Google Cloud

Edge Microgateway

Default Plugins

Agenda

- Plugin Overview
- Default Plugins
  - OAuth
  - Spike arrest
  - Quota
  - Analytics

What is an Edge Microgateway plugin?

A plugin is a Node.js module that implements one or more of the Microgateway events.

- Request
- Response

Request Plugin Events

Request Handlers

onrequest
ondata_request
onend_request
onclose_request
onerror_request

Onrequest

Fires when the first byte of the request is sent. Gives access to the headers, URL, query parameters, and HTTP method.

ondata_request

Called when a chunk of data is sent. Passes the data to the next plugin in the sequence. The data returned by the last plugin is sent to the target.

onclose_request

Indicates that the client connection has closed.

onend_request

Called when all of the request data has been sent from the client.

onerror_request

Called if there is an error sending the request to the target.

Response Plugin Events

Response Handlers

onresponse
ondata_response
onend_response
onclose_response
onerror_response

onresponse

Fires when the first byte of the response is received. Gives access to the response headers and status code.

ondata_response

Called when a chunk of data is received from the target. The payload can be transformed here.

onclose_response

Called when the socket connection to the target is closed.

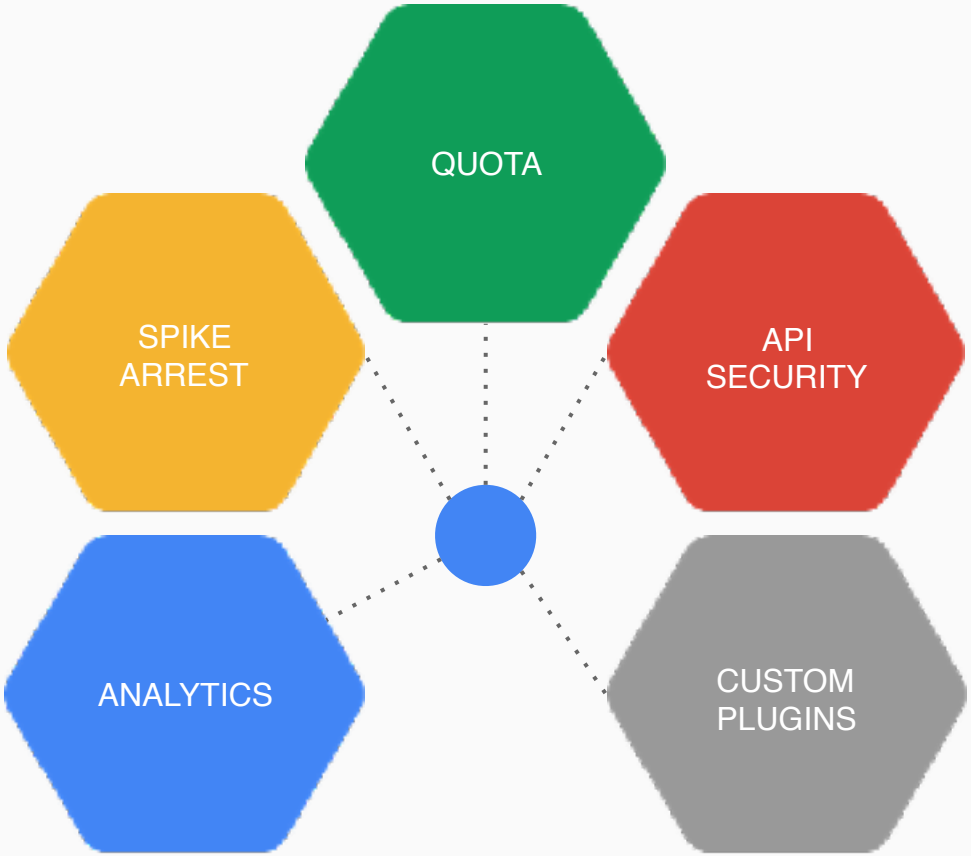
onend_response

Called when all of the response data has been received from the target. The payload can be transformed here too.

onerror_response

Called if there is an error receiving the target response.

Edge Microgateway Standard Plugins



Where are the standard plugins located?

