# myBeNext API documentation

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# Contents

# 1 Basic API information

## 1.1 API Terms of service

The API terms of service are currently available in Dutch only. If you use the API you will automatically agree with the terms of service of the API. The latest version of the terms of service can be found here: api.benext.eu/documentation/gebruiksovereenkomst.pdf.

## 1.2 Authentication

Authentication with the API is done through one of four options: HTTP Basic authentication, HTTP Apikey authorization, HTTP HMAC authorization or session authentication. If authentication is required for an API-call and the request doesn't contain any authentication information a 401 `UNAUTHORIZED` is returned with a request for Basic authentication. Check the returned `WWW-Authenticate` header for the cause of the 401.

### 1.2.1 Basic

Basic authentication can be used to authenticate as a single user. This form of authentication can be used to control most parts of the system and is convenient for apps. By adding basic authentication to every request you can avoid receiving 401 errors or session timeouts. In order to authenticate a user must pass an `Authorization` HTTP-header. The authorization key is constructed as follows:

1. Username and password are combined into a string "username:password"
2. The resulting string is then encoded using the RFC2045-MIME variant of Base64, except not limited to 76 char/line
3. The authorization method and a space i.e. "Basic" is then put before the encoded string.

An example of this header is: `Authorization: Basic QWxhZGRpbjpvcGVuIHNlc2FtZQ==`
An in-depth explanation of Basic authentication can be found here: tools.ietf.org/html/rfc2617 and here en.wikipedia.org/wiki/Basic_access_authentication.
Authentication can only be done for 1 user at a time. Using Basic authentication a user will only have access to their account. If access to multiple accounts is required an API-key is needed.

### 1.2.2 API-key

An API-key is required to manage multiple accounts without having access to their username / password. The API-key can either be passed as query parameter: `apikey=<api_key>` or in the `Authorization` header: `Authorization: Apikey <api_key>`.
For the time being API-keys will have to be requested by e-mail.

### 1.2.3 HMAC

An HMAC-token can be used to provide credentials for a user linked to your API-key without sharing the user credentials or your API-key. This is useful for external services such as IFTTT for which using your API-key might be a security issue.
An HMAC authentication token can be constructed using an API-key. The HMAC can either be passed as query parameter: `hmac=<hmac>&hmac_account_id=<account_id>` or in the `Authorization` header: `Authorization: HMAC <hmac>,account_id=<account_id>`.
The `account_id` should be the account for which you wish to provide the API-key, *NOT* the `account_id` associated with the API-key.

### 1.2.4 Session authentication

Session authentication is mostly useful for front-end frameworks using javascript. By authenticating once and storing the result cookies the API can be queried without storing the username or password. The following example show how to request a session-token using json:

1. Construct the post body: `{ "username": <username>, "password": <password> }`
2. Send the post to: `/login/api/v1/authenticate/`
3. Store the following cookies: `2myhomesession` and `csrftoken`
4. Add the stored cookies to any following requests

It is possible to construct the post-body using the content-types: `application/json`, `text/plain` or `x-www-form-urlencoded`.

### 1.2.5 Multi Factor Authentication (MFA)

The BeNext API supports Multi Factor Authentication (MFA). MFA can be enabled per account and only works with Basic Authentication. A complete description on MFA is given at the Multi Factor Authentication chapter.

## 1.3 Accessing and manipulating resources

Accessing and manipulating resources follow a fixed pattern. Depending on the HTTP request method each request is handled differently. These different ways of handling are described as follows:

**GET** View 1 or more resource(s)
**POST** Create a new instance of a resource
**PUT** Update all or some values of the resource
**DELETE** Remove a resource

Multiple resources can be requested by requesting the base-url of the resources. This returns the entire list of applicable resources. A single resource can be requested by appending the resource id to the url. For example: `/products/` requests all products, while `/products/1/` requests 1 product with the id `1`.
Multiple resources can be requested by using query parameter filters. These are described per resource and vary depending on the resources. In general it's always possible to request multiple resources by id by passing de singular resource name followed by `_id` as query parameter with as value a comma-separated list of ids. For example: `/products/?product_id=1,5,8` will request the resources 1, 5 and 8.

### 1.3.1 Resource bulk creation

Some resources can be created in bulk. This is more efficient than using separate request because it reduces HTTP and database overhead. If a resource allows bulk creation you can send a list of resources instead of a singular resource as POST-body. Bulk creations are performed as an atomic action. If the response code is not 2XX no resources will have been created.
The response will consist of separate responses for each resource. Possible output responses are:

**If the resource is created** The response object will contain the status code 201 and the created resource
**If an error occurs** The response object will contain the relevant status code, message and original request body.

If all individual responses have the same status code, this status code will be used for the entire request status code. E.g. if all resources are created successfully a 201 CREATED will be returned. If the response status codes are mixed, a 207 MULTISTATUS is returned.
If bulk creation is attempted for a resource that does not support bulk creation the resource will return a 422 UNPROCESSABLE ENTITY.

## 1.4 Common & custom request headers

### 1.4.1 Accept-Encoding

It is recommended to send request to the API with an `Accept-Encoding: gzip` header. This will make sure the response is compressed before it is returned to the requester. This reduces network traffic and will (for larger requests) result in a faster transfer time. API calls can also be performed with compression on the request body. If this is desirable, gzip the request body and add a `Content-Encoding: gzip` header to the request.

### 1.4.2 Accept-Language

It is possible to request translated strings through the API using the `Accept-Language` header. Where possible this will translate the API output to the requested language. If a request is made using Basic or session authentication the output will automatically be translated to the language selected by the authenticated user.

### 1.4.3 Accept-Format

It is possible to request a different format for the response output. The default for resource lists is an object wrapped list. This is to ensure proper JSON handling in most edge cases. To allow for easier handling it is possible to just return the list.
To (explicitly) request dictionary format, pass `Accept-Format: object` as header. This is not required, as object wrapping is the default. To request a plain list with resources, pass `Accept-Format: list` as header.
If an accept-format request is invalid or unknown a 406 NOT ACCEPTABLE may be returned.

### 1.4.4 Range

It is possible to do pagination with the `Range` header. This API implementation a custom range-specifier called `resourceids`. If a resource accepts a `resourceids` range this will be noted in the request headers. This range specifier can be used to (efficiently) request part of a resource list. The semantic checking for this header is limited, so invalid header will result in empty requests or request that are not filter. The format is as follows:

```
Range: resourceids <start>-<end>/<count>
```

Both the `count` and `end` specifier are optional. When omitting the `count` specifier, do not used the `/`-separator. Valid value are:

**start** Any integer number or `*`
**end** Any integer number
**count** Any integer number

A valid range request will filter out all resources smaller than `start` and larger than `end`. This operation is inclusive, we both `start` and `end` will be included in the request. `count` will limit the request to at most that many resource. Any range-limited resource will always return a 206 PARTIAL CONTENT response.

## 1.5 Cross-site requests

The API has support for cross-site requests using JSONP-style wrapped JSON data. If the optional query parameter `jsonp=<fn_name>` is passed with a specified function name, the JSON data will be returned as data wrapped in a function with the specified name. The `Content-Type` of this data will be `application/javascript`. This can be used to load data from the API from different origins.

## 1.6 Errors

If a call to the API results in an error, these will be passed in a JSON object. These objects contain a textual description of the problem and an error code. Where possible an appropriate http error code will be used. An example of an error that can be returned is found below:

```
HTTP 404 NOT FOUND
{
  "error": "account not found",
  "resource": "account",
  "code": 12
}
```

## 1.7 Timestamps and timezone information

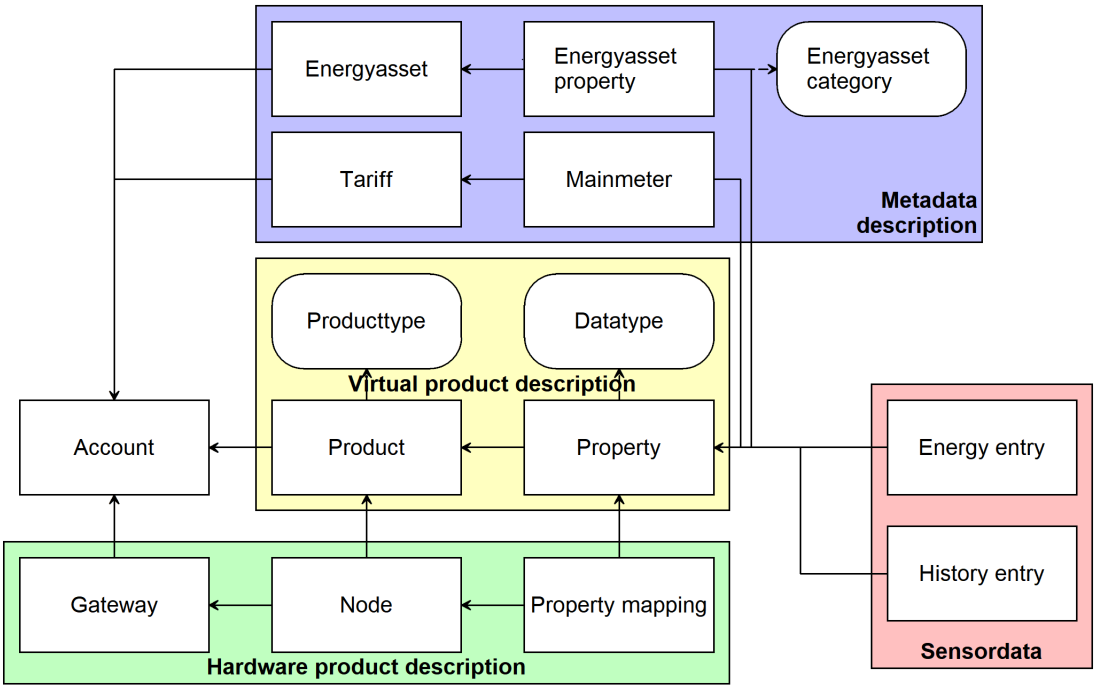
The API has multiple resources which accept timestamp as field or as query parameter. Handling these will always be done with respect to timezones. Anywhere a timestamp can be entered an ISO-format timezone (e.g. +0300) can be appended.
To make sure the API always returns consistent data all timestamp are return in the UTC timezone. This makes sure that the timeseries are always consistent no matter what. This also allow for the usage of multiple timezones in requests. For example, it is possible to use 2 different timezones in history-entry GETs.

## 1.8 API structure

The API has a large amount of distinct resources with many interconnection. An attempt has been made to make the names of resources and parameters as uniform and consistent as possible. Because of the different types of resources in the API, there are different intended purposes of the API. The explanations below try to provide insight in the structure of the API.

### 1.8.1 Sensor data analysis

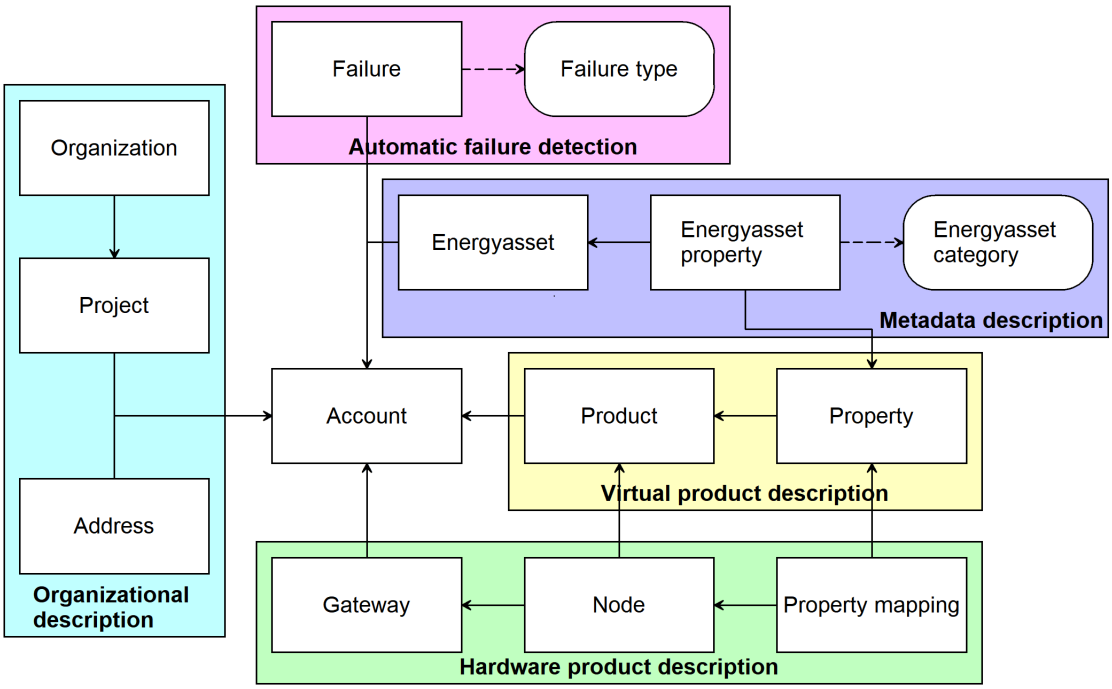
The resources in the graph below focus on measured data from appliances and products. When available, use `energyassetcategories` to determine the way data should be interpreted. These categories contain useful info to determine the efficiency of installations and provide an unambiguous way to figure out what certain properties describe.
If the account is not described by an `energyasset`, `producttypes` and `datatypes` can be combined with `mainmeter` resources to provide a basic insight in energy consumption.




All sensor data is available through the `historyentries` and `energyentries`. The distinction between these two is: `historyentries` contain raw sensor data, including any erroneous data points. `energyentries` are calculated values with corrected, interpolated values at a fixed 15 minute interval for easy presentation. These `energyentries` are calculated only for cumulative energy/gas/water usage related properties.

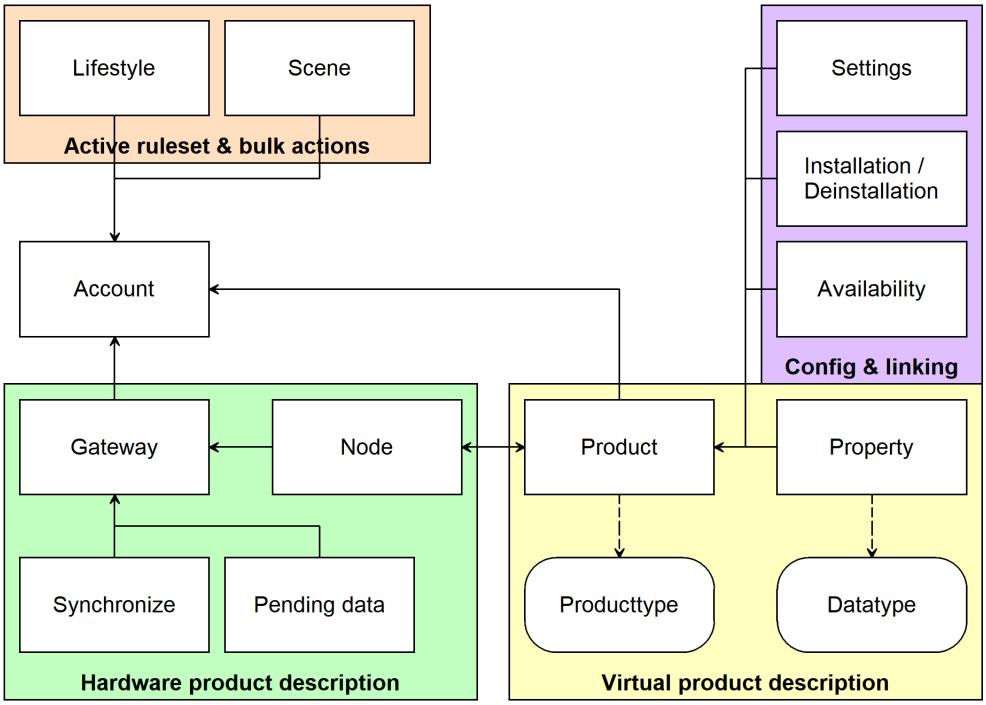
### 1.8.2 Fault detection

The following resources focus on detection anomalies in the data and wrongly configured energyassets. Combining this information with aggregates `failures` and grouping by `project` or `address` allows fast insight in problem areas.
`failures` are automatically generated by the system and describe various fault conditions that can occur.




