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Power Automate Custom Connectors 101

The Basics

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Blackbaud

 bbdevdays



Agenda

1. Review Connectors
2. Review Structure of APIs
3. Creating a Connector from Scratch
4. Tools for working with APIs / Creating Connectors
5. Concept Introduction: API Keys and OAuth



Glen Hutson

Principal Solutions Architect

Joined Blackbaud in 2007

Been working with SKY API / SKY Add-ins since 2019

Safe Harbor Statement

This presentation may contain forward-looking statements that involve inherent risks, uncertainties and assumptions. It outlines Blackbaud's current plans and general product direction as of the date this presentation was created. Functionality described in this presentation that is not currently available is subject to change at any time, without notice, at Blackbaud's sole discretion. It does not represent a commitment to develop or release specific features within the timeframe discussed, according to the presented design, or at all. Please make any purchase decisions based on features and functionality that are currently available.

Anything that is forward-looking will be noted during the conversation.

Third Party References / Links

There are several references to third party examples and tools. These are for illustrative purposes only. Blackbaud is not responsible for, nor can assist, in troubleshooting or assisting in use of these services and tools.

Some examples are shown purely for the functions / features they represent.

Session Description

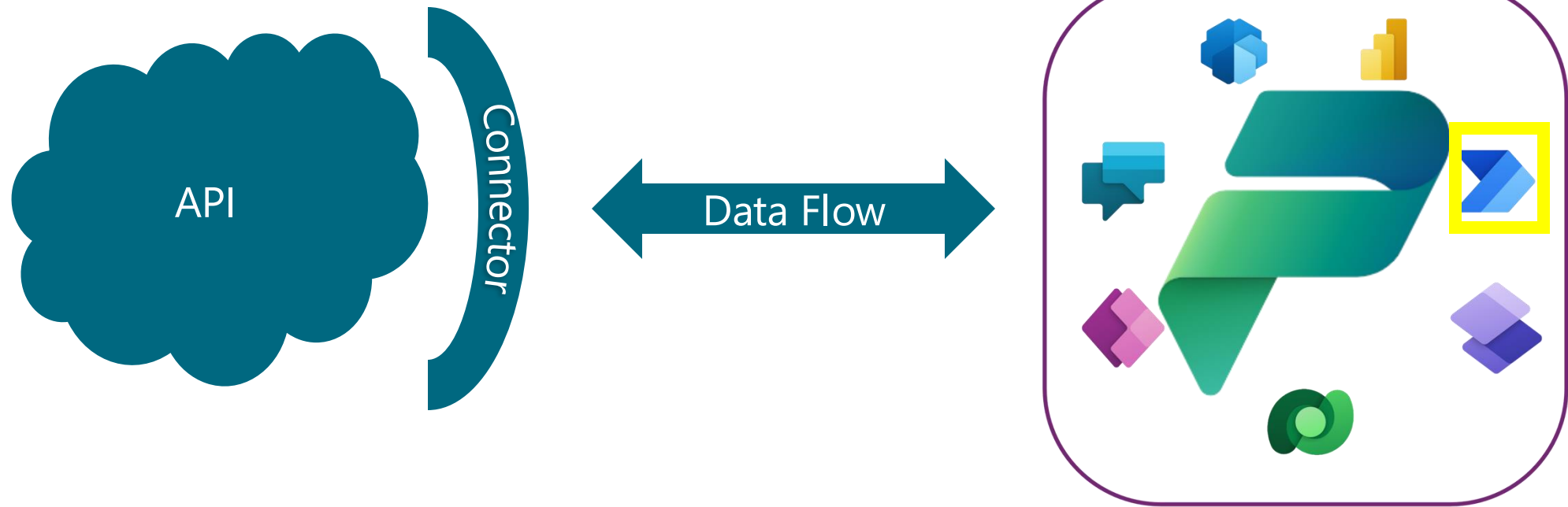
You may already know how to use official connectors in your Power Automate flows. But have you ever wondered if there's another system that you wish had a Power Automate connector? What if you could make your own? This session will introduce you to the essentials of custom connectors, help you identify good candidates, guide you on how to begin, and share some useful tips and tricks.