Standard plugins are stored in the following location:

```
[npm prefix] /lib/node_modules/edgemicro/node_modules/microgateway-plugins
```

What is the npm prefix?

```
npm config get prefix -> /usr/local
```

API Security

- OAuth 2 access token and API Key are supported.
- A special proxy is deployed on Edge that transforms the access token into a JWT token.
- JWT is signed and self-validating. If an API call uses a JWT token there is enough information in it to authenticate the call without contacting Edge.
- If the API key is used instead, the key validity and attributes are fetched from Edge. All is cached in the microgateway for a certain amount of time.

Spike Arrest

- Protects API from spikes in traffic
- Not configured on Edge.

Spike Arrest Plugin Configuration

- Per minute is converted to per second interval
- Per second is converted to per millisecond interval

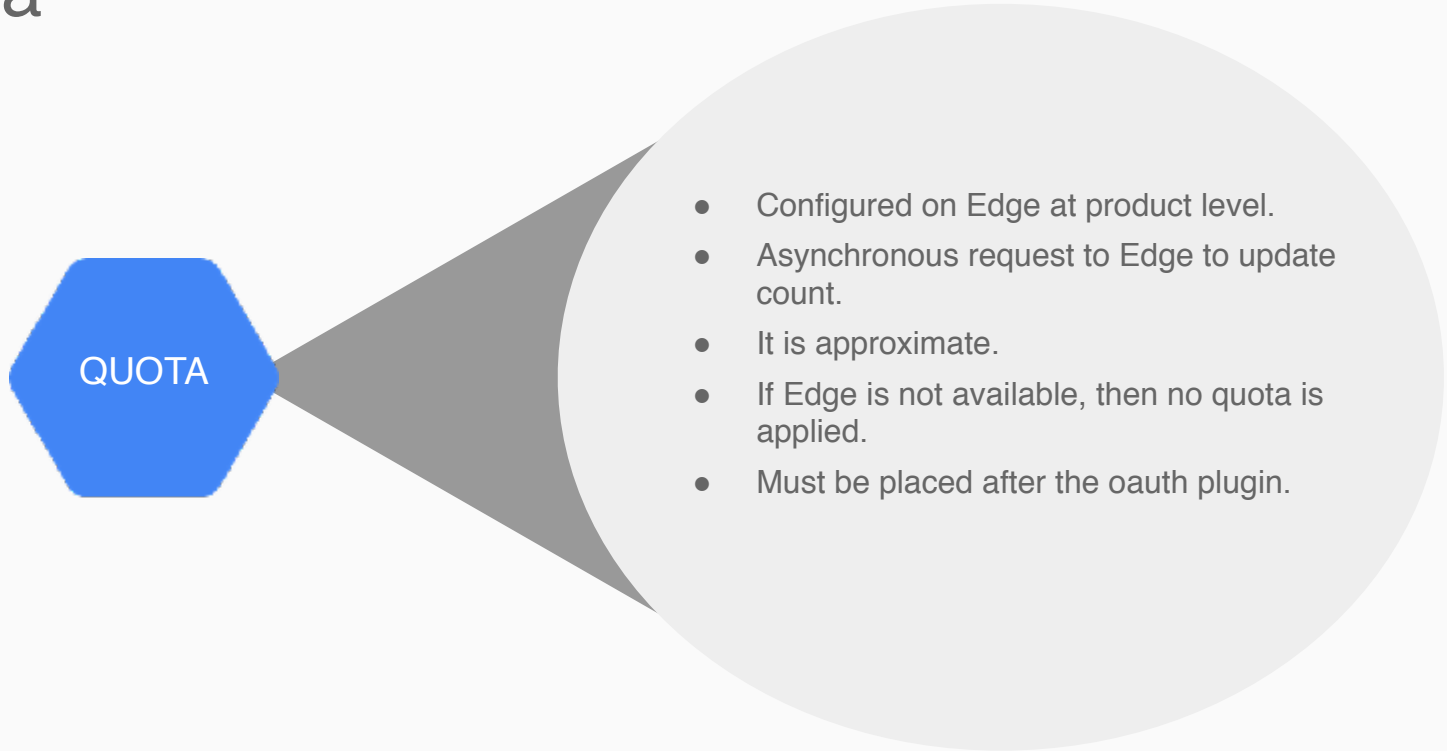
E.g. 10 requests per minute

- 60 sec/10 rpm = 6 second interval ~> 1 request every 6 seconds
- bufferSize - number of requests to buffer and Edge Microgateway will execute these buffered requests when the next interval starts

Spike Arrest Plugin Configuration

```
plugins:
    dir: ../plugins
    sequence:
        - oauth
        - spikearrest
spikearrest:
  timeUnit: minute
  allow: 10
  bufferSize: 10
```

Quota



Quota Plugin - Edge Configuration

Include the quota limit when creating a product in Edge Cloud.