### 1.8.3 Smart home usage

These resources are mainly intended to be used to install, uninstall, configure and control products inside a smart home. Resources such as `lifestyle` and `scene` allow for easy access to high-level features.



# 2 Multi factor authentication

## 2.1 Introduction to MFA

### 2.1.1 Beta feature

This feature is still in its Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 2.1.2 General

The BeNext API supports Multi Factor Authentication (MFA). The current implementation allows for two factor authentication ("2FA") with a Time-based One Time Password (TOTP). This method of MFA is supported by Google Authenticator, Microsoft Authenticate and many other similar apps.
For more information on this type of authentication, you can visit en.wikipedia.org/wiki/Time-based_one-time_password.

### 2.1.3 Adding MFA support to requests

MFA works by adding an `Mfa-Token` header together with regular Basic authentication header to every API-request. This `Mfa-Token` header will prove that a device has successfully gone through the MFA process. If MFA is required for an API-call and the request does not contain a valid `Mfa-Token` header, a 401 `UNAUTHORIZED` is returned with a request for MFA. Check the returned `WWW-Authenticate` header for the cause of the 401.

### 2.1.4 Endpoints

We provide multiple endpoints to set up and maintain the devices for MFA. These endpoints are described further in this chapter.

**Totpkeys** Here you are able to fetch a TOTP setup key to supply to your authenticator tool (such as Google Authenticator).

**Totpdevices** Represents the device which has the authenticator tool that generates a 6-digit Totp-Token. When authenticated with an `Mfa-Token`, this endpoint also supplies methods to manage the TOTP devices on an account.

**Mfaauthenticate** This endpoint will authenticate the device with a Totp-Token. A successful authentication will return an Mfa-Token which you can supply with every API request to complete the MFA.

### 2.1.5 Restrictions

- MFA is enabled on a per-account basis.
- Basic authentication is required to interact with any of these endpoints, no other authentication method is supported.
- Access to an MFA enabled account through API-Key or HMAC authentication is allowed without an `Mfa-Token`. There is no session-based authentication support for any of the MFA-API endpoints.

## 2.2 Totpkeys

The totpkey resource is used to generate a TOTP setup key for MFA purposes. The "totpkey" can be manually entered into an authenticator tool (such as Google Authenticator) to generate a 6-digit Totp-Token. This Totp-Token can then be used to create a `TOTPDevice` resource and handle any subsequent MFA-based requests.

- A totpkey is valid for 10 minutes after which you have to call the endpoint again.
- Only GET requests are allowed on this endpoint.
- Only Basic Authentication is allowed on this endpoint.

For more information on MFA please check out the introduction to this chapter.

### 2.2.1 Beta endpoint

This endpoint is still in it's Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 2.2.2 URL patterns

`/login/api/v1/mfa/totp/key`

#### 2.2.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `totpkey`.

### 2.2.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 2.2.3.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**totpkey** Resource identifier

**Output JSON**

```
Resource = {
    "totpkey": "OV3W4EJKPDJLKS3AOE7DPT7K2QS6I662"
}
```

## 2.3 Totpdevices

The totpdevice resource represents the device which has the authenticator tool that generates a 6-digit Totp-Token needed for MFA. A new TOTP device for MFA can be created with the key given by the Totpkeys endpoint. This device should then be activated by taking the "totptoken" from a tool such as Google Authenticator. The token should be sent over a POST request as described below. Without creating and activating a totpdevice, the user cannot authenticate using the Mfaauthenticate endpoint.

- The user who has already created a TOTP device should authenticate with an MFA-Token to be allowed create a new TOTP device.
- GET, PUT and DELETE requests are only allowed when using MFA.
- Only Basic Authentication is allowed on this endpoint.

For more information on MFA please check out the introduction to this chapter.

### 2.3.1 Beta endpoint

This endpoint is still in it's Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 2.3.2 URL patterns

```
/login/api/v1/mfa/totp/devices/
/login/api/v1/mfa/totp/devices/<totpdevice>/
```

#### 2.3.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `name`, `totpdevice`.

### 2.3.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 2.3.3.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**account** Parent account identifier
**name** Device name
**totpdevice** Resource identifier

If filter queryparams are passed:

- A `ResourceList` containing those totpdevices will be returned
- If no totpdevices are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "totpdevices": [
    {
        "account": "1",
        "name": "Phone 1",
        "totpdevice": "5f822e81105461dbfb39f09a8cffbd11718f5b4c7b146d47206fe9bdb7c131a3"
    },
```

```
    {
        "account": "1",
        "name": "Tablet 1",
        "totpdevice": "624dfa4b6501ab828c2acc5ef5c6c97a431f7b42cc85e11b8d5ad302d9327419"
    }
] }
```

#### 2.3.3.2 POST

A POST request will create a new totpdevice. The totpdevice will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `name`, `totptoken`
**Optional fields** –

Creating a totpdevice is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "name": "Phone 1",
    "totptoken": "123456"
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 2.3.3.3 PUT

A PUT request is used to update fields of a totpdevice. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `name`

Updating a totpdevice is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "name": "Phone 2"
}
```

A PUT request with filtering query parameters or without an totpdevice id *WILL* update multiple totpdevices. It is *NOT* recommend to send a PUT request without an totpdevice id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

#### 2.3.3.4 DELETE

A DELETE request is used to remove a totpdevice. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an totpdevice id *WILL* delete multiple totpdevices. It is *NOT* recommend send a DELETE request without an totpdevice id or filtering query parameters.

## 2.4 Mfaauthenticate

The mfaauthenticate resource is used to generate an `Mfa-Token` to be used with MFA. If the account you are authenticating as has MFA enabled, an `Mfa-Token` should be sent in the header of every request to access API endpoints. To be able to get an `Mfa-Token`, a "totptoken" should be provided as described in the Totpkeys. The resource checks the "totptoken" and returns the "mfatoken" if it is valid. A valid "totptoken" should be obtained from an authenticator tool.

- Only POST requests are allowed on this endpoint.
- Only Basic Authentication is allowed on this endpoint.

For more information on MFA please check out the introduction to this chapter.

### 2.4.1 Beta endpoint

This endpoint is still in it's Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 2.4.2 URL patterns

`/login/api/v1/mfa/authenticate/`

#### 2.4.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `mfatoken`.

### 2.4.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 2.4.3.1 POST

A POST request will create a new mfaauthenticate. The mfaauthenticate will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `totptoken`
**Optional fields** –

Creating a mfaauthenticate is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "totptoken": "123456"
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along the following resource body:

```
Resource = {
    "mfatoken": "ymbbrjg49tl1qu2p8rty3lj5x22ggztb"
}
```

# 3 Account information

## 3.1 Accounts

The account resource allows for the looking up and changing of account information. Using an API-key it is also possible to create accounts.

### 3.1.1 URL patterns

```
/login/api/v1/accounts/
/login/api/v1/accounts/1/
```

#### 3.1.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `addons`, `email`, `firstname`, `language`, `lastname`, `username`.

**account_id** Accepts a comma-separated list

**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 3.1.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.1.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Resource identifier
**addons** List of all active add-ons enabled for user
**email** E-mail for the account, required for password resets
**firstname** First name for the account
**language** Preferred language selected by user
**lastname** Last name for the account
**username** Username for the account, used to log in. Max. 30 characters

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that account doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those accounts will be returned
- If no accounts are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 1,
    "addons": [],
    "email": "no-reply@benext.eu",
    "firstname": "Demo",
    "language": "nl",
    "lastname": "Account",
    "username": "demo"
}

ResourceList = { "accounts": [
    {
        "account": 1,
        "addons": [],
        "email": "no-reply@benext.eu",
        "firstname": "Demo",
        "language": "nl",
        "lastname": "Account",
        "username": "demo"
    }
] }
```

#### 3.1.2.2 POST

A POST request will create a new account. The account will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `username`, `password`, `email`, `firstname`, `lastname`
**Optional fields** `language`

Creating an account is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "username": "jdoe",
    "firstname": "John",
    "lastname": "Doe",
    "email": "johndoe@example.com",
    "password": "password123"
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 3.1.2.3 PUT

A PUT request is used to update fields of a account. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `email`, `firstname`, `lastname`, `language`, `password`

Updating an account is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "email": "new_email@gmail.com",
    "firstname": "New_firstname",
    "lastname": "New_lastname"
}
```

A PUT request with filtering query parameters or without an account id *WILL* update multiple accounts. It is *NOT* recommend to send a PUT request without an account id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

## 3.2 Addresses

Describes the address info for an account, if available. All values except `account` and `address` *MAY* be empty (`""`) or `null`.

### 3.2.1 URL patterns

```
/login/api/v1/addresses/
/login/api/v1/addresses/229/
/login/api/v1/accounts/682/addresses/
/login/api/v1/accounts/682/addresses/229/
```

#### 3.2.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `address`, `city`, `country`, `postal_code`, `street_address`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**address_id** Accepts a comma-separated list
**address_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 3.2.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.2.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**account** Parent account identifier
**address** Resource identifier
**city** City
**country** Country name
**postal_code** Postal Code
**street_address** Street address

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that address doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those addresses will be returned
- If no addresses are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 682,
    "address": 229,
    "city": "Amsterdam",
    "country": "Netherlands",
    "postal_code": "1031HN",
    "street_address": "Asterweg 20L1"
}

ResourceList = { "addresses": [
    {
        "account": 682,
        "address": 229,
        "city": "Amsterdam",
        "country": "Netherlands",
        "postal_code": "1031HN",
        "street_address": "Asterweg 20L1"
    }
] }
```

## 3.3 Projects

The project resource allows grouping of different accounts into projects.

### 3.3.1 URL patterns

```
/login/api/v1/projects/
/login/api/v1/projects/6/
/login/api/v1/accounts/4/projects/
/login/api/v1/accounts/4/projects/6/
```

#### 3.3.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `accounts`, `name`, `organizations`, `project`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**project_id** Accepts a comma-separated list
**project_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 3.3.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.3.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**accounts** Lists accounts linked to this project
**name** Name of the project
**organizations** List of organizations linked to this project
**project** Resource identifier

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that project doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those projects will be returned
- If no projects are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": [
        1,
        5,
        6
    ],
    "name": "Testproject",
    "organizations": [
        1
    ],
    "project": 6
}

ResourceList = { "projects": [
    {
        "accounts": [
            1,
            5,
            6
        ],
        "name": "Testproject",
        "organizations": [
            1
        ],
        "project": 6
    },
    {
        "accounts": [
            5
        ],
        "name": "DemoNomProject",
        "organizations": [
            2
        ],
        "project": 5
    }
] }
```

#### 3.3.2.2 PUT

A PUT request is used to update fields of a project. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `name`

Updating a project is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "name": "New Project"
}
```

A PUT request with filtering query parameters or without an project id *WILL* update multiple projects. It is *NOT* recommend to send a PUT request without an project id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

## 3.4 Organizations

The organization resource provides contact information for companies and organizations associated with projects.

### 3.4.1 URL patterns

```
/login/api/v1/organizations/
/login/api/v1/organizations/1/
/login/api/v1/accounts/4/organizations/
/login/api/v1/accounts/4/organizations/1/
```

#### 3.4.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `city`, `email`, `logo`, `name`, `organization`, `phone`, `street`, `website`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**organization_id** Accepts a comma-separated list

### 3.4.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.4.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**city** City where organization is located, *MAY* be `null`
**email** Contact e-mail address for general inquiry, *MAY* be `null`
**logo** Logo associated with organization, *MAY* be `null`
**name** Printable name of the organization, *MAY* contain UTF-8 and/or special characters
**organization** Resource identifier
**phone** Customer service phone number, *MAY* be `null`
**street** Street address where organization is located, *MAY* be `null`
**website** Website of the organization, *MAY* be `null`

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that organization doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those organizations will be returned
- If no organizations are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "city": "Amsterdam",
    "email": "info@benext.eu",
    "logo": null,
    "name": "BeNext B.V.",
    "organization": 1,
    "phone": null,
    "street": "Asterweg 20L1",
    "website": "https://www.benext.eu"
}

ResourceList = { "organizations": [
    {
        "city": "Amsterdam",
        "email": "info@benext.eu",
        "logo": null,
        "name": "BeNext B.V.",
        "organization": 1,
        "phone": null,
        "street": "Asterweg 20L1",
        "website": "https://www.benext.eu"
    }
] }
```

## 3.5 Lifestyles

The lifestyle resource lists the available lifestyles for an account and denotes which is the currently active lifestyle.
The id field will always be a number between 1 and 10 inclusive indicating the internal id of the lifestyle. These map 1-to-1 on lifestyle names, although it is possible that lifestyle names change. It is possible (and likely) that only some of the possible lifestyles are actually available.
Possible lifestyles include:

**Home** 1
**Home 2** 2
**Home 3** 3
**Home 4** 4
**Away** 5
**Away 2** 6
**Away 3** 7
**Away 4** 8
**Sleep** 9
**Party** 10

### 3.5.1 URL patterns

```
/login/api/v1/lifestyles/
/login/api/v1/lifestyles/2/
/login/api/v1/accounts/1/lifestyles/
/login/api/v1/accounts/1/lifestyles/2/
```

#### 3.5.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `active`, `id`, `lifestyle`, `name`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**lifestyle_id** Accepts a comma-separated list
**active** `true` or `false`
**id** number between 1 and 10, inclusive

### 3.5.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.5.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Parent account identifier
**active** Marks the currently active lifestyle
**id** Account-level unique id for lifestyle

**lifestyle** Resource identifier
**name** Name of lifestyle

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that lifestyle doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those lifestyles will be returned
- If no lifestyles are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 1,
    "active": false,
    "id": 5,
    "lifestyle": 2,
    "name": "away"
}

ResourceList = { "lifestyles": [
    {
        "account": 1,
        "active": true,
        "id": 1,
        "lifestyle": 1,
        "name": "home"
    },
    {
        "account": 1,
        "active": false,
        "id": 5,
        "lifestyle": 2,
        "name": "away"
    },
    {
        "account": 1,
        "active": false,
        "id": 9,
        "lifestyle": 3,
        "name": "sleep"
    }
] }
```

#### 3.5.2.2 PUT

A PUT request is used to update fields of a lifestyle. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `active`

Updating a lifestyle is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "active": true
}
```

- The *ONLY* valid value for `active` is `true`.
- It is *NOT* possible to deactivate a lifestyle.
- If the value `false` is passed a 400 Bad Request will be returned.
- It is *NOT* possible to activate multiple lifestyles at the same time. A PUT request on multiple resources will result in a 400 Bad Request.