Focus for this session.

- This session is truly geared as a “101” / Getting Started discussion focusing on beginning concepts and methodology.
- For in-depth SKY API questions, a good resource is our SKY API community at <https://community.blackbaud.com/forums/viewcategory/425> .
- For in-depth Power Platform questions, there is a dedicated community at <https://community.blackbaud.com/forums/viewcategory/586> as well as User Groups and Regional Workshops (<https://community.blackbaud.com/events/category/66>).
- There is a “Ask a Low-code Developer” session on Thursday at 10:30AM ET.

Review – What is a Connector?

A *connector* wraps around an existing API to hide the nitty-gritty and facilitate data flow in and out of the Power Platform. For this discussion, specifically Power Automate.

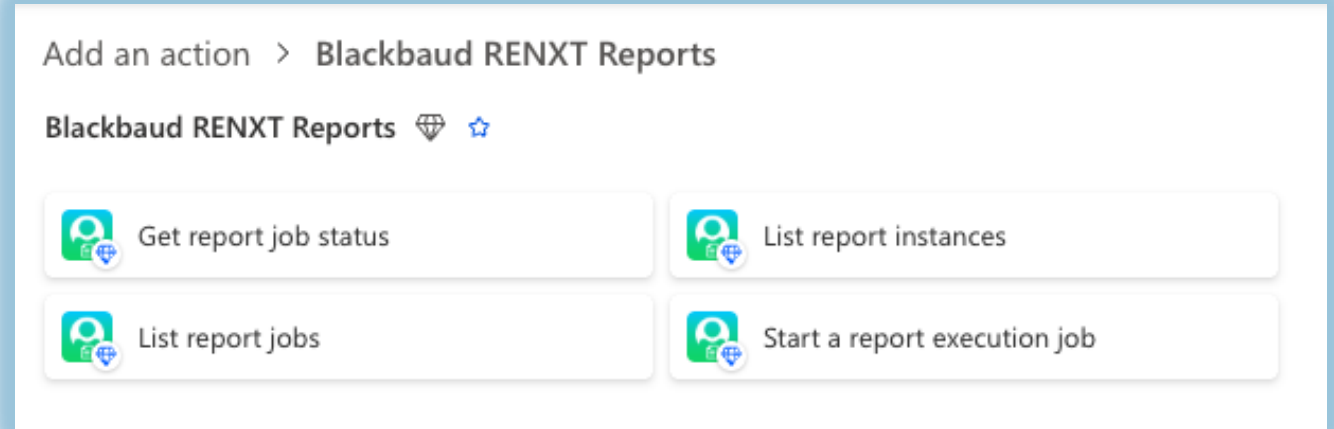


Actions

Actions are the individual tasks that a connector provides. Typically, these are based on specifics of the underlying API (ex: 'endpoints').



Blackbaud RENXT Reports



Lots and Lots of Connectors

There are currently over 1,650 Connectors.

Blackbaud ranks only behind Microsoft as the organization with the most connectors published.

Can't find what you need?

Even though the number of connectors has grown significantly over the past few years, you may not find a connector you're looking for.

You're not of luck.



This session

In this session we'll go over the basic concepts of custom connectors and how you could use those to help augment your Power Platform flows.



Behind the Scenes: REST API

This is still REST API behind the scenes. In order to understand how to create a Custom Connector, you have to know a little bit about APIs.

JSON

This session assumes that you've been working with Power Automate a bit already and have been introduced to JSON (and may have seen versions of this example). This uses *key: value* pairing to describe data. We'll see this in several places when working with connectors.

