

IOX API

Integration Document

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API Specification:

The IOX API is an asynchronous instruction processor, every request is stored as an instruction. Instructions are added to a queue, the IOX Core application is responsible for processes these instructions. Once an instruction is processed the result will be **POSTED** to a webhook.

No unique path conventions to follow in the URL. API version, tenant identification and authorization details provided in request header (see below).

A specific API version can be requested in every call to the IOX API by assigning a version number to the 'api-version' key in the header. If omitted, IOX will assign the default version. The API versioning convention will follow a major.minor numbering system. E.g.: api-version: "1.0"

Additionally, a public key (Guid) used to identify the tenant should be included with every call to the IOX API. E.g.: tenant: "1AA1BBB6-82BB-42D4-81B7-4F31C69BD113"

All requests are served from api/external/

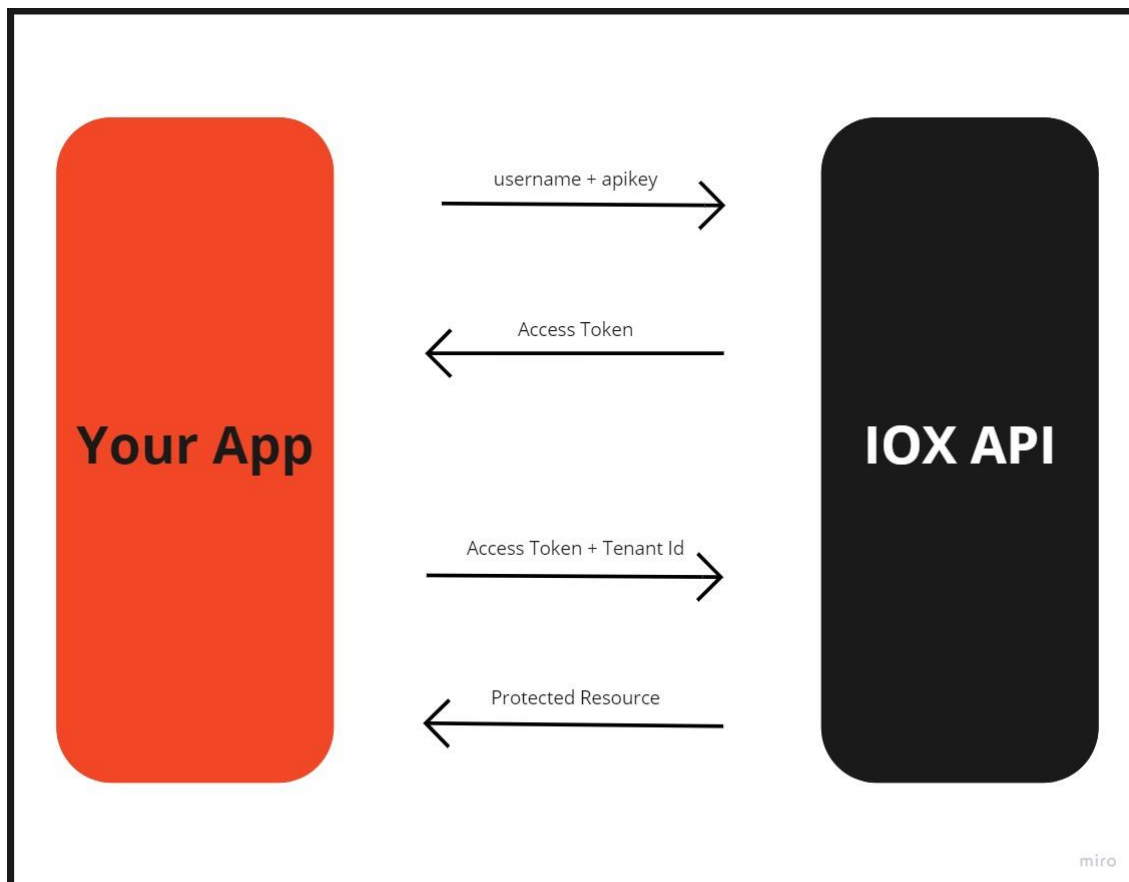
Link to C# Sample application:

https://github.com/iox-consulting/api_sample_app

Link to Test Environment for API:

<http://redocly.github.io/redoc/?url=https://stagingintegration.ioxfleet.co.za/swagger/v1/swagger.json>

Authorization code flow:



Requesting your token:

Post to the Request Token url (../api/ Auth/RequestToken)

Ensure the header has the following entries:

Content-Type: application/json
api-version: 1.0

The body should contain a **username** and **apikey**. The token endpoint will verify all the parameters in the request, ensuring the username and apikey matches. If everything checks out, it will generate your token and return it in the response.

