

RECONNECT

A BEGINNER'S GUIDE TO THE FILEMAKER ODATA API

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ABOUT ME . . .

- Owner Databuzz
- Developing in FileMaker since ~ 1992
- FileMaker Certified Developer
- Interest in Integration
- started working with OData in 2016



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fmAccountingLink



fmAccountingLink

MYOB AccountRight



fmAccountingLink

MYOB Essentials



fmAccountingLink



fmEcommerceLink



fmEcommerceLink



fmESignatureLink

DocuSign®



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AGENDA

- what is OData?
- how does the FileMaker OData API work
- why would you use the FileMaker OData API
- OData API vs Data API
- demos

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**Anyone used OData (non FileMaker) or the FileMaker
OData API in Production?**

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OData

- Open Data Protocol is a standard that defines a set of best practices for building and consuming RESTful APIs
- request and response headers, status codes, HTTP methods, URL conventions, media types, payload formats, query options
- make RESTful APIs easy to consume
- initiated by Microsoft in 2007, now an ISO/IEC approved standard (v4)
- Microsoft Dynamics, Power BI, SAP, MYOB AccountRight API
- <https://www.odata.org>



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FILEMAKER ODATA API

- feature of FileMaker Server (like the FileMaker Data API)
- introduced with FileMaker Cloud v2 and FileMaker Server Linux (19.1.2)
- FileMaker Server 19.5.1: macOS and Windows
- REST API clients to access FileMaker data hosted by FileMaker Cloud and FileMaker Server
- uses your Data API outbound data transfer amount (2GB/month/user)
- provides methods to find records, modify records, run FileMaker scripts, and modify the schema of a hosted database
- returns JSON or XML (Atom)

The word "RECONNECT" is displayed in a bold, white, sans-serif font. It is centered horizontally and partially overlaid by a blue, ethereal, smoke-like or nebula-like graphic that flows from the right side of the frame towards the center. The background of the slide is a dark gradient, transitioning from black on the left to deep blue and purple on the right, where the graphic is most prominent.

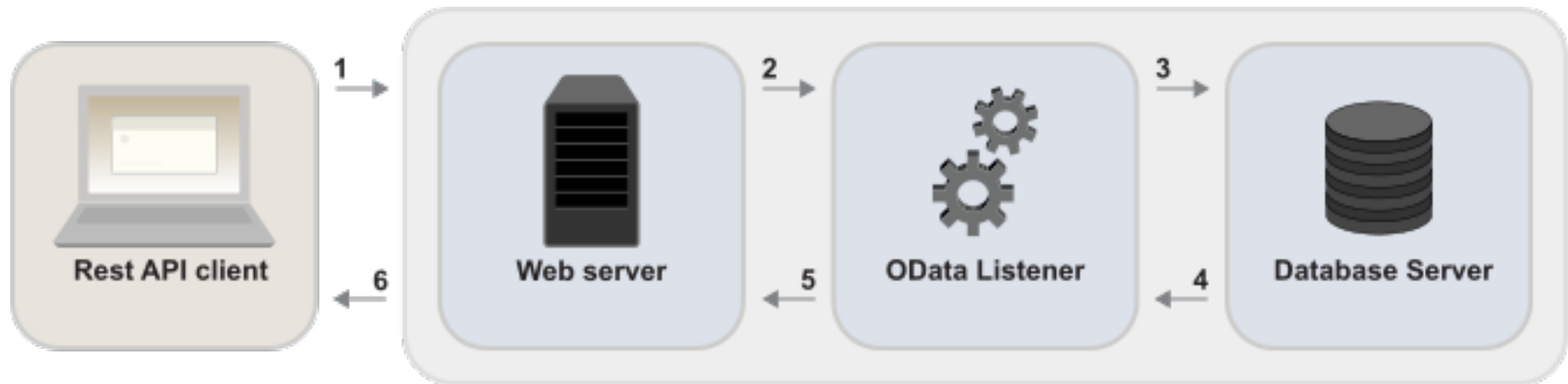
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FILEMAKER ODATA OPERATIONS