Single JSON Object

```
{  
  "make": "DeLorean",  
  "model": "DMC-12",  
  "year": 1981  
}
```

Multiple JSON Objects ("Array")

```
[  
  {  
    "make": "DeLorean",  
    "model": "DMC-12",  
    "year": 1981  
  },  
  {  
    "make": "Cadillac",  
    "model": "Miller-Meteor Sentinel",  
    "year": 1959  
  }  
]
```

Pieces of the Request

There are various ways to break down the structure of an API request. We'll do high level for the purposes of this conversation.

- Method: The type of request
- Host: The server that has the API
- Path: The part of the URL pointing to the specific API endpoint
- Parameter: Zeros in what you're looking for or the filters in a search.
- Body: Typically for POST/PATCH requests, what data is being sent over.
 - Uses JSON.

Method

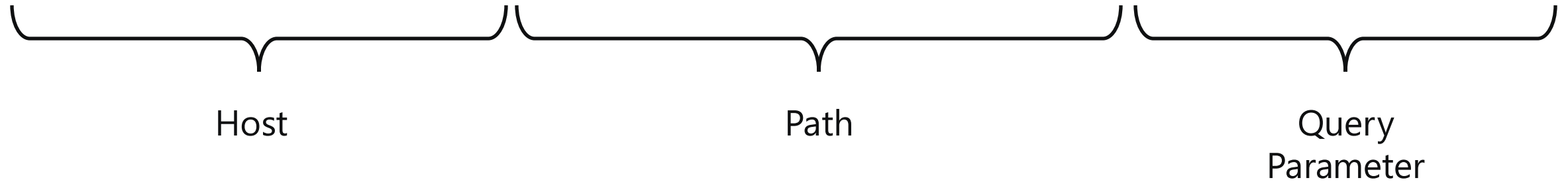
The *Method* is what are you doing. It basically breaks down to are you getting, sending, or deleting data. The common ones you'll see (there are others) are:

- GET: Retrieve Data
- POST: Send data, often creating new records on the other side
 - Sometimes, a POST may be used to retrieve data if there could be a lot of info in that retrieval request. Blackbaud Grantmaking uses this often.
- PATCH: Updating information already on the other side
- DELETE: Poof!

GET Request: Query Parameter

Typical Search / Filter requests often use what's called a Query Parameter:

`https://api.sky.blackbaud.com/constituent/v1/constituents/search?search_text=Hernandez`

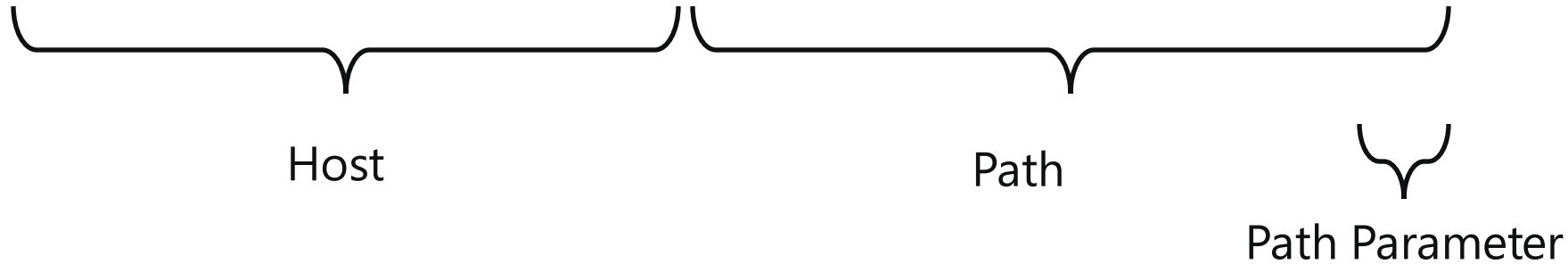


This example is searching for any "Hernandez" constituent.

