

PA ENGINE API - VERSION 2.0  
Developer's Manual and Reference  
Dec 2019



## PA Engine API – Version 2.0

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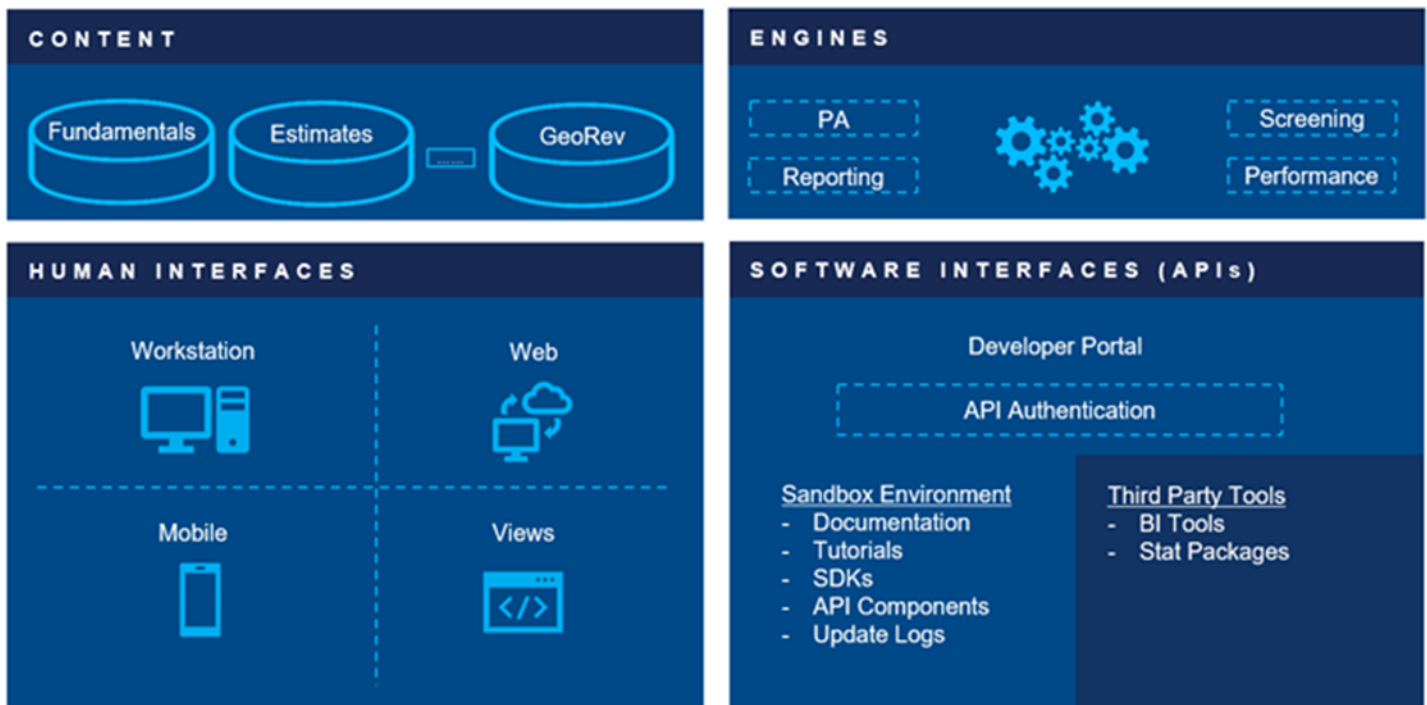
## 1. Motivation

In 1997, FactSet launched Portfolio Analysis 1.0, which set the foundation for Analytics. Soon after, Portfolio Analysis 2.0 integrated risk analytics from third-party vendors, and then expanded to include Fixed Income in 2004. FactSet now offers a robust suite of multi-asset portfolio analytics products that leads the market in flexibility, analytics, and breadth. Today, clients rely on FactSet for interactive analytics through various products, such as Portfolio Analysis (PA), SPAR, Alpha Testing, Optimizers, and Portfolio Dashboard, as well as the distribution of analytics through Portfolio Batcher, Publisher Flat Files, and Publisher documents.