- Database structure and metadata
- Modifying data (create, update and delete)
- Request data (record/s, count, field value, binary value)
- Batch requests (bulk create, edit, delete and find)
- Query options (\$filter, \$orderby, \$top, \$skip, \$count, \$select)
- Modify schema (create/delete tables, create/delete fields, create/delete index)
- work with container data
- Run scripts

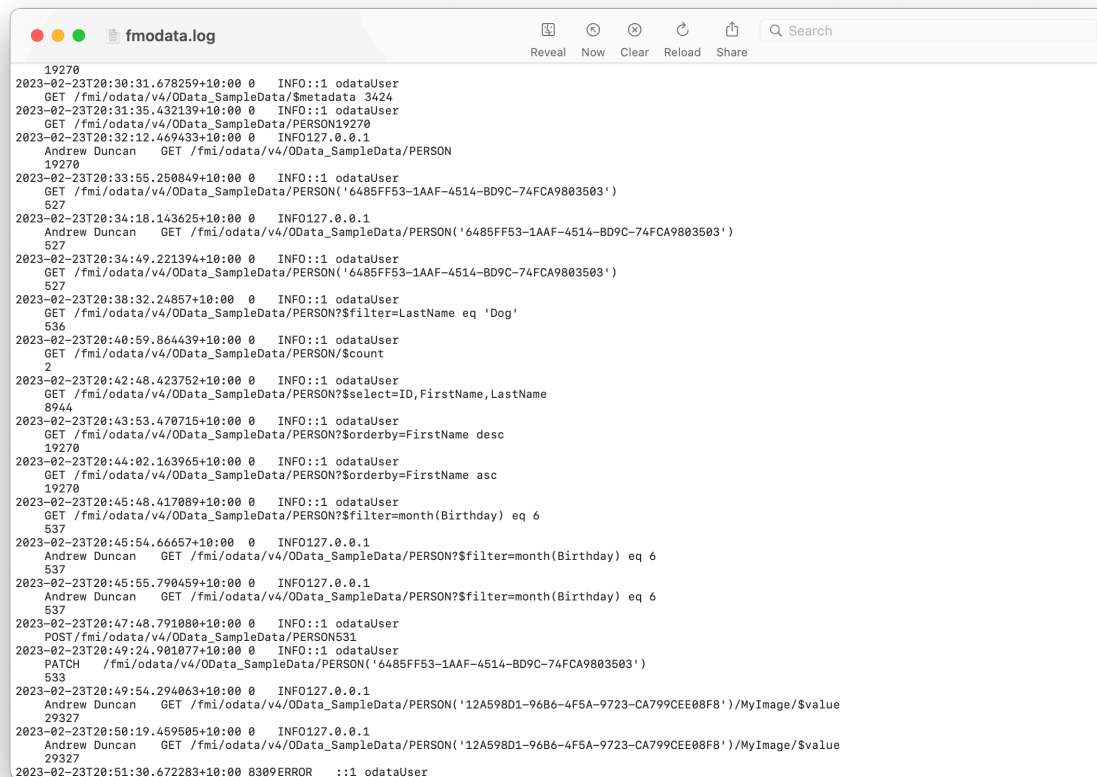
The logo features the word "RECONNECT" in a bold, white, sans-serif font. It is positioned on a dark blue background that transitions into a vibrant, abstract pattern of blue and red light streaks and bokeh effects on the right side.