GET Request: Path Parameter

The “what I’m looking for” may actually be part of the path, called a Path Parameter

`https://api.sky.blackbaud.com/constituent/v1/constituents/280`

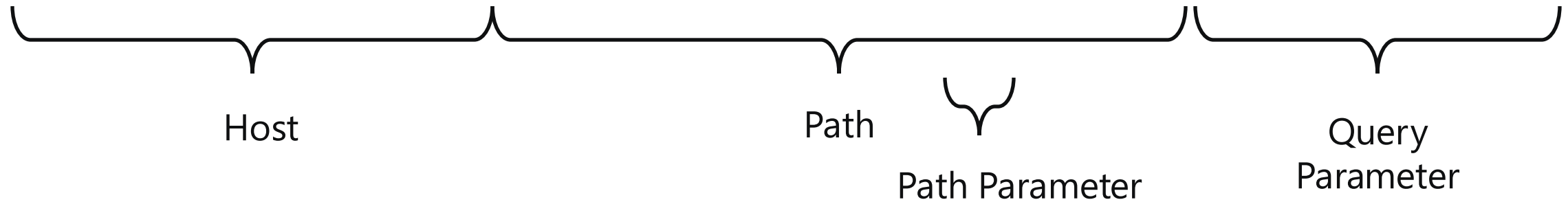


This example is pulling a specific constituent with System Record ID 280, Robert Hernandez.

GET Request: Query & Path Parameter

Some requests can have both:

`https://api.sky.blackbaud.com/constituent/v1/constituents/280/addresses?include_inactive=false`



This example is asking for all the addresses for System Record ID 280, but do not include inactive ones.

Authentication

There are a few authentication options with APIs and Connectors.

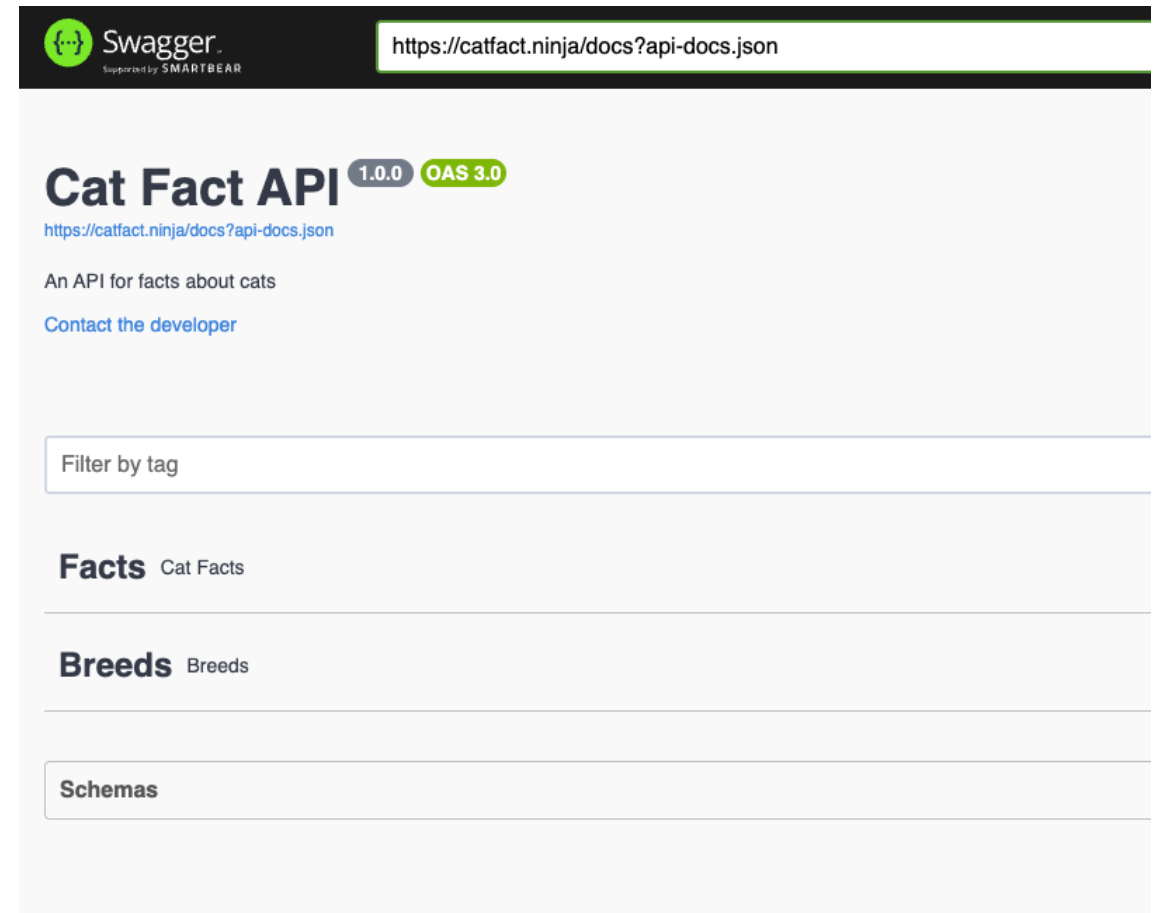
- None
- Basic: Often in the form of a Username / Password
- API Key: Part of the Query Parameter or the Header
- OAuth: Most Secure / More Pieces. Basis of Blackbaud ID (BBID).

