

PA ENGINE API - VERSION 3.0 Developer's Manual and Reference September 2024

PA Engine API – Version 3.0



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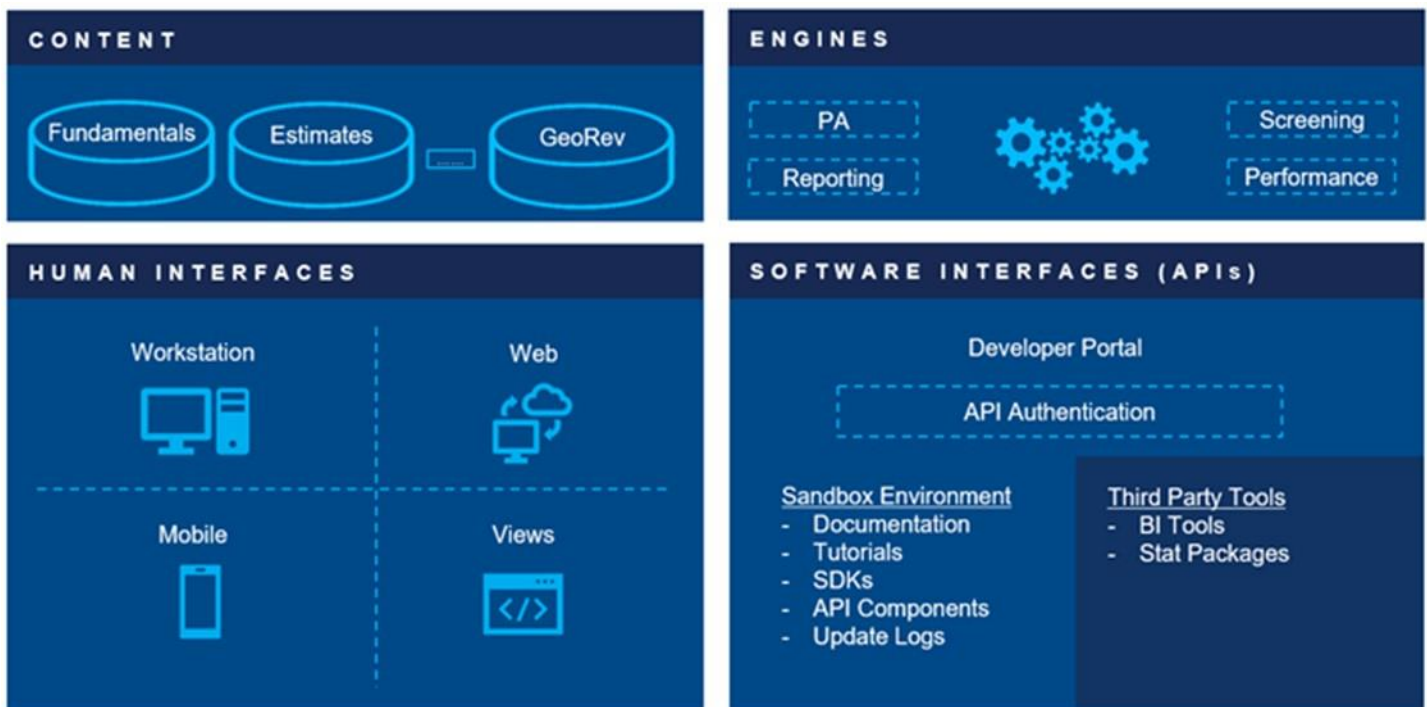
1. Motivation

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 PACalculation APIs

3.1.1 Run Multiple Calculations

POST /analytics/engines/pa/v3/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. **If the X-FactSet-Api-Long-Running-Deadline** header is passed, then this endpoint will return calculation results in the response if the calculation completes within the specified amount of time.

Request Headers

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

Content-Type	Standard HTTP header. Value needs to specify application/JSON (i.e., caller needs to specify that the body is in JSON format).
X-FactSet-Api-Long-Running-Deadline	Long running deadline in seconds when only one unit is passed in the POST body. The endpoint will return calculation results as a response if it completes within the specified amount of time (rather than return the status polling URL).
Cache-Control	Standard HTTP header that holds caching instructions. max-stale is the only supported directive. It indicates that the client will accept a stale response, the value (in seconds) denotes the upper time limit for the stale response. Note that all results are cached for 12 hours, to override the default cache and trigger a new request, set max-stale=0. Max value is 43200 seconds (12 hours). For more information on caching, see the Caching Remarks section .

Request Body

The request body is made up of the following 2 objects, “data” which holds calculation parameters, and “meta” which specifies the response’s STACH content type and formatting.

Object name	Required	Description	Format
data	Yes	Parent object for the request body	List of calculation parameters
meta	No	Allows users to specify the response format and stachContentOrganization	Valid format values are ‘JsonStach’ and ‘Binary’. Default is ‘JsonStach’. Valid stachContentOrganization values are ‘Row’, ‘Column’, ‘SimplifiedRow’, and ‘None’. Default is ‘SimplifiedRow’. Please refer to the STACH v2 documentation here for more information on STACH v2 format types.

The calculation parameters within the “data” object are outlined below:

Parameter name	Data type	Required	Description	Format
data	Object	Yes	Parent object for the request body	
componentid	String	Yes	PA component identifier to analyze.	Component ID can be fetched using the Components Lookup .
accounts	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) , OMS (Order Management System) , VLT (Vaulted returns) or EXT

				<p>(External Returns Data). Default holdings mode value is B&H.</p> <p>Please refer https://my.apps.factset.com/oa/pages/21344#create for creating accounts that can be uploaded through nightly parsers or https://developer.factset.com/apicatalog/model-portfolio-api for creating prospective accounts with model holdings.</p>
benchmarks	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.
dates	Object	No	Date range(s) to run against. Object takes startdate, enddate and frequency.	Supported Date Formats and Frequency Lookup .
datasources	Array	No	List of available pricing sources for calculation.	For example, in order to calculate official benchmark returns, use an MSCI pricing source for MSCI benchmarks.
groups	Array	No	List of groups for calculation.	Groups can be fetched from Groups Lookup .
currencyisocode	String	No	Currency ISO code for calculation.	E.g., USD. Currency ISO codes can be fetched using the Currency Lookup .
componentdetail	String	No	Degree of granularity to return in the PA component	Valid values are 'groups', 'groupsall' 'totals', and 'security'. Default value is 'security'. While the groupsall returns all the group levels in the PA report, when componentdetail is set to groups it only returns the no of levels expanded/collapsed from the PA report.