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NEW LOG FILE



```
19270
2023-02-23T20:30:31.678259+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/$metadata 3424
2023-02-23T20:31:35.432139+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON19270
2023-02-23T20:32:12.469433+10:00 0 INFO127.0.0.1
Andrew Duncan GET /fmi/odata/v4/OData_SampleData/PERSON
19270
2023-02-23T20:33:55.250849+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON('6485FF53-1AAF-4514-BD9C-74FCA9803503')
527
2023-02-23T20:34:18.143625+10:00 0 INFO127.0.0.1
Andrew Duncan GET /fmi/odata/v4/OData_SampleData/PERSON('6485FF53-1AAF-4514-BD9C-74FCA9803503')
527
2023-02-23T20:34:49.221394+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON('6485FF53-1AAF-4514-BD9C-74FCA9803503')
527
2023-02-23T20:38:32.24857+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON?$filter=LastName eq 'Dog'
536
2023-02-23T20:40:59.864439+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON/$count
2
2023-02-23T20:42:48.423752+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON?$select=ID,FirstName,LastName
8944
2023-02-23T20:43:53.470715+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON?$orderby=FirstName desc
19270
2023-02-23T20:44:02.163965+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON?$orderby=FirstName asc
19270
2023-02-23T20:45:48.417089+10:00 0 INFO::1 odataUser
GET /fmi/odata/v4/OData_SampleData/PERSON?$filter=month(Birthday) eq 6
537
2023-02-23T20:45:54.66657+10:00 0 INFO127.0.0.1
Andrew Duncan GET /fmi/odata/v4/OData_SampleData/PERSON?$filter=month(Birthday) eq 6
537
2023-02-23T20:45:55.790459+10:00 0 INFO127.0.0.1
Andrew Duncan GET /fmi/odata/v4/OData_SampleData/PERSON?$filter=month(Birthday) eq 6
537
2023-02-23T20:47:48.791080+10:00 0 INFO::1 odataUser
POST /fmi/odata/v4/OData_SampleData/PERSON531
2023-02-23T20:49:24.901077+10:00 0 INFO::1 odataUser
PATCH /fmi/odata/v4/OData_SampleData/PERSON('6485FF53-1AAF-4514-BD9C-74FCA9803503')
533
2023-02-23T20:49:54.294063+10:00 0 INFO127.0.0.1
Andrew Duncan GET /fmi/odata/v4/OData_SampleData/PERSON('12A598D1-96B6-4F5A-9723-CA799CEE08F8')/MyImage/$value
29327
2023-02-23T20:50:19.459505+10:00 0 INFO127.0.0.1
Andrew Duncan GET /fmi/odata/v4/OData_SampleData/PERSON('12A598D1-96B6-4F5A-9723-CA799CEE08F8')/MyImage/$value
29327
2023-02-23T20:51:30.672283+10:00 8309ERROR ::1 odataUser
```

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BENEFITS OF USING ODATA

- uses Basic Authentication (no tokens/token management)
- can replace ODBC and JDBC for most uses (no drivers required)
- supports batches and creation/deletion of tables, fields, indexes
- no layouts are required for interacting with FileMaker Pro data
- perform script uses POST not GET
- requires minimal changes to get up and running

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WHERE WOULD I USE THIS?

- website integration (no knowledge of FileMaker required)
- 3rd party access to your data (e.g. real estate marketing)
- Zapier/Webhooks
- Tableau
- FileMaker Go client

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ENABLING ODATA

- FileMaker Server Admin Console
- `fmsadmin start odata`
- `fmsadmin stop odata`
- `fmsadmin restart odata`
- Admin API (get and patch)

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[Dashboard](#)[Databases](#)[Backups](#)[Configuration](#)[Connectors](#)[Administration](#)[Logs](#)

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

Annual Limit [?](#)

120 GB

Data Transmitted by This Host [?](#)

0 KB

Total Data Transmitted by All Hosts [?](#)

