**RESTful Service End-points Supported by FMTS Test Application**

**Introduction**

FMTS Test supports three end-points:

* Live Pricing. Given either a list of instruments or a product category, this will return "live" prices.
* Trade Execution. Given an order to buy or sell, this will return an executed trade with a trade reference.
* Client Verification. Given client identifying data, this will return a unique Fidelity trading account number. Or, with client identifying data and a Fidelity trading account number, it will indicate whether the two match.

End-points are addressed as: [servername]:[port]/fmts/[end-point name]

This is just a basic simulation used for basic testing. It is not checking any other validities beyond the ones described in this document.

**Live Pricing**

This end-point fetches "live" prices. However, in reality they are just static prices.

***Prices by Category***

|  |  |
| --- | --- |
| **End-point Name:** | /trades/prices/:categoryId |
| **Parameters supported:** | categoryId |
| **Methods supported:** | GET |
| **Body:** |  |
| **Response:** | List of Price objects in JSON format |
| **Notes:** | Parameter is optional.  All Price objects are returned if the category is not specified.  The categoryId is a category short name (e.g. GOVT, STOCK). |

***Instruments by Category***

|  |  |
| --- | --- |
| **End-point Name:** | /trades/instruments/:categoryId |
| **Parameters supported:** | categoryId |
| **Methods supported:** | GET |
| **Body:** |  |
| **Response:** | List of Instrument objects in JSON format |
| **Notes:** | Parameter is optional.  All Instrument objects are returned if the category is not specified.  The categoryId is a category short name (e.g. GOVT, STOCK). |

**Trade Execution**

This end-point allows a trade to be executed from a client order.

|  |  |
| --- | --- |
| **End-point Name:** | /trades/trade |
| **Parameters supported:** | None |
| **Methods supported:** | POST |
| **Body:** | Order in JSON format incl. Authentication token |
| **Response:** | Trade in JSON format |
| **Notes:** | If the target price in the Order differs by more than 5% from the execution price, the trade will not be executed and an error (409) will be returned instead. |

**Client Verification**

Provides a mechanism to lookup FMTS client ids based on supporting identification documents or verify that a client id and identification documents match.

|  |  |
| --- | --- |
| **End-point Name:** | client |
| **Parameters supported:** | None |
| **Methods supported:** | POST |
| **Body:** | Client in JSON format |
| **Response:** | Client in JSON format incl. Authentication token |
| **Notes:** | If the clientId is left blank, it is populated with a unique value based on the client identifying information passed in the body of the message.  If the clientId is populated, it is validated against the client identifying information.  If they match, the client is returned unchanged.  If they do not match, 406 is returned.  Other types of verification errors will return a 404.  The test end-point does not perform any external client identification activities (such as credit checking). It is supplied with a set of known clients. |

**Data Elements**

***Client***

A client represents a Fidelity client that may trade through FMTS.

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| clientId | String | FMTS Client id  Any valid character string. Unique. |
| country | String | Country of Domicile  A 2-character ISO 3166‑1 country code. However, FMTS Test only supports US, IE, IN and CN. Only US is guaranteed to work. |
| dateOfBirth | String | Date of Birth  Date in ISO 8601 basic format (no hyphens): YYYYMMDD |
| postalCode | String | Postal code  For US clients, this is the ZIP or ZIP+4. In FMTS, all non-alphanumeric characters (spaces, dashes, etc.) are expected to be removed when entering clients. However, FMTS Test imposes no validation, so any string up to 15 characters will work. |
| identification | ClientIdentification[] | Identification for this client At present, only one item is supported in the array. |
| token | String | Authentication token  The authentication token has to be used for any other POST call. The token will remain valid for 5 minutes, after that another Client Verification has to be performed. Every successful call to any FMTS endpoint will extend the validity of the token for another 5 minutes. |
|  |  |  |

Sample JSON:

{

"clientId": "123",

"dateOfBirth": "19260818",

"country": "US",

"postalCode": "90210",

"identification": [

{

"type": "SSN",

"value": "666001234"

}

],

"token": "1552456687"

}

***ClientIdentification***

A client identification represents a type of proof of identity for a client.

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| type | String | Type of identification  Examples: SSN, Passport. Case insensitive. |
| value | String | Value of identification  Unless otherwise specified, all non-alphanumeric characters (spaces, dashes etc.) should be removed. |

Sample JSON:

{

"type": "SSN",

"value": "666001234"

}

***Instrument***

An instrument represents a tradeable product.

