

**Coalition Greenwich**

A division of **CRISIL**

# Focus API

Developers Guide



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## 1.0 Introduction

Focus API provides financial institutions a way to retrieve highly valuable research data from Coalition Greenwich on-demand. The research data has historically been provided to the clients as comma separated values (CSV) files and has proven to be extremely useful in making sales and marketing decisions resulting in significant increases in revenue.

While the CSV files have their utility in traditional applications, Coalition Greenwich has been receiving requests from clients for an API that will help them retrieve relevant data on-demand so they can integrate this into their workflows, particularly in their CRM applications.

Responding to our valued customers' demands, Coalition Greenwich is offering the RESTful Focus API. Customers can register for the use of the API by contacting Coalition Greenwich. Once registered, they can retrieve the data they are entitled to on-demand and use it in their workflows.

## 2.0 Version History

| Date       | Version | Description   |
|------------|---------|---------------|
| 10/16/2019 | 1.0     | Initial Draft |

## 3.0 Registration

Customers can register for Focus API by contacting Coalition Greenwich at [contactus@greenwich.com](mailto:contactus@greenwich.com). Customers will receive a pair of subscription keys called Primary and Secondary subscription keys. Either key can be used in Focus API calls. Once you have received a key from Coalition Greenwich, you are ready to make your first Focus API call.

## 4.0 Anatomy of a Focus API Call

Focus API is a RESTful API with a secure TLS 1.2-based end-point. The information exchange format is JSON (i.e. it receives input parameters and returns data in the JSON format). Security is implemented through subscription keys which are passed in the http headers. Following are details about the anatomy of a Focus API Call

### 4.1 End-point

Focus API is available at the following end-point:

[https://api.greenwich.com/focus\\_api/v1](https://api.greenwich.com/focus_api/v1)

### 4.2 HTTP Headers

To make the call you need to have the following two http headers:

Ocp-Apim-Subscription-Key: (either primary or secondary subscription key)

Content-Type: application/json

### **4.3 HTTP Method**

All Focus API calls are made as POST calls to the End-point mentioned above. The input parameters are sent as a JSON string in the body of the HTTP request and the output is received in the response body.

### **4.4 Input Parameters**

The general format of the input parameters is the following:

```
{
  "function": "GASR" Or "GAMR",
  "mnemonic": "Mnemonic that represents the data that you want",
  "limit": "In case of GAMR the maximum number of rows you want",
  "properties": {
    Additional information such as the filters you want to apply
  }
}
```

Following is the description of the components of the input:

#### **4.4.1 function**

The function specifies whether you are retrieving a single row or multiple rows of data. This parameter is optional.

The valid values for this parameter are “GASR” (GA Single Row) and “GAMR” (GA Multiple Rows)

#### **4.4.2 mnemonic**

Mnemonic is the name of the dataset that you want to retrieve. This is a required parameter. A valid value is one of the following:

GA\_AVAILABLE\_MNEMONICS  
GA\_CLIENT\_ATTRITION\_RISK  
GA\_CLIENT\_ATTRITION\_RISK\_VALUE  
GA\_COMPANY\_BALANCE  
GA\_COMPANY\_ID\_MATCH\_DUNS  
GA\_COMPANY\_ID\_MATCH\_NAME  
GA\_COMPANY\_PROBABILITY  
GA\_COMPANY\_REVENUE  
GA\_COMPANY\_TEARSHEET\_URL  
GA\_COMPANY\_WALLET\_SHARE  
GA\_GEO\_SEGMENT  
GA\_LEAD\_BANK  
GA\_LEAD\_BANK\_ATTRITION\_RISK  
GA\_PRODUCT

Each of these is described in detail later in the document.

#### 4.4.3 limit

The limit is the maximum number of rows that you want returned in response to certain requests that return multiple rows of data. At the time of this writing the limit only applies to GA\_COMPANY\_ID\_MATCH mnemonic. In the future it will also apply to type 3 mnemonic.

The parameter is optional. The GA\_COMPANY\_ID\_MATCH mnemonic returns the top 1 row if limit is not provided.

The value of this parameter is ignored for all other mnemonics.

#### 4.4.4 properties

This is where you provide the additional information that is needed to retrieve the data that you are interested in. This typically is the criteria you want to apply, for example, the GA Company ID of a company, the DUNS number of a company or the name of a company. The properties for each mnemonic are described in the details for that mnemonic.