A PUT request with filtering query parameters or without an lifestyle id *WILL* update multiple lifestyles. It is *NOT* recommend to send a PUT request without an lifestyle id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

## 3.6 Scenes

The scene resource describes the required data to send local-api requests to trigger scene and lists the available scenes by name.
It is currently not possible to request what products are changed by a scene but this is on the feature list for addition to the scene resource.

### 3.6.1 URL patterns

```
/login/api/v1/scenes/
/login/api/v1/scenes/3/
/login/api/v1/accounts/1/scenes/
/login/api/v1/accounts/1/scenes/3/
```

#### 3.6.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `code`, `name`, `scene`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**scene_id** Accepts a comma-separated list
**scene_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 3.6.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.6.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Parent account identifier
**code** Code to trigger scene on the local API of the Gateway
**name** Name of scene
**scene** Resource identifier

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that scene doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those scenes will be returned
- If no scenes are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 1,
    "code": 75,
    "name": "LightsOn",
    "scene": 3
}

ResourceList = { "scenes": [
    {
        "account": 1,
        "code": 75,
        "name": "LightsOn",
        "scene": 3
    },
    {
        "account": 1,
        "code": 76,
        "name": "Film",
        "scene": 4
    }
] }
```

#### 3.6.2.2 PUT

A PUT request is used to update fields of a scene. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `name`, `trigger`

Updating a scene is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "trigger": true
}
```

`trigger: true` will activate the scene in the Gateway.
A PUT request with filtering query parameters or without an scene id *WILL* update multiple scenes. It is *NOT* recommend to send a PUT request without an scene id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

#### 3.6.2.3 DELETE

A DELETE request is used to remove a scene. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an scene id *WILL* delete multiple scenes. It is *NOT* recommend send a DELETE request without an scene id or filtering query parameters.

## 3.7 Files

Describes the contents and location of various files linked to an account. A title and description provide some context to about the file. Additional tags allow for filtering and classification. Examples of tags may be: `manual`, `promo`, `tandc`.

### 3.7.1 URL patterns

```
/login/api/v1/files/
/login/api/v1/accounts/1/files/
```

#### 3.7.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `desc`, `location`, `mimetype`, `tags`, `title`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**tags_contains** Accepts a comma-separated list

### 3.7.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 3.7.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**account** Parent account identifier
**desc** Description of the file,
**location** URL pointing to the file
**mimetype** Mime-type of the file
**tags** Tags associated with the image
**title** Title of file, intended for printing and display

If filter queryparams are passed:

- A `ResourceList` containing those files will be returned
- If no files are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "files": [
    {
        "account": 1,
        "description": "Manual for explaining our NOM-service",
        "location": "https://s3-eu-west-1.amazonaws.com/cdn-benext/static/nom_files/manuals/BeNext
        "tags": [
            "manual",
            "nom"
        ],
        "title": "NOM/EPV handleiding",
```

```
        "type": "application/pdf"
    },
    {
        "account": 1,
        "description": "The BeNext Smart Home website",
        "location": "https://www.benext.eu/",
        "tags": [
            "promo"
        ],
        "title": "Homepage",
        "type": "text/html"
    }
] }
```

# 4 General product information

## 4.1 Producttypes

The producttype resource describes the type of a product and the associated image. They also contain information on the full name of the product and metadata about how the product should be used in the myBeNext interface.
If possible the correct producttype should be chosen over installing a product as a generic device.

### 4.1.1 URL patterns

`/login/api/v1/producttypes/`
`/login/api/v1/producttypes/42/`

#### 4.1.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `addable`, `appearance`, `image`, `installable`, `manufacturer`, `name`, `producttype`, `type`.
**climatecontroller** Accepts a boolean value: `true` or `false`
**producttype_id** Accepts a comma-separated list

### 4.1.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.1.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**addable** Indicates if this product can be added under normal circumstances
**appearance** Lists the possible appearance options for the `producttype`, always includes the producttype itself
**image** Image of producttype
**installable** Indicates if this product can be installed using the API
**manufacturer** Gives the name of manufacturer, if available/applicable. May be `null`
**name** Name of producttype
**producttype** Resource identifier
**type** Specifies the type of product, `P` for physical product (the devices), `I` for images (e.g. Boiler, PC, lamp)

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that producttype doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those producttypes will be returned
- If no producttypes are relevant or selected, an empty list will be returned.

**Output JSON**


```
Resource = {
    "appearance": [
        42,
        48,
        143,
        140
    ],
    "image": "/static/uploads/peripheral_class_images/EnergySwitch.png",
    "manufacturer": "BeNext",
    "name": "Energy Switch",
    "producttype": 42,
    "type": "P"
}

ResourceList = { "producttypes": [
    {
        "appearance": [
            52,
            60,
            111,
            112
        ],
        "image": "/static/uploads/peripheral_class_images/EnergySwitch.png",
        "manufacturer": "BeNext",
        "name": "Energy Switch",
        "producttype": 42,
        "type": "P"
    }
] }
```

## 4.2 Products

The product resource lists the virtual products linked to an account. Each virtual product may be linked to *one* physical product. These links are based on Manufacturer specific information listed by the device.
Products also have sub-resources: properties. These can be used to determine functionality of a device. The appearance of a product is linked to a producttype which contains the image for the icon.

### 4.2.1 URL patterns

```
/login/api/v1/products/
/login/api/v1/products/29/
/login/api/v1/accounts/1/products/
/login/api/v1/accounts/1/products/29/
```

#### 4.2.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `appearance`, `name`, `product`, `producttype`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**appearance_id** Accepts a comma-separated list
**node_null** Accepts a boolean value: `true` or `false`
**product_id** Accepts a comma-separated list
**product_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**producttype_id** Accepts a comma-separated list

### 4.2.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.2.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Parent account identifier
**appearance** Producttype resource id, describes the associated image
**name** Name of product, may be an empty string
**product** Resource identifier
**producttype** Producttype resource id, describes the physical product

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that product doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those products will be returned
- If no products are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 1,
    "appearance": 1,
    "name": "Internet Gateway",
    "product": 35,
    "producttype": 1
}

ResourceList = { "products": [
    {
        "account": 1,
        "appearance": 73,
        "name": "Electricity Meter",
        "product": 36,
        "producttype": 73
    },
    {
        "account": 1,
        "appearance": 48,
        "name": "Boiler",
        "product": 41,
        "producttype": 42
    }
] }
```

#### 4.2.2.2 POST

A POST request will create a new product. The product will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `producttype`, `account`
**Optional fields** `name`, `appearance`

Creating a product is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "producttype": 1,
    "account": 1
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 4.2.2.3 PUT

A PUT request is used to update fields of a product. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `name`, `appearance`

Updating a product is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "name": "Boiler",
    "appearance": 53
}
```

A PUT request with filtering query parameters or without an product id *WILL* update multiple products. It is *NOT* recommend to send a PUT request without an product id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

## 4.3 Datatypes

The datatype resource describes how values should be displayed and handled. The functionality of a property *CAN* and *SHOULD* be determined by looking at the datatype of the property.
If a property value has a specific suffix, this should be used to correctly display the value. The property resource is described by the following value types:

| Type | Meaning |
|---|---|
| `boolean` | A boolean value will have 2 choices, described by `min` and `max`. The respective `min_conv` and `max_conv` values should be used to display which one is active. As a rule, the `min` value will be an inactive state. |
| `choice` | The value can be 1 of the keys listed in the `choices` field. Values should be displayed using the values from the `choices` field. |
| `integer` | An integer value with a `min`, `max` and `step` argument for usage in slider and spinboxes. Does *NOT* allow decimal values. |
| `float` | An floating point value with a `min`, `max` and `step` argument for usage in slider and spinboxes. Does allow decimal values. |
| `composite` | These values *MAY* be composed of 2 separate integer values, divided by a comma (e.g. `3,FF`). The first part will be an integer, the second part a hexadecimal encoded integer. |
| `custom` | Parsing and handling this type of property requires custom code. For implementation and support contact the Api-maintainer. |

### 4.3.1 Commonly used datatypes

Also provided below is are a few lists of commonly used datatypes for properties with defining details:

#### 4.3.1.1 Datatypes usable with `energyentry` resource

| Id | Name | Suffix | Description |
|---|---|---|---|
| 39 | `Energy_kWh` | kWh | Total consumed energy, used for mainmeters and products |
| 50 | `EnergyReceived_kWh` | kWh | Total returned energy, amount of energy feed back in to the power grid |
| 63 | `EnergyProductionkWh` | kWh | Total produced energy, amount of energy produced by e.g. solar panels |
| 51 | `GasVolume` | m3 | Total volume of natural gas |
| 52 | `WaterVolume` | m3 | Total volume of water |
| 47 | `GigaJouleHeat` | GJ | Total energy used for heating (either DHW or CH) |
| 103 | `GigaJouleCool` | GJ | Total energy used for cooling |

#### 4.3.1.2 Datatypes used of measuring and controlling temperature

| Id | Name | Suffix | Description |
|---|---|---|---|
| 3 | `ScheduleOverride` | °C | Setpoint logic for Heating Control, requires custom logic |
| 67 | `Setpoint` | °C | Thermostat setpoint for Z-wave devices (4 – 28 °C) |
| 83 | `SecureSetpoint` | °C | Setpoint for secure devices, allows only whole steps |
| 12 | `Temperature` | °C | Measured temperature, small range (0 – 50 °C) |
| 102 | `HighTemperature` | °C | Measured temperature, large range (-40 – 200 °C) |

#### 4.3.1.3 Datatypes used for control

| Id | Name | Suffix | Description |
|---|---|---|---|
| 1 | SwitchOrder1 | — | Same as Switch, but gets sorted first |
| 9 | Switch | — | Has 2 values, On and Off (255 and 0) |
| 8 | Dimmer | % | Dimmer, range 0 – 99 (100 gets converted too 99) |
| 44 | WindowDimmer | % | Dimmer, range 0 – 99 (100 gets converted too 99) |
| 53 | Basic | % | Accepts both Switch and dimmer command, 0 – 99, 255 |
| 55 | Door lock | — | Has 2 values, Lock and Unlock (255 and 0) |

#### 4.3.1.4 Datatypes used for measure sensor data

| Id | Name | Suffix | Description |
|---|---|---|---|
| 4 | LightLux | lx | Measured light level in lux |
| 10 | Battery | % | Measured battery level in percentage |
| 11 | Lux | % | Measured light level in percentage |
| 13 | Movement | — | Has 2 values, Detected and Idle (255 and 0) |
| 15 | Contact | — | Has 2 values, Open and Closed (255 and 0) |
| 18 | Energy | Watt | Current amount of power used |
| 54 | Meter | — | Measured value, displayed as decimal |
| 56 | Sensor | — | Measured value, displayed as decimal |
| 62 | EnergyProductionWatt | Watt | Current amount of power produced (e.g. solar panels) |
| 66 | Flow | m3/h | Measured value, displayed as decimal |
| 75 | Humidity | % | Measured value in percentage |
| 80 | CO2 | ppm | Measured value, displayed as whole number |
| 87 | Ampere | A | Measured value, displayed as decimal |
| 88 | Voltage | V | Measured value, displayed as decimal |
| 91 | Velocity | m/s | Measured value, displayed as decimal |
| 92 | AirPressure | kPa | Measured value, displayed as decimal |
| 96 | BarPressure | bar | Measured value, displayed as decimal |
| 97 | RelativePressure | bar | Measured value, displayed as decimal |
| 101 | PowerWattage | Watt | Current amount of power (DC, only used in 1 product) |

### 4.3.2 URL patterns

```
/login/api/v1/datatypes/
/login/api/v1/datatypes/12/
```

#### 4.3.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `datatype`, `name`, `suffix`, `value`.

**datatype_id** Accepts a comma-separated list

### 4.3.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.3.3.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**datatype** Resource identifier
**name** Name of datatype
**suffix** Describes the suffix for the value, if applicable
**value** value description

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that datatype doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those datatypes will be returned
- If no datatypes are relevant or selected, an empty list will be returned.

#### Output JSON

```
Resource = {
    "datatype": 15,
    "name": "Contact",
    "suffix": "",
    "value": {
        "cmp": [
            "eq"
        ],
        "max": 255,
        "max_conv": "Opened",
        "min": 0,
        "min_conv": "Closed",
        "type": "boolean"
    }
}

ResourceList = { "datatypes": [
    {
        "datatype": 25,
        "name": "Mode",
        "suffix": "",
        "value": {
            "choice": {
                "1": "Alarm",
                "2": "Error",
                "3": "Walk in",
                "4": "Alert",
                "5": "Wake up",
                "6": "Doorbell"
            },
            "cmp": [
                "eq"
            ],
            "type": "choice"
        }
    },
    {
        "datatype": 27,
        "name": "Duration",
        "suffix": " sec",
        "value": {
            "cmp": [
```

```
                "lt",
                "eq",
                "gt"
            ],
            "max": 15,
            "min": 0,
            "step": 1,
            "suffix": " sec",
            "type": "integer"
        }
    }
] }
```

## 4.4 Properties

The property resource describes a single measurement source for a product. Any values received for the same property always refer to the same sensor on the same product. Examples include temperature and energy measurements. It's possible for two properties from one product to have the same datatype. This simply means that it corresponds to two different sensors. e.g. inside temperature and outside temperature

### 4.4.1 URL patterns

```
/login/api/v1/properties/
/login/api/v1/properties/222/
/login/api/v1/products/36/properties/
/login/api/v1/products/36/properties/222/
/login/api/v1/account/1/properties/
/login/api/v1/account/1/properties/222/
/login/api/v1/accounts/1/products/44/properties/
/login/api/v1/accounts/1/products/44/properties/222/
```

#### 4.4.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `datatype`, `name`, `product`, `property`, `receiving`, `sending`, `updated`, `value`.

**account_id** Accepts a comma-separated list

**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**appearance_id** Accepts a comma-separated list

**datatype_id** Accepts a comma-separated list

**energy_data** Accepts a boolean value: `true` or `false`

**node_null** Accepts a boolean value: `true` or `false`

**product_id** Accepts a comma-separated list

**product_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**producttype_id** Accepts a comma-separated list

**property_id** Accepts a comma-separated list

**property_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**updated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**updated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**value_like** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 4.4.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.4.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**datatype** Datatype resource id, describes the value conversion
**name** Name of property, may *NOT* be empty
**product** Parent product identifier
**property** Resource identifier
**receiving** Indicates if a product can receive messages
**sending** Indicates if a product can send messages
**updated** Timestamp at which the latest value was received in ISO format, may also be `null` if no value is ever received
**value** Current value

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that property doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those properties will be returned
- If no properties are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "datatype": 8,
    "name": "Dimmer",
    "product": 44,
    "property": 222,
    "receiving": true,
    "sending": true,
    "updated": "2018-04-20T14:53:00Z",
    "value": "80"
}

ResourceList = { "properties": [
    {
        "datatype": 8,
        "name": "Dimmer",
        "product": 44,
        "property": 222,
        "receiving": true,
        "sending": true,
        "updated": "2018-04-20T14:53:00Z",
        "value": "80"
    },
    {
        "datatype": 18,
        "name": "Energy",
        "product": 44,
        "property": 223,
        "receiving": false,
        "sending": true,
        "updated": "2018-04-20T14:53:00Z",
        "value": "150"
    },
```

```
    {
        "datatype": 39,
        "name": "kWh",
        "product": 44,
        "property": 224,
        "receiving": false,
        "sending": true,
        "updated": "2018-04-20T14:53:00Z",
        "value": "348.92"
    }
] }
```

#### 4.4.2.2 POST

A POST request will create a new property. The property will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error. This resource allows the bulk creation. To create multiple resources in 1 request, send all resources in a list. Read the introduction chapter for more information on this feature.