## 2. API Program

### 2.1 Overview

Clients have been moving towards building a custom solution, driven by the need to increase productivity by consolidating information into a single user experience. By exposing analytics, performance, and risk through APIs, it provides you with a sophisticated channel to interact with FactSet’s leading multi-asset analytics. As the market continues to demand more transparency and data, FactSet will provide flexible options to meet those demands. APIs complement the current analytics suite offerings and facilitate partnerships by allowing you to build private experiences, integrate with third-party BI tools like Tableau, third-party stat packages like RStudio, and increase control over internal consumption of analytics from FactSet.



The first stage of exposing Analytics APIs will focus on the portfolio analytics engine. Later, the program will expand to include other analytics engines, products, and APIs from other business units.

The program will provide the following:

- Developer toolkit to build proof of concept
- Uniform feel across all FactSet’s Enterprise scale APIs
- Adherence to industry standards
- Versioned APIs
- Extensive documentation and tutorials on the developer portal

### 3. PA Engine API

Measure performance, risk, style, and characteristics for multiple portfolios and asset classes with best-in-class, flexible reports and charts. With faster reporting and automated calculations, go from data to decision first. FactSet’s full range of [portfolio analytics](#) combines all the data and flexibility you need to examine your portfolio across asset classes and strategies.

All APIs are hosted under <https://api.factset.com>. Authentication is handled using API Keys and authorization is handled using FactSet’s in-house subscriptions product. You can find more information about using API Keys at <https://developer.factset.com/authentication>.

HTTP request and response header names should be considered case insensitive as per [HTTP Standard](#). Please do not rely on case sensitive matching of headers in your code.

#### 3.1 Multiple Calculation APIs

##### 3.1.1 Run Multiple Calculations

**POST** /analytics/engines/v2/calculations

##### Description

This endpoint runs multiple calculations on PA Engine based on parameters specified in the POST body. It must be used first, before checking status or cancelling endpoints. A successful response will contain the URL to check the status of the request.

##### Request Headers

Header name	Description
<b>Authorization</b>	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
<b>Content-Type</b>	Standard HTTP header. Value needs to specify application/JSON (i.e., caller needs to specify that the body is in JSON format).

##### Request Body

The request body accepts a collection of calculation parameters. The parameters are outlined below:

Parameter name	Data type	Required	Description	Format
<b>componentid</b>	String	Yes	PA component identifier to analyze.	Component ID can be fetched using the <a href="#">ComponentLookup</a> .
<b>accounts</b>	Array	Yes	List of user’s FactSet account paths OR benchmarks.	Account identifiers must have .ACCT or .ACTM extension or BENCH: prefix. Holdings mode can be optionally set for every account. Possible values for holdings mode are B&H (Buy and Hold), TBR (Transaction based

				returns) or OMS. Default holdings mode value is B&H.
<b>benchmarks</b>	Array	No	List of user's FactSet account paths OR benchmarks to compare against.	Benchmark identifiers must have .ACCT or .ACTM extension or BENCH: prefix. Holdings mode can be optionally set for every benchmark. Possible values for holdings mode are B&H (Buy and Hold), TBR (Transaction based returns) or OMS. Default holdings mode value is B&H.
<b>dates</b>	Object	No	Date range(s) to run against. Object takes startdate, enddate and frequency.	<a href="#">Supported Date Formats</a> and <a href="#">Frequency Lookup</a> .
<b>groups</b>	Array	No	List of groups for calculation.	Groups can be fetched from <a href="#">Groups Lookup</a> .
<b>currencyisocode</b>	String	No	Currency ISO code for calculation.	E.g., USD. Currency ISO codes can be fetched using the <a href="#">Currency Lookup</a> .

## Response Headers

Header name	Description
<b>X-DataDirect-Request-Key</b>	FactSet's request key header.
<b>X-FactSet-API-Request-Key</b>	Key to uniquely identify an Analytics API request. Only available after successful authentication.
<b>X-FactSet-API-Units-Limit</b>	Maximum units limit across all requests.
<b>X-FactSet-API-Units-Remaining</b>	Number of units remaining till unit limit reached.
<b>Location</b>	Standard HTTP header. Contains URL to check status of the request.
<b>X-FactSet-API-RateLimit-Limit</b>	Number of allowed requests for the time window.
<b>X-FactSet-API-RateLimit-Remaining</b>	Number of requests left for the time window.
<b>X-FactSet-API-RateLimit-Reset</b>	Number of seconds remaining till rate limit resets.