#### 4.5 Output

Following is the typical output:

```
{
  "headers": [
    "the requested mnemonic"
  ],
  "mnemonic": "the requested mnemonic",
  "function": "the requested function",
  "limit": the limit that was mentioned in the request,
  "properties": {
    <The properties that were sent in the input>
  },
  "errCode": error code in case an error occurred, null if no error,
  "errMsg": error message, null if no error,
  "numCols": the number of columns in each row,
  "numRows": the total number of rows returned,
  "rows": [
    <The rows of data returned>
  ]
}
```

Following is a description of the components of the response:

#### 4.5.1 headers

Array of information related to the request. Currently, it only contains the name of the requested mnemonic. Additional information may be added in the future versions of the API.

#### 4.5.2 mnemonic, function, limit, and properties

These attributes contain copy of the input sent to the API

#### 4.5.3 errCode and errMsg

If an error occurs inside the API, these attributes return the code and the message. Sometimes, an error occurs outside of the code of the API, e.g. too many requests, in which case the error is returned as an HTTP status code and no response body is received. A list of error codes and messages is provided at later in this document.

#### 4.5.4 numCols

This contains the number of columns in each row of the response.

#### 4.5.5 numRows

This contains the number of rows returned.

#### 4.5.6 rows

An array of returned data. The structure of the row depends on the mnemonic type. Details of row structure can be found in the details of each mnemonic.

### 4.6 *Example*

Following is an example API call made using curl:

```
curl -X POST \  
  https://api.greenwich.com/focus_api/v1 \  
  -H 'Content-Type: application/json' \  
  -H 'Ocp-Apim-Subscription-Key: a1b2c3d4e5g6h7i8j10k11l12m13n14o' \  
  -d '{  
    "properties": {"CompanyName": "ABC"},  
    "function": "GAMR",  
    "mnemonic": "GA_COMPANY_ID_MATCH_NAME",  
    "limit": "2"  
  }'
```

Note: the subscription key specified above is not a real subscription key. Coalition Greenwich will provide a real subscription key with the purchase of Focus API.

The following is an example response to the above request:

```
{
  "headers": [
    "GA_COMPANY_ID_MATCH_NAME"
  ],
  "mnemonic": "GA_COMPANY_ID_MATCH_NAME",
  "function": "GAMR",
  "limit": 2,
  "properties": {
    "companyName": "ABC"
  },
  "errCode": null,
  "errMsg": null,
  "numCols": 9,
  "numRows": 2,
  "Rows": [
    {
      "comments": null,
      "GACompanyID": "GA000123456",
      "companyName": "ABC Trucking Inc",
      "address": "33 S Broadway Ste 123",
      "city": "White Plains",
      "state": "New York",
      "zip": "10601-0000",
      "country": "United States",
      "phone": "5555555555"
    },
    {
      "comments": "Company found but not in Greenwich dataset
($1MM-$2B, US, HQ or single location only. Excludes Government, Non-
Profit, CRE, and Financial Institutions)",
      "GACompanyID": null,
      "companyName": "ABC Careers LLC",
      "address": "103 W Canton Ave Ste A320",
      "city": "Winter Park",
      "state": "Florida",
      "zip": "32789-0000",
```

```

        "country": "United States",
        "phone": ""
    }
]
}

```

## 5.0 Mnemonics

A mnemonic is the name given to the query that you want to make in the Coalition Greenwich dataset. For example, if you want to find out the wallet share of a company, you use the GA\_COMPANY\_WALLET\_SHARE mnemonic.

The mnemonics have been divided into 4 broad types. Following is a description of each type and the description of the mnemonics in that type.

Note that the common inputs and outputs for the mnemonics have been described in section 4.4 Input Parameters and section 4.5 Output respectively. The descriptions here will only describe the inputs and outputs particular to each mnemonic.

For inputs, the described attributes appear inside the “properties” attribute. For outputs, the described attributes appear inside each row in the “rows” attributes.

### 5.1 Type 1

Type 1 mnemonics allow you to match either the DUNS number or the name of a company that you are interested in. The returned value is the unique GA Company ID which you need to pass in to the Type 3 through Type 5 mnemonics. Following are the Type 1 mnemonics:

#### 5.1.1 GA\_COMPANY\_ID\_MATCH\_DUNS

This mnemonic receives DUNS # as input, looks for exact match in the GA dataset and responds back with the corresponding GA Company ID. This is a GASR function.

