THE PEAK OF DATA INTEGRATION
2022 UC

REST API UC Training Course

SAFE SOFTWARE

Presenters

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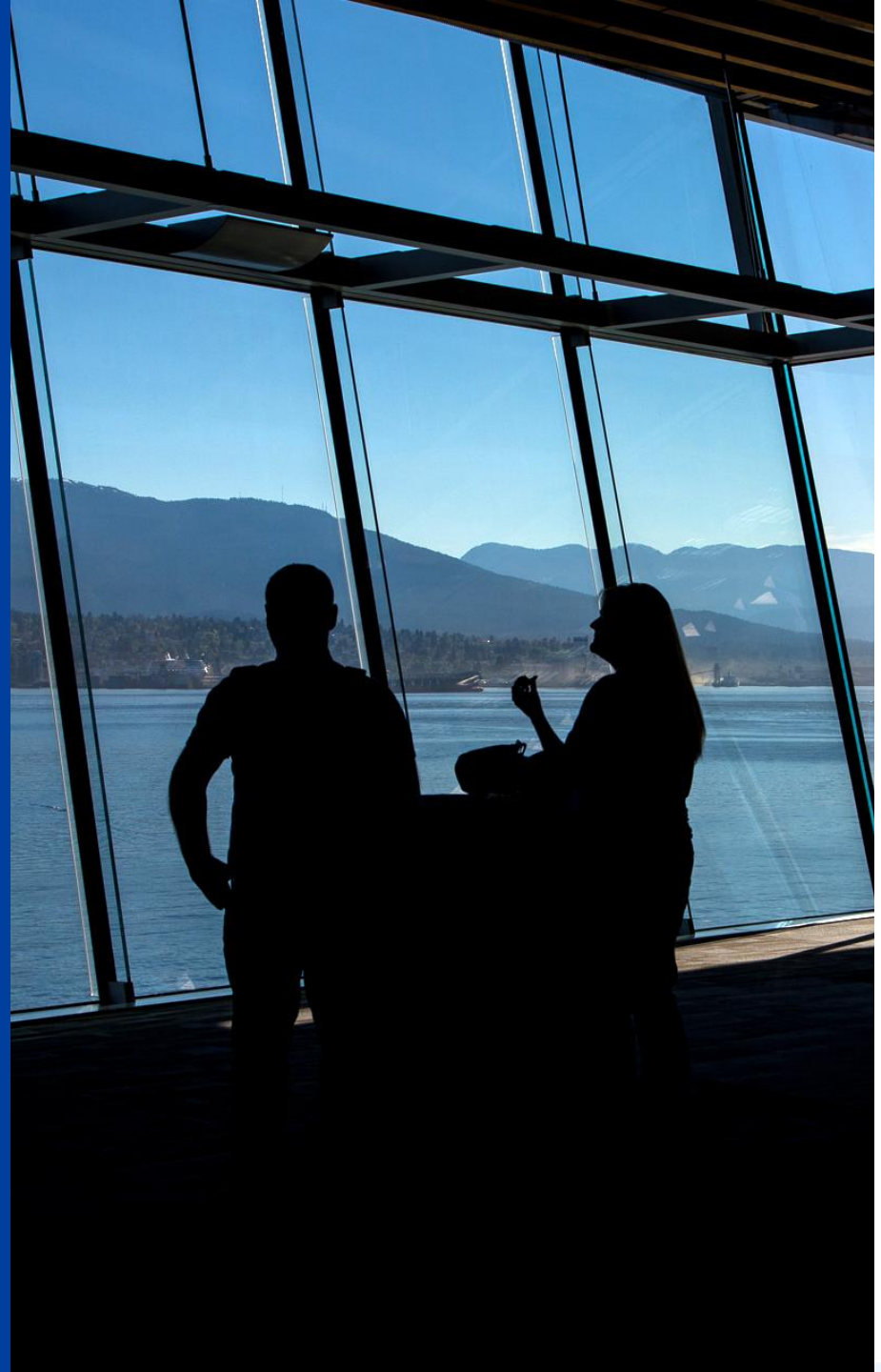


Agenda

- What is a REST API?
  - Benefits of using APIs
  - Reading API documentation
- FME Overview
  - Using APIs in FME
- Activity 1: Making a GET Request with HTTPCaller
- Activity 2: Download Files from a REST API Using FME
- Q&A and Wrap Up

Why use APIs?

Ever needed to download a report from an online service but were tired of manually logging in and fetching the same data over and over again?

