Free your design data

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More Questions? Visit the Forge booth

Class summary

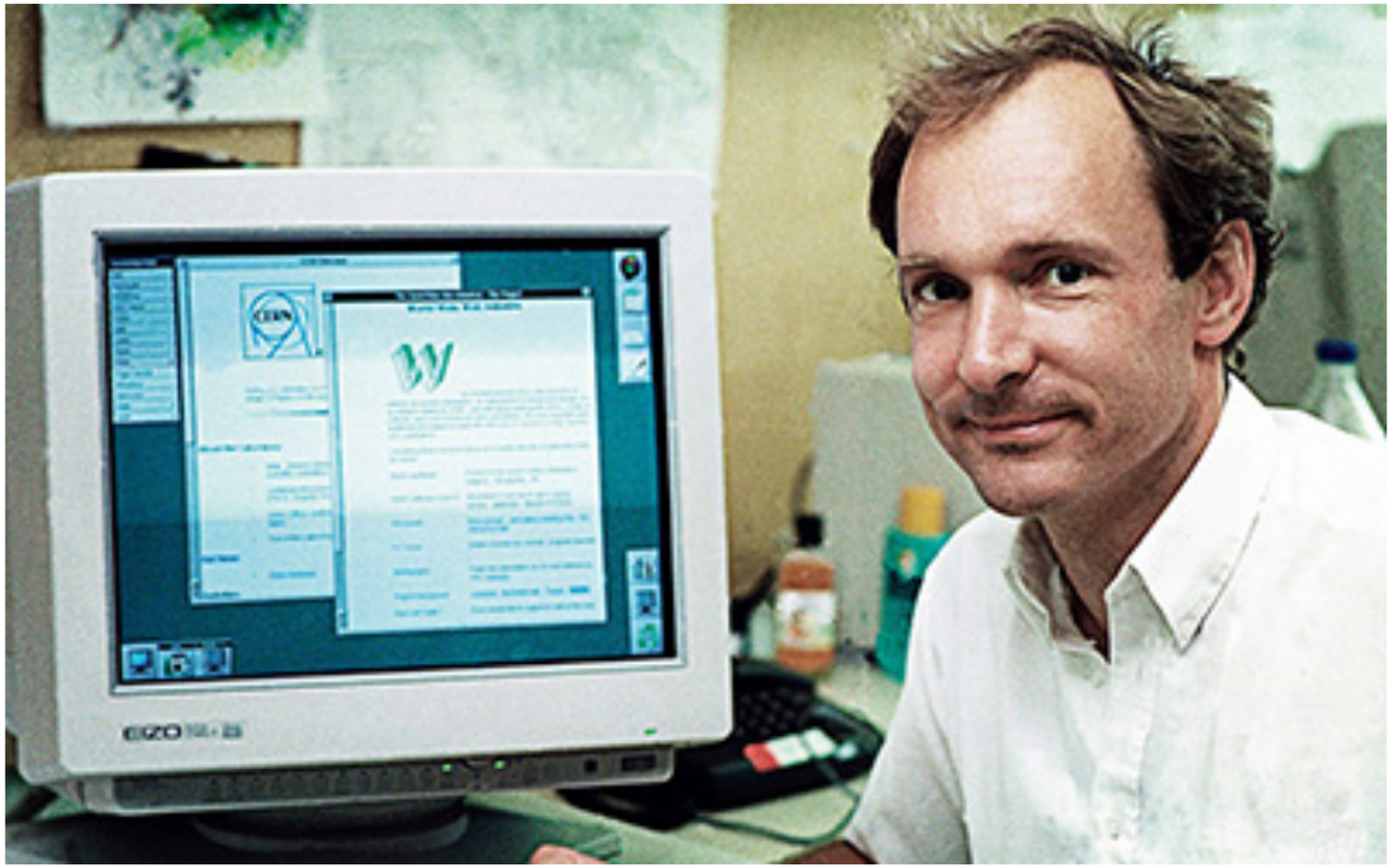
Is this the end of the proprietary file format? The Forge Model Derivative API allows you to easily translate your design files to different formats and also extract data from those files for you to use almost anywhere. In this class we will introduce these APIs by walking you through a series of sample code demonstrations.

Key learning objectives

At the end of this class, you will be able to:

- Know what services are available as part of Forge
- Know how to access files on OSS and A360
- Know how Data Management and Model Derivative services can work together
- Know how to get information from A360 files through the Model Derivative service

The World Wide Web



Sir Tim Berners-Lee

“In those days [1980’s], there was different information on different computers, but you had to log on to different computers to get at it. Also, sometimes you had to learn a different program on each computer. Often it was just easier to go and ask people when they were having coffee…”
Sir Tim Berners-Lee

“In those days [2000’s], there was different design data on different computers, but you had to use different computers to get at it. Also, sometimes you had to use a different application on each computer. Often it was just easier to go and ask people when they were having coffee…”
Adam Nagy