##### 5.1.1.1 Input

| Attribute | Type   | Description                            | Possible Values   | Example   |
|-----------|--------|--|---|-----------|
| DUNS      | String | The 9-digit DUNS number of the company | Any nine-digit number. The leading zeros shown in the example are optional. | 000090234 |



### 5.1.1.2 Output

| Attribute   | Type   | Description  | Possible Values                                    | Example               |
|-------------|--------|--|--|-----------------------|
| companyID   | String | The GA Company ID for the company                    | The nine-digit GA Company ID prefixed with GA      | GA100000009           |
| companyName | String | Name of the company                                  | Any valid string                                   | ABC Trucking Inc.     |
| address     | String | Street address of the company                        | Any valid string                                   | 1998 Main St. Ste 103 |
| city        | String | The city in the full address of the company          | Any valid string                                   | Philadelphia          |
| state       | String | Full name of the state in the address of the company | Any valid state name                               | Pennsylvania          |
| zip         | String | The zip code in the address of the company           | 5-digit or 9-digit zip code                        | 90234-1234            |
| country     | String | The country in the address of the company            | In the current data set it is always United States | United States         |
| phone       | String | The phone number on record for the company.          | 11-digit phone number                              | 5555555555            |

### 5.1.2 GA\_COMPANY\_ID\_MATCH\_NAME

This mnemonic receives a company name as input and looks for matches in the GA data and returns a list of matched companies. GA has the basic data of the 22-million+ companies that have been issued a DUNS number by Dun and Bradstreet. However, GA has done research on a subset of this larger set of companies and it is this subset that GA considers to be in its data set. If a company's name matches the name provided in the input but is not a part of the smaller subset, the following message is returned in the "comment" attribute:

*Company found but not in Coalition Greenwich dataset (\$1MM-\$2B, US, HQ or single location only. Excludes Government, Non-Profit, CRE, and Financial Institutions)*

#### 5.1.2.1 Input

| Attribute | Type | Description | Possible Values | Example |
|-----------|------|-------------|-----------------|---------|
|-----------|------|-------------|-----------------|---------|

|             |        |   |                  |                   |
|-------------|--------|---|------------------|-------------------|
| CompanyName | String | Partial or full name of the company that you are interested in. More complete names return more specific and fewer results. | Any valid string | ABC Trucking Inc. |
|-------------|--------|---|------------------|-------------------|

#### 5.1.2.2 Output

| Attribute   | Type   | Description  | Possible Values  | Example                  |
|-------------|--------|--|--|--------------------------|
| comments    | String | If the company is not in GA dataset, it contains the text specified in the mnemonic description above, otherwise null. | The text specified in the mnemonic description above or null.                          |                          |
| GACompanyID | String | The GA Company ID for the company  | The 9-digit GA Company ID prefixed with GA. If company is not in GA dataset then null. | GA100000009              |
| companyName | String | Name of the company  | Any valid string   | ABC Trucking Inc.        |
| address     | String | Street address of the company  | Any valid string   | 1998 Main St.<br>Ste 103 |
| city        | String | The city in the full address of the company  | Any valid string   | Philadelphia             |
| state       | String | Full name of the state in the address of the company   | Any valid state name   | Pennsylvania             |
| zip         | String | The zip code in the address of the company   | 5-digit or 9-digit zip code  | 90234-1234               |
| country     | String | The country in the address of the company  | In the current data set it is always United States                                     | United States            |
| phone       | String | The phone number on record for the company.  | 11-digit phone number  | 5555555555               |

## 5.2 Type 2

This type of mnemonics returns reference data that can be used to populate filters in your application. Following are the type 2 mnemonics. All type 2 mnemonics are GAMR functions. None of the Type 2 mnemonics has any input other than the common inputs described in section 4.4 Input Parameters.

### 5.2.1 GA\_AVAILABLE\_MNEMONICS

This mnemonic returns the list of all available mnemonics.

#### 5.2.1.1 Output

| Attribute | Type   | Description     | Possible Values                             | Example                |
|-----------|--------|-----------------|---|------------------------|
| value     | String | A mnemonic name | One of the names of the available mnemonics | GA_AVAILABLE_MNEMONICS |

### 5.2.2 GA\_CLIENT\_ATTRITION\_RISK\_VALUE

This mnemonic returns the complete list of possible attrition risk values.