Users often want to access APIs so that they can:

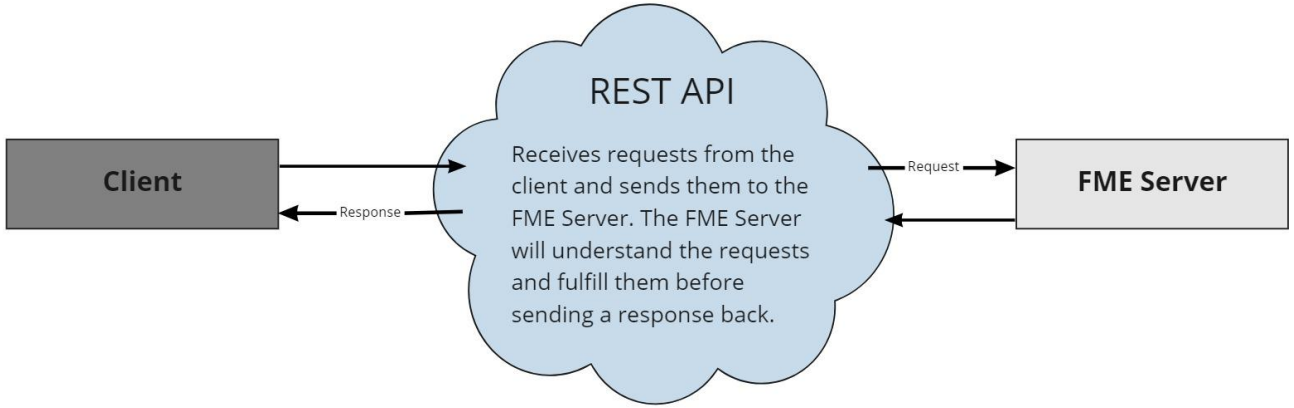
- Automate manual processes
- Fetch the most up to date data
- Send data to the web
- Integrate applications

Components of a API Request

Requests are made through URLs.

Request:
HTTP METHOD: GET, POST, PUT, or DELETE
URL: http://<domain>/endpoint
Request Header:
Request Body:

Responses are formatted in JSON or XML for SOAP APIs



REST Terminology

- **REST-** a common type of API, has a uniform structure, uses a URL to call a resource
- **HTTP Method**- determines the action you are using.
- **Request Headers-** gives context to the call. What data type is being sent?
- **Request Body-** specifies the information to be modified, created, or deleted

API documentation.

Everything you need to know to build a request.

Method

Parameters

URL

Headers

Body

POST /security/accounts

Implementation Notes

Creates an account on the FME Server instance.

Parameters

Parameter	Value	Description	Parameter Type	Data Type
email		Email of the account user.	form	string
enabled	true (default)	Specifies whether the account is enabled or not.	form	boolean
fullName		Full name of the account.	form	string
name	(required)	**Unique name of the account to create.**	**form**	**string**
password		Password for the account.	form	string
passwordChangeNeeded	false (default)	Specifies whether a password is required to be changed on the next login.	form	boolean
roles	Add row	Roles to assign to the account.	form	array
sharingEnabled	true (default)	Specifies whether the account is allowed to share items with other users and roles.	form	boolean

Response Status Codes

HTTP Status Code	Reason
409	The specified FME Server account already exists.
422	Some or all of the input parameters are invalid.
201	Success. The account was created. A URI is rendered in the response.

Try it out!

Request URL

```
http://ap-fmeserv220/fmerest/v3/security/accounts
```

Request Headers

```
Content-Type: application/x-www-form-urlencoded
Accept: application/json
```

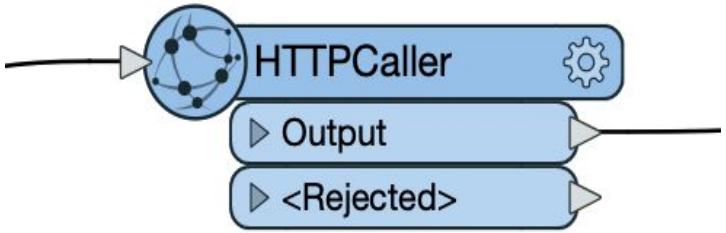
Request Body

```
enabled=true&passwordChangeNeeded=false&sharingEnabled=true
```

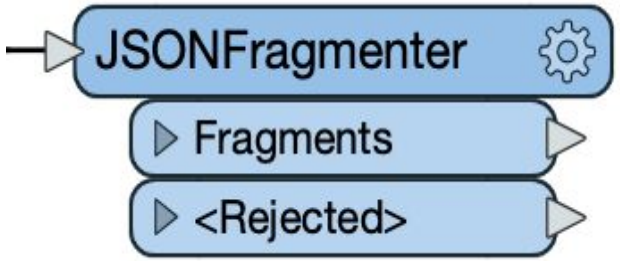
Powerful API Transformers

Typically most workflows in FME begin with a Reader that initiates the workflow.

