psHEALTH mapCache

Technical Architecture

**Reference: PDS Integration**

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# Scope

This document describes the technical architecture of mapCache. The goal of this document is to define technologies, product and techniques to develop and support the system.

# Overall Technical Architecture

Google has yearly and daily usage limit for map distance matrix lookup, depending on the contract, e.g. 1 million elements a year and daily free quota of 100,000 elements per 24 hours. Google doesn’t alert customers for credit overdraft.

Purpose of this application is to create a local cache to save result from google in order for future lookup instead of querying google and alert customer when they run out of credit.

## System Architecture Component Definitions

### RESTful Handler

This is a RESTful Endpoint exposed to client to cached google map lookup service. Jersey is integrated with Spring Boot.

### Request Filter

Request filter authenticates incoming request by checking api key for a particular tenant. Exception will be raised if authentication fails.

### Distance Service

This component looks up local cache before issuing a distance request to google and saves result into local database.

### Database

This is MySQL database acts as local distance cache of google lookup. There is also a stored procedure triggered on a daily basis to calculate google credit usage.

## Restriction

mapCache keeps track of daily and yearly credit usage and set corresponding flag in order to alert client.

* There is only one origin postcode and multiple destination postcode per request
* Request to google map will be disabled once the daily and yearly limit has been reached and returned result is only limited from cache.
* Daily and yearly flag is set by stored procedure which is executed on a daily basis.

### Algorithm

Main quota limit logic resides in stored procedure which can be found at section appendix.

### Usage alert

Customer will receive an alert email for running out of quota of current contract. Note this alert is not real-time and one day delayed at the most.

# Database design

There are five tables in mapCache. Table details can be found at appendix.

## Tenant

This table records all tenants that allowed to use mapCache. ApiKey can be found in google API console which is required to pass google authentication. Tenant Id need to be embedded in request header for security validation.

## Tenant contract

This table contains all contracts for particular tenant. Yearly usage flag is recorded in this table.

## Distance Cache

Table distance cache saves all distance matrix between two postcodes. This cache is shared by all tenants.

## Transaction

One entry will be created for each request to google.

## Credit history

One entry will be created per day for a particular tenant contract.

# Sample message

## Sample request

Http-Header:

|  |  |
| --- | --- |
| Key | Value |
| Content-Type | Application/JSON |
| tenantId | 1 |

{

"origin\_postcodes" : ["SE1 7BJ"],

"destination\_postcodes" : ["AB23 8HG","AB12 3AL","AB31 5TQ","AB45 1FQ","BN1 6SG"],

"tenantId" : 1

}

## Sample response

The element array sequence matches destination array sequence. For example the distance between SE1 7BJ and AB23 8HG is 886588 meters and travel duration is 34249 seconds. outofYearlyCredits will be set to true if yearly limit has been reached.

{

"origin\_addresses": [

"SE1 7BJ"

],

"destination\_addresses": [

"AB23 8HG",

"AB31 5TQ",

"AB45 1FQ",

"AB12 3AL",

"BN1 6SG"

],

"rows": [

{

"elements": [

{

"distance": 886588,

"duration": 34249

},

{

"distance": 860539,

"duration": 33408

},

{

"distance": 951319,

"duration": 37852

},

{

"distance": 875955,

"duration": 33278

},

{

"distance": 80226,

"duration": 5812

}

]

}

],

"outofYearlyCredits": false

}

# Appendix