Our Examples Today

- Our examples today go through a methodical approach of introduction to the basics of custom connectors and understanding their components.
- If you've already worked with custom connectors, you may see me "skipping shortcuts". That's on purpose as sometimes the shortcuts may not make sense unless you have a feel for the underlying pieces.

Simple Example

- <https://catfact.ninja> (yes, that's a real address, and sorry, there's not a direct dog version) is a good example of getting started with REST APIs .



API Keys

- Many APIs require at the minimum an API Key to process requests
- May be used for rate-limiting (especially for free tiers)
- May be used for tracking non-free subscriptions.
- The specific API Service Documentation will tell you how to send it
 - Query Parameter *`https://api.something.fake/v1/search=Hernandez&api_key=rt24asr2`*
 - Header
 - X-API-Key
 - Note the above are *examples* on how it may need to be sent, the API documentation will give exact details.
- Each time a new author uses the connector, will be prompted for a key.

Example API Security Setup - Query

Connector Name

SomeConnector

1. General

2. Security

3. Definition

4. AI Plugin (preview)

5. Code

6. Test

Swagger editor

Create connector

Cancel

Security

Choose the authentication type and fill in the required fields to set the security for your custom connector.
[Learn more](#)

Authentication type

Choose what authentication is implemented by your API *

API Key

API Key

Users will be required to provide the API Key when creating a connection

Parameter label *

APIKey

Parameter name *

api_key

Parameter location *

Query

General

Definition

Example API Security Setup - Header

Connector Name

SomeConnector

1. General

>

2. Security

>

3. Definition

>

4. AI Plugin (preview)

>

5. Code

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Swagger editor

✓

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✕

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X-API-Key

Parameter location *

Header

←

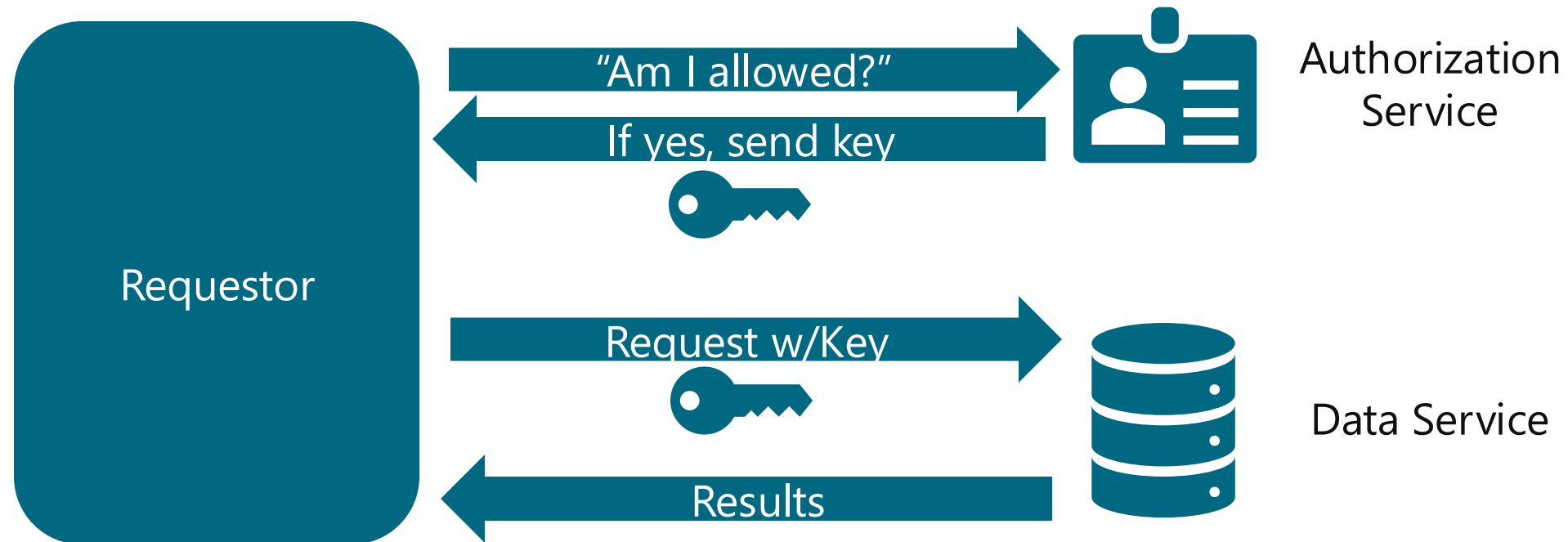
General

Definition

→

OAuth - Concept