However, since most APIs use the HTTPCaller as the Reader. The Creator is used to kick off the workflow.



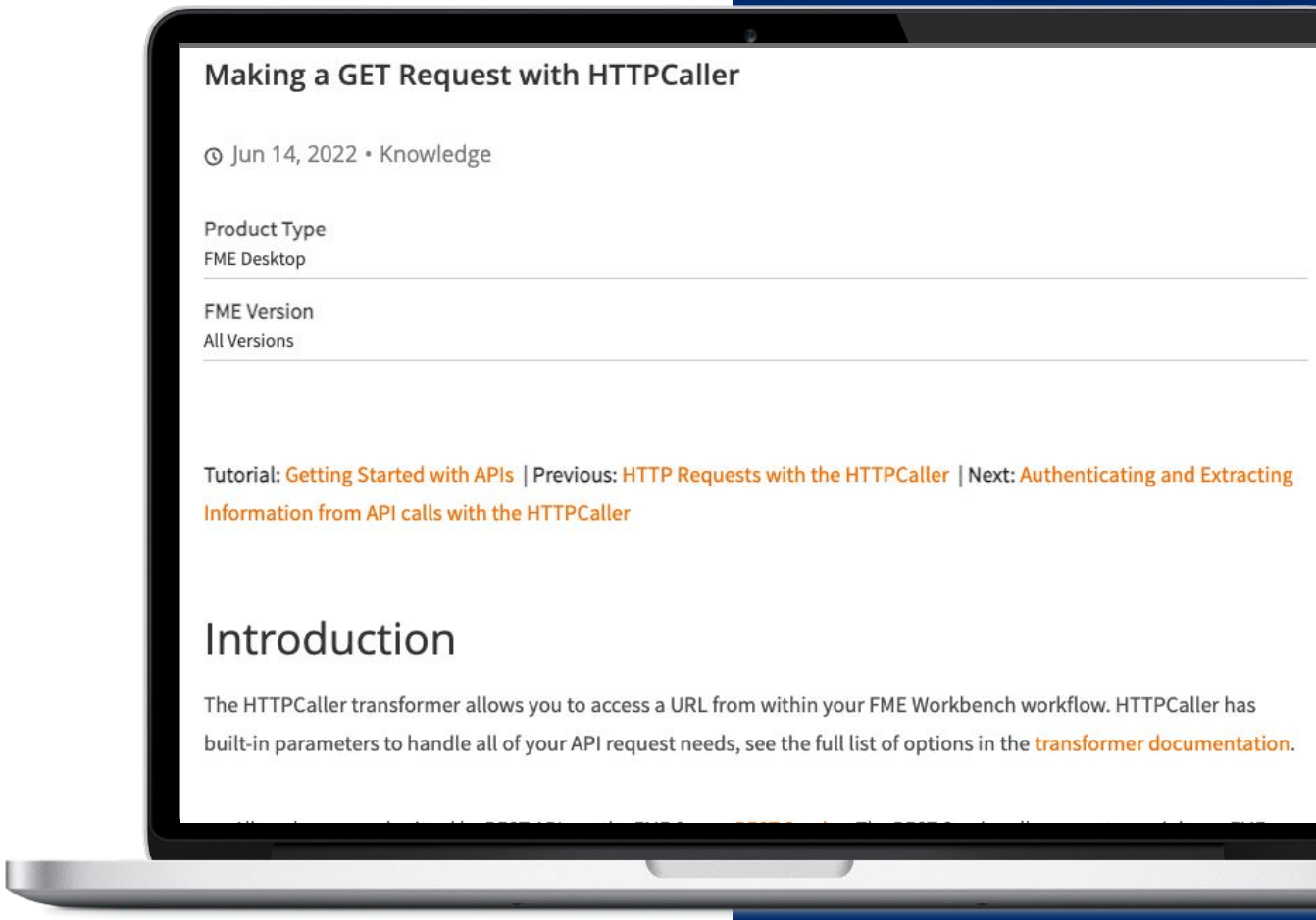
The HTTPCaller is where the call to the REST API is handled.



Most REST APIs return JSON. JSON can be parsed in the JSON fragmenter.