**Required fields** `product`, `name`, `datatype`, `receiving`, `sending`
**Optional fields** –

Creating a property is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "product": 15,
    "name": "kWh",
    "datatype": 39,
    "receiving": false,
    "sending": true
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 4.4.2.3 PUT

A PUT request is used to update fields of a property. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `name`, `datatype`, `receiving`, `sending`, `value`

Updating a property is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "name": "PV_kWh",
    "datatype": 39,
    "receiving": false,
    "sending": false,
    "value": "21"
}
```

A PUT request with filtering query parameters or without an property id *WILL* update multiple properties. It is *NOT* recommend to send a PUT request without an property id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

#### 4.4.2.4 DELETE

A DELETE request is used to remove a property. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an property id *WILL* delete multiple properties. It is *NOT* recommend send a DELETE request without an property id or filtering query parameters.

## 4.5 Mainmeters

The mainmeter resource describes which properties combine to form the mainmeter for an account. Note that these property *MAY* be spread amongst multiple physical products.

### 4.5.1 URL patterns

```
/api/v1/mainmeters/
/api/v1/mainmeters/331/
/api/v1/accounts/682/mainmeters/
/api/v1/accounts/682/mainmeters/331/
```

#### 4.5.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `mainmeter`, `property`, `tariff`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**mainmeter_id** Accepts a comma-separated list

### 4.5.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.5.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**account** Parent account identifier
**mainmeter** Resource identifier
**property** Parent property identifier
**tariff** Tariff identifier

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that mainmeter doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those mainmeters will be returned
- If no mainmeters are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 682,
    "mainmeter": 1,
    "property": 3763,
```

```
    "tariff": 331
}

ResourceList = { "mainmeters": [
    {
        "account": 682,
        "mainmeter": 1,
        "property": 3763,
        "tariff": 331
    }
] }
```

#### 4.5.2.2 POST

A POST request will create a new mainmeter. The mainmeter will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `account`, `property`, `tariff`
**Optional fields** –

Creating a mainmeter is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "account": 682,
    "property": 3763,
    "tariff": 331
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 4.5.2.3 DELETE

A DELETE request is used to remove a mainmeter. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an mainmeter id *WILL* delete multiple mainmeters. It is *NOT* recommend send a DELETE request without an mainmeter id or filtering query parameters.

## 4.6 Tariffs

The tariff resource provides information about the configured tariffs for the mainmeter. These can be used to convert measured values into monetary values uniformly throughout the system. Note that the symbols are purely graphic and provide no form of conversion.

### 4.6.1 URL patterns

```
/login/api/v1/tariffs/
/login/api/v1/tariffs/331/
/login/api/v1/accounts/682/tariffs/
/login/api/v1/accounts/682/tariffs/331/
```

#### 4.6.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `symbol`, `tariff`, `type`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**tariff_id** Accepts a comma-separated list
**type_str** Accepts a comma-separated list

### 4.6.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.6.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**account** Parent account identifier
**symbol** Symbol for tariff
**tariff** Resource identifier
**type** Tariff type, possible options:
**value** Tariff per unit

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that tariff doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those tariffs will be returned
- If no tariffs are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 682,
    "symbol": "€",
    "tariff": 331,
    "type": "energy_normal",
    "value": 0.12
}

ResourceList = { "tariffs": [
    {
        "account": 682,
        "symbol": "€",
        "tariff": 331,
        "type": "energy_normal",
        "value": 0.22
    },
    {
        "account": 682,
        "symbol": "€",
        "tariff": 335,
        "type": "gas",
        "value": 0.65
    },
    {
        "account": 682,
        "symbol": "€",
        "tariff": 336,
        "type": "water",
        "value": 0.006
    }
] }
```

#### 4.6.2.2 PUT

A PUT request is used to update fields of a tariff. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `value`, `symbol`

Updating a tariff is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "value": 0.22,
    "symbol": "$"
}
```

A PUT request with filtering query parameters or without an tariff id *WILL* update multiple tariffs. It is *NOT* recommend to send a PUT request without an tariff id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

## 4.7 Climatecontrollers

The climate controller resource lists the virtual climate controllers linked to an account. Each virtual climate controller may be linked to *one* physical product. These links are based on Manufacturer specific information listed by the device.
The resource has two fields which use arbitrary numbers to describe the status of the resource.Schedule type:

| Type | Description |
|---|---|
| 0 | Following internal schedule |
| 1 | Temporary schedule override |
| 2 | Permanent schedule override |

Valve status:

| Status | Description |
|---|---|
| 0 | Unknown |
| 1 | CH (Central Heating) |
| 2 | DHW (Domestic Hot Water) |

Mode:

| Mode | **Description |
|---|---|
| 0 | Idle |
| 1 | Heating |
| 2 | Cooling |
| 3 | Fan Only |
| 4 | Pending Heat |
| 5 | Pending Cool |
| 6 | Vent/Economizer |
| 7 | Aux Heating |
| 8 | Stage Heating |
| 9 | Stage Cooling |
| 10 | Stage Aux Heat |
| 11 | 3 Stage Aux Heat |

### 4.7.1 URL patterns

```
/login/api/v1/climatecontrollers/
/login/api/v1/climatecontrollers/35/
/login/api/v1/accounts/1/climatecontrollers/
/login/api/v1/accounts/1/climatecontrollers/35/
```

#### 4.7.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `controllable`, `datatype`, `formattedtemperature`, `heatdemand`, `mode`, `product`, `scheduletype`, `setpoint`, `synchronised`, `temperature`, `valvestatus`.

**account_id** Accepts a comma-separated list

**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**appearance_id** Accepts a comma-separated list
**node_null** Accepts a boolean value: `true` or `false`
**product_id** Accepts a comma-separated list
**product_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**producttype_id** Accepts a comma-separated list

### 4.7.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 4.7.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:
**controllable** Is the climate controller controllable. *MAY* be `null`
**datatype** Datatype resource identifier, describes the main setpoint
**formattedtemperature** The measured temperature of the controller in a formatted representation. Can be an empty string
**heatdemand** Indicates if there is a demand for heat. *MAY* be `null`
**mode** The mode of the climate controller. *MAY* be `null`
**product** Product resource identifier
**scheduletype** The behaviour of the climate schedule, see the description for more details. *MAY* be `null`
**setpoint** The wanted set point of the controller. *MAY* be `null`
**synchronised** The synchronisation status of the controller tells if the controller has had a wake-up and has set the requested value
**temperature** The measured raw temperature value of the controller. *MAY* be `null`
**valvestatus** The status of the valve. *MAY* be `null`

If the URL is passed without id:
- The `ResourceList` will be returned

If an id is passed in the URL:
- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that product doesn't exist

If filter queryparams are passed:
- A `ResourceList` containing those climatecontrollers will be returned
- If no climatecontrollers are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "controllable": true,
    "datatype": 73,
    "formattedtemperature": "20.4 gr C",
    "heatdemand": false,
    "mode": 0,
    "product": 35,
    "schedulteype": 0,
    "setpoint": 20.5,
    "synchronised": true,
    "temperature": 20.4566,
    "valvestatus": 0
```

```
}

ResourceList = { "climatecontrollers": [
    {
        "controllable": true,
        "datatype": 73,
        "formattedtemperature": "20.5 gr C",
        "heatdemand": false,
        "mode": 0,
        "product": 35,
        "schedulteype": 0,
        "setpoint": 20.5,
        "synchronised": true,
        "temperature": 20.4566,
        "valvestatus": 0
    },
    {
        "controllable": true,
        "datatype": 73,
        "formattedtemperature": "18.5 gr C",
        "heatdemand": true,
        "mode": 0,
        "product": 36,
        "schedulteype": 0,
        "setpoint": 12.0,
        "synchronised": false,
        "temperature": 18.4566,
        "valvestatus": 0
    }
] }
```

#### 4.7.2.2 PUT

A PUT request is used to update fields of a product. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `setpoint`, `scheduletype`

Updating a product is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "setpoint": 18.5,
    "scheduletype": 1
}
```

A PUT request with filtering query parameters or without an product id *WILL* update multiple climatecontrollers. It is *NOT* recommend to send a PUT request without an product id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

# 5 Sensor data & availability

## 5.1 Availabilities

Provide information about when products were available and unavailable.

### 5.1.1 URL patterns

`/login/api/v1/availability/`

#### 5.1.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `product`, `status`, `timestamp`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**begin** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**end** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**product_id** Accepts a comma-separated list

### 5.1.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 5.1.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**product** Product for which the status message is received
**status** Availability status report: available, retrying and unreachable
**timestamp** Time at which the status code was received, in ISO format

If filter queryparams are passed:

- A `ResourceList` containing those availabilities will be returned
- If no availabilities are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "availabilities": [
    {
        "product": 35670,
        "status": "product_retry",
        "timestamp": "2017-08-16T12:34:40.159Z"
    },
    {
```

```
        "product": 35670,
        "status": "product_avail",
        "timestamp": "2017-08-16T12:34:50.039Z"
    }
] }
```

## 5.2 Historyentries

History entries are the way raw data is stored in the myBeNext environment. They are linked to a property and contain a timestamp and a "raw" value. This value is stored as a string because it may contain any form of data including, but not limited to: comma-separated values, floating points, strings and Z-Wave specific metadata.

### 5.2.1 URL patterns

```
/login/api/v1/historyentries/<datetime>/<datetime>/
/login/api/v1/properties/historyentries/<datetime>/<datetime>/
/login/api/v1/properties/222/historyentries/<datetime>/<datetime>/
/login/api/v1/products/historyentries/<datetime>/<datetime>/
/login/api/v1/products/29/historyentries/<datetime>/<datetime>/
```

The `<datetime>` part of the URL consists of an ISO8601 extended timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-1300)`.
The first timestamp describes the start of the query (inclusive), the second timestamp describes the end of query (exclusive).

#### 5.2.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `property`, `timestamp`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**aggregates** Aggregates data based on the chosen aggregate on a per day base. Please note that due to architectural limitations this only works for history data older than three days. Options are: `min`, `avg`, `max`, `cnt`.
**appearance_id** Accepts a comma-separated list
**datatype_id** Accepts a comma-separated list
**energy_data** Accepts a boolean value: `true` or `false`
**node_null** Accepts a boolean value: `true` or `false`
**product_id** Accepts a comma-separated list
**product_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**producttype_id** Accepts a comma-separated list
**property_id** Accepts a comma-separated list
**property_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**timezone** IANA Tz database formatted timezone. Used for DST calculations and interpretation of timestamps in URL. Does *NOT* affect output.
**updated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**updated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**value_like** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any

character once. This syntax matches normal `LIKE` lookups in SQL.

### 5.2.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 5.2.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**property** Parent property identifier
**timestamp** Timestamp for entry in ISO format
**value** Historic value at timestamp

If the `end` timestamp is smaller than or equal to the `begin` timestamp a 400 Bad Request error is returned. If more than 31 days of data is requested a 400 Bad Request is returned.
If the amount of data is within the allowed 31 days, but the amount of data proves to be too much for the API to serve, a 422 Unprocessable Content error is returned. In this case, lower the number of days and/or properties you are trying to fetch data for.
If filter queryparams are passed:

- A `ResourceList` containing those historyentries will be returned
- If no historyentries are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "historyentries": [
    {
        "property": 172,
        "timestamp": "2015-03-30T00:00:00Z",
        "value": 0
    }
] }
```

## 5.3 Energyentries

Energy entries are the way aggregated data is stored in the myBeNext environment. They are linked to a property and contain a timestamp and a floating point value. All values are normalized to 15 minute interval values. These are *NOT* cumulative and can be summed to gain a total over a period of time (e.g. sum all data from 2015-05-01 to 2015-05-05 to gain the total energy used over this period).
These values can be aggregated a different resolution as listed below.
Energyentries are generated for the following list of datatypes: 39, 47, 50, 51, 52, 63, 103.

### 5.3.1 URL patterns

```
/login/api/v1/energyentries/<aggregate>/<datetime>/<datetime>/
/login/api/v1/properties/energyentries/<aggregate>/<datetime>/<datetime>/
/login/api/v1/properties/222/energyentries/<aggregate>/<datetime>/<datetime>/
/login/api/v1/products/energyentries/<aggregate>/<datetime>/<datetime>/
/login/api/v1/products/29/energyentries/<aggregate>/<datetime>/<datetime>/
```

The `<aggregate>` part of the URL indicates the resolution at which to aggregate. Possible options are: `minute`, `hour`, `day`, `week`, `month`, `quarter`, `year`
The `<datetime>` part of the URL consists of an ISO8601 extended timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-1300)`.
The first timestamp describes the start of the query (inclusive), the second timestamp describes the end of query (exclusive).