## Returns

HTTP status code	Description
<b>202</b>	Expected response, contains the URL in the Location header to check the status of the request.
<b>400</b>	Invalid POST body.
<b>401</b>	Missing or invalid authentication.
<b>403</b>	User is forbidden access with current credentials.
<b>415</b>	Missing/Invalid Content-Type header. Header needs to be set to application/json.
<b>429</b>	Rate limit reached. Cancel older requests using Cancel Calculation endpoint or wait for older requests to finish / expire.

500	Server error. Log the X-DataDirect-Request-Keyheader to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Remarks**

- Maximum 500 units allowed per request and across all simultaneous requests.
- Any settings in POST body will act as a one-time override over the settings saved in the PA template.
- Multi-horizon frequencies are not supported through this endpoint.

**Examples**

```

Request:
POST https://api.factset.com/analytics/engines/v2/calculations

Headers:
content-type: application/json
Authorization: Basic RkRTX0RFTU9fVVMt*****
Accept-Encoding: gzip
content-length: 201

Body:
{
  "pa": {
    "1": {
      "componentid": "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50",
          "holdingsmode": "B&H",
        }
      ],
      "dates": {
        "startdate": "20170101",
        "enddate": "20180101",
        "frequency": "Monthly"
      },
      "groups": [
        {
          "id": "E5DB59F608778844CD784DD5659F65AA8A0A9F63F9E4314B2D92761AF0B1B3D9"
        }
      ],
      "benchmarks": [

```

```

    {
      "id": "BENCH:R.1000"
    }
  ],
  "currencyisocode": "USD"
},
"2": {
  "componentid": "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFB5752788F4E9",
  "accounts": [
    {
      "id": "BENCH:SP50"
    }
  ],
  "dates": {
    "startdate": "20180101",
    "enddate": "20180107",
    "frequency": "Daily"
  },
  "groups": [
    {
      "id": "E5DB59F608778844CD784DD5659F65AA8A0A9F63F9E4314B2D92761AF0B1B3D9"
    }
  ],
  "benchmarks": [
    {
      "id": "BENCH:R.1000"
    }
  ],
  "currencyisocode": "USD"
}
}
}

```

**Response:**

HTTP 202 Accepted

**Headers:**

location: <https://api.factset.com/analytics/engines/v2/calculations/8F2D7849BBBED69A889B578B8CE43F9FE17C23FEFD67804A4B42449FEE2F4D78>  
 x-datadirect-request-key: zpdo6aebv58fiaoi  
 x-factset-api-request-key: 6p2d41m4sw1yfh0h

**3.1.2 Get Calculation Status By ID**

**GET** /analytics/engines/v2/calculations/{id}

**Description**

This is the endpoint to check on the progress of a previous request that was submitted using [Run Multiple Calculations](#) endpoint. The response body contains status information of the entire request and each individual calculation. If an individual calculation has finished computing, the result parameter in the response body will contain the result URL.

**Request Headers**

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.

**Response Headers**

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Cache-Control	Standard HTTP header. Header will specify max-age in seconds. Polling can be adjusted based on the max-age value.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

**Returns**

HTTP status code	Description
200	Expected response. The response body contains status information of the entire request and each individual calculation.
400	Invalid identifier parameter provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	There was no request for the identifier provided, or the request was already canceled for the provided identifier.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**



```

Request:
GET
https://api.factset.com/analytics/engines/v2/calculations/8F2D7849BBBED69A889B578B8CE43F9FE17C23FEFD67804A4B42449FEE2F4D78

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: yxuvd73bjejn02ij
x-factset-api-request-key: 4nboxc5wctfzauq0

Body:
{
  "status": "Executing",
  "units": 17,
  "calculations": {
    "1": {
      "status": "Success",
      "result":
        "https://api.factset.com/analytics/engines/v2/calculations/8F2D7849BBBED69A889B578B8CE43F9FE17C23FEFD67804A4B42449FEE2F4D78/results/DD697278BC996FD99946587244C98244F13DBAFE9056F32A43E38ECC41587462"
    },
    "2": {
      "status": "Executing"
    }
  }
}

```

### 3.1.3 Get All Active Calculations

**GET** /analytics/engines/v2/calculations/

#### Description

This is the endpoint to check on the progress of all active requests.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

**Response Headers**

Header name	Description
X-DataDirect-Request-Key	FactSet's requestkey header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-API-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-API-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-API-RateLimit-Reset	Number of seconds remaining till rate limit resets.