The access token expires after 120 minutes, to request a new token repeat the above-mentioned process.

Call the API

Make calls against the IOX APIs by simply adding the following headers to your request:

Authorization: "Bearer " + access_token
tenant: tenantId

Once a request is made a new instruction is saved and a unique request reference will be returned in the response object.

Response Object:

| Parameter | Data Type | Description |
|------------------|----------------------|--|
| requestreference | String | Unique identifier for request (For further tracking during the request lifecycle) |
| status | String | Indicates the result of the request, either if it was successful or not. Possible values: Success Failed |
| errors | Array<ResponseError> | A collection of errors, if synchronous results of IOX API call, any possible validation errors caught before executing the instruction. If asynchronous, business logic errors while processing the instruction. |
| responseType | Int32 | The following types can be returned: Instruction Status Update – 1 Account OTP - 3 |
| Result | Object | If Type is Account OTP result's type will be AccountOTPResponse |

Response Error:

| Parameter | Data Type | Description |
|-----------|-----------|--|
| code | Int32 | Indicates pre-defined error code associated with an exception. |
| message | String | A detailed message of what went wrong. |

Possible API calls

1. Create Account - This request creates a new account

Create Account Request

| Parameter | Data type | Mandatory | Description |
|----------------------------------|-------------------|-----------------------------------|---|
| referenceId | String | Yes | A unique reference to this account, internal to the 3 rd party. This reference will be used to link individuals, vehicles and BRN to this account. A random string up to 20 characters |
| isBusinessAccount | Bool | Yes | Identifies account type True – Business Account False – Private Account |
| accountName | String | Yes | An account name |
| accountEmail | String | Yes | A contact email for the account |
| accountContactNumber | String | No | A contact number for the account |
| companyRegistrationNumber | String | Only if isBusinessAccount is true | Company registration number |
| contactPersonFirstName | String | Yes | Account contact person first name |
| contactPersonLastName | String | Yes | Account contact person last name |
| brn | Array<Brn> | No | A list of brns. |
| vehicles | Array<Vehicle> | No | A list of vehicles |
| individuals | Array<Individual> | Yes | A list of individuals |
| departments | Array<Department> | No | A list of departments |

BRN

| Parameter | Data type | Mandatory | Description |
|---------------------------|-----------|---|---|
| brnNumber | String | Yes, if CreateAccountRequest's isBusinessAccount is true and brns array is not empty. | Business registration number for Enatis |
| individualIdNumber | String | Yes, if CreateAccountRequest's isBusinessAccount is true and brns array is not empty. | Proxy's identification number |

Vehicle

| Field | Data type | Mandatory | Description |
|---------------------------|-----------|---|---|
| licenseNumber | String | Yes | The vehicle license plate number |
| vinNumber | String | Yes | Vehicle VIN number |
| vehicleRegisterNo | String | Yes | Veh. Register no on disk |
| engineNumber | String | No | The vehicle engine number |
| licenseDiscNumber | String | Yes | The license disc number as displayed on the license disc |
| licenseExpiryDate | DateTime | Yes | The expiry date as displayed on the license disc |
| categoryId | Int16 | Yes | A vehicle category. If incorrect, the quoted renewal will fail once instruction is issued to renewal network. See possible values below (Vehicle Categories) |
| tare | Int32 | Yes | The vehicle tare |
| make | String | No | The vehicle make |
| model | String | No | The vehicle model |
| colour | String | No | The vehicle colour |
| departmentName | String | No | Department name this vehicle will be linked to. |
| discImage | String | No | A base64 encoded string for the JPEG image of the current license disc. |
| Brn | String | Only if account's isBusinessAccount is true and account's vehicles array is not empty. This brn should also be listed in account's brn array. | The business brn number |
| individualIdNumber | String | Only If account's isBusinessAccount is false and account's vehicle array is not empty. This id number should also be listed in account's individual array. | The owner's identification number |

Individual:

| Field | Data type | Mandatory | Description |
|---------------------------------|-----------|-----------|--|
| idType | String | Yes | RSAID Passport TRN |
| idNumber | String | Yes | The individual identification number for the given IdType |
| driversLicenseImage | String | No | A base64 encoded string for the JPEG image of the individual driver's license. |
| firstname | String | Yes | The individual first name, as specified in the supplied ID |
| lastname | String | Yes | The individual last name, as specified in the supplied ID |
| initials | String | Yes | The individual's initials |
| driversLicenseNumber | String | No | The individual's driver license number |
| driversLicenseExpiryDate | DateTime | No | The individual's driver license expiry date |