#### 5.2.2.1 Output

| Attribute | Type   | Description                               | Possible Values | Example |
|-----------|--------|---|-----------------|---------|
| value     | String | One of all possible attrition risk values |                 | High    |

### 5.2.3 GA\_GEO\_SEGMENT

This mnemonic returns complete list of geo segments that your institution is entitled to in the Coalition Greenwich data set.

#### 5.2.3.1 Output

| Attribute        | Type   | Description                                     | Possible Values | Example       |
|------------------|--------|---|-----------------|---------------|
| region           | String | Name of the region                              |                 | Americas      |
| country          | String | Name of the country                             |                 | United States |
| countrySubregion | String | Name of the sub-region within the country       |                 | South         |
| state            | String | Full name of the state                          |                 | Alabama       |
| county           | String | Name of the county                              |                 | Calhoun       |
| msaName          | String | Name of the Metropolitan Statistical Area (MSA) |                 | AL-Anniston   |

### 5.2.4 GA\_PRODUCT

Returns complete list of products.

| Attribute                | Type   | Description   | Possible Values        | Example                    |
|--------------------------|--------|---|------------------------|----------------------------|
| product                  | String | Name of the product   | A valid string         | Card Products              |
| productLevel1Description | String | Name of the level 1 product under which this product falls. If this is a level 1 product then product and this attribute have the same value.   | A valid string or null | Banking                    |
| productLevel2Description | String | Name of the level 2 product under which this product falls. If this is a level 2 product then product and this attribute have the same value. If this is a level 1 product then this attribute is null.           | A valid string or null | Cash Management            |
| productLevel3Description | String | Name of the level 3 product under which this product falls. If this is a level 3 product then product and this attribute have the same value. If this is a level 2 or higher product then this attribute is null. | A valid string or null | Cash Management – Domestic |
| productLevel4Description | String | Name of the level 4 product. If this is a level 4 product then product and this attribute have the same value. If this is a level 3 or higher product then this attribute is null.                                | A valid string or null | Card Products              |

### 5.3 Type 3

Type 3 mnemonics return companies that meet specific criteria. These mnemonics are being built and are not available yet. Company list that meets a specific or combination of criteria

### 5.4 Type 4

This type of mnemonic returns a single data-point specific to a company and – optionally and if applicable – a product. The following mnemonics are included in this type. Note that for all type 4 mnemonics your institution must have entitlement to the company that you provide as input. If you receive "Company is not authorized for this operation" message and you believe you are entitled to this company, please contact Coalition Greenwich .

All type 4 mnemonics are GASR functions.

#### 5.4.1 GA\_CLIENT\_ATTRITION\_RISK

This mnemonic returns GA’s assessed attrition risk that your company has for your institution or financial institution. Note that the company must have mentioned your institution as one of its providers of financial services.

##### 5.4.1.1 Input

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

##### 5.4.1.2 Output

| Attribute | Type   | Description  | Possible Values   | Example |
|-----------|--------|--|---|---------|
| value     | String | The level of attrition risk that your institution has for this company | One of the values returned by GA_CLIENT_ATTRITION_RISK_VALUE mnemonic | Low     |

#### 5.4.2 GA\_COMPANY\_TEARSHEET\_URL

This mnemonic returns the tear sheet URL for the company. The URL includes an authorization token that expires after 60 seconds. Coalition Greenwich recommends opening the URL in a browser window immediately after retrieving it.

5.4.2.1 **Input**

| Attribute   | Type   | Description  | Possible Values  | Example    |
|-------------|--------|--|------------------|------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA10000009 |

5.4.2.2 **Output**

| Attribute | Type   | Description                         | Possible Values                 | Example   |
|-----------|--------|-------------------------------------|---------------------------------|---|
| Value     | String | The URL of the company's tearsheet. | URL of the company's tearsheet. | <a href="https://www.greenwich.com/webticket/sense/app/556ed16f-8b47-4030-b9db-571b2375ffd4/sheet/9e6a9fe0-c75f-4812-8bbe-fbfc8f2934c2/sate/analysis/select/Client/ABC/select/DUNS/100000009?qlikTicket=jGu.TogxFhkUH4A">https://www.greenwich.com/webticket/sense/app/556ed16f-8b47-4030-b9db-571b2375ffd4/sheet/9e6a9fe0-c75f-4812-8bbe-fbfc8f2934c2/sate/analysis/select/Client/ABC/select/DUNS/100000009?qlikTicket=jGu.TogxFhkUH4A</a> |

### 5.4.3 GA\_LEAD\_BANK

The name of the bank that the company has indicated as their lead provider of financial services.