Quota Plugin Configuration

```
plugins:
   dir: ../plugins
sequence:
    - oauth
    - spikearrest
    - quota
oauth:
      allowNoAuthorization: false
      allowInvalidAuthorization: false
```

Quota Plugin - Cache-Config.yaml file

- Example of the quota property in the cache config file.
  - Cache config file is used by Microgateway during run-time

```
quota:
  EdgemicroProductSSL:
    allow: '10'
    interval: '1'
    timeUnit: minute
    bufferSize: 10000
    uri: >-
      http://192.168.56.101:9001/edgemicro/quotas/organization/demo/
environment/test
```

Analytics

- AX data gets sent to Edge asynchronously in batch.
- If for some reason the AX data cannot be sent and the batch size is reached, data is dropped to favor runtime traffic.
- AX data gets sent regardless of the target availability.

Analytics Plugin Configuration

Analytics plugin is enabled by default and it does not need to be included in the plugin sequence.

- bufferSize - maximum number of records the buffer can hold before it starts to drop requests
- batchSize - maximum number of records sent to Edge Analytics
- flushInterval - Number of ms between each flush of a batch of records to Edge.

```
analytics:
     bufferSize: 5
     batchSize: 5
     flushInterval: 10000
```

Analytics Plugin

- The buffer size, batch size and flush interval are important.
- Microgateway will flush the buffer with the batch size according to the flushInterval.

Gotchas!

- If Microgateway has items stored in it's buffer
  - and it crashes, then it loses the analytics data stored there.

- If Microgateway has items stored in it's buffer
  - And the internet connection to Edge is lost
  - And the flush interval is applied
  - THEN the Microgateway sends the analytics data, but the request will fail and that data will be lost

Analytics Plugin - Configuration Approaches

Two approaches to handle the previous Gotchas

- Large buffer size and small interval
  - This will cover the case where you have a stable connection, but you expect the server on which EM executes to restart regularly
  - Analytics will be sent to Edge frequently (every 500 ms)

- Large buffer size and large interval
  - This will cover the case where the connection to Edge is not stable, but the server on which EM executes is stable
  - Analytics will be sent to Edge infrequently (e.g. once every 15 minutes)
  - Analytics will be stored in the buffer and sent once the interval or the buffer limit is reached

Additional Plugins

Additional Plugins

Plugin	Enabled By Default	Description
header-uppercase	No	A commented, sample proxy intended as a guide to help developers write custom plugins. See Edge Microgateway sample plugin.
accumulate-request	No	Accumulates request data into a single object before passing the data to the next handler in the plugin chain. Useful for writing transform plugins that need to operate on a single, accumulated request content object.
accumulate-response	No	Accumulates response data into a single object before passing the data to the next handler in the plugin chain. Useful for writing transform plugins that need to operate on a single, accumulated response content object.
transform-uppercase	No	Transforms request or response data. This plugin represents a best practice implementation of a transform plugin. The example plugin performs a trivial transform (converts request or response data to uppercase); however, it can easily be adapted to perform other kinds of transformations, such as XML to JSON.

Microgateway Labs

Complete the following Edge Microgateway Labs.

- Review the prerequisites
- Lab - Enable Spike Arrest
- Lab - Enable Quota
- Lab - Analytics

THANK YOU

Edge Microgateway Configuration

Edgemicro gateway configuration (partial view) is stored in the following file:

```
~/.edgemicro/org-env-config.yaml
```

Plugins must be included in the sequence section. Notice that oauth is included by default.

```
edgemicro:
...
  plugins:
     sequence:
       - oauth
```

Quota Plugin - Details Please!

- As of version 2.3.1, the quota policy requires access to Edge (private or public cloud)
  - Quota is distributed among other Microgateway instances
    - Quota is created and maintained in Edge
    - Microgateway asynchronously sends POST request to Edge to apply the quota and get remaining quota
    - Quota identifier is the organization + the Edge application ID

- If it does not have access to Edge then the quota is NOT applied
  - i.e. all requests are allowed to pass through the Microgateway