Exercise 1
Making a GET Request with the HTTPCaller

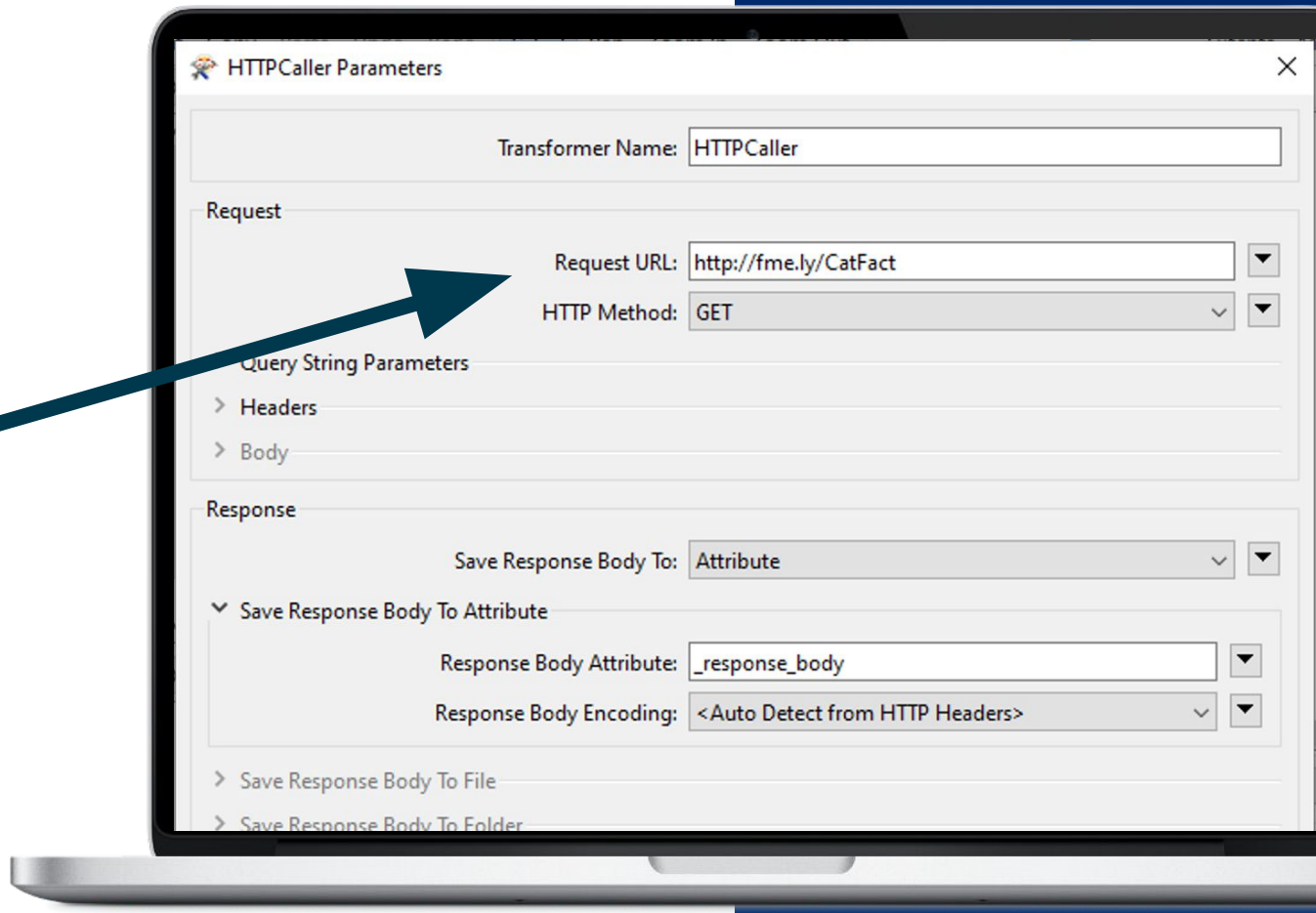
Please note: Step 12 (the email step) is optional and does require a Gmail account.



https://community.safe.com/s/article/Making-a-GET-Request-with-HTTPCaller

In Step 5.