Design data

Evolution of design access

You need to install the design software

You need to install “the” viewer

Just use Viewer from a web browser

Forge API’s

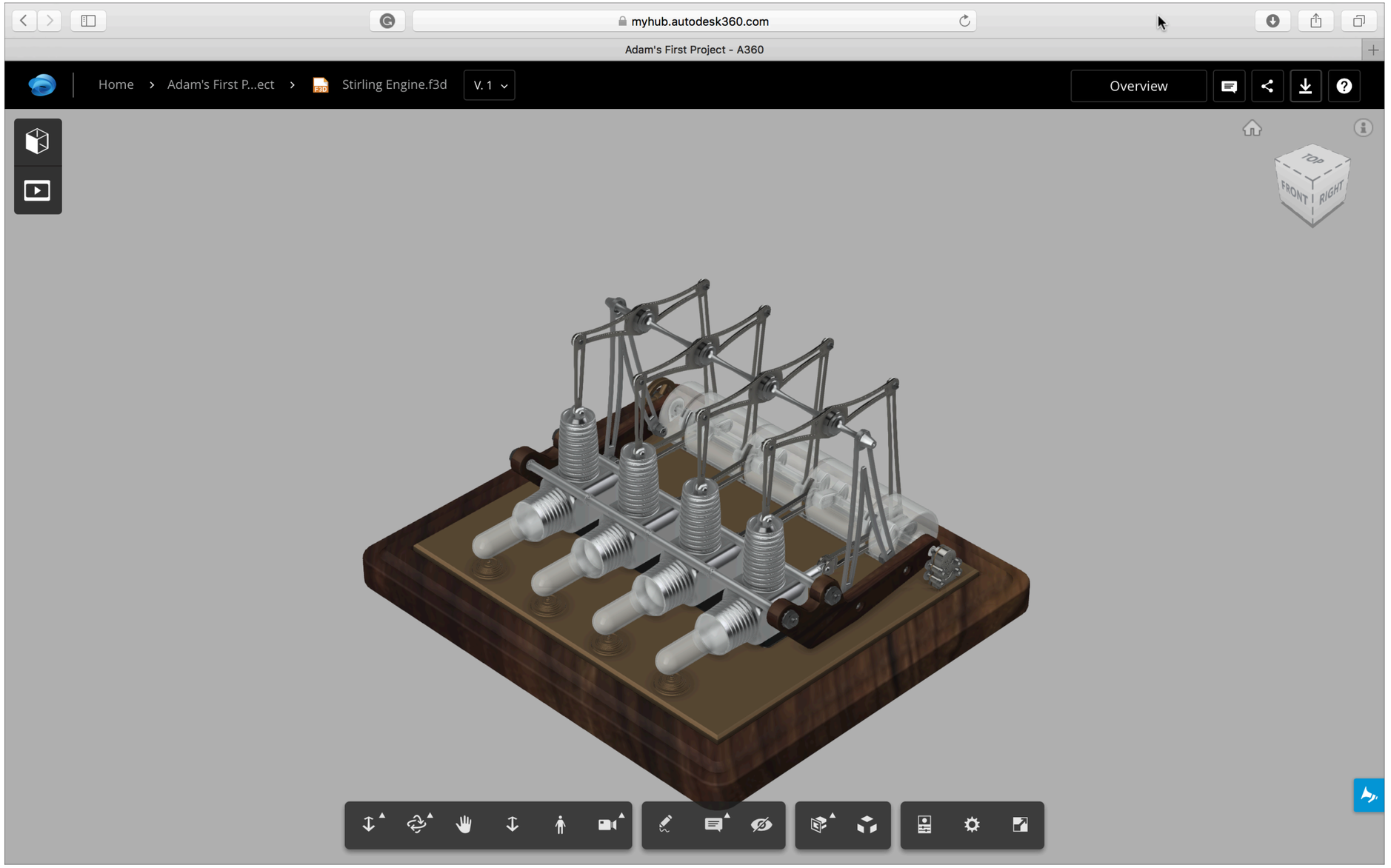
Forge API's

- Authentication
- Data Management API
- Model Derivative API
- Design Automation API
- Viewer