#### 5.4.3.1 Input

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

#### 5.4.3.2 Output

| Attribute | Type   | Description            | Possible Values  | Example  |
|-----------|--------|------------------------|------------------|----------|
| Value     | String | Name of the lead bank. | Any valid string | ABC Bank |

### 5.4.4 GA\_LEAD\_BANK\_ATTRITION\_RISK

This mnemonic returns GA's assessed attrition risk that the lead bank has for the company provided as input. Note that the company must have indicated you as one of the providers of financial services.

#### 5.4.4.1 Input

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

#### 5.4.4.2 Output

| Attribute | Type   | Description  | Possible Values   | Example |
|-----------|--------|--|---|---------|
| Value     | String | The level of attrition risk that your institution has for this company | One of the values returned by GA_CLIENT_ATTRITION_RISK_VALUE mnemonic | Low     |

### 5.5 Type 5

Mnemonics of this type return data points specific to a company and list of applicable products. Note that for all type 5 mnemonics your institution must have entitlement to the company that you provide as input. If you receive "Company is not authorized for this operation" message and you believe you are entitled to this company, please contact Coalition Greenwich. Following are the mnemonics of this type:

#### 5.5.1 GA\_COMPANY\_BALANCE

This mnemonic returns the balance of the company with your institution specific to products as provided to Coalition Greenwich by the company.

##### 5.5.1.1 Input

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

##### 5.5.1.2 Output

| Attribute     | Type   | Description   | Possible Values          | Example               |
|---------------|--------|---|--------------------------|-----------------------|
| productLevel2 | String | The name of the level 2 product   | Any valid string         | Credit                |
| productLevel3 | String | The name of the level 3 product. If this is null, then the value attribute in this row represents a cumulative number at level 2.                   | Any valid string or null | Loans/Lines of Credit |
| productLevel4 | String | The name of the level 4 product. If this is null, but level3 is not then the value attribute in this row represents a cumulative number at level 3. |                          | Business+ Loan        |
| Value         | String | The amount of balance for this particular product.  |                          | 64000                 |



### 5.5.2 GA\_COMPANY\_PROBABILITY

This mnemonic returns the probability of use for a company broken up by product and metric (Revenue or Balance)

#### 5.5.2.1 Input

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

#### 5.5.2.2 Output

| Attribute     | Type   | Description   | Possible Values          | Example               |
|---------------|--------|---|--------------------------|-----------------------|
| productLevel2 | String | The name of the level 2 product   | Any valid string         | Credit                |
| productLevel3 | String | The name of the level 3 product. If this is null, then the value attribute in this row represents a cumulative number at level 2.                   | Any valid string or null | Loans/Lines of Credit |
| productLevel4 | String | The name of the level 4 product. If this is null, but level3 is not then the value attribute in this row represents a cumulative number at level 3. | Any valid string or null | Business+ Loan        |
| Metric        | String | Either "Revenue" or "Balance"   | Revenue or Balance       | Revenue               |
| Value         | String | A number between 0 and 1.   |                          | 0.6                   |

### 5.5.3 GA\_COMPANY\_REVENUE

This mnemonic returns the revenue of the company as reported to Coalition Greenwich broken up by product.

**5.5.3.1 Input**

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

**5.5.3.2 Output**

| Attribute     | Type   | Description   | Possible Values          | Example                    |
|---------------|--------|---|--------------------------|----------------------------|
| productLevel2 | String | The name of the level 2 product   | Any valid string         | Cash Management            |
| productLevel3 | String | The name of the level 3 product. If this is null, then the value attribute in this row represents a cumulative number at level 2.                   | Any valid string or null | Cash Management - Domestic |
| productLevel4 | String | The name of the level 4 product. If this is null, but level3 is not then the value attribute in this row represents a cumulative number at level 3. | Any valid string or null | Mobile Check Deposit       |
| Value         | String | The amount of revenue for this particular product.  | A number                 | 64000                      |

**5.5.4 GA\_COMPANY\_WALLET\_SHARE**

This mnemonic returns wallet share of the company broken up by products. Note that the company must have indicated you as one of their providers of financial services.

