

# WHAT ABOUT ODATA?

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FMP2dtm : VAT bridge software

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# INTRO

- REST is a generic design technique used to describe how a web service can be accessed. Using REST you can make http requests to get data.
- OData is a specific protocol/technology that exposes structured data through REST
- OData shares some similarities with JDBC and ODBC; maybe SQL for web?
- Not limited to relational databases

# ODATA

- Microsoft initiated OData in 2007
  - Lots of native support in .NET and other technologies
    - Microsoft Dynamics
  - May or may not be a good thing..!
- Now a standard managed by OASIS
  - Organization for the Advancement of Structured Information Standards
- Current version is v4.01. - v4.0 from 2013 used by FM

## WHY?

- The secret to data in the future will not be with the repositories which contain the data but the way we transport that data back and forth from applications, online services, and the cloud. *ZDNet 2012*
- OData makes it much smoother and easier to query and share data between unconnected systems
- Remove data siloes. Merge all your various data sources into a single, consolidated view
- Because data can be frequently and automatically queried, you get your results dynamically

## HTTP VERBS FOR CRUD

- GET: Get the resource (a collection of entities, a single entity, a structural property, a navigation property, a stream, etc.)
- POST: Create a new resource
- PUT: Update an existing resource by replacing it with a complete instance – **not in FM**
- PATCH: Update an existing resource by replacing part of its properties with a partial instance
- DELETE: Remove the resource

## LEARN MORE

- <https://www.odata.org>
- Getting started
  - </getting-started/understand-odata-in-6-steps/>
- Postman collection
  - </getting-started/learning-odata-on-postman/>
- Docs
  - <http://docs.oasis-open.org/odata/odata/v4.0/odata-v4.0-part2-url-conventions.html>

# IMPLEMENTATION

- In FMCloud and FM Server Linux (so v19)
  - Custom web publishing (PHP/XML) goes away. Functionality now with Data API or Odata (both metered for data out)
- Claris help
  - <https://help.claris.com/en/odata-guide/>
- DigFM presentation
  - <https://www.youtube.com/watch?v=jWpQ4Klvy3I>
    - Demo file shortly via Beezwax blog

## Connectors

Connectors retrieve data, update data, or add features to hosted databases. Click the tabs below to specify configuration settings for connectors.

[Web Publishing](#)[FileMaker Data API](#)[Plug-ins](#)[ODBC / JDBC](#)[OData](#)

## OData

### General Settings

OData	Enabled	<input checked="" type="checkbox"/>
Annual Limit <a href="#">?</a>	240 GB	
Data Transmitted by This Host <a href="#">?</a>	739 KB	
Total Data Transmitted by All Hosts <a href="#">?</a>	739 KB	
Annual Reset Date	31/05/2021, 00:00	



## Configuration

Click the tabs below to specify configuration settings.

[General Settings](#)[FileMaker Clients](#)[Folders](#)[Script Schedules](#)[Notifications](#)[SSL Certificate](#)[Logging](#)

## Logging

### Log Settings

Top Call Statistics [?](#) Disabled

Server Statistics Enabled

### Log Files

FileMaker Logs

Choose the log to download ▾

[event.log](#)[access.log](#)[wpe.log](#)[fmdapi.log](#)[topcallstats.log](#)[stats.log](#)[fmodata.log](#)

2020-11-06T13:47:22.391416Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/Items	345840
2020-11-06T13:47:50.954496Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent	1307
2020-11-06T13:48:04.690835Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/Service	55884
2020-11-06T13:49:20.710326Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/Service('7F686F5B-E3C4-4FA0-8280-E98D030BA51B')	917
2020-11-06T14:15:53.557294Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/\$metadata	51050
2020-11-06T14:33:05.372179Z	0	INFO	81.133.79.252	john	PATCH /fmi/odata/v4/webContent/FileMaker_Tables/DataTable	957
2020-11-06T14:34:00.605741Z	-1020	ERROR	81.133.79.252	john	GET /fmi/odata/v4/webContent/FileMaker_Tables	90
2020-11-06T14:34:17.961951Z	-1012	ERROR	81.133.79.252	john	POST /fmi/odata/v4/webContent/FileMaker_Tables	97
2020-11-06T14:36:37.856805Z	0	INFO	81.133.79.252	john	PATCH /fmi/odata/v4/webContent/FileMaker_Tables/DataTable	1013
2020-11-06T14:58:21.708099Z	10	ERROR	81.133.79.252	john	DELETE /fmi/odata/v4/webContent/FileMaker_Tables/DataTable/textMe	76
2020-11-06T14:58:44.827552Z	0	INFO	81.133.79.252	john	DELETE /fmi/odata/v4/webContent/FileMaker_Tables/DataTable/testMe	0
2020-11-06T16:23:27.935353Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/Service('7F686F5B-E3C4-4FA0-8280-E98D030BA51B')	917
2020-11-06T16:25:44.615804Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/	1307
2020-11-06T16:25:56.578825Z	0	INFO	81.133.79.252	john	GET /fmi/odata/v4/webContent/Service	55884
2020-11-06T18:43:28.664394Z	207	ERROR	81.133.79.252	james	PATCH /fmi/odata/v4/webContent/FileMaker_Tables/DataTable	67
2020-11-06T18:43:56.117812Z	207	ERROR	81.133.79.252	james	PATCH /fmi/odata/v4/webContent/FileMaker_Tables/DataTable	67