Department

| Parameter | Data type | Mandatory | Description |
|-------------|-----------|--|-----------------|
| name | String | Yes, if department array is not empty. | Department name |

2. Send Account Email Invites – This request triggers account invites to be sent to the provided users.

AccountInviteTokenRequest

| Field | Data type | Mandatory | Description |
|-------------------------|----------------------|-----------|--|
| accountReference | String | Yes | A unique reference to an existing account. |
| referenceId | String | Yes | A unique reference to this instruction, internal to the 3 rd party. |
| accountInvites | Array<AccountInvite> | Yes | At least one account invite should be present |

AccountInvite

| Field | Data type | Mandatory | Description |
|------------------|-----------|-----------|---|
| firstName | String | Yes | First name of person to receive invite token. |
| lastName | String | Yes | Last name of person to receive invite token. |
| email | String | Yes | Email of person to receive invite token. |

3. Request Account OTP -This request-requests an account OTP

AccountOTPRequest

| Field | Data type | Mandatory | Description |
|-------------------------|-----------|-----------|--|
| referenceId | String | Yes | A unique reference to this instruction. |
| accountReference | String | Yes | A unique reference to this account, internal to the 3 rd party. |

4. Create Department – This request creates a new department

DepartmentRequest

| Field | Data type | Mandatory | Description |
|-------------------------|-----------|-----------|---|
| name | String | Yes | Department name |
| referenceId | String | Yes | A unique reference to this instruction, internal to the 3 rd party. |
| accountReference | String | Yes | A unique reference to the account this department will be linked to. An account with this reference already be created. |

5. Create / Update BRN

BRNRequest

| Field | Data type | Mandatory | Description |
|---------------------------|-----------|-----------|--|
| brn | String | Yes | Business Registration number for Enatis |
| individualIdNumber | String | Yes | Proxy's id number. An individual with this id number should already be created. |
| referenceId | String | Yes | A unique reference to this instruction, internal to the 3 rd party. |
| accountReference | String | Yes | A unique reference to the account this brn will be linked to. An account with this reference already be created. |

6. Create / Update Individual

Individual Request

| Field | Data type | Mandatory | Description |
|---------------------------------|-----------|-----------|---|
| referenceId | String | Yes | A unique reference to this instruction, internal to the 3 rd party. |
| accountReference | String | Yes | A unique reference to the account this individual will be linked to. An account with this reference already be created. |
| idType | String | Yes | RSAID Passport TRN |
| idNumber | String | Yes | The individual identification number for the given IdType |
| driversLicenseImage | String | No | A base64 encoded string for the JPEG image of the individual driver's license. |
| firstname | String | Yes | The individual first name, as specified in the supplied ID |
| lastname | String | Yes | The individual last name, as specified in the supplied ID |
| initials | String | Yes | The individual's initials |
| driversLicenseNumber | String | No | The individual's driver license number |
| driversLicenseExpiryDate | DateTime | No | The individual's driver license expiry date |

7. Create / Update Nomination Driver

Nomination Target Request

| Field | Data type | Mandatory | Description |
|-------------------------|---------------------------------|-----------|--|
| referenceId | String | Yes | A unique reference to this instruction, internal to the 3 rd party. |
| accountReference | String | Yes | A unique reference to the account this brn will be linked to. An account with this reference already be created. |
| personalDetails | NominationTargetPersonalDetails | Yes | Nomination Target personal details |
| addressDetails | NominationTargetAddressDetails | Yes | Nomination Target address details |
| Documents | Array<NominationTargetDocument> | Yes | Nomination Target document (At least 1) |

Nomination Target Personal Details

| Field | Data type | Mandatory | Description |
|-----------------------|-----------|-----------|--------------------------------|
| initials | String | Yes | Person Initials |
| FullName | String | Yes | Person Fullname |
| surname | String | Yes | Person Surname |
| idNumber | String | Yes | Person IdNumber / Passport |
| gender | String | Yes | Person Gender |
| idType | String | Yes | Person Id Type |
| countryOfIssue | String | Yes | Id document's country of issue |
| contactNumber | String | No | Person Contact Number |
| email | String | No | Person Email Address |

Nomination Target Address Details

| Field | Data type | Mandatory | Description |
|-------------------|-----------|-----------|---------------------|
| streetNo | String | Yes | Address street no |
| streetName | String | Yes | Address street name |
| suburb | String | No | Address suburb |
| city | String | Yes | Address city |
| postalCode | String | Yes | Address Postal code |
| country | String | Yes | Address country |