**Returns**

HTTP status code	Description
200	List of outstanding active calculations.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request :
GET https://api.factset.com/analytics/engines/v2/calculations/

Headers :
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 OK

Headers :
x-datadirect-request-key: 1dn9wrqj9w9juddx
x-factset-api-request-key: 5jqw73yzx5qvni3q
    
```

```

Body :
{
  "F7BFEBDBAD3DEA7D79EF1DA7F13E54BCC282032DDBEA4495BC33B30DF5BD2A00": {
    "status": "Executing",
    "units": 17,
    "requestTime": "2019-02-04T22:21:33.877Z",
    "lastPollTime": "2019-02-04T22:22:24.05Z"
  },
  "FCC47C2D9EA3B33DAB8E4CE127173280C83B6FAB15263AF8D0E2A5CDDBB563E9": {
    "status": "Completed",
    "units": 10,
    "requestTime": "2019-02-04T22:21:14.693Z",
    "lastPollTime": "2019-02-04T22:21:14.693Z"
  }
}

```

### 3.1.4 Cancel Multiple Calculations

**DELETE** /analytics/engines/v2/calculations/{id}

#### Description

This endpoint is used to cancel a previously submitted request. Instead of doing a HTTP GET on the status URL, cancel the request by doing a HTTP DELETE.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-Api-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-Api-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-Api-RateLimit-Reset	Number of seconds remaining till rate limit resets.

#### Returns

HTTP status code	Description
204	Expected response, request was cancelled successfully.

400	Invalid identifier parameter provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	There was no request for the identifier provided, or the request was already canceled for the provided identifier.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

### Examples

```

Request:
DELETE
https://api.factset.com/analytics/engines/v2/calculations/8F2D7849BBED69A889B578B8CE43F9FE17C23FED67804A4B42449FEE2F4D78

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 204 No Content

Headers:
x-datadirect-request-key: iwkitryrtam8l8z1
x-factset-api-request-key: dx8wju5k6ogb2rp8
    
```

## 3.2 Lookup APIs

### 3.2.1 Components Lookup

**GET** /analytics/lookups/v2/engines/pa/components?document={documentname}

#### Description

This endpoint returns a list of components within a PA document. [Run Multiple Calculations](#) expects component identifiers returned by this endpoint.

Component identifiers are of variable-length and are expected to change. Users should always use this API before calling [Run Multiple Calculations](#).

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.

**Accept** (Optional) Standard HTTP header. Value needs to be application/json.

**Request Query Parameters**

Parameter name	Data type	Description	Format
document	String	PA document name.	FactSet-root:/document-path. Possible values for FactSet-root are client, personal, super_client, or pa_documents.

**Response Headers**

Header name	Description
X-DataDirect-Request-Key	FactSet’s request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-API-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-API-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-API-RateLimit-Reset	Number of seconds remaining till rate limit resets.

**Returns**

HTTP status code	Description
200	Expected response.
400	Invalid query parameter/value provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Document not found.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request :
GET
https://api.factset.com/analytics/lookups/v2/engines/pa/components?document=PA\_DOCUMENTS%3ADEFAULT

Headers :
    
```

```

Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: pqlnunhpmpu7eg1
x-factset-api-request-key: coy3y67i0ym1083y

Body:
{
  "782DA0A0C9CCA9F80C2F3622FC1373AED30E1B7C1CF58F4677FE8C4C4901A53": {
    "name": "Weights",
    "category": "Weights / Exposures"
  },
  "48AACB9F99E5F4F2B20B9E9A996F7ACF29DDAB4378FF22192E52CCE80443FA27": {
    "name": "Contribution to return",
    "category": "Performance / Contribution result"
  }
}
    
```

### 3.2.2 Component Settings Lookup

GET /analytics/lookups/v2/engines/pa/components/{id}

#### Description

This endpoint returns settings for a given PA component.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-API-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-API-RateLimit-Remaining	Number of requests left for the time window.