0 KB

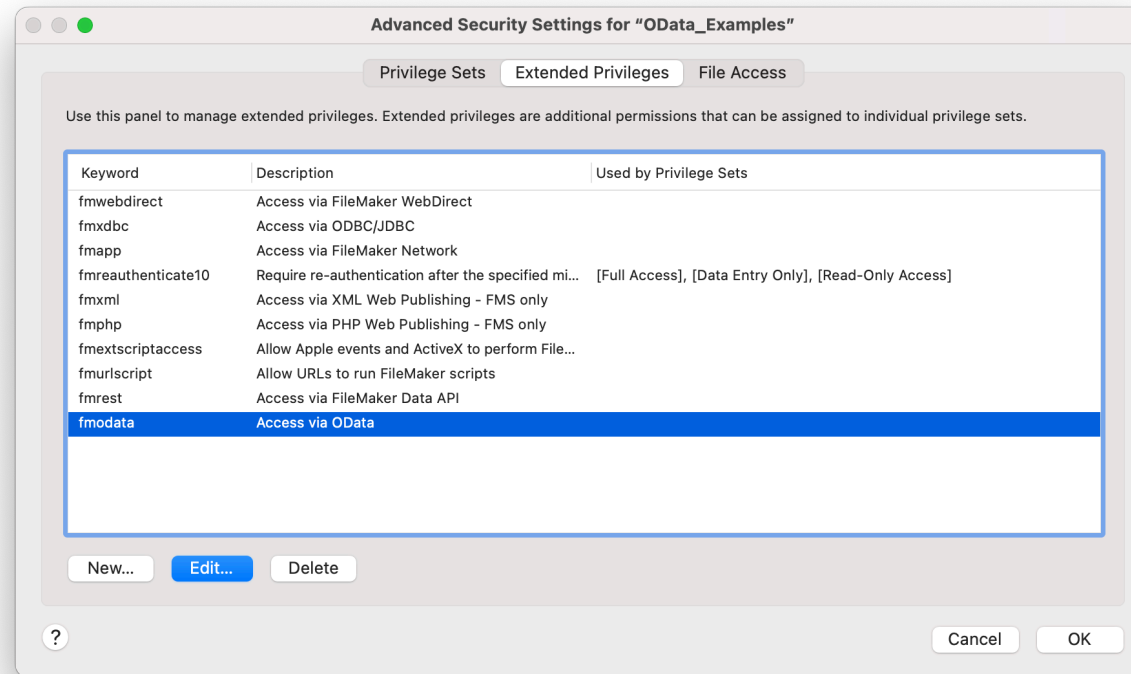
Annual Reset Date

02/01/2024, 11:00

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REQUIREMENTS

► fmodata Extended Privileges



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OData term	FileMaker term
entity	record
entity set	table
entity container	group of fields that is not necessarily a record (such as a database name and URL)
collection of entity containers	list of a group of fields (for example, a list of database names)
property	field
path segment	value between two slash characters (in a URL)
raw value	a binary value that is a string of bytes rather than a human-readable structured JSON or Atom value



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AUTHENTICATION

- FileMaker Server: use a FileMaker file account with a password defined in the hosted database
- FileMaker Cloud: use a Claris ID account/token
- Use a base64-encoded string representing the account name and password used to log in to the hosted database
- Header: Basic database_username:database_password
- " --header " & Quote("Authorization: Basic " & Base64EncodeRFC (3548 ; OData_Username & ":" & OData_Password))

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WARNING!

- OData requires that each table define a primary key.
- OData uses fields that are **not empty** and that require a **unique value** as a primary key. Therefore, if you don't have such fields defined for your tables, the ROWID system field is used as the primary key.
- The ROWID system field contains the same value as the Get (RecordID) function for the record.
- By default, record data returned by a GET request includes all non-container fields defined in the table.
- Container fields are returned as Base64 encoded and are metered (different to Data API)
- URL encode query strings (FirstName eq 'Sarah' becomes `FirstName%20eq%20'Sarah'`)
- review OData unsupported features in Claris OData docs



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QUERY OPTIONS

- \$filter - filter the records: /fmi/odata/v4/ContactMgmt/Contacts?\$filter=Title eq 'Manager' or startswith(Title,'Admin')
- \$orderby - request records in either ascending or descending order: /fmi/odata/v4/ContactMgmt/Contacts?\$orderby=Company desc
- \$count - request a count of matching records: /fmi/odata/v4/ContactMgmt/Contacts?\$count=true
- \$select - request a limited set of fields for each table: /fmi/odata/v4/ContactMgmt/Contacts?\$select=Company,Website
- \$top and \$skip - page through a larger result set. \$top query option specifies the number of records to include in your results, and the \$skip query option specifies the number to omit.: /fmi/odata/v4/ContactMgmt/Contacts?\$top=2