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.
Location	Standard HTTP header. Contains URL to check status of the request.
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 if the calculation has one unit and is completed with an error
201	Expected response if the calculation has one unit and is completed in a short span or pre-defined span via the X-FactSet-Api-Long-Running-Deadline header. Returns JSON in the format specified in the “meta” section of the Calculation parameters
202	Expected response, contains the URL in the Location header to check the status of the request.
400	Invalid POST body.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	One or more calculation settings were unavailable.
415	Missing/Invalid Content-Type header. Header needs to be set to application/json.
429	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-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in some time.

Remarks

- Maximum 50 POST requests allowed in a 5 second window for each API. The same can be verified using the various Rate-Limit headers available in the API response.
 - 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.
- Maximum 1000 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.
- Please refer to the STACH v2 documentation [here](#) for more information on STACH v2 format types
- The stored result 12-hour period is applied to each individual calculation unit after it completes. It is not applied to the entire calculation.

- If we are overriding grouping frequency without overriding the group id it will not be applied to the default groupings saved to the original component.
- If we are overriding the grouping with a frequency, we will be overriding the grouping saved to the original component and also overriding the default frequency of the Beginning of Period to whatever we pass in the request body.

Caching Remarks

- *All results will be cached for 12 hours by default.* This means that by default (without sending any cache-control headers), after the first request successfully completes, all subsequent requests with unchanged request parameters will return the same results for 12 hours.
- Setting the max-stale=<staleness limit in seconds> allows you to fetch pre-calculated results with any subsequent POST requests, as long as they were last calculated within the staleness limit.
 - o Once set, the API will check to see if the stored results are within the staleness limit.
 - If they are within the limit, then the request will return the cached results, allowing for a quick response and eliminating unnecessary points accrual.
 - If the results are not within the limit, a brand-new calculation request will be triggered to get the latest results.
- To immediately request the latest results, override the cache by setting “max-stale=0” in the Cache-control header parameter.
- Changes made to the underlying PA document via the workstation will not trigger a results re-calculation. The cache-control parameter should be set to “max-stale=0” to immediately request the latest results
- The max cache-control value is “max-stale=43200” (12 hours)
- The cached result period is applied to each individual calculation unit after it completes. It is not applied to the entire calculation.

Examples

```
Request:  
POST https://api.factset.com/analytics/engines/pa/v3/calculations  
  
Request Headers:  
content-type:application/json  
Authorization: Basic RkRTX0RFTU9fVVMt*****  
Accept-Encoding: gzip  
content-length: 739  
cache-control: "max-stale=0"
```


Body:

```

{
  "data": {
    "1": {
      "componentid": "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50",
          "holdingsmode": "B&H",
        }
      ],
      "dates": {
        "startdate": "20170101",
        "enddate": "20180101",
        "frequency": "Monthly"
      },
      "groups": [
        {
          "id": "E5DB59F608778844CD784DD5659F65AA8A0A9F63F9E4314B2D92761AF0B1B3D9",
          "frequency": "Daily"
        }
      ],
      "benchmarks": [
        {
          "id": "BENCH:R.1000"
        }
      ],
      "currencyisocode": "USD"
    },
    "2": {
      "componentid": "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50"
        }
      ],
      "datasources": {
        "portfoliopricingsources": [
          {
            "id": "D4A1D551BE11F15FDCC54E3F3B3F0B0A053180F4358D580FCDE340AFB1698B07"
          }
        ]
      }
    }
  }
}

```

```

],
  "useportfoliopricingsourcesforbenchmark": true    },
  "groups": [
    {
      "id": "E5DB59F608778844CD784DD5659F65AA8A0A9F63F9E4314B2D92761AF0B1B3D9",
      "frequency": "Daily"
    }
  ],
  "benchmarks": [
    {
      "id": "BENCH:R.1000"
    }
  ],
  "currencyisocode": "USD"
}
},

"meta": {
  "stachContentOrganization": "SimplifiedRow",
  "format": "JsonStach"
}
}

```

Response:

HTTP 202 Accepted

```

{
  "data": {
    "calculationid": "cbd632d85dcb4716ac49bad5ad67f589",
    "status": "Executing",
    "units": {
      "1": {
        "status": "Executing"
      },
      "2": {
        "status": "Executing"
      }
    }
  }
}
}

```

Response Headers:

x-datadirect-request-key: zpdo6aebv58fiaoi
x-factset-api-request-key: 6p2d41m4sw1yfh0h

location:

<https://api.factset.com/analytics/engines/pa/v3/calculations/cbd632d85dcb4716ac49bad5ad67f589/status>

3.1.2 Create and Update PA Calculation

PUT /analytics/engines/v3/pa/calculations/{id}

Description

This endpoint can be used to either:

- Create a new PA calculation(s) with a custom id specified in the id path parameter. Note that the user-provided id path parameter is required.
- Update calculation parameters and run a pre-existing PA calculation

Like the POST endpoint, the PUT endpoint must be used first, before checking status or cancelling endpoints. A successful response will contain the URL to check the status of the request. **If the X-FactSet-Api-Long-Running-Deadline** header is passed, then this endpoint will return calculation results in the response if the calculation completes within the specified amount of time.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
Content-Type	Standard HTTP header. Value needs to specify application/JSON (i.e., caller needs to specify that the body is in JSON format).
X-FactSet-Api-Long-Running-Deadline	Long running deadline in seconds when only one unit is passed in the POST body. The endpoint will return calculation results in the response if it completes within the specified amount of time (rather than return the status polling URL) Max value is 20 seconds.
Cache-Control	Standard HTTP header that holds caching instructions. max-stale is the only supported directive. It indicates that the client will accept a stale response, the value (in seconds) denotes the upper time limit for the stale response. Note that all results are cached for 12 hours, to override the default cache and trigger a new request, set max-stale=0. Max value is 43200 seconds (12 hours). For more information on caching, see the Caching Remarks section .

