

# **REST API UC Training Course**



## 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

#### **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) V	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) V	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) V	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.* 

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Tutorial: Getting Started with APIs | Previous: HTTP Requests with the HTTPCaller | Next: Authenticating and Extracting Information from API calls with the HTTPCaller

### Introduction

The HTTPCaller transformer allows you to access a URL from within your FME Workbench workflow. HTTPCaller has built-in parameters to handle all of your API request needs, see the full list of options in the transformer documentation.

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

	Transformer Name:	HTTPCaller
Request		
	Request URL:	http://fme.ly/CatFact
	HTTP Method:	GET
Query String P	arameters	
> Headers		
> Body		
Response		
	Save Response Body To:	Attribute
✓ Save Response	Body To Attribute	
	Response Body Attribute:	_response_body
	Response Body Encoding:	<auto detect="" from="" headers="" http=""></auto>

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



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# **Exercise 2** Download Files from a REST API Using FME

### Download Files from a REST API Using FME

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Product Type FME Desktop

FME Version 2020.1

Tutorial: Tutorial: Getting Started with APIs | Previous: Authenticating and Extracting Information from API calls with the HTTPCaller | Next: Advanced API Calls

### Introduction

This article will provide instructions on how to access Movebank's REST API using the HTTPCaller. Movebank is a public database containing animal movement data from scientific studies all over the world.

In this demonstration, the HTTPCaller returns data on the movement of a bald eagle from a study based in British Columbia. The workspace will allow users to choose one of the ten tagged birds from the study at run time. The HTTPCaller will receive a response from the Movebank API containing spatial and temporal data about the selected eagle. Using the timestamp of each GPS reading, we will categorize the point locations by season to create a GeoJSON that displays migratory patterns of the eagle throughout the year.

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

## 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**  $\bullet$
- Webinar: How to Build Complex Calls to APIs  $\bullet$
- Webinar: How to Connect to Any REST API







Q&A



# **Thank You!**

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