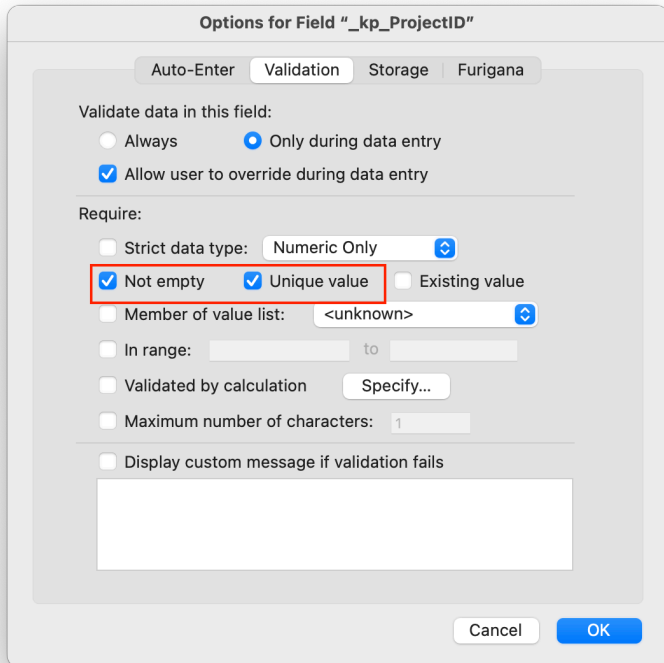
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FILTER CASE SENSITIVE

- /fmi/odata/v4/ContactMgmt/Contacts?
\$filter=FirstName eq 'Sarah'
- /fmi/odata/v4/ContactMgmt/Contacts?
\$filter=toupper(FirstName) eq 'SARAH'

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TIP #1 - PRIMARY KEY UPDATES



Options for Field "_kp_ProjectID"

Auto-Enter Validation Storage Furigana

Validate data in this field:

☐ Always ☒ Only during data entry

☒ Allow user to override during data entry

Require:

☐ Strict data type: Numeric Only

☒ Not empty ☒ Unique value ☐ Existing value

☐ Member of value list: <unknown>

☐ In range: to

☐ Validated by calculation Specify...

☐ Maximum number of characters: 1

☐ Display custom message if validation fails

Cancel OK

```
{  
  "code": "8309",  
  "message": "An expression contains incompatible data types."  
}
```

\$metadata identifies the primary key field

```
"$Key": [  
  "_kp_StaffID"  
],
```

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TIP #2 - UNDERScores

- ▶ Enclose field names that include special characters, such as spaces or underscores, in double-quotation marks when doing a query
- ▶ "https://yourserver.com/fmi/odata/v4/CRM/Projects? \$filter=\"_kf_ProjectManagerID\" eq '' & Interface::zv_ProjectManagerID_gt & '' and Status eq 'Active' &\$top=" & \$top & "&\$skip=" & \$skip

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TIP #3 - DATE FORMATS

- YYYY-MM-DD Date format
- use custom function to convert from/to

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TIP #4 - EDITLINK

```
{  
  "@odata.id": "https://server.databuzz.com.au/fmi/odata/v4/Projects/Staff('F77FF446-CCF2-4059-83AE-5AC57FB0A6EA')",  
  "@odata.editLink": "https://server.databuzz.com.au/fmi/odata/v4/Projects/Staff('F77FF446-CCF2-4059-83AE-5AC57FB0A6EA')",  
  "FirstName": "Alfie",  
  "LastName": "Wilkins"  
}
```

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TIP #5 - REQUEST RECORDS LIMIT

- 10,000 max returned when doing `https://host/fmi/odata/version/database-name/table-name`
- use the \$top and \$skip query options to page through a larger result set
- request number of records in the table: `https://host/fmi/odata/version/database-name/table-name/$count`

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FILEMAKER SERVER VERSION 20.1.1

- SchemaVersion is now included in the **\$metadata** response. The **\$schemaversion** query option can now be used to determine whether the schema has changed, since a request for a non-current schema version will be rejected.
- OData now supports the PUT/POST/PATCH/DELETE \$ref operations and also supports aliases.

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RESOURCES

- Claris OData API and FileMaker OData API Guide
- The Context Podcast (episodes 69 and 83)
- AutoEnter Live 2022
- Beezwax Blog (3 Parts): OData for FileMaker – New Player in an Old Game

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DEMOS



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