#### 5.3.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `property`, `timestamp`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**appearance_id** Accepts a comma-separated list
**datatype_id** Accepts a comma-separated list
**energy_data** Accepts a boolean value: `true` or `false`
**node_null** Accepts a boolean value: `true` or `false`
**product_id** Accepts a comma-separated list
**product_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**producttype_id** Accepts a comma-separated list
**property_id** Accepts a comma-separated list
**property_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**timezone** IANA Tz database formatted timezone. Used for DST calculations and interpretation of timestamps in URL. Does *NOT* affect output.
**updated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**updated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**value_like** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 5.3.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 5.3.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**property** Parent property identifier
**timestamp** Timestamp for entry in ISO format
**value** Aggregated value

If the `end` timestamp is smaller than or equal to the `begin` timestamp a 400 Bad Request error is returned.
If filter queryparams are passed:

- A `ResourceList` containing those energyentries will be returned
- If no energyentries are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "energyentries": [
    {
        "property": 248,
        "timestamp": "2015-03-30T00:00:00Z",
        "value": 99.24999999999993
    },
    {
        "property": 249,
        "timestamp": "2015-03-30T00:00:00Z",
        "value": 68.18848888888905
    },
    {
        "property": 250,
        "timestamp": "2015-03-30T00:00:00Z",
        "value": 0.0030000000000001137
    }
] }
```

## 5.4 Energyentrytotals

Energy entries are the way aggregated data is stored in the myBeNext environment. They are linked to a property and contain a timestamp and a floating point value. All values are normalized to 15 minute interval values. These are *NOT* cumulative and can be summed to gain a total over a period of time (e.g. sum all data from 2015-05-01 to 2015-05-05 to gain the total energy used over this period).
These values can be aggregated a different resolution as listed below.
Energyentries are generated for the following list of datatypes: 39, 47, 50, 51, 52, 63, 103.

### 5.4.1 URL patterns

```
/login/api/v1/energyentries/total/<datetime>/<datetime>/
/login/api/v1/properties/energyentries/total/<datetime>/<datetime>/
/login/api/v1/properties/222/energyentries/total/<datetime>/<datetime>/
/login/api/v1/products/energyentries/total/<datetime>/<datetime>/
/login/api/v1/products/29/energyentries/total/<datetime>/<datetime>/
```

Note that this url is similar to the normal energyentry resource. The main difference between the two is the output format, which for energyentrytotals does *NOT* include a timestamp.
The `<datetime>` part of the URL consists of an ISO8601 extended timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-1300)`.
The first timestamp describes the start of the query (inclusive), the second timestamp describes the end of query (exclusive).

#### 5.4.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `property`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**appearance_id** Accepts a comma-separated list
**datatype_id** Accepts a comma-separated list
**energy_data** Accepts a boolean value: `true` or `false`
**node_null** Accepts a boolean value: `true` or `false`
**product_id** Accepts a comma-separated list
**product_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**producttype_id** Accepts a comma-separated list
**property_id** Accepts a comma-separated list
**property_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**updated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**updated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**value_like** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any

character once. This syntax matches normal `LIKE` lookups in SQL.

### 5.4.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 5.4.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**property** Parent property identifier
**value** Aggregated value

If filter queryparams are passed:

- A `ResourceList` containing those energyentrytotals will be returned
- If no energyentrytotals are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "energyentrytotals": [
    {
        "property": 1103,
        "value": 0.316
    },
    {
        "property": 914,
        "value": 11.6200000000092
    },
    {
        "property": 1102,
        "value": 0.168000000000001
    }
] }
```

# 6 Device linking & configuration

## 6.1 Gateways

The Gateway resource describes the metadata associated with the physical Gateway connected to the account. Gateways can be installed using the serial number, a public ip address of the network the Gateway is on or a mac address that is listed on the back of the Gateway.

### 6.1.1 URL patterns

```
/login/api/v1/gateways/
/login/api/v1/gateways/1/
/login/api/v1/accounts/13/gateways
```

#### 6.1.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `firmware`, `gateway`, `public_ip`, `serial`, `status`, `status_time`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**gateway_id** Accepts a comma-separated list

### 6.1.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.1.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Parent account identifier
**firmware** Describes whether the firmware can or should be updated
**gateway** Resource identifier
**public_ip** Public ip associated with the Gateway
**serial** Internal serial number of Gateway
**status** Gateway availability status
**status_time** Status time

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that gateway doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those gateways will be returned
- If no gateways are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 1,
    "firmware": "newest",
    "gateway": 1,
    "public_ip": "4.4.4.4",
    "serial": "000042"
}

ResourceList = { "gateways": [
    {
        "account": 1,
        "firmware": "newest",
        "gateway": 1,
        "public_ip": "4.4.4.4",
        "serial": "000042"
    }
] }
```

#### 6.1.2.2 POST

A POST request will create a new gateway. The gateway will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `account`, (`serial` or `public_ip`)
**Optional fields** `serial`, `public_ip`, `exists`

Creating a gateway is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "account": 1,
    "serial": "000042"
}
```

When creating a gateway either a `serial` or `public_ip` is *REQUIRED*. If either one is *NOT* present a 400 BAD REQUEST will be returned with a message explaining that 1 of them is required. In the case that both are present the `serial` *WILL* take precedence over `public_ip`.
If the specified `account` doesn't exist a 404 NOT FOUND will be raised, indicating the account doesn't exist. If the specified `account` already has a gateway installed, a 409 CONFLICT will be returned.
If the provided `serial` is already in use, the api will return a 409 CONFLICT indicating the serial is already in use.
The `exists` value specifies if the server should check whether the gateway specified already exists. This is useful if you want to want to verify if the gateway is connected to the server. If the `exists` value is set to `true` the API will verify that *1* gateway is present for the provided `serial` or `public_ip`. If no Gateway is connected with the server a 404 NOT FOUND http code will be returned. If multiple gateways are found a 400 BAD REQUEST is returned with a message explained multiple gateways were found.
If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

## 6.2 Settings

The settings subresource is lists the possible settings you can send to a device. These are the same settings that can be sent using the myBeNext-interface. The setting resource does *NOT* have a unique identifier. Rather, the resource is a combination of the product resource and the name of the setting.
The resource has a special `value` field which describes the possible values you can send to the resource.
The contents of the `value`-field depends on the `type` that is passed in the value. The following types are currently supported:

| Type | Meaning |
|---|---|
| `choice` | 1 of the choices listed in the `choices` field may be passed in the `value` field. |
| `multiplechoice` | 1 or more of the choices listed in the `choices` field may be passed in the `value` field. These values should be passed as comma-separated list |
| `char` | A character string may be passed in the `value` field. Optional `min` and/or `max` fields may describe the minimum and/or maximum length that may be passed. |
| `integer` | An integer may be passed in the `value` field. Optional `min`, `max` and `step` field may describe the minimum and maximum values. The `step` field describes the possible step from the minimum value up. The maximum value will always be a valid value. |
| `float` | A float may be passed in the `value` field. Optional `min`, `max` and `step` field may describe the minimum and maximum values. The `step` field describes the possible step from the minimum value up. The maximum value will always be a valid value. |
| `boolean` | A boolean `true` or `false` may be passed in the `value` field. |
| `null` | A special type reserved for future support. Ignore any fields with this type. |

### 6.2.1 URL patterns

```
/login/api/v1/settings/
/login/api/v1/products/108/settings/
```

#### 6.2.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `name`, `product`, `value`.
**product_id** Accepts a comma-separated list

### 6.2.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.2.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**name** Name of setting
**product** Parent product identifier
**value** value description

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that setting doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those settings will be returned
- If no settings are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "settings": [
    {
        "name": "latitude",
        "product": 108,
        "value": {
            "max": 90,
            "min": -90,
            "type": "float"
        }
    },
    {
        "name": "longtitude",
        "product": 108,
        "value": {
            "max": 180,
            "min": -180,
            "type": "float"
        }
    },
    {
        "name": "dst",
        "product": 108,
        "value": {
            "type": "boolean"
        }
    }
] }
```

#### 6.2.2.2 POST

A POST request will create a new setting. The setting will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `product`, `name`, `value`
**Optional fields** –

Creating a setting is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "product": 108,
    "name": "latitude",
    "value": 52.37
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

## 6.3 Nodes

The node resource lists the nodes that the Gateway has registered.
If a node has a linked product the product field contains the resource identifier for that product. Otherwise the product field *MAY* be `null`.
If a node has relevant version and/or serial number information these fields will contain the relevant info. Otherwise, they *MAY* be `null`.

### 6.3.1 URL patterns

```
/login/api/v1/nodes/
/login/api/v1/nodes/13/
/login/api/v1/gateways/2/nodes/
/login/api/v1/gateways/2/nodes/13/
```

#### 6.3.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `gateway`, `node`, `product`, `protocol`, `serial`, `status`, `version`, `zwave_id`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**gateway_id** Accepts a comma-separated list
**node_id** Accepts a comma-separated list
**product_id** Accepts a comma-separated list
**product_null** Accepts a boolean value: `true` or `false`
**protocol_id** Accepts a comma-separated list
**status_id** Accepts a comma-separated list
**zwave_id** Accepts a comma-separated list

### 6.3.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.3.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**gateway** Parent gateway identifier
**node** Resource identifier
**product** Linked product identifier
**protocol** Node protocol
**serial** Serial of the node, *MAY* be `null`
**status** Z-Wave availability status
**version** Version of the node, *MAY* be `null`
**zwave_id** Z-Wave node id

The status of the node is indicated by the `status` field. This field has multiple possible values:

**0:** Node is available

**1:** Node has an unstable connection
**2:** Node has no connection

The protocol of the node is indicated by the `protocol` field. This field has multiple possible values:
`mygate`: : This the the representative node for the Gateway
**`zwave`:** These nodes communicate using the Z-wave protocol
**`p1`:** These nodes communicate using the P1 or wM-Bus protocol

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that node doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those nodes will be returned
- If no nodes are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "gateway": 2,
    "node": 13,
    "product": 13,
    "protocol": "zwave",
    "serial": null,
    "status": 2,
    "version": null,
    "zwave_id": 3
}

ResourceList = { "nodes": [
    {
        "gateway": 2,
        "node": 13,
        "product": 13,
        "protocol": "zwave",
        "serial": null,
        "status": 2,
        "version": null,
        "zwave_id": 3
    },
    {
        "gateway": 2,
        "node": 14,
        "product": 17,
        "protocol": "zwave",
        "serial": null,
        "status": 2,
        "version": null,
        "zwave_id": 8
    }
] }
```

#### 6.3.2.2 POST

A POST request will create a new node. The node will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `zwave_id`, `gateway`
**Optional fields** –

Creating a node is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "zwave_id": 26,
    "gateway": 2
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

## 6.4 Propertymappings

The propertymapping resource describes the way properties are linked to the physical parameters of a node. This is based on the Z-Wave command class model. For more information on this subject, please contact BeNext at support@benext.eu

### 6.4.1 URL patterns

```
/login/api/v1/propertymappings/
/login/api/v1/nodes/13/propertymappings/
/login/api/v1/gateways/2/propertymappings/
/login/api/v1/accounts/13/propertymappings
```

#### 6.4.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `channel`, `commandclass`, `node`, `parameter`, `property`, `propertymapping`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**channel_id** Accepts a comma-separated list
**commandclass_id** Accepts a comma-separated list
**gateway_id** Accepts a comma-separated list
**node_id** Accepts a comma-separated list
**parameter_id** Accepts a comma-separated list
**product_id** Accepts a comma-separated list
**product_null** Accepts a boolean value: `true` or `false`
**property_id** Accepts a comma-separated list
**propertymapping_id** Accepts a comma-separated list
**protocol_id** Accepts a comma-separated list
**status_id** Accepts a comma-separated list
**zwave_id** Accepts a comma-separated list

### 6.4.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.4.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**channel** Z-Wave command class channel
**commandclass** Z-Wave command class ID
**node** Parent gateway identifier
**parameter** Z-Wave scale/option identifier
**property** Linked property identifier
**propertymapping** Resource identifier

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that propertymapping doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those propertymappings will be returned
- If no propertymappings are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "channel": 1,
    "command_class": 50,
    "node": 211,
    "parameter": 0,
    "property": 1100,
    "propertymapping": 681
}

ResourceList = { "propertymappings": [
    {
        "channel": 1,
        "command_class": 50,
        "node": 211,
        "parameter": 0,
        "property": 1100,
        "propertymapping": 681
    },
    {
        "channel": 2,
        "command_class": 50,
        "node": 211,
        "parameter": 0,
        "property": 1101,
        "propertymapping": 682
    },
    {
        "channel": 3,
        "command_class": 50,
        "node": 211,
        "parameter": 0,
        "property": 1102,
        "propertymapping": 683
    }
] }
```

#### 6.4.2.2 POST

A POST request will create a new propertymapping. The propertymapping will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `node`, `command_class`, `property`
**Optional fields** `channel`, `parameter`

Creating a propertymapping is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
```

```
    "node": 13,
    "command_class": 50,
    "property": 298
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 6.4.2.3 DELETE

A DELETE request is used to remove a propertymapping. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an propertymapping id *WILL* delete multiple propertymappings. It is *NOT* recommend send a DELETE request without an propertymapping id or filtering query parameters.

## 6.5 Installation

The installation resource is used to install or "unpair" physical Z-wave products onto virtual products.This resource is a wrapper for the installation procedure and doesn't directly map to any database resources.
The installation API can be used to start and stop the installation process and it will report back feedback on the current state of the installation process. Possible `type` statuses are:

| Type | Meaning |
|---|---|
| `install_start` | Install request successfully sent to Gateway |
| `install_accepted` | Install request received by Gateway |
| `install_searching` | Gateway ready for node info |
| `install_found` | Gateway received node info |
| `install_configuring` | Gateway is configuring node |
| `install_conf_success` | Node configuration success |
| `install_success` | Node is successfully installed on product |
| `install_unknown_dev` | Installed node is an unknown product |
| `install_wrong_dev` | Installed node did not match type of product |
| `install_node_mapped` | Node was already mapped to a product |
| `install_aborted` | Installation was aborted |
| `install_rwu_fail` | Node went in sleep-mode to fast |
| `install_conf_fail_w` | Node went unreachable during configuration (Wakeup) |
| `install_conf_fail_l` | Node went unreachable during configuration (Listening) |
| `install_internal` | Internal Gateway error |
| `install_sec_hs_fail` | Secure handshake failure |
| `install_no_sis` | No SIS available |
| `install_busy` | Driver timeout |
| `install_no_space` | No more space in Gateway |
| `install_proto_fail` | Protocol failure |
| `install_timeout` | Installation timed out |

### 6.5.1 URL patterns

`/login/api/v1/installation/`

#### 6.5.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `product`, `status`, `timestamp`.

**account_id** Accepts a comma-separated list

**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**begin** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**end** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**product_id** Accepts a comma-separated list

### 6.5.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.5.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**product** Product for which the status code was sent
**status** Status identifier
**timestamp** Time at which the status code was received, in ISO format

If filter queryparams are passed:

- A `ResourceList` containing those installation will be returned
- If no installation are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "installation": [
    {
        "product": 41,
        "status": "install_received",
        "timestamp": "2015-03-30T10:23:05Z"
    }
] }
```

#### 6.5.2.2 POST

A POST request will create a new installation. The installation will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `product`
**Optional fields** `secure`, `timeout`