Nomination Target Document

| Field | Data type | Mandatory | Description |
|-----------------------------|-----------|-----------|----------------------------|
| documentBase64String | String | Yes | Base 64 string of document |
| documentType | Int | Yes | Document type |
| expiryDate | DateTime | No | Expiry date of document |

Id Types

| Id | Description |
|----------|-------------------------|
| 1 | South African ID |
| 2 | Foreign Id |
| 3 | Passport |
| 4 | Traffic Register Number |
| 5 | Driver's License |

Document Types

| Id | Description |
|----------|-------------------|
| 1 | Driver's License |
| 2 | Passport Document |
| 3 | South African ID |
| 4 | Foreign ID |

8. Create / Update Vehicle

Vehicle Request

| Field | Data type | Mandatory | Description |
|---------------------------|-----------|---|---|
| referenceId | String | Yes | A unique reference to this instruction, internal to the 3 rd party. |
| accountReference | String | Yes | A unique reference to the account this vehicle will be linked to. An account with this reference already be created. |
| licenseNumber | String | Yes | The vehicle license plate number |
| vinNumber | String | Yes | Vehicle VIN number |
| vehicleRegisterNo | String | Yes | Veh. Register no on disk |
| engineNumber | String | No | The vehicle engine number |
| licenseDiscNumber | String | Yes | The license disc number as displayed on the license disc |
| licenseExpiryDate | DateTime | Yes | The expiry date as displayed on the license disc |
| departmentName | String | No | The department this vehicle will be linked to. |
| categoryId | Int16 | Yes | A vehicle category. If incorrect, the quoted renewal will fail once instruction is issued to renewal network. See possible values below |
| tare | Int32 | Yes | The vehicle tare |
| make | String | No | The vehicle make |
| model | String | No | The vehicle model |
| colour | String | No | The vehicle colour |
| disclImage | String | No | A base64 encoded string for the JPEG image of the current license disc. |
| Brn | String | Only if account's isBusinessAccount is true and account's vehicles array is not empty. This brn should also be listed in account's brn array. | The business brn number |
| individualIdNumber | String | Only If account's isBusinessAccount is false and account's vehicle array is not empty. This id number should also be listed in account's individual array. | The owner's identification number |

Vehicle Categories

| Id | Description |
|----|---|
| 1 | Motorcycle/Motor tricycle/Motor quadracycle |
| 2 | Light passenger vehicle (less than 12 persons) |
| 3 | Heavy passenger vehicle (12 or more persons) |
| 4 | Light load vehicle (GVM 3 500 kg or less) |
| 5 | Heavy load vehicle (GVM > 3 500 kg, not to draw) |
| 6 | Special class vehicle |
| 7 | Heavy load vehicle (GVM > 3 500 kg, equipped to draw) |
| 8 | Tractor used on public roads |
| 9 | Breakdown vehicle |

Setting up an endpoint for the webhook

Once the IOX Core application has processed your instruction an instruction response will be posted to the endpoint you configured.

Post to the Setup endpoint URL (../api/ endpoint/SetupEndpoint)

Ensure the header has the following entries:

Content-Type: application/json
api-version: 1.0
Authorization: "Bearer" + access_token
Tenant: tenantId

The body should contain an **url** and **sharedkey**. An endpoint will be configured, and the shared key will be returned in the response object. You will use this shared key in the endpoint HMAC Authentication explained below.

HMAC authentication is used in the webhook process to verify that a request is coming from the IOX API and that the request has not been tampered with in transit. This is achieved by including a HMAC hash and Nonce in the request's header.

Headers:

Nonce: "8256019327"
HMAC: "3a9805afa6ec3850b80273c61a06a11702c38b868cc986e8d981b4a63d2356f2"

The sharedkey used to configure the endpoint will be used in the HMAC generation process. Append the Nonce at the end of the payload body, generate a new HMACSHA256 hash using the shared key, if the generated HMAC matches the HMAC in the header the request has not been tampered with. (Look at the `iox_sample_app/SignatureVerifier.cs` to see a working example of this process)

Receiving webhook requests locally:

1. Download ngrok (<https://ngrok.com/download>)
2. Run ngrok.exe
3. In the command line window run ngrok http **PORT_YOUR_APPLICATION_IS_LISTENING_ON**
(This port will be exposed by ngrok).
4. Use the URL and append "endpoint/response" to the ngrok URL.
(e.g. <https://66fcf8608ec6.ngrok.io/endpoint/response>)
5. Follow the steps mentioned above (**Setting up an endpoint for the webhook**) and use the new ngrok URL.

You will now be able to receive instructions from the IOX API in your local environment.