<b>X-FactSet-Api-RateLimit-Reset</b>	Number of seconds remaining till rate limit resets.
--------------------------------------	-----------------------------------------------------

**Returns**

HTTP status code	Description
200	Expected response.
400	Invalid component identifier.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Component not found.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request:
GET
https://api.factset.com/analytics/lookups/v2/engines/pa/components/782DA0A0C9CCA9F80C2F3622FC1373AED30E1B7C1CF58F4677FE8C4C4901A53

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 0zsbdmxnlz3aeg
x-factset-api-request-key: lipbij4lhxcoiney

Body:
{
  "id": "782DA0A0C9CCA9F80C2F3622FC1373AED30E1B7C1CF58F4677FE8C4C4901A53",
  "name": "Weights",
  "category": "Weights / Exposures",
  "accounts": [],
  "benchmarks": [],
  "currencyisocode": "USD",
  "dates": {

```

```

    "frequency": "Single",
    "enddate": "0"
  },
  "snapshot": true
}

```

### 3.2.3 Groups Lookup

GET /analytics/lookups/v2/engines/pa/groups

#### Description

This endpoint returns a list of FactSet-defined and user-defined groups. Group identifiers from this endpoint can be used in [Run Calculation API](#).

Group identifiers are of variable-length and are expected to change.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Cache-Control	(Optional) Standard HTTP header. Use no-cache directive to get latest groupings and refresh cache.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Age	Standard HTTP header. Age of cache in seconds.
X-FactSet-API-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-API-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-API-RateLimit-Reset	Number of seconds remaining till rate limit resets.

#### Returns

HTTP status code	Description
200	Expected response.
401	Missing or invalid authentication.



403	User is forbidden access with current credentials.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/groups

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: oo3y6rf8t1v0elau
x-factset-api-request-key: czqie5p55bqfgujz

Body:
{
  "031995E1CFCAE106A531BD014B29D013B8F66C5275F23D8C74DF18E6D6E999F1": {
    "name": " Sub Industry",
    "directory": "Client",
    "category": "MSCI"
  },
  "0364445F4849751A52DDA5181F01D0D61E23E69036D825BB1119CB000EFF24B8": {
    "name": "Market Sector",
    "directory": "Factset",
    "category": "Dow Jones Global (Old)"
  }
}
    
```

**3.2.4 Currency Lookup**

GET /analytics/lookups/v2/engines/pa/currencies

**Description**

This endpoint returns a list of supported currencies.

**Request Headers**

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

**Response Headers**

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
X-FactSet-API-RateLimit-Limit	Number of allowed requests for the time window.
X-FactSet-API-RateLimit-Remaining	Number of requests left for the time window.
X-FactSet-API-RateLimit-Reset	Number of seconds remaining till rate limit resets.

**Returns**

HTTP status code	Description
200	Expected response.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/currencies

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: fns911nz73wv6hb4
x-factset-api-request-key: m2h184putr0jctn4
    
```

```

Body:
{
  "USD": {
    "name": "U.S. Dollar"
  },
  "JPY": {
    "name": "Japanese Yen"
  },
  "GBP": {
    "name": "British Pounds"
  }
}

```

### 3.2.5 Account Lookup

**GET** /analytics/lookups/v2/accounts/{path}

#### Description

This endpoint returns a list of account and composite files as well as the directories these files can be found under. Account names from this endpoint can be used in [Run Multiple Calculations](#). If no path is provided, a list of root level directories is returned, which can then be passed again to this endpoint to retrieve accounts and sub-directories.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Age	Standard HTTP header. Age of cache in seconds.

#### Returns

HTTP status code	Description
200	Expected response.
400	Invalid query parameter or value provided.

401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Path not found.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

### Examples

```

Request:
GET https://api.factset.com/analytics/lookups/v2/accounts/

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 564d5a1d49ffluvj
x-factset-api-request-key: 1gm8zeczlyj3w6bd

Body:
{
  "directories": [
    "Client:",
    "Factset:"
  ]
}
    
```

```

Request:
GET https://api.factset.com/analytics/lookups/v2/accounts/Client%3Afolder1/folder2/

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
    
```

```
x-datadirect-request-key: 564d5a1d49ffluj
x-factset-api-request-key: 1gm8zeczlyj3w6bd