**5.5.4.1 Input**

| Attribute   | Type   | Description  | Possible Values  | Example     |
|-------------|--------|--|------------------|-------------|
| GACompanyID | String | The company id returned by either of the two Type 1 mnemonics. | Any valid string | GA100000009 |

**5.5.4.2 Output**

| Attribute     | Type   | Description   | Possible Values          | Example                    |
|---------------|--------|---|--------------------------|----------------------------|
| productLevel2 | String | The name of the level 2 product   | Any valid string         | Cash Management            |
| productLevel3 | String | The name of the level 3 product. If this is null, then the value attribute in this row represents a cumulative number at level 2.                   | Any valid string or null | Cash Management - Domestic |
| productLevel4 | String | The name of the level 4 product. If this is null, but level3 is not then the value attribute in this row represents a cumulative number at level 3. | Any valid string or null | Mobile Check Deposit       |
| Value         | String | The amount of revenue for this particular product.  | A number                 | 64000                      |

**6.0 Errors**

There are two types of errors that can occur in a call to Focus API. When an error occurs in the infrastructure through which APIs are called or an unhandled exception occurs inside the API, you will receive an HTTP status code other than the 200 range.

When a logic error occurs in the API code, you'll receive an HTTP status code of 200 OK but the errCode and errMsg attributes will contain the error info.

**6.1 HTTP Errors**

| Error Code | Error Message         | Description  |
|------------|-----------------------|--|
| 429        | Too Many Requests     | To prevent misuse of Focus API, rate limits have been applied to Focus API. A status code of 429 means that you've exceeded the rate limit. You can get more information in the response body which will contain something like the following: <pre> {   "statusCode": 429,   "message": "Rate limit is exceeded. Try again in 49 seconds." } </pre> |
| 400        | Bad Request           | Occurs if the input JSON is invalid or if the provided data doesn't match the expected data type. For example, a non-numeric value for limit results in a 400 Bad Request error.   |
| 401        | Access Denied         | This occurs mostly because of invalid subscription key. Make sure that you are using one of the two subscription keys that Coalition Greenwich has provided you. If you do not have a subscription key, please contact Coalition Greenwich.  |
| 404        | Resource Not Found    | This occurs if you have specified a wrong end-point. Please make sure that the end-point you are using is <a href="https://api.greenwich.com/focus_api/v1">https://api.greenwich.com/focus_api/v1</a> .  |
| 500        | Internal Server Error | An internal server error occurred. This is rare and mostly transitional. If the error persists, please contact Coalition Greenwich.  |

## 6.2 Application Errors

Following is the list of application errors that can be returned:

| Error Code | Error Message                                      | Description   |
|------------|--|---|
| 404        | Null value for company for this metric in dataset  | Can occur in any mnemonic when data for the required mnemonic doesn't exist.  |
| 505        | Wrong mnemonic or mnemonic is not allowed.         | This error occurs when a non-existent mnemonic is used. Please check the spelling of the mnemonic that you passed in against the list of mnemonics returned by GA_AVAILABLE_MNEMONICS |
| 506        | DUNS must be provided to match the company.        | It occurs only in GA_COMPANY_ID_MATCH_DUNS if the DUNS attribute is missing in the input or has a blank value.  |
| 507        | CompanyName must be provided to match the company. | It occurs only in GA_COMPANY_ID_MATCH_NAME if the CompanyName attribute is missing in the input or has a blank value.   |
| 508        | GACompanyID must be provided.                      | Occurs in all mnemonics that expect a GACompanyID when the attribute is missing or is blank.  |
| 509        | GACompanyID format not supported.                  | Occurs in all mnemonics that expect a GACompanyID when it is not formatted correctly. GA Company IDs are 9-digit integers prefixed with the letters GA                                |
| 512        | We are getting ready. Please try again in a while. | This is a very rare occurrence during some internal maintenance tasks and should not last more than a second or two. Please contact GA if it lasts longer.                            |
| 513        | Subscription key is not valid.                     | Occurs when the provided subscription key doesn't match any financial institution.  |
| 514        | Token not found.                                   | Occurs only in "GA_COMPANY_TEARSHEET_URL" mnemonic while trying to retrieve an authentication token to be used with   |

| Error Code | Error Message   | Description  |
|------------|---|--|
|            |   | the URL as tearsheet reside outside the Focus API.   |
| 1000       | Company is not authorized for this operation.   | Occurs when the calling bank doesn't have access to the requested data.  |
| 1001       | Company found but not in Coalition Greenwich dataset (\$1MM-\$2B, US, HQ or single location only. Excludes Government, Non-Profit, CRE, and Financial Institutions) | Occurs in GA_COMPANY_ID_MATCH_NAME mnemonic when company name matches a company in the 22 million data set but is not part of the 1.2 million GA data set. |