Request Body

Like the POST endpoint, the request body is made up of the following 2 objects, "data" which holds calculation parameters, and "meta" which specifies the response's STACH content type and formatting.

Object name	Required	Description	Format
data	Yes	Parent object for the request body	List of calculation parameters
meta	No	Allows users to specify the response format and stachContentOrganization	Valid format values are 'JsonStach' and 'Binary'. Default is 'JsonStach'. Valid stachContentOrganization values are 'Row', 'Column', 'SimplifiedRow', and 'None'. Default is 'SimplifiedRow'. Please refer to the STACH v2 documentation here for more information on STACH v2 format types.

The calculation parameters within the “data” object are outlined below:

Parameter name	Data type	Required	Description	Format
componentid	String	Yes	PA component identifier to analyze.	Component ID can be fetched using the Component Lookup .
accounts	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) , OMS (Order Management System) , VLT (Vaulted returns) or EXT (External Returns Data) . Default holdings mode value is B&H. Please refer https://my.apps.factset.com/oa/pages/21344#create for creating accounts that can be uploaded through nightly parsers or https://developer.factset.com/apicatalog/model-portfolio-api for creating prospective accounts with model holdings.
benchmarks	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.
dates	Object	No	Date range(s) to run against. Object takes startdate, enddate and frequency.	Supported Date Formats and Frequency Lookup .
datasources	Array	No	List of available pricing sources for calculation.	For example, in order to calculate official benchmark returns, use an MSCI pricing source for MSCI benchmarks.
groups	Array	No	List of groups for calculation.	Groups can be fetched from Groups Lookup .

currencyisocode	String	No	Currency ISO code for calculation.	E.g., USD. Currency ISO codes can be fetched using the Currency Lookup .
componentdetail	String	No	Degree of granularity to return in the PA component	Valid values are 'groups', 'groupsall', 'totals', and 'security'. Default value is 'security'. While the groupsall returns all the group levels in the PA report, when componentdetail is set to groups it only returns the no of levels expanded/collapsed from the PA report.

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.
Location	Standard HTTP header. Contains URL to check status of the request.
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 if the calculation has one unit and is completed with an error
201	Expected response if the calculation has one unit and is completed in a short span or pre-defined span via the X-FactSet-Api-Long-Running-Deadline header. Returns JSON in the format specified in the Calculation parameters
202	Expected response, contains the URL in the Location header to check the status of the request.
400	Invalid calculation parameters.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	One or more calculation settings were unavailable.
415	Missing/Invalid Content-Type header. Header needs to be set to application/json.
429	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-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in some time.

Examples

Request:

PUT <https://api.factset.com/analytics/engines/pa/v3/calculations/custom-id>

Request Headers:

content-type: application/json

Authorization: Basic RkRTX0RFTU9fVVMt*****

Accept-Encoding: gzip

Body:

```
{
  "data": {
    "1": {
      "componentid": "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50",
          "holdingsmode": "B&H",
        }
      ],
      "dates": {
        "startdate": "20170101",
        "enddate": "20180101",
        "frequency": "Monthly"
      },
      "groups": [
        {
          "id": "E5DB59F608778844CD784DD5659F65AA8A0A9F63F9E4314B2D92761AF0B1B3D9",
          "frequency": "Daily"
        }
      ],
      "benchmarks": [
        {
          "id": "BENCH:R.1000"
        }
      ]
    }
  }
}
```

```

    "currencyisocode": "USD"
  },
  "2": {
    "componentid": "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
    "accounts": [
      {
        "id": "BENCH:SP50"
      }
    ],
    "dates": {
      "startdate": "20180101",
      "enddate": "20180107",
      "frequency": "Daily"
    },
    "datasources": {
      "portfoliopricingsources": [
        {
          "id": "D4A1D551BE11F15FDCC54E3F3B3F0B0A053180F4358D580FCDE340AFB1698B07"
        }
      ],
      "useportfoliopricingsourcesforbenchmark": true
    },
    "groups": [
      {
        "id": "E5DB59F608778844CD784DD5659F65AA8A0A9F63F9E4314B2D92761AF0B1B3D9",
        "frequency": "Daily"
      }
    ],
    "benchmarks": [
      {
        "id": "BENCH:R.1000"
      }
    ],
    "currencyisocode": "USD"
  }
},
"meta": {
  "stachContentOrganization": "SimplifiedRow",
  "format": "JsonStach"
}
}

```

Response:

HTTP 202 Accepted

Body:

```
{
  "data": {
    "calculationid": "custom-id",
    "status": "Executing",
    "units": {
      "1": {
        "status": "Executing"
      },
      "2": {
        "status": "Executing"
      }
    }
  }
}
```

Response Headers:

x-datadirect-request-key: zpdo6aebv58fiaoi

x-factset-api-request-key: 6p2d41m4sw1yfh0h

location: <https://api.factset.com/analytics/engines/pa/v3/calculations/custom-id/status>**3.1.3 Get Calculation Status By ID**

GET /analytics/engines/pa/v3/calculations/{id}/status

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. Otherwise, the calculation is still running, and the X-FactSet-Api-PickUp-Progress header will contain a progress percentage.