Use http://fme.ly/CatFact as the Request URL in the HTTPCaller



https://community.safe.com/s/article/how-to-access-an-api-using-the-httpcaller

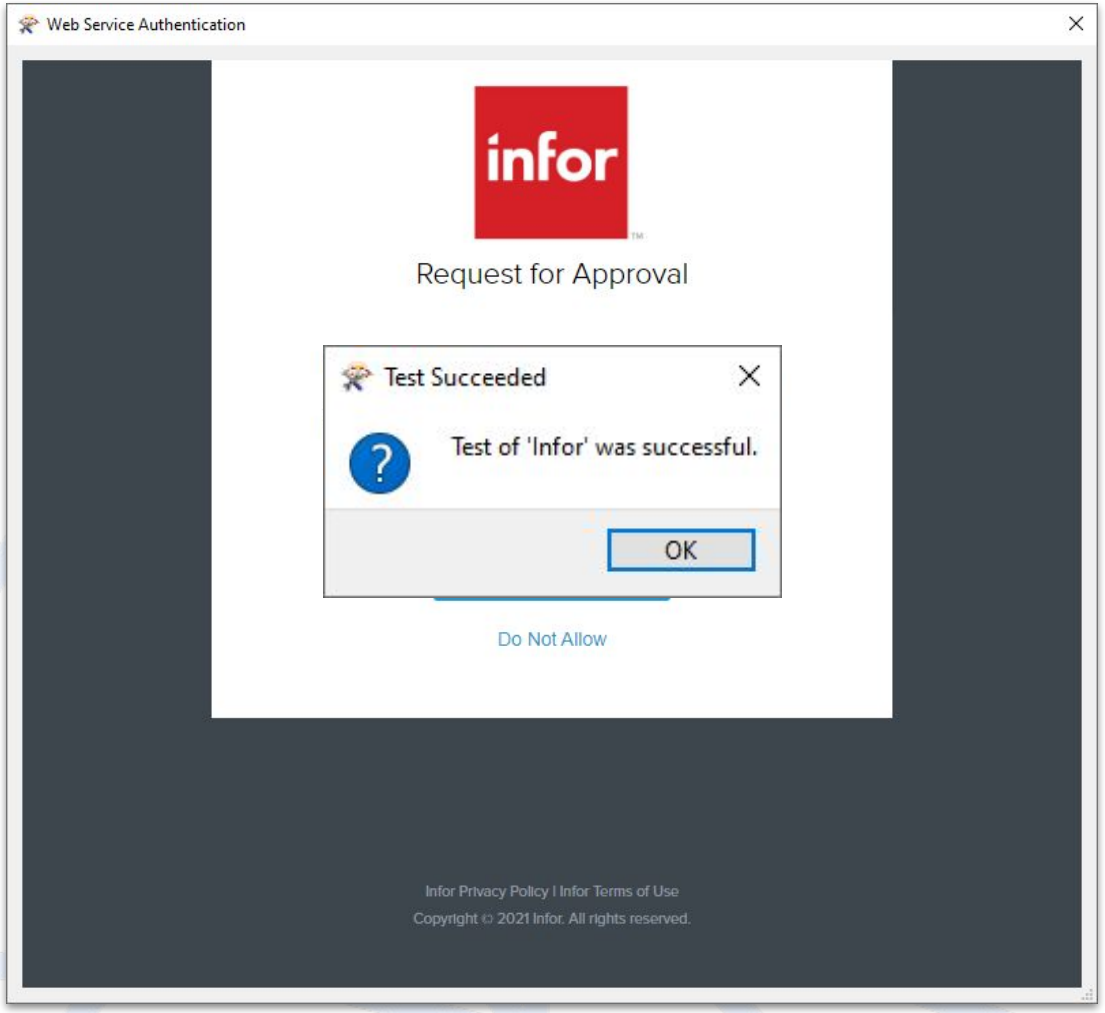
Authentication Types

OAuth 2.0: An open-standard protocol where an application can authenticate a user and access their information through a third-party application without the user's credentials.