## 7.0 Programming Language Examples

### 7.1 .NET

```

using System;
using System.Net.Http.Headers;
using System.Text;
using System.Net.Http;
using System.Net;

namespace CSHttpClientSample
{
    static class Program
    {
        static void Main()
        {
            MakeRequest();
            Console.WriteLine("Hit ENTER to exit...");
            Console.ReadLine();
        }

        static async void MakeRequest()
        {
            System.Net.ServicePointManager.SecurityProtocol =
SecurityProtocolType.Tls12 | SecurityProtocolType.Tls11 |
SecurityProtocolType.Tls;
            var client = new HttpClient();

            // Request headers
            client.DefaultRequestHeaders.Add("Ocp-Apim-Subscription-
Key", "{subscription key}");
            var uri = "https://api.greenwich.com/focus_api/v1";

            HttpResponseMessage response;

            var body = "{ \"function\": \"GASR\", ";
            body += "\"mnemonic\": \"GA_COMPANY_ID_MATCH_DUNS\", ";
            body += "\"properties\": { ";
            body += "\"DUNS\": \"10000001\" } }";
            // Request body

```

```

        byte[] byteData = Encoding.UTF8.GetBytes(body);

        using (var content = new ByteArrayContent(byteData))
        {
            content.Headers.ContentType = new
MediaTypesHeaderValue("application/json");
            response = await client.PostAsync(uri, content);
        }

        Console.WriteLine(response.Content.ReadAsStringAsync().Result);
    }
}

```

## 7.2 Java

```

// This sample uses the Apache HTTP client from HTTP Components
// (http://hc.apache.org/httpcomponents-client-ga/)

import java.net.URI;
import org.apache.http.HttpEntity;
import org.apache.http.HttpResponse;
import org.apache.http.client.HttpClient;
import org.apache.http.client.methods.HttpPost;
import org.apache.http.client.methods.HttpGet;
import org.apache.http.client.utils.URIBuilder;
import org.apache.http.entity.StringEntity;
import org.apache.http.impl.client.HttpClients;
import org.apache.http.util.EntityUtils;

public class JavaSample
{
    public static void main(String[] args)
    {
        HttpClient = HttpClients.createDefault();

        try
        {
            URIBuilder builder = new
URIBuilder("https://api.greenwich.com/v1");

            URI uri = builder.build();
            HttpPost request = new HttpPost(uri);

```

```

        request.setHeader("Content-Type", "application/json");
        request.setHeader("Ocp-Api-Subscription-Key",
"{subscription key}");

String body = "{ \"function\": \"GASR\", ";
body += "\"mnemonic\": \"GA_COMPANY_ID_MATCH_DUNS\", ";
body += "\"properties\": { ";
body += "\"DUNS\": \"10000001\" } }";
// Request body
StringEntity reqEntity = new StringEntity(body);
request.setEntity(reqEntity);

HttpResponse response = httpClient.execute(request);
HttpEntity entity = response.getEntity();

if (entity != null)
{
    System.out.println(EntityUtils.toString(entity));
}
}
catch (Exception e)
{
    System.out.println(e.getMessage());
}
}
}

```

## 8.0 Security and Firewall Considerations

The Focus API service is hosted on Microsoft Azure, and requires the following considerations:

1. For consistent performance, whitelisting of outbound connections to the API service is recommended.
  - a. Depending on your web security filtering solution, you may need to employ IP address whitelisting over URL security filtering.
  - b. For URL security filtering, please whitelist [api.greenwich.com](http://api.greenwich.com), [azure-api.net](http://azure-api.net) and [cloudapp.net](http://cloudapp.net).



- c. For IP address filtering, please whitelist all items listed under AzureCloud.eastus in <https://www.microsoft.com/en-us/download/details.aspx?id=56519>. While the API currently uses an IP address in the 104.45.128.0/18 subnet, Azure does dynamically assign IP addresses to resources. In this case, it is advisable to whitelist the entire AzureCloud.eastus range.
2. Some customers may routinely execute vulnerability scanning, web application or penetration testing against the resources of their vendors. This testing is subject to the following Microsoft rules of engagement <https://www.microsoft.com/en-us/msrc/pentest-rules-of-engagement>