Advanced Security Settings for "HMrecords"

Privilege Sets **Extended Privileges** File Access

Use this panel to manage extended privileges. Extended privileges are additional permissions that can be assigned to individual privilege sets.

Keyword	Description	Used by Privilege Sets
fmwebdirect	Access via FileMaker WebDirect	
fmjdbc	Access via ODBC/JDBC	
fmapp	Access via FileMaker Network	[Full Access], [Data Entry Only], [Read-Onl...
fmreauthenticat...	Require re-authentication after the specified mi...	[Data Entry Only], [Read-Only Access]
fmxml	Access via XML Web Publishing - FMS only	
fmphp	Access via PHP Web Publishing - FMS only	
fmscriptdisabled		
fmextscriptaccess	Allow Apple events and ActiveX to perform File...	[Full Access]
fmurlscript	Allow URLs to run FileMaker scripts	[Full Access]
fmrest	Access via FileMaker Data API	
<b>fmodata</b>	<b>Access via OData</b>	

New... Edit... Delete

? Cancel OK

# ODATA VS DAPI

- **DAPI**

- Token authorisation (store, expiry, refresh)
- Based on FM layouts
- Streaming containers not (currently) metered

- **ODATA**

- Basic authorisation
- Only based on Table Occurrence
- Containers are an issue
- BUT schema changes AND batch transactions

# ODATA QUERIES

- Base URL + filename
  - Special modifiers
    - \$metadata, \$count, \$top, \$offset, \$orderby, \$filter
  - URL parameters for FILTER == query (case sensitive)
    - Similar to SQL/JDBC
      - eq, ne, lt, gt for = ≠ < >
    - String and Int functions
      - toupper, substring, startswith, month, floor, ceiling

# ODATA SCHEMA

- Query the FileMaker\_Tables special table
  - POST to create table (with default fields) - **FULL ACCESS**
- FileMaker\_Tables/table
  - PATCH, DELETE to add or delete fields
  - Field type included (SQL type)
    - NUMERIC, DECIMAL, INT, DATE, TIME, TIMESTAMP, VARCHAR, CHARACTER VARYING, BLOB, VARBINARY, LONGVARBINARY, or BINARY VARYING
    - primary, unique, global, default (keywords like USERNAME, CURRENT\_DATE, externalSecurePath)

# ODATA EXTRAS

- Create/ delete indexes
  - FileMaker\_Indexes
- Run scripts
  - /database-name/Script.script-name
  - DOES run the OnFirstWindowOpen and OLWC scripts!
    - As body {"scriptParameterValue" : "value"} (string, number, and JSON)
    - No script names with special characters (for example, @, &, /) or beginning with a number
    - If script contains Exit Script, returned as resultParameter

## ODATA URL

- `https:// {{server}} /fmi/odata/v4/`
- `{{filename}}`
- `?query params`
  - `$filter=code_ACCREDITATIONID eq '06602'`
  - `&$select=ACCREDITATIONID`
- url encoded
- Case sensitive
- Respects record locking and field validation rules



# ISSUES

- **Number fields**
  - Limits similar to JSON, so truncation can happen
  - -H header `IEEE754Compatible=true` will treat as strings so avoid the issue (in most cases)
  - To create, use Atom (xml) format -- quoted form gives type-mismatch error
- **Container fields**
  - Upload data as Base64 or binary in variable `@$data`
- **FMCloud**
  - FMID `Claris_ID_token` auth Amazon Cognito – not for fainthearted

## WHAT IS THE WHY?

- Provide data to external tools that are not dependant on your specific developer style
- Pool of external expertise
- Modify schema without needing plugin
- Respects record lock and field validation
- Batches are theoretically transactional
- Can provide a 'data-separation' model without external file references

## ODATA EXAMPLE

- Provided – XML with spec for value lists (code & value)
- Loop over nodes
  - Is the field there? If not, create it (code\_Node & Node)
  - Then loop over node values
    - Modify field values, up to number of values, then add records