Request Headers

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

Path Parameters

Name	Required	Description
id	Yes	From url, provided from the location header in the Create and Run PA calculation endpoint

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
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.
X-FactSet-Api-PickUp-Progress	Percentage of progress completed for this request

Returns

HTTP status code	Description
200	Expected response once the calculation is completed. The response body contains status information of the entire request and each individual calculation.
202	Expected response returned if the calculation is not yet completed. Contains X-FactSet-Api-PickUp-Progress header with a percentage of progress completed
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	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET
https://api.factset.com/analytics/engines/pa/v3/calculations/0c0a17af3e0e495282ec59aa83e9669c/status

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:
x-datadirect-request-key: yxuvd73bjejn02ij
x-factset-api-request-key: s4nboxc5wctfzau
x-factset-api-pickup-progress: 50

Body:
{
  "data": {
    "calculationid": "0c0a17af3e0e495282ec59aa83e9669c",
    "status": "Completed",
    "units": {
      "1": {
        "status": "Success",
        "result":
"https://api.factset.com/analytics/engines/pa/v3/calculations/0c0a17af3e0e495282ec59aa83e9669c/units/1/result",
        "progress": "100"
      }
    }
  }
}

```

3.1.4 Get Calculation Results By ID

GET /analytics/engines/pa/v3/calculations/{id}/units/{unitId}/result

Description

This is the endpoint to get the result of a previously requested calculation. If the calculation has finished computing, the body of the response will contain the requested document in JSON.

Request Headers

Header name	Description
Accept	(Optional) Standard HTTP header. Value can be gzip, compress, deflate, br, identity and/or *

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run PA calculation endpoint
unitId	Yes	Unit id. from url, provided from the location header in the Get PA calculation status by id endpoint

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
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 once calculation is completed, returns JSON in the format specified in the Calculation parameters.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Calculation was already returned, provided id was not a requested calculation, or the calculation was cancelled
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	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET
https://api.factset.com/analytics/engines/pa/v3/calculations/0c0a17af3e0e495282ec59aa83e9669c/units/1/result

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:
x-datadirect-request-key: yxuvd73bjejn02ij
x-factset-api-request-key: s4nboxc5wctfzau

Body:
See a sample SimplifiedRow formatted response here
    
```

3.1.5 Generate PA Portfolio Commentary By Calculation And Unit ID

POST /analytics/engines/pa/v3/calculations/{id}/units/{unitId}/commentary

Description

This endpoint can be used to generate the FactSet’s AI generated PA portfolio commentary based on a previous successful calculation.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
X-FactSet-Api-Long-Running-Deadline	Long running deadline in seconds when only one unit is passed in the POST body. The endpoint will return calculation results in the response if it completes within the specified amount of time (rather than return the status polling URL) Max value is 30 seconds.

Path Parameters

There is no request body but to generate the commentary, a successful calculation id and respective unit id is mandatory.

The calculation parameters within the POST URL are outlined below:

Parameter name	Data type	Required	Description	Format
id	String	Yes	Successful calculation id	Calculation ID can be fetched using the Get Calculation Results by ID .
Unit Id	String	Yes	Unit id associated with the successful calculation id	Unit ID can be fetched using the Get Calculation Results by ID .

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.
Location	Standard HTTP header. Contains URL to check status of the request.
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
201	Expected response to generate the commentary in a short span or pre-defined span via the X-FactSet-Api-Long-Running-Deadline header. Returns the commentary in a pre-defined JSON format.
202	Expected response, contains the URL in the Location header to check the status of the request.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
415	Missing/Invalid Content-Type header. Header needs to be set to application/json.
429	Rate limit reached. Wait for older requests to finish / expire"
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in some time.

Remarks

The PA component used in the calculation must be an attribution tile.

The "Variation in Average Weight" column must be included along with those required as specified on the OA page (https://my.apps.factset.com/oa/pages/13632#portfolio_commentary) in the component for successful commentary generation; otherwise, the request will result in an error.

The PA portfolio commentary generation is not supported for multi-port requests.

For every successful PA attribution calculation, the respective commentary can be generated using the calculation ID and unit ID associated with the calculation via a new request.

The POST calculation must use a single portfolio and a single benchmark to generate the commentary.

PA portfolio commentary with sub-period analysis will be returned only when the frequency is set to something other than "single" and the report contains more than one sub-period.

Examples

Request:

POST <https://api.factset.com/analytics/analytics/engines/pa/v3/calculations/{id}/units/{unitId}/commentary>

Request Headers:

content-type: application/json

Authorization: Basic RkRTX0RFTU9fVVMt*****

Accept-Encoding: gzip

Response:

HTTP 202 Accepted

Response Body:

```
{
  "data": {
    "calculationid": "string",
    "unitid": "string",
    "status": "Executing"
  }
}
```

Response Headers:

x-datadirect-request-key: zpdo6aebv58fiaoi

x-factset-api-request-key: 6p2d41m4sw1yfh0h

3.1.6 Get PA Portfolio Commentary Status By Calculation And Unit ID

GET /analytics/engines/pa/v3/calculations/{id}/units/{unitId}/commentary/status

Description

This endpoint allows you to check the progress of a previously requested PA portfolio commentary. If the commentary generation is complete, the location header will provide the URL for the result.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
X-FactSet-Api-Long-Running-Deadline	Long running deadline in seconds when only one unit is passed in the POST body. The endpoint will return calculation results in the response if it completes within the specified amount of time (rather than return the status polling URL) Max value is 30 seconds.

Path Parameters

The calculation parameters within the GET URL are outlined below:

Parameter name	Data type	Required	Description	Format
id	String	Yes	Successful calculation id	Calculation ID can be fetched using the Get Calculation Results by ID .
Unit Id	String	Yes	Unit id associated with the successful calculation id	Unit ID can be fetched using the Get Calculation Results by ID .