Creating an installation is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "product": 15
}
```

- If no Gateway is linked to the account for the requested product, a 400 Bad Request will be returned.
- If the requested product does not exist, a 404 Not Found will be returned.
- If no connection could be setup to the Gateway or an error is received, a 502 Bad Gateway error will be returned
- If the installation is requested as non-secured, but the product requires secure installation, a 400 Bad Request will be returned
- If the resource is created successfully, a 202 ACCEPTED http code will be returned. A GET to the installation resource, with an optional product filter, can be performed to list the historic and current installation state.

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 6.5.2.3 DELETE

A DELETE request is used to remove an installation. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.

A DELETE with filtering query parameters or without an installation id *WILL* delete multiple installation. It is *NOT* recommend send a DELETE request without an installation id or filtering query parameters.

## 6.6 Deinstallation

The deinstallation resource is used to deinstall or "unpair" physical Z-Wave products from virtual products. This resource is a wrapper for the deinstallation procedure and doesn't directly map to any database resources.
The deinstallation API can be used to start and stop the deinstallation process, and it will report back feedback on the current state of the deinstallation process.
The product field is required, but it is possible to pass `null` as value to allow deinstallation of a physical product which is unknown in the network. Possible `type` statuses are:

| Type | Meaning |
|---|---|
| `deinst_start` | Deinstall request successfully sent to Gateway |
| `deinst_accepted` | Deinstall request received by Gateway |
| `deinst_searching` | Gateway ready for node info |
| `deinst_found` | Gateway received node info |
| `deinst_success` | Deinstallation successful |
| `deinst_wrong_dev` | Wrong product was deinstalled |
| `deinst_not_modified` | Node was removed from a different network or not installed |
| `deinst_aborted` | Deinstallation was aborted |
| `deinst_internal` | Internal Gateway error |
| `deinst_busy` | Driver timeout |
| `deinst_proto_fail` | Protocol failure |
| `deinst_timeout` | Installation timed out |

### 6.6.1 URL patterns

`/login/api/v1/deinstallation/`

#### 6.6.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `product`, `status`, `timestamp`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**begin** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**end** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**product_id** Accepts a comma-separated list

### 6.6.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.6.2.1 GET

A GET returns the relevant `ResourceList`. The resource contains the following fields:

**product** Product for which the status code was sent
**status** Status identifier
**timestamp** Time at which the status code was received, in ISO format

If filter queryparams are passed:

- A `ResourceList` containing those deinstallation will be returned
- If no deinstallation are relevant or selected, an empty list will be returned.

**Output JSON**

```
ResourceList = { "deinstallation": [
    {
        "product": null,
        "status": "deinst_start",
        "timestamp": "2015-08-18T08:42:50.315Z"
    },
    {
        "product": null,
        "status": "deinst_accepted",
        "timestamp": "2015-08-18T08:42:50.534Z"
    },
    {
        "product": null,
        "status": "deinst_searching",
        "timestamp": "2015-08-18T08:42:50.581Z"
    },
    {
        "product": null,
        "status": "deinst_found",
        "timestamp": "2015-08-18T08:42:57.377Z"
    },
    {
        "product": null,
        "status": "deinst_not_modified",
        "timestamp": "2015-08-18T08:42:59.377Z"
    }
] }
```

#### 6.6.2.2 POST

A POST request will create a new deinstallation. The deinstallation will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `product`
**Optional fields** `timeout`

Creating a deinstallation is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "product": 41
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 6.6.2.3 DELETE

A DELETE request is used to remove a deinstallation. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.

A DELETE with filtering query parameters or without an deinstallation id *WILL* delete multiple deinstallation. It is *NOT* recommend send a DELETE request without an deinstallation id or filtering query parameters.

## 6.7 Synchronize

The synchronize resource allows for the synchronization of rules for 1 or more gateways. Synchronization should always be performed after installing products to ensure the Gateway is configured correctly. Possible statuses for synchronization are:

| Status | Meaning |
|---|---|
| `uninitialized` | The Gateway has never been synchronized |
| `accepted` | The synchronization request has been accepted |
| `sending` | Update is being sent to the Gateway |
| `verifying` | Update is being verified by the Gateway |
| `programming` | Update is being installed in the Gateway |
| `success` | Update successful |
| `error` | Update failed |

### 6.7.1 URL patterns

```
/login/api/v1/synchronize/
/login/api/v1/gateways/1/synchronize/
```

#### 6.7.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `gateway`, `status`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**gateway_id** Accepts a comma-separated list

### 6.7.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.7.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**gateway** Parent gateway identifier
**status** Synchronization status

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that sychronization doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those synchronize will be returned
- If no synchronize are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "gateway": 1,
    "status": "success"
}

ResourceList = { "synchronize": [
    {
        "gateway": 1,
        "status": "accepted"
    }
] }
```

#### 6.7.2.2 POST

A POST request will create a new sychronization. The sychronization will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** –
**Optional fields** –

This object has no required fields. Anything added to the POST body will be ignored. Creating a sychronization is done by passing the resource as JSON data with POST.
If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

## 6.8 Pendingdatas

Pending data resources allows tracking of when and if values are sent to a specific product.

### 6.8.1 URL patterns

```
/login/api/v1/pendingdata/
/login/api/v1/pendingdata/16599/
/login/api/v1/gateways/65/pendingdata/
/login/api/v1/gateways/65/pendingdata/16599/
```

#### 6.8.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `channel`, `command_class`, `eta`, `gateway`, `node`, `parameter`, `pendingdata`, `protocol`, `status`, `timestamp`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**begin** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**command_class_id** Accepts a comma-separated list
**end** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**gateway_id** Accepts a comma-separated list
**node_id** Accepts a comma-separated list
**pendingdata_id** Accepts a comma-separated list

### 6.8.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 6.8.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**channel** Channel ID
**command_class** Command Class
**eta** Estimated time at which the value will be sent
**gateway** Parent account identifier
**node** Node ID
**parameter** Parameter
**pendingdata** Resource identifier
**protocol** Protocol identifier
**status** Status
**timestamp** Time at which the data was sent to the gateway
**value** The encoded value to be sent

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that pendingdata doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those pendingdatas will be returned
- If no pendingdatas are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "channel": 0,
    "command_class": 132,
    "eta": "2015-08-19T15:39:33Z",
    "gateway": 65,
    "node": 2,
    "parameter": 0,
    "pendingdata": 16599,
    "protocol": "zwave",
    "status": "wakeup",
    "timestamp": "2015-08-19T15:39:33Z",
    "value": "100E00000100000000000000"
}

ResourceList = { "pendingdatas": [
    {
        "channel": 0,
        "command_class": 132,
        "eta": "2015-08-19T15:39:33Z",
        "gateway": 65,
        "node": 2,
        "parameter": 0,
        "pendingdata": 16599,
        "protocol": "zwave",
        "status": "wakeup",
        "timestamp": "2015-08-19T15:39:33Z",
        "value": "100E00000100000000000000"
    },
    {
        "channel": 0,
        "command_class": 132,
        "eta": "2016-11-16T10:24:46Z",
        "gateway": 65,
        "node": 5,
        "parameter": 0,
        "pendingdata": 17568,
        "protocol": "zwave",
        "status": "wakeup",
        "timestamp": "2016-11-16T10:17:40Z",
        "value": "201C00000100000000000000"
    }
] }
```

#### 6.8.2.2 POST

A POST request will create a new pendingdata. The pendingdata will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `gateway`, `protocol`, `node`, `command_class`

**Optional fields** `channel`, `parameter`, `value`

Creating a pendingdata is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "gateway": 65,
    "protocol": "zwave",
    "node": 5,
    "command_class": 112
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 6.8.2.3 DELETE

A DELETE request is used to remove a pendingdata. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an pendingdata id *WILL* delete multiple pendingdatas. It is *NOT* recommend send a DELETE request without an pendingdata id or filtering query parameters.

# 7 Energy asset reporting

## 7.1 Energyassetcategories

The energyassetcategory defines sets of properties which can be used to calculate information about an energyasset. These categories have a fixed `name` and a `title` which will be translated based on the provided Accept-Language or the configured language of the account. The list of categories is provided below, along with an explanation of what this category defines.

| Id | Name | Meaning | Unit |
|---|---|---|---|
| 6 | `usage` | Energy used for domestic appliances | kWh |
| 7 | `building_related_energy` | Energy used for heating, installation | kWh |
| 8 | `live_energy_generating` | Live power produced | Watt |
| 9 | `warm_water` | Domestic hot water | m3 |
| 10 | `generating` | Energy produced by asset | kWh |
| 11 | `heat` | Energy used for central heating | GJ |
| 12 | `ventilation` | Energy used by ventilation | kWh |
| 13 | `heatpump` | Energy used by heatpump | kWh |
| 14 | `help` | Energy used by aux. installation | kWh |
| 15 | `roomtemp` | Measured room temperature | °C |
| 16 | `watertemp_ch` | Measured central heating flow temp. | °C |
| 17 | `co2` | Measured CO2 | ppm |
| 18 | `gas` | Natural gas | m3 |
| 19 | `electric_heating` | Energy used by electrical heating | kWh |
| 20 | `warm_water_heat` | Energy used for domestic hot water | GJ |
| 21 | `boiler` | Energy used by boiler | kWh |
| 22 | `live_energy_grid` | Live power im/exported to/form grid | Watt |
| 23 | `live_energy_building_related` | Live power used for heating, install. | Watt |
| 24 | `live_energy_usage` | Live power used for domestic appliances | Watt |
| 25 | `outsidetemp` | Outside temperature | °C |
| 26 | `grid_feedin` | Energy feed back into grid | kWh |
| 27 | `grid_usage` | Energy imported from grid | kWh |
| 28 | `setpoint_ch` | Central heating setpoint | °C |
| 29 | `setpoint_dhw` | Domestic hot water setpoint | °C |
| 30 | `setpoint_roomtemp` | Room temperature setpoint | °C |
| 31 | `watertemp_dhw` | Measured domestic hot water temperature | °C |
| 32 | `heat_volume` | Central heating water used | m3 |
| 33 | `battery_charging` | Energy used to charge an accupack | kWh |
| 34 | `battery_usage` | Energy extracted from an accupack | kWh |
| 35 | `live_energy_battery` | Live energy charging/using from accu | Watt |
| 36 | `watertemp_return_ch` | Central heating return temperature | °C |
| 37 | `watertemp_return_dhw` | Domestic hot water return temperature | °C |
| 38 | `cooling` | Energy used for cooling | GJ |
| 39 | `cooling_volume` | Cooling water volume used | m3 |
| 40 | `tap_water` | Cold domestic (tap) water volume | m3 |
| 41 | `heatpump_booster` | Energy used by heatpump (booster) | kWh |
| 42 | `heatpump_ch` | Energy used by heatpump (central heating) | kWh |
| 43 | `heatpump_dhw` | Energy used by heatpump (domestic hot water) | kWh |
| 44 | `heatpump_cooling` | Energy used by heatpump (cooling) | kWh |
| 45 | `heat_kwh` | Energy used for heating (kWh) | kWh |
| 46 | `cooling_kwh` | Energy used for cooling (kWh) | kWh |

### 7.1.1 URL patterns

```
/login/api/v1/energyassetcategories/
/login/api/v1/energyassetcategories/7/
```

#### 7.1.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `datatypes`, `displaycolor`, `energyassetcategory`, `name`, `order`, `thresholdtype`, `title`, `valueconversion`.

**energyassetcategory_id** Accepts a comma-separated list

### 7.1.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.1.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**datatypes** List of Datatype resource identifiers to be used with this category

**displaycolor** Color to be used

**energyassetcategory** Resource identifier

**name** Category name

**order** Indicates the preferred ascending order of displaying the categories in graphs

**thresholdtype** Indicates whether the bundle should be maximum expected value (`max`) or minimum required value (`min`)

**title** Category title

**valueconversion** Describes the conversions factors and corresponding suffixes

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that energyassetcategory doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those energyassetcategories will be returned
- If no energyassetcategories are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "datatypes": [
        39
    ],
    "displaycolor": "#888888",
    "energyassetcategory": 7,
    "name": "building_related_energy",
    "thresholdtype": "min",
    "title": "Building related",
    "valueconversion": [
        {
```

```
            "factor": 0.0036,
            "preferred": false,
            "suffix": "GJ"
        },
        {
            "factor": 1,
            "preferred": true,
            "suffix": "kWh"
        },
        {
            "factor": 3.6,
            "preferred": false,
            "suffix": "MJ"
        },
        {
            "factor": 0.001,
            "preferred": false,
            "suffix": "MWh"
        }
    ]
}

ResourceList = { "energyassetcategories": [
    {
        "datatypes": [
            39
        ],
        "displaycolor": "#95b455",
        "energyassetcategory": 6,
        "name": "usage",
        "thresholdtype": "min",
        "title": "Household",
        "valueconversion": [
            {
                "factor": 0.0036,
                "preferred": false,
                "suffix": "GJ"
            },
            {
                "factor": 1,
                "preferred": true,
                "suffix": "kWh"
            },
            {
                "factor": 3.6,
                "preferred": false,
                "suffix": "MJ"
            },
            {
                "factor": 0.001,
                "preferred": false,
                "suffix": "MWh"
            }
        ]
    },
    {
        "datatypes": [
            39
```

```
        ],
        "displaycolor": "#888888",
        "energyassetcategory": 7,
        "name": "building_related_energy",
        "thresholdtype": "min",
        "title": "Building related",
        "valueconversion": [
            {
                "factor": 0.0036,
                "preferred": false,
                "suffix": "GJ"
            },
            {
                "factor": 1,
                "preferred": true,
                "suffix": "kWh"
            },
            {
                "factor": 3.6,
                "preferred": false,
                "suffix": "MJ"
            },
            {
                "factor": 0.001,
                "preferred": false,
                "suffix": "MWh"
            }
        ]
    },
    {
        "datatypes": [
            62,
            113
        ],
        "displaycolor": "#9b98c8",
        "energyassetcategory": 8,
        "name": "live_energy_generating",
        "thresholdtype": "min",
        "title": "Live production energy",
        "valueconversion": [
            {
                "factor": 1,
                "preferred": true,
                "suffix": "W"
            },
            {
                "factor": 0.001,
                "preferred": false,
                "suffix": "kW"
            },
            {
                "factor": 1e-06,
                "preferred": false,
                "suffix": "MW"
            }
        ]
    }
] }
```

## 7.2 Energyassets

### 7.2.1 URL patterns

```
/login/api/v1/energyassets/
/login/api/v1/energyassets/1/
/login/api/v1/accounts/5/energyassets/
/login/api/v1/accounts/5/energyassets/1/
```

#### 7.2.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `bundles`, `energyasset`, `validated`.

**account_id** Accepts a comma-separated list

**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**energyasset_id** Accepts a comma-separated list

**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.

**validated_null** Accepts a boolean value: `true` or `false`

### 7.2.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.2.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Parent account identifier

**bundles** Lists the various measurement categories, estimated by month

**energyasset** Resource identifier

**validated** Date on which energyasset was officially done, may be `null` if the asset is not finished yet

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that energyasset doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those energyassets will be returned
- If no energyassets are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 5,
    "bundles": {
        "6": [
            469,
            402,
            409,
            349,
            335,
            314,
            310,
            318,
            335,
            375,
            411,
            467
        ]
    },
    "energyasset": 1,
    "validated": null
}

ResourceList = { "energyassets": [
    {
        "account": 5,
        "bundles": {
            "10": [
                92,
                209,
                368,
                635,
                709,
                750,
                713,
                619,
                407,
                252,
                131,
                109
            ]
        },
        "energyasset": 1,
        "validated": "2018-01-01T00:00:00Z"
    }
] }
```

## 7.3 Energyassetproperties

### 7.3.1 URL patterns

```
/login/api/v1/energyassetproperties/
/login/api/v1/energyassetproperties/2/
/login/api/v1/energyassets/1/energyassetproperties/
/login/api/v1/energyassets/1/energyassetproperties/2/
/login/api/v1/accounts/5/energyassetproperties/
/login/api/v1/accounts/5/energyassetproperties/2/
/login/api/v1/accounts/5/energyassets/1/energyassetproperties/
/login/api/v1/accounts/5/energyassets/1/energyassetproperties/2/
```

#### 7.3.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `energyasset`, `energyassetcategory`, `energyassetproperty`, `property`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**energyasset_id** Accepts a comma-separated list
**energyassetcategory_id** Accepts a comma-separated list
**energyassetproperty_id** Accepts a comma-separated list
**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_null** Accepts a boolean value: `true` or `false`

### 7.3.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.3.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**energyasset** Parent energyasset identifier
**energyassetcategory** Parent energyassetcategory identifier
**energyassetproperty** Resource identifier
**property** Parent property identifier

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that energyassetproperty doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those energyassetproperties will be returned
- If no energyassetproperties are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "energyasset": 1,
    "energyassetcategory": 7,
    "energyassetproperty": 2,
    "property": 922
}

ResourceList = { "energyassetproperties": [
    {
        "energyasset": 1,
        "energyassetcategory": 6,
        "energyassetproperty": 1,
        "property": 918
    },
    {
        "energyasset": 1,
        "energyassetcategory": 9,
        "energyassetproperty": 2,
        "property": 919
    }
] }
```

#### 7.3.2.2 POST

A POST request will create a new energyassetproperty. The energyassetproperty will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error.