Body:
{
  "accounts": [
    "ACCOUNT1.ACCT",
    "COMPOSITE1.ACTM"
  ],
  "directories": [
    "folder3",
    "folder4"
  ]
}
```

### 3.2.6 Document Lookup

**GET** /analytics/lookups/v2/engines/pa/documents/{path}

#### Description

This endpoint returns a list of PA3 documents as well as the directories these files can be found under. Document names from this endpoint can be used in [Components Lookup](#). If no path is provided, a list of root level directories is returned, which can then be passed again to this endpoint to retrieve documents and sub-directories.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Age	Standard HTTP header. Age of cache in seconds.

#### Returns

HTTP status code	Description
------------------	-------------

200	Expected response.
400	Invalid query parameter or value provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Path not found.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/documents/

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 564d5a1d49ffluvj
x-factset-api-request-key: 1gm8zecz1yj3w6bd

Body:
{
  "directories": [
    "Client:",
    "Factset:"
  ]
}
    
```

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/documents/Client%3Afolder1/folder2/

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
    
```

```

HTTP 200 Success

Headers:
x-datadirect-request-key: 564d5a1d49ffluvj
x-factset-api-request-key: 1gm8zeczlyj3w6bd

Body:
{
  "documents": [
    "document1"
  ],
  "directories": [
    "folder3",
    "folder4"
  ]
}
    
```

### 3.2.7 Columns Lookup

GET /analytics/lookups/v2/engines/pa/columns

#### Description

This endpoint returns a list of FactSet-defined and user-defined columns. Column identifiers from this endpoint can be used in [Run Multiple Calculations](#).

Column identifiers are of variable-length and are expected to change.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.
Age	Standard HTTP header. Age of cache in seconds.

#### Returns

HTTP status code	Description
200	Expected response.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

### Examples

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/columns

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 564d5a1d49ffluvj
x-factset-api-request-key: 1gm8zeczlyj3w6bd

Body:
{
  "E5663F0DE0CC1F84E4DD2C316B0B334608ECE71A786A848F65B54110C4DF638E": {
    "name": "Port. Beginning Quantity Held",
    "directory": "Factset",
    "category": "Portfolio/Position Data"
  },
  "2B729FA4EA4EA5A58B3300455A5D064FC4FA32491DA3F9D169C3DAD9793880F5": {
    "name": "Port. P/L Contribution To Return",
    "directory": "Factset",
    "category": "Portfolio/Contributions to Return"
  }
}

```

### 3.2.8 Column Settings Lookup

GET /analytics/lookups/v2/engines/pa/columns/{id}

#### Description



This endpoint returns settings for a given column.

**Request Headers**

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

**Response Headers**

Header name	Description
X-DataDirect-Request-Key	FactSet's requestkey header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.

**Returns**

HTTP status code	Description
200	Expected response.
400	Invalid column identifier.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Column not found.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Keyheader to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request:
GET
https://api.factset.com/analytics/lookups/v2/engines/pa/columns/2B729FA4EA4EA5A58B3300455A5D064FC4FA32491DA3F9D169C3DAD9793880F5

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success
    
```

```

Headers :
x-datadirect-request-key: xpfalpmac31sqiyc
x-factset-api-request-key: 8rbye9jnec26bkxj

Body :
{
  "defaultstatisticsids": [
    "f25882fe0b724c1da563a99ce96085db"
  ],
  "name": "Port. P/L Contribution To Return",
  "directory": "Factset",
  "category": "Portfolio/Contributions to Return"
}

```

### 3.2.9 Column Statistics Lookup

GET /analytics/lookups/v2/engines/pa/columnstatistics

#### Description

This endpoint returns a list of column statistics. Column statistic identifiers from this endpoint can be applied to any column used in the [Run Multiple Calculations](#).

Column statistic identifiers are of variable-length and are expected to change.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's request key header.
X-FactSet-Api-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.

#### Returns

HTTP status code	Description
200	Expected response.

401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

### Examples

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/columnstatistics

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 564d5a1d49ffluvj
x-factset-api-request-key: 1gm8zeczlyj3w6bd

Body:
{
  "f25882fe0b724c1da563a99ce96085db": {
    "name": "Sum"
  },
  "998e9415544f4376a7db4085fe4cda39": {
    "name": "Average"
  }
}
    
```

#### 3.2.10 Frequency Lookup

GET /analytics/lookups/v2/engines/pa/frequencies

#### Description

This endpoint returns a list of supported frequencies.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.