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
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.
X-FactSet-Api-PickUp-Progress	Percentage of progress completed for this request
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.
Location	Standard HTTP header. Contains URL to check status of the request.
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. If the commentary generation is complete, the location header will provide the URL for the result.
202	Expected response, contains the URL in the Location header to check the status of the request.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in some time.

Examples

Request:

POST <https://api.factset.com/analytics/analytics/engines/pa/v3/calculations/{id}/units/{unitId}/commentary/status>

Request Headers:

content-type: application/json

Authorization: Basic RkRTX0RFTU9fVVMt***** Accept-

Encoding: gzip

Response:

HTTP 200 Success

Response Body:

```
{
  "data": {
    "result":
    "https://api.factset.com/analytics/engines/pa/v3/calculations/9c36da006b9c45018a8cb3d12a3c3238/un
its/unit-0/commentary/result",
    "calculationid": "9c36da006b9c45018a8cb3d12a3c3238",
    "unitid": "unit-0",
    "status": "Success"
  }
}
```

Response Headers:

x-datadirect-request-key: zpdo6aebv58fiaoi

x-factset-api-request-key: 6p2d41m4sw1yfh0h

3.1.7 Get PA Portfolio Commentary Result By Calculation And Unit Id

GET /analytics/engines/pa/v3/calculations/{id}/units/{unitId}/commentary/result

Description

This endpoint retrieves the result of a previously requested portfolio commentary. If the commentary generation is complete, the commentary will be returned in a predefined JSON format.

Request Headers

Header name	Description
Authorization	Standard HTTP header. Value needs to use 'Basic <base64 encoded value>' format.
X-FactSet-Api-Long-Running-Deadline	Long running deadline in seconds when only one unit is passed in the POST body. The endpoint will return calculation results in the response if it completes within the specified amount of time (rather than return the status polling URL) Max value is 30 seconds.

Path Parameters

The calculation parameters within the GET URL are outlined below:

Parameter name	Data type	Required	Description	Format
id	String	Yes	Successful calculation id	Calculation ID can be fetched using the Get Calculation Results by ID .
Unit Id	String	Yes	Unit id associated with the successful calculation id	Unit ID can be fetched using the Get Calculation Results by ID .

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.
Location	Standard HTTP header. Contains URL to check status of the request.
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. If the commentary generation is complete, the location header will provide the URL for the result.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
415	Missing/Invalid Content-Type header. Header needs to be set to application/json.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in some time.

Examples

```

Request:
GET https://api.factset.com/analytics/analytics/engines/pa/v3/calculations/{id}/units/{unitId}/commentary/result

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

Response:
HTTP 200 Success

Response Body:
{
  "data": {
    "commentaryId": "d5882c7d-6705-4467-b245-7ff403da191f",
    "sections": [
      {
        "metadata": {
          "tileName": "3 Factor Brinson Attribution",
          "portfolioDescription": "S&P 500",
          "benchmarkDescription": "S&P 100",
          "startDate": {
            "yyyymmdd": 20240408
          }
        }
      }
    ]
  }
}
    
```

```

    "endDate": {
      "yyyymmdd": 20240508
    },
    "frequency": "FREQUENCY_WEEKLY"
  },
  "title": "Executive Summary",
  "content": "Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
tempor incididunt ut labore et dolore magna aliqua.",
  "subSections": [
    {
      "title": "Alphabet Inc. Class A",
      "content": "Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do
eiusmod tempor incididunt ut labore et dolore magna aliqua."
    }
  ]
},
"disclaimer": "Powered by FactSet Generative Artificial Intelligence"
}
}

```

Response Headers:

```

x-datadirect-request-key: zpdo6aebv58fiaoi
x-factset-api-request-key: 6p2d41m4sw1yfh0h

```

3.1.8 Get All Calculations

GET /analytics/engines/pa/v3/calculations

Description

This endpoint returns all calculation requests. The data is sorted in descending order by request time and by default one page will fetch 20 calculations.

Request Headers

Header name	Description
Accept	(Optional) Standard HTTP header. Value can be gzip, compress, deflate, br, identity and/or *

Query Parameters

Name	Required	Type	Description
pageNumber	Yes	Integer	Page number

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
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.

Response Body Parameters

Header name	Description
data	Parent object of the response body
meta	Contains pagination details

Data object includes following parameters -

Header name	Description
status	Status of the calculation id . E.g. completed, failed, queued, executing etc.
units	Number of units for a calculation request.
requestTime	Time at which the calculation request was made.
lastPollTime	Time at which the calculation was last polled.

Meta object includes following parameters -

Header name	Description
pageNumber	Number of the page requested.
pageSize	Number of requests in a page.
totalPages	Total number of pages at a given time.
totalCalculation	Total number of calculations at a given time.
nextPage	Following page number.
lastPage	Previous page number

Returns

HTTP status code	Description
200	List of calculation requests.
400	Invalid page number.
401	Missing or invalid authentication.
403	User is forbidden with current credentials.
404	No calculation found.
406	Unsupported Accept header. Header needs to be set to application/json.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
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/pa/v3/calculations?pageNumber=1>

Response:

HTTP 200 OK

Response Headers:

x-datadirect-request-key: 62d7ef371709b08a
x-factset-api-request-key: 62d7ef3755f31322

Body:

```
{
  "data": {
    "934b42b0d37f43b9be28ff2597048b45": {
      "status": "Executing",
      "units": 1,
      "requestTime": "2022-07-20T12:03:38.059101Z",
      "lastPollTime": " 2022-07-20T15:25:33.339849Z"
    }
  },
  "meta": {
    "pagination": {
      "pageNumber": 1,
      "pageSize": 20,
      "totalPages": 1,
      "totalCalculations": 1,
      "nextPage": null,
      "previousPage": null
    }
  }
}
```


3.1.9 Get Calculation Parameters By ID

GET /analytics/engines/pa/v3/calculations/{id}

Description

This endpoint that returns the calculation parameters passed for a calculation.