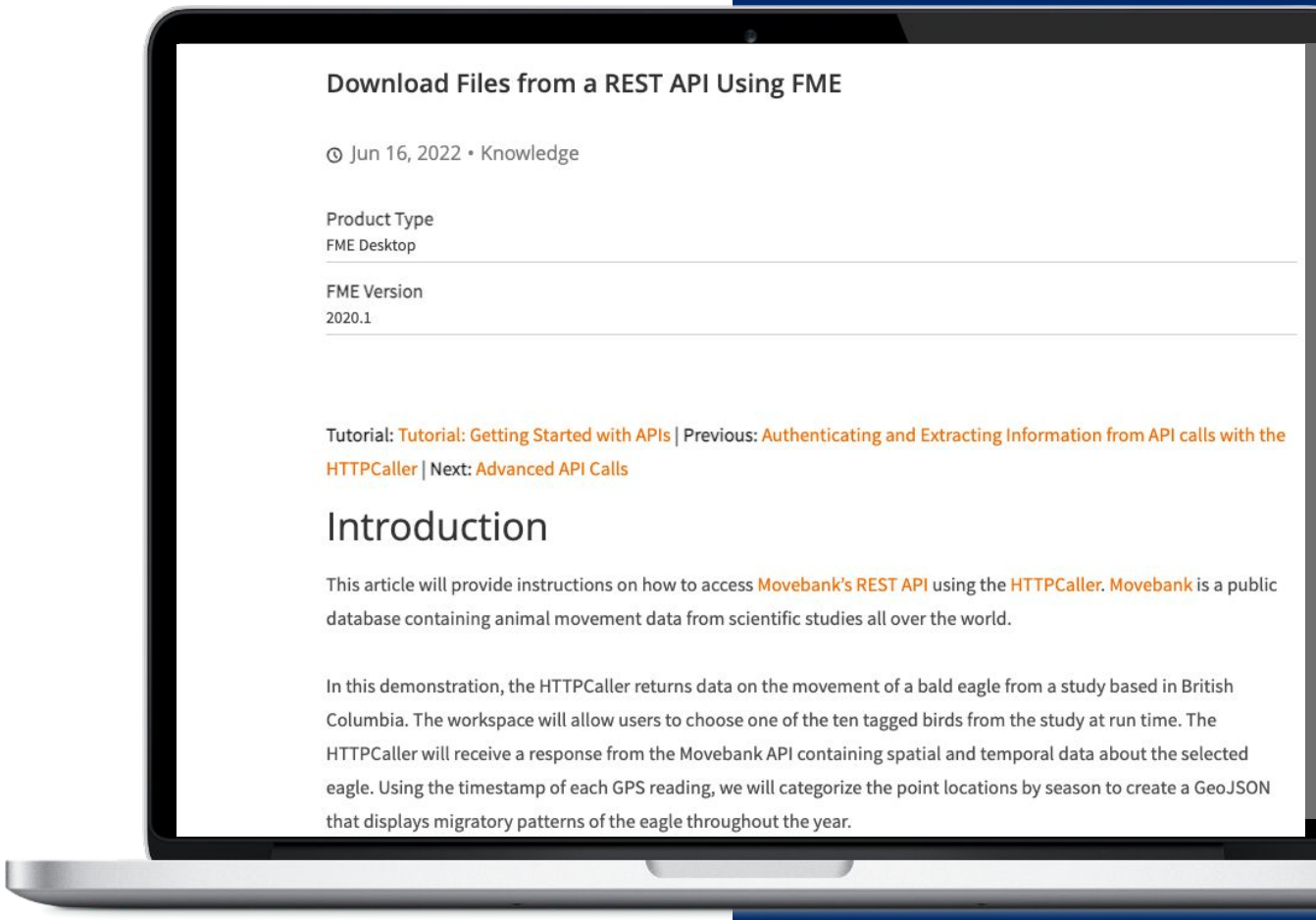
Token: An alpha-numeric string used to authenticate and identify an application to an API as opposed to defining a user.

HTTP Authentication Services:

- **Basic**: Username/password (Base64)
- **Digest**: Username/password (MD5)
- **NTLM**: Windows NT LAN Manager (SSO)
- Dynamic: session tokens



Exercise 2
Download Files from a REST API Using FME



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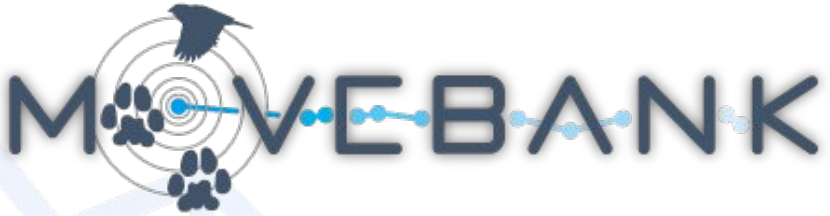
Access Movebank API

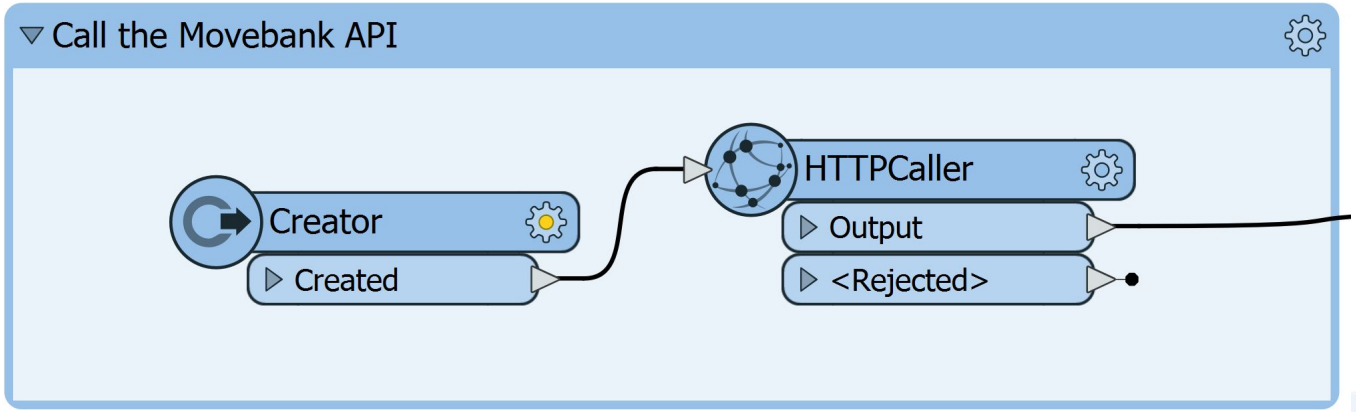
Movebank is a free, online database of animal tracking data hosted by the Max Planck Institute of Animal Behavior. They help animal tracking researchers to manage, share, protect, analyze and archive their data.