**Accept** (Optional) Standard HTTP header. Value needs to be application/json.

### Response Headers

Header name	Description
X-DataDirect-Request-Key	FactSet's requestkey header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.

### Returns

HTTP status code	Description
200	Expected response.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

### Examples

```

Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/frequencies

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: fns911nz73wv6hb4
x-factset-api-request-key: m2h184putr0jctn4

Body:
{
  "Single": {
    "name": "Single"
  },
  "FiscalYearly": {
    "name": "Fiscal Yearly"
  }
}
    
```

```

},
"Annually": {
  "name": "Annually"
},
"SemiAnnually": {
  "name": "Semi Annually"
},
"Quarterly": {
  "name": "Quarterly"
},
"Monthly": {
  "name": "Monthly"
},
"Weekly": {
  "name": "Weekly"
},
"Daily": {
  "name": "Daily"
}
}

```

### 3.2.11 Dates Translation

#### GET

/analytics/lookups/v2/engines/pa/dates?startdate={startdate}&enddate={enddate}&componentid={componentid}&account={account}

#### Description

This endpoint converts part or the whole relative date to its absolute format, i.e., YYYYMMDD format. If the date specified is not a trading day, the API picks the closest trading day prior to the specified date.

#### Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Accept	(Optional) Standard HTTP header. Value needs to be application/json.

#### Request Query Parameters

Parameter name	Data type	Required	Description	Format
startdate	String	No	Relative start date.	<a href="#">Supported Date Formats</a> and <a href="#">FrequencyLookup</a> .

<b>enddate</b>	String	Yes	Relative end date.	<a href="#">Supported Date Formats</a> and <a href="#">FrequencyLookup</a> .
<b>componentid</b>	String	Yes	PA component identifier to analyze.	Component identifier can be fetched using the <a href="#">Component Lookup</a> .
<b>account</b>	String	Yes	User's FactSet account path.	Account must have .ACCT or .ACTM extension.

**Response Headers**

Header name	Description
<b>X-DataDirect-Request-Key</b>	FactSet's requestkey header.
<b>X-FactSet-API-Request-Key</b>	Key to uniquely identify an Analytics API request. Only available after successful authentication.

**Returns**

HTTP status code	Description
200	Expected response.
400	Invalid query parameter/value provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Document or account not found.
406	Unsupported Accept header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Request timed out. Retry the request in sometime.

**Examples**

```

Request :
GET https://api.factset.com/analytics/lookups/v2/engines/pa/dates?enddate=-1M&componentid=%20782DA0A0C9CCCA9F80C2F3622FC1373AED30E1B7C1CF58F4677FE8C4C4901A53&account=test.acct

Headers :
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: e43vazt21fr6ln83
    
```

```
x-factset-api-request-key: 0j2zg6l1sxcfqx4vy

Body:
{
  "enddate": "20160303"
}
```

```
Request:
GET https://api.factset.com/analytics/lookups/v2/engines/pa/dates?enddate=-1M&startdate=-2M&componentid=782DA0A0C9CCCA9F80C2F3622FC1373AED30E1B7C1CF58F4677FE8C4C4901A53&account=test.acct

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Headers:
x-datadirect-request-key: 4cqpdv2nn14ln8gv
x-factset-api-request-key: 6pwnk7iavmt2j434

Body:
{
  "startdate": "20160203",
  "enddate": "20160303"
}
```

## Supported Date Formats

### Absolute Date Formats

Format	Description	Examples
MM/DD/YYYY	A day.	7/11/2016, 1/1/2015, 3/6/2014.
MM/YYYY	A month end.	6/2016, 4/2015, 11/2014, 5/2013.
YYYY/MMF	A fiscal quarter end.	2016/3F, 2015/2F.
YYYY/MMC	A calendar quarter end.	2016/1C, 2015/3C.
YYYY	A fiscal year end.	2016, 2015.