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run PA calculation endpoint

Response Headers

Header name	Description
Content-Encoding	Standard HTTP header. Header value based on Accept-Encoding Request header.
Content-Type	Standard HTTP header.
Transfer-Encoding	Standard HTTP header. Header value will be set to Chunked if Accept-Encoding header is specified.
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, returns the PA calculation parameters.
400	Invalid identifier provided.
401	Missing or invalid authentication.
403	User is forbidden access with current credentials.
404	Calculation id not found.

500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in sometime.

Examples

Request:

GET

<https://api.factset.com/analytics/engines/pa/v3/calculations/0c0a17af3e0e495282ec59aa83e9669c>**Response:**

HTTP 200 OK

Response Headers:

x-datadirect-request-key: 1dn9wrqj9w9juddx

x-factset-api-request-key: 5jqw73yzx5qvni3q

Body:

```
{
  "data":{
    "1":{
      "componentid":"125872e5d836683a3eb09ef8c73d3e1be854be4ef6173bab4bfbb5752788f4e9",
      "accounts":[
        {
          "id":"bench:sp50",
          "holdingsmode":null
        }
      ],
      "benchmarks":[
        {
          "id":"bench:r.1000",
          "holdingsmode":null
        }
      ],
      "dates":{
        "startdate":"20180101",
        "enddate":"20180617",
        "frequency":"daily"
      }
    },
  },
}
```

```

    "groups":[
      {
        "id":"e5db59f608778844cd784dd5659f65aa8a0a9f63f9e4314b2d92761af0b1b3d9"
      }
    ],
    "currencyisocode":"usd",
    "columns":null,
    "componentdetail":null
  }
},
"meta":{
  "stachContentOrganization":"SimplifiedRow",
  "format":"JsonStach"
}
}

```

3.1.10 Cancel Calculation by ID

DELETE /analytics/engines/pa/v3/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.

Path Parameters

Name	Required	Description
id	Yes	Calculation id. From url, provided from the location header in the Create and Run PA calculation endpoint

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	Service unavailable. Retry the request in sometime.

Examples

```

Request:
DELETE
https://api.factset.com/analytics/engines/pa/v3/calculations/0c0a17af3e0e495282ec59aa83e9669c

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/engines/pa/v3/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.

Response Codes

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.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET https://api.factset.com/analytics/engines/pa/v3/components?document=PA3\_DOCUMENTS%3ADEFAULT

Request Headers:
Authorization: Basic
RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:
x-datadirect-request-key: qlnunhpmmpu7eg1
x-factset-api-request-key: coy3y67i0ym1083y

Body:
{
  "data": {
    "801B800245E468A52AEBEC4BE31CFF5AF82F371DAEF5F158AC2E98C2FA324B46": {
      "name": "Weights",
      "category": "Weights / Exposures"
    }
  }
}

```

```

    },
    "3C9AA796BF1E7C61A0A633565E83A801E183C579D8D93155C150D546F3C5CFAF": {
      "name": "Weights Difference",
      "category": "Weights / Exposures"
    }
  }
}

```

3.2.2 Component Settings Lookup

GET /analytics/engines/pa/v3/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-Reset	Number of seconds remaining till rate limit resets.
X-FactSet-API-RateLimit-Remaining	Number of requests left for the time window.

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.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in sometime.

Examples

Request:

GET

<https://api.factset.com/analytics/engines/pa/v3/components/801B800245E468A52AEBEC4BE31CFF5AF82F371DAEF5F158AC2E98C2FA324B46>

Request Headers:

Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:

HTTP 200 Success

Response Headers:

x-datadirect-request-key: 0zsbdmxnlztw3aeg
 x-factset-api-request-key: lipbij4lhxcoiney

Body:

```
{
  "data": {
    "id": "801B800245E468A52AEBEC4BE31CFF5AF82F371DAEF5F158AC2E98C2FA324B46",
    "accounts": [],
    "benchmarks": [],
    "currencyisocode": "USD",
    "dates": {
      "startdate": null,
      "enddate": "0",
      "frequency": "Single"
    },
  },
  "snapshot": true,
  "name": "Weights",
  "category": "Weights / Exposures"
```



```
}
}
```

3.2.3 Groups Lookup

GET /analytics/engines/pa/v3/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.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
503	Service unavailable. Retry the request in sometime.

Examples

Request:

GET <https://api.factset.com/analytics/engines/pa/v3/groups>

Request Headers:

Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:

HTTP 200 Success

Response Headers:

x-datadirect-request-key: oo3y6rf8t1v0elau
 x-factset-api-request-key: lipbij4lhxcoiney

Body:

```
{
  "data": {
    "10D46537D08F37A521A57FC77105FFE7CA8F336AAFDF876B09EAA384A6024ED0": {
      "name": "3M Momentum",
      "directory": "Client",
      "category": "Client"
    },
    "07D67EFA4356CEA4CFE65F545BB6B158BB6A8356D7C5F89A7544CDAC4A0936F2": {
      "name": "AGI Asset Class",
      "directory": "Client",
      "category": "Client"
    }
  }
}
```

3.2.4 Groups Frequencies Lookup

GET /analytics/engines/pa/v3/grouping-frequencies

Description

This endpoint returns a list of supported frequencies to override FactSet-defined and user-defined groups frequencies. We can override these group frequencies from this endpoint can use in [Run Calculation API](#).

Remarks

If we are overriding the grouping with a frequency, we will be overriding the grouping saved to the original component and also overriding the default frequency of the Beginning of Period to whatever we pass in the request body.

When running a time-series report, you will need to choose a frequency of when grouping definitions are re-calculated. Some groupings do not change over a time series report, and these typically use 'Beginning of Period' as frequency such as Sector & Industry, Region & Industry, Asset Class & Asset type, and Currency. Other groupings do change over time (Equity valuation metrics, Fixed income calculations, High/Low, etc.)