OAuth = "Open Authorization" and is a multi-step process for granting authorization to resources. It basically splits the authorization and data request into multiple pieces. Current version is OAuth 2.0 , though referred to as simply "OAuth" for short.



This is a conceptual diagram for high-level illustration purposes only.

Prevalence

OAuth is used by a variety of services:

- Google
- Facebook
- Microsoft
- Apple
- Blackbaud
- Many, many other companies.

Those services can in turn be used for “Single Sign On” scenarios.

Use in Connectors

- OAuth can be used in Power Automate Connectors.
- Approach can vary a bit (so not covered directly in this 101 session), but can include concepts such as "App", "Client ID", "Client Secret", "Token", and more.

1. General > **2. Security** > 3. Definition > 4. AI Plugin (preview) > 5. Code > 6. Test

☐ Swagger editor ☒ Update connector [Close](#)

Security

Choose the authentication type and fill in the required fields to set the security for your custom connector.
[Learn more](#)

Authentication type

Choose what authentication is implemented by your API *

OAuth 2.0

OAuth 2.0

Identity Provider

Generic OAuth 2

Client ID *

Client secret *

Authorization URL *

Token URL *

Refresh URL *

Scope

Sharing your Custom Connector

- Sharing a Custom Connector is similar to sharing a Power Automate Flow.
- You can download the .swagger.json file from the Custom connectors screen.
- *MAKE SURE YOU DELETE ANY SENSITIVE INFORMATION YOU MAY HAVE IN YOUR CONNECTOR SUCH AS API KEYS OR APP INFORMATION.*
- Others can then upload it via the *Import an OpenAPI file* option.

Independent Publisher



- You may see some connectors in Power Platform labeled as *Independent Publisher*.
- These are certified connectors submitted by those not directly affiliated with the API / Service they're connecting.
- See <https://learn.microsoft.com/en-us/connectors/custom-connectors/certification-submission-ip> for official details.
- Check out our SKY Developer YouTube Channel at <https://www.youtube.com/blackbaudskydeveloper> and search for "Independent Publisher".
 - This is a previous #bbdevdays presentation I gave on my personal experience becoming an Independent Publisher.