### Relative Date Formats

Format	Examples
D	0D is the most recently completed trading day, -1D is one trading day prior.
AW	0AW is the most recently completed trading day, -1AW is the one actual week (7 days) prior to the most recently completed trading day.
W	0W is the last day of the most recently completed trading week (usually Friday), -1W is the last trading day of the prior week.
AM	0AM is the most recently completed trading day, -1AM is the same day, one actual month prior.
M	0M is the last trading day of the most recent month, -1M is the last trading day of the prior month.
Q	0Q is the last trading day of the company's most recent fiscal quarter, -1Q is the last day of the prior fiscal quarter.
CQ	0CQ is the last trading day of the most recent calendar quarter (March, June, September, or December), -1CQ is the last trading day of the prior calendar quarter.
AY	0AY is the most recently completed trading day, -1AY is one actual year (365 days) prior.
Y	0Y is the last trading day of the company's most recent fiscal year, -1Y is the last trading day of the prior fiscal year.
CY	0CY is the last trading day of the most recent calendar year (the last trading day in December), -1CY is the last trading day of the prior calendar year.
M/D/Y	M, D, and Y can be zero, negative, or a positive number. Examples: 0/0/-1 is the day one year ago, 0/-7/0 is the day one week ago, -1/0/0 is the day one month ago, 12/31/-1 is the day at the end of last year.

### Special FactSet Date Identifiers

The user needs to set the following properties in their account (.ACCT/.ACTM file) if they wish to use these identifiers:

Identifier	Definition
INCEPTION	Date the account was created. This typically corresponds to the first day of data in the holdings portfolio.
ALTERINCEPTION	Alternative date option to define when the portfolio was created. This is helpful in cases where the inception date isn't the official day the portfolio was created.
TERMINATION	Date the account is terminated.
END_OF_LAST_FISCAL	End of last fiscal year.

## 4. Troubleshooting

Following steps are recommended to troubleshoot errors from any of the different APIs:

- Record the X-DataDirect-Request-Key response header so that FactSet's API engineering team can analyze your specific request/response.
- Record the response body when the response is an error response. All HTTP status codes equal to and greater than 400 are considered error responses.



- Reach out to your account team with the above information for assistance.

## 5. Version Upgrade

FactSet will support old API versions for a limited time. The actual support time will depend on the API and the release stage (i.e., beta or production). All breaking changes, functionality additions, and bug fixes across earlier versions will be documented in the changelog.

FactSet’s API engineering team will work with the clients to ensure smooth transition to newer versions.

## 6. Appendix: Run Multiple Calculations Request Body Scenarios

Below table lists down multiple calculation scenarios to help understand the points breakdown.

Request Body	Description
<pre>{   "pa": {     "1": {       "componentid":         "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",       "accounts": [         {           "id": "BENCH:SP50",           "holdingsmode": "OMS"         },         {           "id": "BENCH:KLDLCSN0"         }       ],       "benchmarks": [         {           "id": "BENCH:R.1000"         }       ],       "dates": {         "startdate": "20170101",         "enddate": "20180101",         "frequency": "Monthly"       },       "currencyisocode": "USD"     }   } }</pre>	<p>No. of Calculations: 1</p> <p><u>Calculation 1</u>            No. of Accounts: 2            No. of Benchmarks: 1            No. of Points: 2 x 1 = 2</p> <p><u>Total</u>            No. of Points: 2</p>
<pre>{   "pa": {     "1": {       "componentid":         "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",       "accounts": [</pre>	<p>No. of Calculations: 2</p> <p><u>Calculation 1</u>            No. of Accounts: 3</p>

```

{
  "id": "BENCH:SP50"
},
{
  "id": "BENCH:KLDLCSN0"
},
{
  "id": "BENCH:R.1000",
  "holdingsmode": "B&H"
}
]
},
"2": {
  "componentid":
    "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
  "accounts": [
    {
      "id": "BENCH:SP50"
    }
  ],
  "benchmarks": [
    {
      "id": "BENCH:R.1000"
    },
    {
      "id": "BENCH:KLDLCSN0"
    }
  ],
  "dates": {
    "startdate": "20180101",
    "enddate": "20180107",
    "frequency": "Daily"
  }
}
}
}
}
}

```

No. of Benchmarks: 1 (*Default – Assuming the PA Document has 1 Benchmark*)

No. of Points: 3 x 1 = 3

Calculation 2

No. of Accounts: 1

No. of Benchmarks: 2

No. of Points: 1 x 2 = 2

Total

No. of Points: 3 + 2 = 5