If set to Beginning of Period, you should see that the group stays excluded. However, with a Daily frequency, it looks as through PA will exclude securities based on the first date in the report, but if security enters that group later, it will show up.

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.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
503	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET https://api.factset.com/analytics/engines/pa/v3/grouping-frequencies

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:
x-datadirect-request-key: oo3y6rf8t1v0elau
x-factset-api-request-key: lipbij4lhxcoiney

Body:
{
  "data": {
    "BeginningOfPeriod": {
      "name": "Beginning Of Period"
    },
    "EndOfPeriod": {
      "name": "End Of Period"
    },
    "Annually": {
      "name": "Annually"
    },
    "SemiAnnually": {

```

```

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

```

3.2.5 Pricing Sources Lookup

GET /analytics/engines/pa/v3/pricing-sources

Description

This endpoint lists all the PA pricing sources that can be applied to a PA calculation. Pricing Source identifiers from this endpoint can be used in [Run Multiple Calculations](#).

Pricing Source 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.
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.
404	Pricing sources 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	Service unavailable. Retry the request in sometime.

Examples

The query parameters must have a directory in all the cases. so, the combinations are
 Directory
 Directory/category
 Directory/category/name
 Directory/name

```

Request:
GET https://api.factset.com/analytics/engines/pa/v3/pricing-sources?name=ESG&category=MSCI&directory=Equity

Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

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

Body:
{
  "data": {
    "57AEDD0A703D76D80BB9EF6DE3292071F0F4806083D3EF1E550CF32FBFBA54ED": {
      "name": "MSCI EAFE ex Select Countries + Canada Custom ESG Leaders - Gross",
    }
  }
}
    
```

```

    "directory": "Equity",
    "category": "MSCI"
  },
  "5FBC932D2B699A6924BED2A122EAD0B41BBCFF3897C3B389446AC03AEF46B57D": {
    "name": "MSCI EAFE ex Select Countries + Canada Custom ESG Leaders - Net",
    "directory": "Equity",
    "category": "MSCI"
  },
  "C9FF82C980F0128AD4B3142D3CFC80E393E1BCFC6F904630C719E8CBB6E900A8": {
    "name": "MSCI EM (Emerging Markets) Select Countries Custom ESG ex Controversial Weapons
Special Tax",
    "directory": "Equity",
    "category": "MSCI"
  },
  "361D0CC6301675652002274F88102988AB748148F17E6D61CE8CF2DDCD0FDCB8": {
    "name": "MSCI EM (Emerging Markets) Select Countries Custom ESG ex Controversial Weapons
Special Tax - Net",
    "directory": "Equity",
    "category": "MSCI"
  },
  "F9E4E95E62EC68E230D51D0DD399BA27E9B706342A3DBE9227A08FC53C4C2D97": {
    "name": "MSCI World Select Countries Custom ESG ex Controversial Weapons Special Tax Index
- Gross",
    "directory": "Equity",
    "category": "MSCI"
  },
  "F1D074FE97E161130A9F2D4B68D261D4991E3F6335B8B35FAA47475AF870508A": {
    "name": "MSCI World Select Countries Custom ESG ex Controversial Weapons Special Tax Index
- Net",
    "directory": "Equity",
    "category": "MSCI"
  }
}

```

3.2.6 Currency Lookup

GET /analytics/lookups/v3/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	Service unavailable. Retry the request in sometime.

Examples

Request:
 GET <https://api.factset.com/analytics/lookups/v3/currencies>

Headers:
 Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:

HTTP 200 Success

Response Headers:

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

Body:

```
{
  "data": {
    "USD": {
      "name": " U.S. Dollar"
    },
    "JPY": {
      "name": "Japanese Yen"
    }
  }
}
```

3.2.7 Account Lookup

GET /analytics/lookups/v3/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.

Request 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

Header name	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.
429	Rate limit reached. Wait till the time specified in Retry-After header value to make further requests.
500	Server error. Log the X-DataDirect-Request-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET https://api.factset.com/analytics/lookups/v3/accounts

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

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

Body:
{
  "data":{
    "directories":[
      "Client:",
      "Personal:",

```

```

    "Super_client:"
  ]
}
}

```

Request:
GET <https://api.factset.com/analytics/lookups/v3/accounts/Client%3Afolder1>

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response: HTTP
200 Success

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

Body:
{
 "data":{
 "accounts":[
 "TEST.ACCT"
],
 "directories":[
 "test1",
 "test2"
]
 }
}

3.2.8 Document Lookup

GET /analytics/engines/pa/v3/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	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET https://api.factset.com/analytics/engines/pa/v3/documents/Client%3Afolder1%2Ffolder2

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****
    
```

Response: HTTP

200 Success

Response Headers:

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

Body:

```
{  
  "data":{  
    "documents":[  
      "PA_TEST"  
    ],  
    "directories":[  
      "test1",  
      "test2"  
    ]  
  }  
}
```

Request:

GET <https://api.factset.com/analytics/engines/pa/v3/documents>

Request Headers:

Authorization: Basic RkRTX0RFTU9fVVMt*****

Response: HTTP

200 Success

Response Headers:

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

Body:

```
{  
  "data":{  
    "directories":[  
      "Client:",  
      "Personal:",  
      "Super_client:",  
      "FactSet:"  
    ]  
  }  
}
```

```
}

```

3.2.9 Columns Lookup

GET /analytics/engines/pa/v3/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	Service unavailable. Retry the request in sometime.

Examples

Request:GET <https://api.factset.com/analytics/engines/pa/v3/columns>**Request Headers:**

Authorization: Basic RkRTX0RFTU9fVVMt*****

Response: HTTP

200 Success

Response Headers:

x-datadirect-request-key: 564d5a1d49ffluvj

x-factset-api-request-key: 1gm8zeczlyj3w6bd

Body:

```
{
  "data":{
    "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"
    }
  }
}
```

3.2.10 Column Settings Lookup

GET /analytics/engines/pa/v3/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 request key header.
X-FactSet-API-Request-Key	Key to uniquely identify an Analytics API request. Only available after successful authentication.

Response

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-Key header to assist in troubleshooting.
503	Service unavailable. Retry the request in sometime.

Examples

```
Request:
GET
https://api.factset.com/analytics/engines/pa/v3/columns/E5663F0DE0CC1F84E4DD2C316B0B334608ECE71A786A848F65B54110C4DF638E
```



```

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

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

Body:
{
  "data": {
    "defaultstatisticsids": [],
    "name": "Port. Beginning Quantity Held",
    "directory": "Factset",
    "category": "Portfolio/Position Data"
  }
}

```

3.2.11 Column Statistics Lookup

GET /analytics/engines/pa/v3/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	Service unavailable. Retry the request in sometime.

Examples

```

Request:
GET https://api.factset.com/analytics/engines/pa/v3/columnstatistics

Request Headers:
Authorization: Basic RkRtX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:

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

Body:
{
  "data": {
    "eb9d6d91416e4224bacadc261787e56f": {
      "name": "Active Weights"
    },
    "998e9415544f4376a7db4085fe4cda39": {
      "name": "Average"
    }
  }
}
    
```

```
"27d56741635f478c8a818bccdba5c9ab": {
  "name": "Geometric Average"
}
}
```

3.2.12 Frequency Lookup

GET /analytics/engines/pa/v3/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 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	Service unavailable. Retry the request in sometime.

Examples

Request:

GET <https://api.factset.com/analytics/engines/pa/v3/frequencies>

Request Headers:

Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:

HTTP 200 Success

Response Headers:

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

Body:

```
{
  "data": {
    "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"
  }
}
}

```

3.2.13 Dates Translation

GET

/analytics/engines/pa/v3/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.

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	Service unavailable. Retry the request in sometime.

Request Query Parameters

Parameter name	Data type	Required	Description	Format
startdate	String	No	Relative start date.	Supported Date Formats and Frequency Lookup .
enddate	String	Yes	Relative end date.	Supported Date Formats and Frequency Lookup .
componentid	String	Yes	PA component identifier to analyze.	Component identifier can be fetched using the Component Lookup .
account	String	Yes	User's FactSet account path.	Account must have. ACCT or. ACTM extension.

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.
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	Service unavailable. Retry the request in sometime.

Examples

Request:
GET <https://api.factset.com/analytics/engines/pa/v3/dates?enddate=-1M&componentid=801B800245E468A52AEBEC4BE31CFF5AF82F371DAEF5F158AC2E98C2FA324B46&account=test1.aacct>

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:
x-datadirect-request-key: e43vazt21fr6ln83
x-factset-api-request-key: 0j2zg6lsxcfqx4vy

Body:
{
 "data":{
 "enddate":"20210331"
 }
}

Request:
GET <https://api.factset.com/analytics/engines/pa/v3/dates?startdate=-2M&enddate=-1M&componentid=801B800245E468A52AEBEC4BE31CFF5AF82F371DAEF5F158AC2E98C2FA324B46&account=Client%3Atest%2Faccount1.acct>

Request Headers:
Authorization: Basic RkRTX0RFTU9fVVMt*****

Response:
HTTP 200 Success

Response Headers:

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

Body:

```
{
  "data":{
    "startdate":"20210226",
    "enddate":"20210331"
  }
}
```

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

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

- Calculation specific endpoints (POST, PUT, GET Status, GET Results, GET All Calculations)
 - o Record the below response headers so that FactSet's API support team can analyze your specific request/response:
 - x-factset-api-calculation-instance-id
 - x-factset-api-calculation-id
 - x-datadirect-request-key
 - o 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.
 - o Reach out to your account team with the above information for assistance.

- Lookups endpoints (GET Components, GET Components by id, GET Accounts, GET Groups etc)

- o Record the x-datadirect-request-key response header so that FactSet's API support team can analyze your specific request/response.
- o 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.
- o 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

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

Request Body	Description
--------------	-------------

```

{
  "data": {
    "1": {
      "componentid":
        "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50",
          "holdingsmode": "OMS"
        },
        {
          "id": "BENCH:KDLCSN0"
        }
      ],
      "benchmarks": [
        {
          "id": "BENCH:R.1000"
        }
      ],
      "dates": {
        "startdate": "20170101",
        "enddate": "20180101",
        "frequency": "Monthly"
      },
      "currencyisocode": "USD"
    }
  }
}

```

No. of Calculations: 1

Calculation 1

No. of Accounts: 2

No. of Benchmarks: 1

No. of Points: 2 x 1 = 2

Total

No. of Points: 2

```
{
  "data": {
    "1": {
      "componentid":
        "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50"
        },
        {
          "id": "BENCH:KDLCSN0"
        },
        {
          "id": "BENCH:R.1000",
          "holdingsmode": "B&H"
        }
      ]
    },
    "2": {
      "componentid":
        "125872E5D836683A3EB09EF8C73D3E1BE854BE4EF6173BAB4BFBB5752788F4E9",
      "accounts": [
        {
          "id": "BENCH:SP50"
        }
      ],
      "benchmarks": [
        {
          "id": "BENCH:R.1000"
        },
        {
          "id": "BENCH:KDLCSN0"
        }
      ],
      "dates": {
        "startdate": "20180101",
        "enddate": "20180107",
        "frequency": "Daily"
      }
    }
  }
}
```

No. of Calculations: 2

Calculation 1

No. of Accounts: 3

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

No. of Points: $3 \times 1 = 3$

Calculation 2

No. of Accounts: 1

No. of Benchmarks: 2

No. of Points: $1 \times 2 = 2$

Total

No. of Points: $3 + 2 = 5$