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| instrumentId | String | FMTS Instrument id  Any valid character string. Unique. |
| externalIdType | String | Type of external instrument identifier  Typically, the numbering agency for the instrument id. The only values supported by FMTS Test are CUSIP and ISIN. |
| externalId | String | External instrument identifier  Instrument id assigned by the numbering agency in external\_id\_type. Values are not checked in any way (length, composition, check digits, etc.). |
| categoryId | String | Instrument category  The category of this instrument. This is the short name, such as GOVT, CORP. |
| description | String | Instrument description  Standard description for this instrument, usually assigned when the instrument is first registered and never changed, but do not rely on them being fixed for all time. |
| maxQuantity | Number | Maximum tradeable quantity  The largest amount of this instrument that can be traded "automatically". Larger lot sizes may be available by special arrangement, but not through this service. |
| minQuantity | Number | Minimum tradeable quantity  The smallest amount of this instrument that can be traded "automatically". Smaller lot sizes may be available by special arrangement, but not through this service. |

Sample JSON:

{

"instrumentId": "T67878",

"description": "USA, Bond 3 15aug2048 30Y",

"externalIdType": "CUSIP",

"externalId": "912810SD1",

"minQuantity": 100,

"maxQuantity": 10000,

"category": "GOVT"

}

***Order***

An order is a client request to trade.

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| instrumentId | String | FMTS Instrument id  Must exist in FMTS Test system. |
| quantity | Number | Amount of this order  Amount of the instrument to be traded. |
| targetPrice | Number | Target trade price  Price requested for this trade. The price has to be within 1% of the bidPrice or the askPrice if the requested instrument respectively |
| direction | B, S | Trade direction  B = Fidelity buys, S = Fidelity sells |
| clientId | String | Client of this order  FMTS Client id. |
| orderId | String | Order identifier  Unique identification generated by order system. Note that there is no way to query existing orders to find out which ids have been used. Applications will need to use some scheme to generate globally unique ids: consider a scheme like GUID. |

Sample JSON:

{

"orderId": "PQR",

"quantity": 10.0,

"targetPrice": 104.0,

"direction": "S",

"clientId": "123",

"instrumentId": "N123456"

}

***Price***

A Price is the current price for an instrument

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| instrumentId | String | FMTS Instrument id  instrumentId is repeated here, even though it is also included in the embedded instrument object. |
| askPrice | Number | Price at which Fidelity sells (ask price) |
| bidPrice | Number | Price at which Fidelity buys (bid price) |
| timestamp | String | Timestamp at which price was captured  Date time in ISO 8601 basic format (with no hyphens or colons) YYYYMMDDThhmmss.sssZ or YYYYMMDDThhmmss.sss±hhmm (where Z indicates UTC and ±hhmm is the hour and minute offset from UTC). |
| instrument | Instrument | Instrument for which this price is quoted |

Sample JSON:

{

"instrument": {

"instrumentId": "T67878",

"description": "USA, Bond 3 15aug2048 30Y",

"externalIdType": "CUSIP",

"externalId": "912810SD1",

"minQuantity": 100,

"maxQuantity": 10000,

"category": "GOVT"

},

"bidPrice": 0.98546875,

"askPrice": 0.9853125,

"timestamp": "20190419T100002.002Z",

"instrumentId": "T67878"

}

***Trade***

A trade represents an executed trade.

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| instrumentId | String | FMTS Instrument id |
| quantity | Number | Amount of this trade Amount of the instrument to be traded. |
| executionPrice | Number | Price at which trade was executed |
| direction | B, S | Trade direction B = Fidelity buys, S = Fidelity sells |
| clientId | String | Client of this trade |
| order | Order | The order that originated this trade  Note that not all trades are initiated by orders, this will only be populated if appropriate. |
| tradeId | String | Unique identifier generated by trading system. |
| cashValue | Number | Total cash value of the trade, including any fees or discounts. |

Sample JSON:

{

"tradeId": "a62375d7-bcb4-46a1-b2f0-5ba6719ae9b5",

"quantity": 10,

"executionPrice": 104.75,

"direction": "S",

"order": {

"orderId": "PQR",

"quantity": 10,

"targetPrice": 104,

"direction": "S",

"clientId": "123",

"instrumentId": "N123456"

},

"cashValue": 1052.5,

"clientId": "123",

"instrumentId": "N123456"

}

***Authentication Token***

An authentication token is used to proof prior successful authentication when accessing FMTS endpoints

| **Property** | **Data Type** | **Property Description** |
| --- | --- | --- |
| token | String | Authentication Token  Alphanumeric token valid for 5 minutes |

Sample JSON:

{

"token": "152466741"

}

**Initial Testing of FMTS**

***Advanced REST client***

For the purpose of initial testing and also as a guide for FMTS endpoint usage am ARC configuration file was added to the project: arc-data-export-11-9-2019.json

Just install the Advanced REST client in your development environment and IMPORT the json file name above. When selection the Projects tab the FMTS project will come available. When selecting the menu button (three vertical dots to the right), select <OPEN details>. This will give you access to all the predefined test.

Before testing any of the requests make sure you ran an <npm install> on the FMTS project and started the service with <npm start>. The service is currently running on port 3000