**Required fields** `energyasset`, `energyassetcategory`, `property`
**Optional fields** –

Creating an energyassetproperty is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "property": 100,
    "energyasset": "1",
    "energyassetcategory": 10
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 7.3.2.3 DELETE

A DELETE request is used to remove an energyassetproperty. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned. A DELETE with filtering query parameters or without an energyassetproperty id *WILL* delete multiple energyassetproperties. It is *NOT* recommend send a DELETE request without an energyassetproperty id or filtering query parameters.

## 7.4 Energyassetbundles

The energyassetbundles show how much energy is consumed per energyassetcategory in the chosen period. The bundles returned represent the `bundles` found in `energyassets`

### 7.4.1 URL patterns

```
/login/api/v1/energyassetbundles/<aggregate>/<calendardate>/<calendardate>/
/login/api/v1/energyassetbundles/7/<aggregate>/<calendardate>/<calendardate>/
/login/api/v1/energyassets/2/energyassetbundles/<aggregate>/<calendardate>/
    <calendardate>/

/login/api/v1/energyassets/2/energyassetbundles/7/<aggregate>/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/3/energyassetbundles/<aggregate>/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/3/energyassetbundles/7/<aggregate>/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/3/energyassets/2/energyassetbundles/<aggregate>/
    <calendardate>/<calendardate>/

/login/api/v1/accounts/3/energyassets/2/energyassetbundles/7/<aggregate>/
    <calendardate>/<calendardate>/
```

The `<aggregate>` part of the URL indicates the resolution at which to aggregate. Possible options are: `minute`, `hour`, `day`, `month`, `year`.
The `<calendardate>` part of the URL consists of an ISO6801 extended timestamp. The following formats are possible: `YYYY-MM-dd`, `YYYY-MM`, `YYYY`.
The first `<calendardate>` represents the start of the query (inclusive), the second `<calendardate>` represents the end of the query (exclusive).

#### 7.4.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `bundle`, `energyasset`, `energyassetcategory`, `expectedvalue`, `timestamp`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**energyasset_id** Accepts a comma-separated list
**energyassetbundle_id** Accepts a comma-separated list
**energyassetcategory_id** Accepts a comma-separated list
**ignore_bundles** Accepts a boolean value: `true` or `false`
**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_null** Accepts a boolean value: `true` or `false`

### 7.4.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.4.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**bundle** The bundle value
**energyasset** Parent energyasset identifier
**energyassetcategory** Energyassetcategory identifier
**expectedvalue** The expected energy consumption
**timestamp** Timestamp for which the bundle was calculated, in ISO format
**value** The aggregated value

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that energyassetbundle doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those energyassetbundles will be returned
- If no energyassetbundles are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "bundle": 3000.0,
    "energyasset": 2,
    "energyassetcategory": 7,
    "expectedvalue": 1896.9,
    "timestamp": "2015",
    "value": 1581.5
}

ResourceList = { "energyassetbundles": [
    {
        "bundle": 190.4,
        "energyasset": 2,
        "energyassetcategory": 7,
        "expectedvalue": 134.9,
        "timestamp": "2015-03",
        "value": 156.5
    },
    {
        "bundle": 120.0,
        "energyasset": 2,
        "energyassetcategory": 10,
        "expectedvalue": 34.1,
        "timestamp": "2015-03",
        "value": 49.8
    }
] }
```

## 7.5 Energyassetbundletotals

The energyassetbundletotals are the aggregated bundle values for the given period. The bundles returned represent the `bundles` found in `energyassets`

### 7.5.1 URL patterns

```
/login/api/v1/energyassetbundles/total/<calendardate>/<calendardate>/
/login/api/v1/energyassetbundles/7/total/<calendardate>/<calendardate>/
/login/api/v1/energyassets/2/energyassetbundles/total/<calendardate>/
    <calendardate>/

/login/api/v1/energyassets/2/energyassetbundles/7/total/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/1/energyassetbundles/total/<calendardate>/<calendardate>/
/login/api/v1/accounts/1/energyassetbundles/7/total/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/1/energyassets/2/energyassetbundles/total/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/1/energyassets/2/energyassetbundles/7/total/
    <calendardate>/<calendardate>/
```

Note that this resource is similar to the normal bundle resource.
The main difference between the two is the output format, which for bundletotals does *NOT* include a timestamp.
The `<calendardate>` part of the URL consists of an ISO6801 extended timestamp. The following formats are possible: `YYYY-MM-dd`, `YYYY-MM`, `YYYY`.
The first `<calendardate>` represents the start of the query (inclusive), the second `<calendardate>` represents the end of the query (exclusive).

#### 7.5.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `bundle`, `energyasset`, `energyassetcategory`, `expectedvalue`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**energyasset_id** Accepts a comma-separated list
**energyassetbundletotal_id** Accepts a comma-separated list
**energyassetcategory_id** Accepts a comma-separated list
**ignore_bundles** Accepts a boolean value: `true` or `false`
**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_null** Accepts a boolean value: `true` or `false`

### 7.5.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.5.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**bundle** The bundle value
**energyasset** Parent energyasset identifier
**energyassetcategory** Energyassetcategory identifier
**expectedvalue** The expected energy consumption for the given period
**value** The aggregated value

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that energyassetbundletotal doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those energyassetbundletotals will be returned
- If no energyassetbundletotals are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "bundle": 3000.0,
    "energyasset": 2,
    "energyassetcategory": 7,
    "expectedvalue": 1896.9,
    "timestamp": "2015",
    "value": 1581.5
}

ResourceList = { "energyassetbundletotals": [
    {
        "bundle": 190.4,
        "energyasset": 2,
        "energyassetcategory": 7,
        "expectedvalue": 134.9,
        "timestamp": "2015-03",
        "value": 156.5
    },
    {
        "bundle": 120.0,
        "energyasset": 2,
        "energyassetcategory": 10,
        "expectedvalue": 34.1,
        "timestamp": "2015-03",
        "value": 49.8
    }
] }
```

## 7.6 Energyassetaggregates

The energyassetaggregates resource lists the most recent value for each energyassetcategory.Where `value` is an aggregation of the energyassetproperties per energyassetcategory.

| Id | Name | Aggregate | Unit |
|---|---|---|---|
| 6 | usage | custom | kWh |
| 7 | building_related_energy | sum | kWh |
| 8 | live_energy_generating | sum | Watt |
| 9 | warm_water | sum | m3 |
| 10 | generating | sum | kWh |
| 11 | heat | sum | GJ |
| 12 | ventilation | sum | kWh |
| 13 | heatpump | sum | kWh |
| 14 | help | sum | kWh |
| 15 | roomtemp | average | °C |
| 16 | watertemp_ch | average | °C |
| 17 | co2 | average | ppm |
| 18 | gas | sum | m3 |
| 19 | electric_heating | sum | kWh |
| 20 | warm_water_heat | sum | GJ |
| 21 | boiler | sum | kWh |
| 22 | live_energy_grid | sum | Watt |
| 23 | live_energy_building_related | sum | Watt |
| 24 | live_energy_usage | custom | Watt |
| 25 | outsidetemp | average | °C |
| 26 | grid_feedin | sum | kWh |
| 27 | grid_usage | sum | kWh |
| 28 | setpoint_ch | average | °C |
| 29 | setpoint_dhw | average | °C |
| 30 | setpoint_roomtemp | average | °C |
| 31 | watertemp_dhw | average | °C |
| 32 | heat_volume | sum | m3 |
| 33 | battery_charging | sum | kWh |
| 34 | battery_usage | sum | kWh |
| 35 | live_energy_battery | sum | Watt |
| 36 | watertemp_return_ch | average | °C |
| 37 | watertemp_return_dhw | average | °C |
| 38 | cooling | sum | GJ |
| 39 | cooling_volume | sum | m3 |
| 40 | tap_water | sum | m3 |
| 41 | heatpump_booster | sum | kWh |
| 42 | heatpump_ch | sum | kWh |
| 43 | heatpump_dhw | sum | kWh |
| 44 | heatpump_cooling | sum | kWh |
| 45 | heat_kwh | sum | kWh |
| 46 | cooling_kwh | sum | kWh |

#### 7.6.0.1 Custom aggregation categories:

| Id | Aggregation |
|---|---|
| 6 | `usage` is calculated:<br>`grid_usage + generating - grid_feedin - building_related_energy = usage` |
| 24 | `live_energy_usage` is calculated:<br>`live_energy_grid + live_energy_generating - live_energy_building_related` |

| Id | Aggregation |
|---|---|
| | = live_energy_usage |

### 7.6.1 URL patterns

```
/login/api/v1/energyassetaggregates/
/login/api/v1/energyassetaggregates/7/
/login/api/v1/energyassets/1/energyassetaggregates/
/login/api/v1/energyassets/1/energyassetaggregates/7/
/login/api/v1/accounts/5/energyassetaggregates/
/login/api/v1/accounts/5/energyassetaggregates/7/
/login/api/v1/accounts/5/energyassets/1/energyassetaggregates/
/login/api/v1/accounts/5/energyassets/1/energyassetaggregates/7/
```

#### 7.6.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `energyasset`, `energyassetcategory`, `value`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**energyasset_id** Accepts a comma-separated list
**energyassetaggregate_id** Accepts a comma-separated list
**energyassetcategory_id** Accepts a comma-separated list
**filter_unused_categories** Accepts a boolean value: `true` or `false`
**updated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_null** Accepts a boolean value: `true` or `false`

### 7.6.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.6.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**energyasset** Energyasset identifier
**energyassetcategory** Energyassetcategory identifier
**value** Aggregated energy asset value

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that energyassetaggregate doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those energyassetaggregates will be returned
- If no energyassetaggregates are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "energyasset": 2,
    "energyassetcategory": 7,
    "value": 4554.0
}

ResourceList = { "energyassetaggregates": [
    {
        "energyasset": 2,
        "energyassetcategory": 7,
        "value": 4554.0
    },
    {
        "energyasset": 2,
        "energyassetcategory": 8,
        "value": 223.34
    }
] }
```

## 7.7 Heatpumpcops

The Coefficient Of Performance (COP) of a heatpump is the ratio of useful heating or cooling provided to the work required to generate either heating or cooling. This endpoint returns a collection of the heating and/or cooling used,heatpump power usage and COP based on the selected time range and aggregate.

### 7.7.1 Beta endpoint

This endpoint is still in it's Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 7.7.2 URL patterns

```
/login/api/v1/heatpumpcop/<aggregate>/<calendardate>/<calendardate>/
/login/api/v1/energyassets/2/heatpumpcop/<aggregate>/<calendardate>/
    <calendardate>/

/login/api/v1/accounts/3/heatpumpcop/<aggregate>/<calendardate>/<calendardate>/
/login/api/v1/accounts/3/energyassets/2/heatpumpcop/<aggregate>/<calendardate>/
    <calendardate>/
```

The `<aggregate>` part of the URL indicates the resolution at which to aggregate. Possible options are: `minute`, `hour`, `day`, `month`, `year`.
The `<calendardate>` part of the URL consists of an ISO6801 extended timestamp. The following formats are possible: `YYYY-MM-dd`, `YYYY-MM`, `YYYY`.
The first `<calendardate>` represents the start of the query (inclusive), the second `<calendardate>` represents the end of the query (exclusive).

#### 7.7.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `cooling`, `cop`, `energyasset`, `heat`, `heatpump`, `timestamp`, `unit`, `warm_water_heat`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**energyasset_id** Accepts a comma-separated list
**heatpumpcop_id** Accepts a comma-separated list
**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_null** Accepts a boolean value: `true` or `false`

### 7.7.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.7.3.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**cooling** Energy used for cooling
**cop** The calculated COP value
**energyasset** Parent energyasset identifier
**heat** Energy used for central heating
**heatpump** Energy used by heatpump
**timestamp** Timestamp for which the COP was calculated, in ISO format
**unit** The energy unit of the intermediate results
**warm_water_heat** Energy used for domestic warm water

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that heatpumpcop doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those heatpumpcops will be returned
- If no heatpumpcops are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "cooling": 0,
    "cop": 7.5,
    "energyasset": 2,
    "heat": 3.4,
    "heatpump": 1.2,
    "timestamp": "2015",
    "unit": "kWh",
    "warm_water_heat": 5.6
}

ResourceList = { "heatpumpcops": [
    {
        "cooling": 0,
        "cop": 7.5,
        "energyasset": 2,
        "heat": 3.4,
        "heatpump": 1.2,
        "timestamp": "2015-03",
        "unit": "kWh",
        "warm_water_heat": 5.6
    },
    {
        "cooling": 0,
        "cop": 7.5,
        "energyasset": 2,
        "heat": 3.4,
        "heatpump": 1.2,
        "timestamp": "2015-04",
        "unit": "kWh",
        "warm_water_heat": 5.6
    }
] }
```

## 7.8 Heatpumpcoptotals

The Coefficient Of Performance (COP) of the heatpump is a ratio of useful heating or cooling provided to the work required to generate said heating or cooling. This endpoint returns the aggregates of the heating and/or cooling used,heatpump power usage and COP based on the selected time range.

### 7.8.1 Beta endpoint

This endpoint is still in it's Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 7.8.2 URL patterns

```
/login/api/v1/heatpumpcop/total/<calendardate>/<calendardate>/
/login/api/v1/energyassets/2/heatpumpcop/total/<calendardate>/<calendardate>/
/login/api/v1/accounts/3/heatpumpcop/total/<calendardate>/<calendardate>/
/login/api/v1/accounts/3/energyassets/2/heatpumpcop/total/<calendardate>/
    <calendardate>/
```

The `<calendardate>` part of the URL consists of an ISO6801 extended timestamp. The following formats are possible: `YYYY-MM-dd`, `YYYY-MM`, `YYYY`.
The first `<calendardate>` represents the start of the query (inclusive), the second `<calendardate>` represents the end of the query (exclusive).