1. Create a Movebank account to gain permissions for animal tracking data
2. View the metadata for the bald eagle study
3. View Movebank's API Documentation



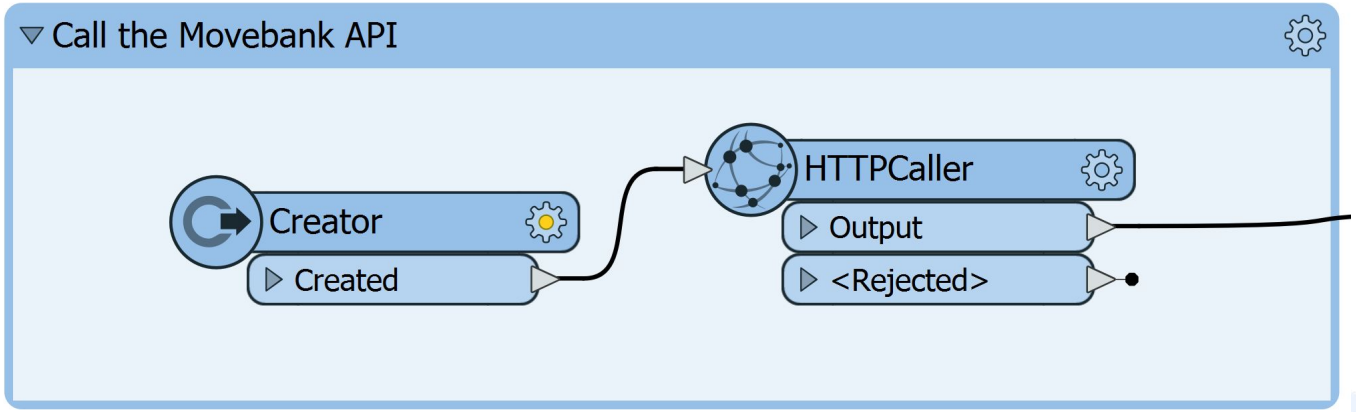
Set up the first call to Movebank

1. Add a Creator as a trigger for your workspace
2. Add an HTTPCaller to set up the first call to Movebank
3. Run the workspace to ensure that the CSV file is saved in the correct directory



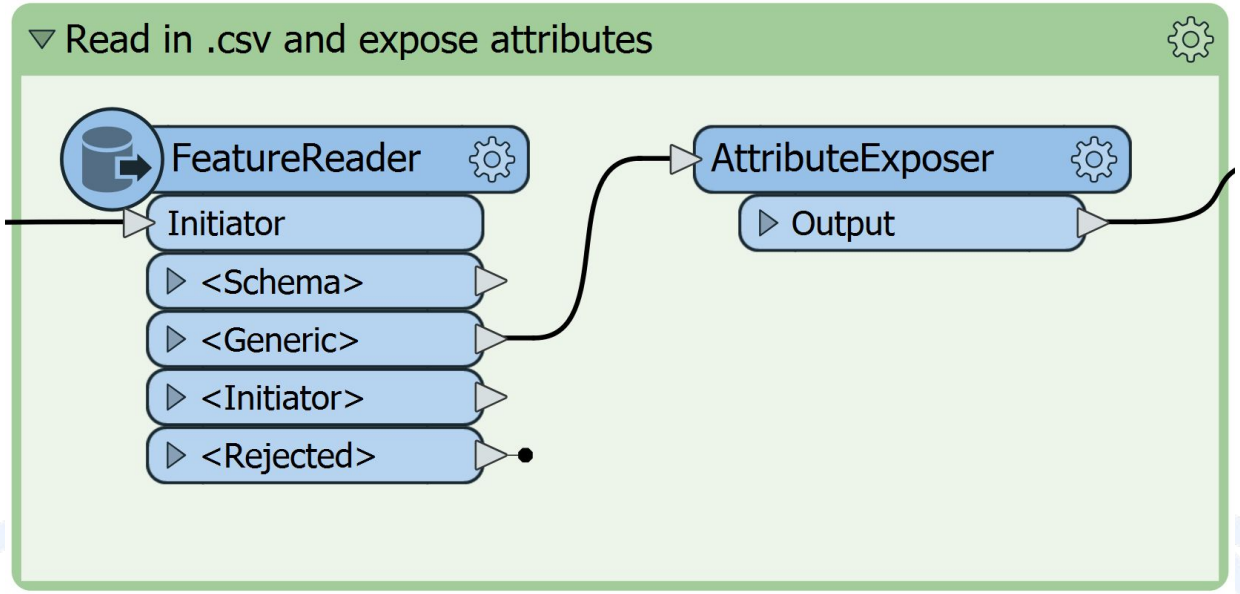
Set up the next call to the Movebank API

