-a047-5c45-ee38b8ba812a/account_numbers \  
-H 'MD-SESSION-TOKEN: :session_token' \  
-H 'Content-Type: application/vnd.mx.nexus.v1+json' \  
-H 'Accept: application/vnd.mx.nexus.v1+json'
```

#### Example response:

```
{
  "account_numbers": [
    {
      "account_guid": "ACT-15f3a4de-cb45-d892-4480-6d05576011a8",
      "account_number": "10001",
      "institution_number": "null",
      "routing_number": "68899990000000",
      "transit_number": "null",
      "member_guid": "MBR-c6536f4c-61dc-a047-5c45-ee38b8ba812a",
      "user_guid": "USR-11141024-90b3-1bce-cac9-c06ced52ab4c"
    }
  ]
}
```

If MX has *both an account number and a routing number* for at least one of the member's accounts, that information will be returned when calling *read account numbers*. No information will be returned for accounts that are missing a value for one or both of these fields.

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## Testing verification

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For the most robust end-to-end testing of verification, MX will need to set up test accounts for a partner. Please contact MX to perform this kind of testing.

However, MX provides simple, static-data test endpoints for verification.

In order to use these test endpoints, you must:

1. Make requests through the MX integration environment; test endpoints will not function in the production environment;
2. Use the following Nexus session token: `test_session`;
3. Use the following Nexus endpoint paths:
  - Get account numbers (no data exists): `GET /members/unverified/account_numbers/`
  - Get account numbers (data does exist): `GET /members/test_nexus_member/account_numbers`;
  - Verify: `POST /members/test_nexus_member/verify`.