#### 7.8.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `cooling`, `cop`, `energyasset`, `heat`, `heatpump`, `unit`, `warm_water_heat`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**energyasset_id** Accepts a comma-separated list
**heatpumpcoptotal_id** Accepts a comma-separated list
**validated_after** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_before** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**validated_null** Accepts a boolean value: `true` or `false`

### 7.8.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 7.8.3.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**cooling** Energy used for cooling

**cop** The calculated COP value
**energyasset** Parent energyasset identifier
**heat** Energy used for central heating
**heatpump** Energy used by heatpump
**unit** The energy unit of the intermediate results
**warm_water_heat** Energy used for domestic warm water

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that heatpumpcoptotal doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those heatpumpcoptotals will be returned
- If no heatpumpcoptotals are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "cooling": 0,
    "cop": 7.5,
    "energyasset": 2,
    "heat": 3.4,
    "heatpump": 1.2,
    "unit": "kWh",
    "warm_water_heat": 5.6
}

ResourceList = { "heatpumpcoptotals": [
    {
        "cooling": 0,
        "cop": 7.5,
        "energyasset": 2,
        "heat": 3.4,
        "heatpump": 1.2,
        "unit": "kWh",
        "warm_water_heat": 5.6
    },
    {
        "cooling": 0,
        "cop": 7.5,
        "energyasset": 3,
        "heat": 3.4,
        "heatpump": 1.2,
        "unit": "kWh",
        "warm_water_heat": 5.6
    }
] }
```

# 8 Problem detection and resolution

## 8.1 Failuretypes

Provides extra information about the Failures which occurred and what type of resource they are linked to.

### 8.1.1 URL patterns

```
/login/api/v1/failuretypes/
/login/api/v1/failuretypes/product/gateway/unavailable/
```

#### 8.1.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `failuretype`, `impact`, `resourcetype`.

**failuretype_id** Accepts a comma-separated list

**failuretype_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

### 8.1.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 8.1.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**failuretype** Resource identifier

**impact** Impact

**resourcetype** Resource type

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that failuretype doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those failuretypes will be returned
- If no failuretypes are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "failuretype": "product/gateway/unavailable",
    "resource_type": "gateway"
}

ResourceList = { "failuretypes": [
    {
```

```
        "failuretype": "product/gateway/unavailable",
        "resource_type": "gateway"
    },
    {
        "failuretype": "product/general/unavailable",
        "resource_type": "peripheral"
    }
] }
```

## 8.2 Failures

Provides a list of all failures associated with an account. Failures will be automatically be removed after 6 months. To get an overview of the latest status of all products use the `latest=true` query parameter.

### 8.2.1 URL patterns

```
/login/api/v1/failures/
/login/api/v1/failures/130/
/login/api/v1/accounts/1/failures/
/login/api/v1/accounts/1/failures/130/
```

#### 8.2.1.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `failure`, `failuretype`, `resource`, `status`, `timestamp`.
**account_id** Accepts a comma-separated list
**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**begin** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**end** ISO-8601 timestamp. The following formats are possible: `YYYY-MM-DD`, `YYYY-MM-DDTHH:mm:ss`, `YYYY-MM-DDTHH:mm:ss(Z|+-13:00)`.
**failure_id** Accepts a comma-separated list
**failuretype_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.
**impact** Accepts a comma-separated list
**latest** Accepts a boolean value: `true` or `false`
**resource_id** Accepts a comma-separated list
**status_str** Accepts a comma-separated list

### 8.2.2 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 8.2.2.1 GET

A GET returns the relevant `Resource` or `ResourceList`. This resources allows for pagination using the `Range` header. See the introduction chapter for more information on the implementation. The resource contains the following fields:

**account** Parent account identifier
**failure** Resource identifier
**failuretype** Parent failuretype identifier
**resource** Resource type identifier pk
**status** Status of failure, options are: `no_failure`, `failed`, `accepted`
**timestamp** Timestamp for failure ISO format

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that failure doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those failures will be returned
- If no failures are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 1,
    "failure": 128,
    "failuretype": "product/gateway/unavailable",
    "resource": 1,
    "status": "no_failure",
    "timestamp": "2018-05-07T00:00:00Z"
}

ResourceList = { "failures": [
    {
        "account": 1,
        "failure": 128,
        "failuretype": "product/gateway/unavailable",
        "resource": 1,
        "status": "no_failure",
        "timestamp": "2018-05-07T00:00:00Z"
    },
    {
        "account": 1,
        "failure": 130,
        "failuretype": "product/general/unavailable",
        "resource": 5,
        "status": "failed",
        "timestamp": "2018-05-14T07:18:13.988Z"
    }
] }
```

#### 8.2.2.2 POST

A POST request will create a new failure. The failure will automatically be linked to the API key. Any query parameters not required for creation will be ignored. A POST request with an id will result in a 404 NOT FOUND error. This resource allows the bulk creation. To create multiple resources in 1 request, send all resources in a list. Read the introduction chapter for more information on this feature.

**Required fields** `failuretype`, `account`, `status`, `timestamp`
**Optional fields** `resource`

Creating a failure is done by passing the resource as JSON data with POST. An example of the POST body is

```
{
    "failuretype": "product/gateway/unavailable",
    "account": 1,
    "status": "failed",
    "timestamp": "2018-05-14T07:18:13.988Z"
}
```

If the resource is created successfully a 201 CREATED http code will be returned, along with the id of the created resource. A Location header containing a canonical url to the created resource will also be passed.

#### 8.2.2.3 PUT

A PUT request is used to update fields of a failure. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `failuretype`, `account`, `status`, `resource`

Updating a failure is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is

```
{
    "failuretype": "product/general/unavailable",
    "account": 5,
    "status": "no_failure",
    "resource": null
}
```

A PUT request with filtering query parameters or without an failure id *WILL* update multiple failures. It is *NOT* recommend to send a PUT request without an failure id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

#### 8.2.2.4 DELETE

A DELETE request is used to remove a failure. If the resource does not exist a 404 NOT FOUND is returned. If the resource is successfully deleted a 204 NO CONTENT is returned.
A DELETE with filtering query parameters or without an failure id *WILL* delete multiple failures. It is *NOT* recommend send a DELETE request without an failure id or filtering query parameters.

# 9 User interface

## 9.1 Tiles

Tiles defines a set of UI elements defined in the Tile's views. There are three kind of views, static, property and actionable. Styles `normal`, `warning`, and `critical` are actionable, which means a `put` call can activate them. `static` is used to show static data using `view_data`. `property` indicates to show a specific property.

| view | info |
|---|---|
| `view` | `int` |
| `order` | `int` |
| `style` | `string`, describes the style of the view |
| `property` | `int`, `null` unless style is `property` |
| `view_data` | `dict`, `null` if style is `static` or `property` |

How the UI element should look and what to display is defined by the combination of `style` and `view_data`.

| view_data | info |
|---|---|
| `name` | `string`, either `name` or `icon` is not `null` |
| `icon` | `string`, either `name` or `icon` is not `null` |
| `value` | `string`, can be `null` |
| `alert_message` | `string`, can be `null` |

`icon` references an icon from materialdesignicons.com (for example `MdiIcons.alarmLightOffOutline`).

### 9.1.1 Beta endpoint

This endpoint is still in it's Beta stage. This means that the results from this endpoint might not be as expected. All aspects might be subject to change in the future as well. To have beta features enabled for you, please contact BeNext.

### 9.1.2 URL patterns

```
/login/api/v1/tiles/
/login/api/v1/tiles/30/
/login/api/v1/tiles/30/1
/login/api/v1/accounts/6/tiles/
/login/api/v1/accounts/6/tiles/30/
```

#### 9.1.2.1 Query parameters

Query parameters are extra resource list filters that can be passed with a GET request. These parameters are always optional. If after filtering no resources remain, an empty resource list will be returned.

**fields** Comma-separated list, if this parameter is used only the selected fields will be show. Options are: `account`, `name`, `tile`, `views`.

**account_id** Accepts a comma-separated list

**account_name** Lookups are *NOT* case sensitive. Complex lookups are possible using the `%` and _ symbol. The `%`-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**account_search** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**group** Lookups are *NOT* case sensitive. Complex lookups are possible using the % and _ symbol. The %-symbol match any character for any amount. The _-symbol matches any character once. This syntax matches normal `LIKE` lookups in SQL.

**tile_id** Accepts a comma-separated list

### 9.1.3 Usable HTTP methods

The following section describes what HTTP methods are available for this resource. It also describes possible side-effect and return codes for API-calls.

#### 9.1.3.1 GET

A GET returns the relevant `Resource` or `ResourceList`. The resource contains the following fields:

**account** Parent account identifier

**name** Tile name

**tile** Resource identifier

**views** The views for this tile

If the URL is passed without id:

- The `ResourceList` will be returned

If an id is passed in the URL:

- A `Resource` will be returned.
- A 404 NOT FOUND will be returned if that tile doesn't exist

If filter queryparams are passed:

- A `ResourceList` containing those tiles will be returned
- If no tiles are relevant or selected, an empty list will be returned.

**Output JSON**

```
Resource = {
    "account": 6,
    "group": "ventilation",
    "name": "Ventilation",
    "tile": 29,
    "views": [
        {
            "order": 1,
            "property": null,
            "style": "normal",
            "view": 1,
            "view_data": {
                "alert_message": "Alert Demo",
                "icon": "MdiIcons.fan",
                "name": null,
                "value": null
            }
        }
    ]
}

ResourceList = { "tiles": [
    {
        "account": 6,
        "group": "ventilation",
```

```
        "name": "Ventilation",
        "tile": 29,
        "views": [
            {
                "order": 1,
                "property": null,
                "style": "normal",
                "view": 1,
                "view_data": {
                    "alert_message": "Alert Demo",
                    "icon": "MdiIcons.fan",
                    "name": null,
                    "value": null
                }
            }
        ]
    },
    {
        "account": 6,
        "group": "ventilation",
        "name": "Ventilation",
        "tile": 30,
        "views": [
            {
                "order": 1,
                "property": null,
                "style": "static",
                "view": 2,
                "view_data": {
                    "alert_message": "Are you sure you want to reset the filter?",
                    "icon": "MdiIcons.alert",
                    "name": "Reset Filter",
                    "value": null
                }
            },
            {
                "order": 2,
                "property": 3565,
                "style": "property",
                "view": 3,
                "view_data": null
            }
        ]
    }
] }
```


#### 9.1.3.2 PUT

A PUT request is used to update fields of a tile. If a field is passed that cannot be updated, a 400 Bad Request error will be returned. If a field is passed that is not recognized it will be ignored.

**Updatable fields** `trigger`

Updating a tile is done by passing the values to be updated as JSON data with a PUT. An example of the PUT body is


```
{
    "trigger": true
}
```


`trigger: true` will activate the scenes associated with the tile_view.

A PUT request with filtering query parameters or without an tile id *WILL* update multiple tiles. It is *NOT* recommend to send a PUT request without an tile id or filtering query parameters.
A successful PUT request will return a 200 OK http code with an empty response body.

# 10 | Changelog

## 10.1 Release 1.54 — 2023-12-13

- Removed `Range` header support from `heatpumpcop` and `heatpumpcoptotals` endpoints
- `heatpumpcoptotals` endpoints had incorrect URL examples
- Fixed a few spelling errors

## 10.2 Release 1.53 — 2023-09-13

- Clarified 422 status code for `historyentries` endpoint

## 10.3 Release 1.51 — 2023-04-19

- Added a new API call `Tiles`

## 10.4 Release 1.50 — 2023-02-08

- Added new failure types for the detection of extreme energy peaks in energy bundles
- Added limitation for a request of `TOTP devices` with basic Authentication when the user already has a TOTP device
- Removed `totptoken` header dependency for creation of an `Mfa-Token`

## 10.5 Release 1.49.3 — 2023-01-24

- Removed `DELETE` option from `Accounts`, `Gateway` and `Product` endpoints

## 10.6 Release 1.49 — 2022-12-07

- Added new experimental `Multi Factor Authentication` endpoints
- Added new `energyassetcategories`: `heat_kwh` and `cooling_kwh`
- Added `datatypes` to the `energyassetcategory` resource
- Added an optional query parameter `ignore_bundles` to return data for all energyassetproperties instead of only for bundles in `energyassetbundles` and `energyassetbundletotals`
- `historyentries` now allows 31 days of data to be fetched

## 10.7 Release 1.48 — 2022-08-18

- Added new `/login/api/v1/accounts/1/gateways` pattern for `gateways`
- Added new `/login/api/v1/accounts/1/propertymappings` pattern for `propertymappings`
- Updated valueconversion `factor` in `energyassetcategories` to make values suitable for multiplication only

## 10.8 Release 1.47.3 — 2022-07-18

- Added a way to filter unused `energycategories` in `energyassetaggregates`

## 10.9 Release 1.47 – 2022-06-14

- Added new `energyassetcategories`: `tap_water`, `heatpump_booster`, `heatpump_ch`, `heatpump_dhw` and `heatpump_cooling`.
- Updated `aggregate` and `calenderdate` explanations for the `energyassetbundle`, `energyassetbundletotal`, `heatpumpcop` and `heatpumpcoptotal` resources.
- Various spelling and grammar corrections throughout the documentation.

## 10.10 Release 1.45.3 – 2022-02-23

- `organizations` and `projects` resources now accept reverse account queries.
- Corrected reference to C02 (with a zero) to the correct CO2.

## 10.11 Release 1.44 – 2021-07-07

- Added `heatpumpcop` and `heatpumpcoptotal` endpoint documentation (beta)

## 10.12 Release 1.43 – 2021-04-07

- Various spelling and grammar corrections throughout the documentation.
- Incorrectly named `expectedvalue` attribute in `energyassetbundle` resource.
- Added `timezone` and `aggregates` query parameters for the `historyentry` resource.
- Updated all functions that support the `range` header and those that do not.
- Clarified the use of `trigger` for the `scene` resource.
- Added boolean `node_null` and `energy_data` query parameters for the `product` resource.
- Show changelog as most recent changes on top.

## 10.13 Release 1.42 – 2020-11-10

- Various spelling and grammar corrections throughout the documentation.
- Products with THERMOSTAT_OPERATING_STATE now recognised as having a `heating` attribute in `climatecontroller` resource.
- Added `climatecontroller` attribute to `producttype`.
- All URLS to `energyassetbundles` were incorrectly referencing `bundles`.

## 10.14 Release 1.40 – 2020-04-08

- Various spelling corrections throughout the documentation.
- 3.7 - Added `climatecontroller` resource.

## 10.15 Release 1.39 – 2020-02-07

- 3.4 - Added a query parameter `energydata` to filter properties which can have energyentries.
- 6.1 - Added multiple attributes related uniformly to displaying energyassetcategories.

## 10.16 Release 1.38 – 2019-10-10

- 6.4 - Added `bundle` resource.
- 6.5 - Added `bundletotal` resource.
- 6.6 - Added `energyassetaggregate` resource.

## 10.17 Release 1.37 – 2019-07-17

- 1.4 - Documented `Accept-Language` support.
- 1.8 - Added an API-structure section to the introduction chapter.
- 2.1 - Added possibility to changed `password` of an account.
- 4.2 – 4.4 - Updated `energyentry` and `historyentry` chapters to reflect correct usage of timestamp.
- 5.3 - Added a `zwave_id` filter to the node resource.
- 6.1 - Additional explanation of energyassetcategories.