1. Create a User Parameter to select an individual eagle at run time
2. Go back into the HTTPCaller to make another call to the Movebank API
3. Run the workspace to make sure the HTTPCaller is working



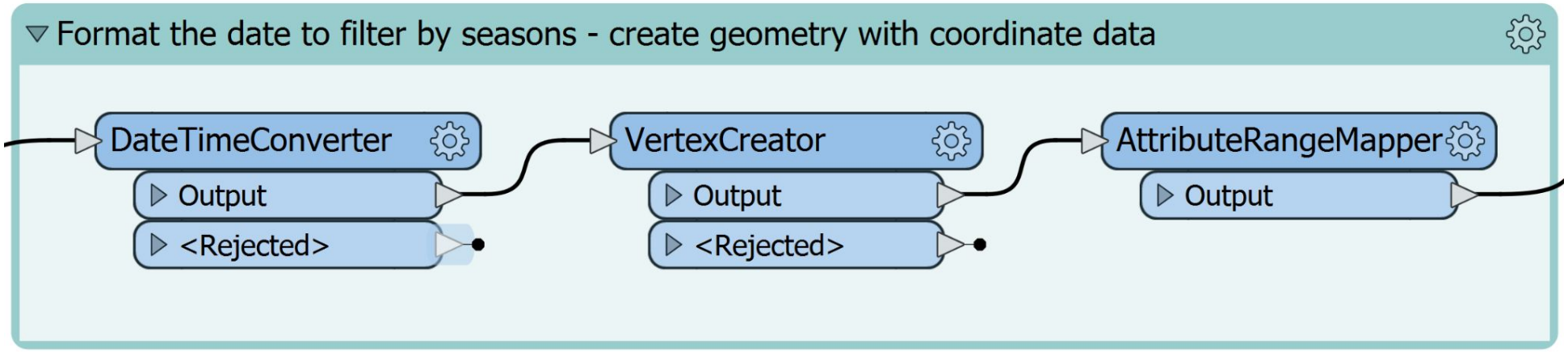
Read in .csv and expose attributes

1. Add a FeatureReader to read in your CSV file
2. Add an AttributeExposer to reveal hidden attributes



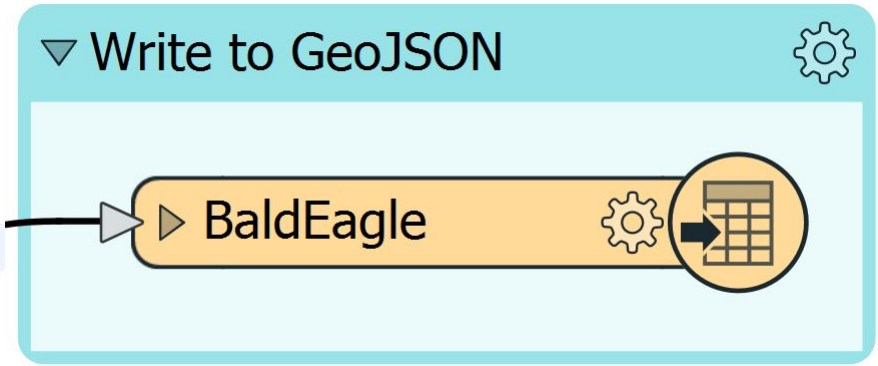
Format to filter and create geometry

1. Add a DateTimeConverter to reformat the timestamp attribute
2. Add a VertexCreator to create point geometry
3. Add an AttributeRangeMapper to categorize dates into seasons



View the migratory patterns of your select bald eagle

1. Add a GeoJSON writer for your output
2. Run the workspace and ensure that the GeoJSON file is saved in the correct directory
3. View the migratory patterns of your select bald eagle



What did we learn today?

- Authentication methods
- How to make a request to an API using the HTTPCaller
- How to download content from an API
- How to wrangle your JSON body

Resources

- Tutorial: Getting Started with APIs
- Webinar: How to Build Complex Calls to APIs
- Webinar: How to Connect to Any REST API

Q&A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Thank You!
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