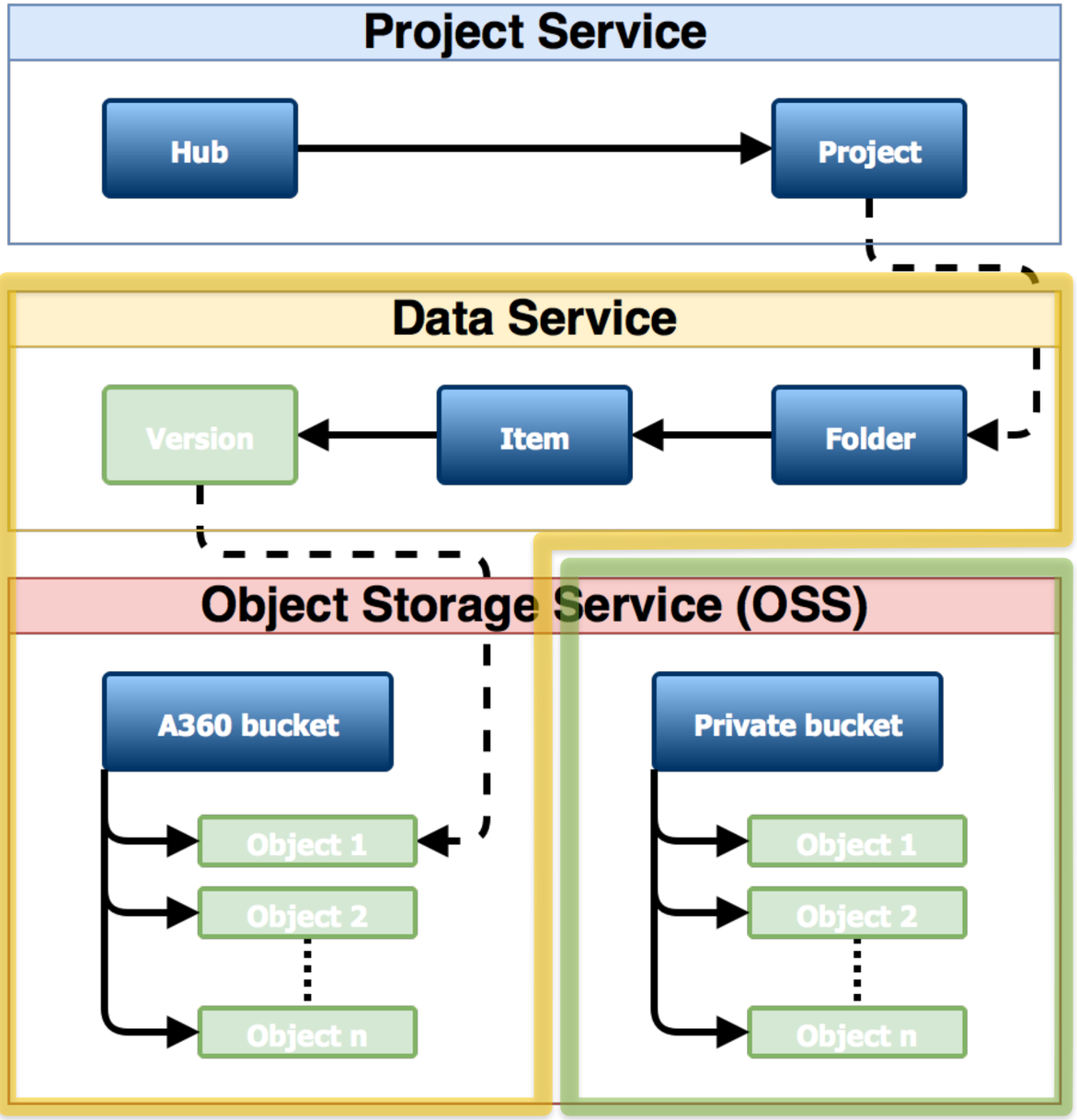
Forge API's

Viewer

(enabled by Model Derivative API)


myhub.autodesk360.com
Adam's First Project - A360
Home
Adam's First P...ect
Stirling Engine.f3d
V. 1
Overview
TOP
FRONT
RIGHT

Data Management API

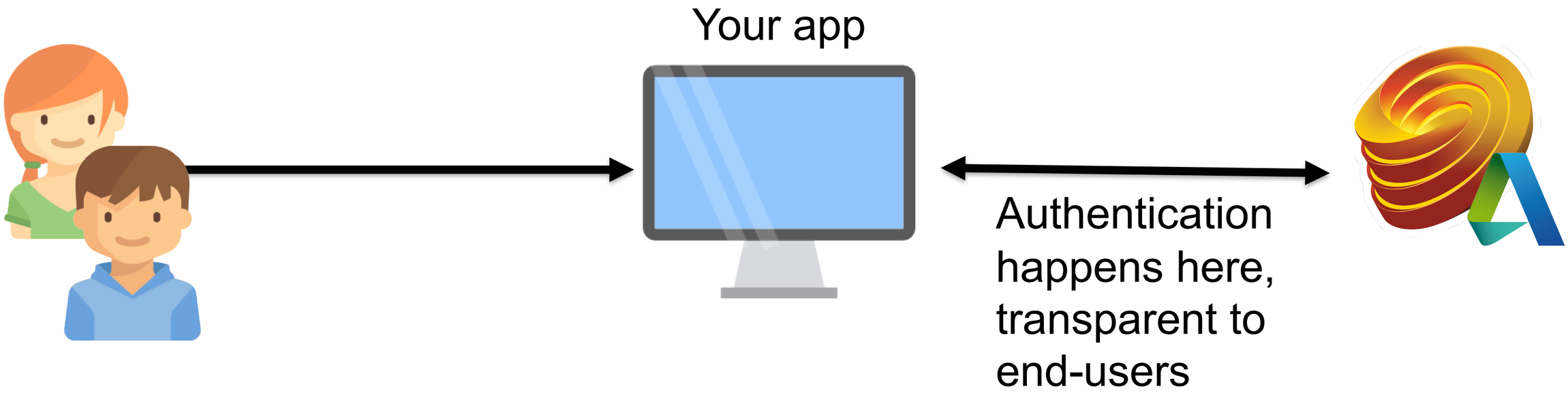


3 legged

2 legged

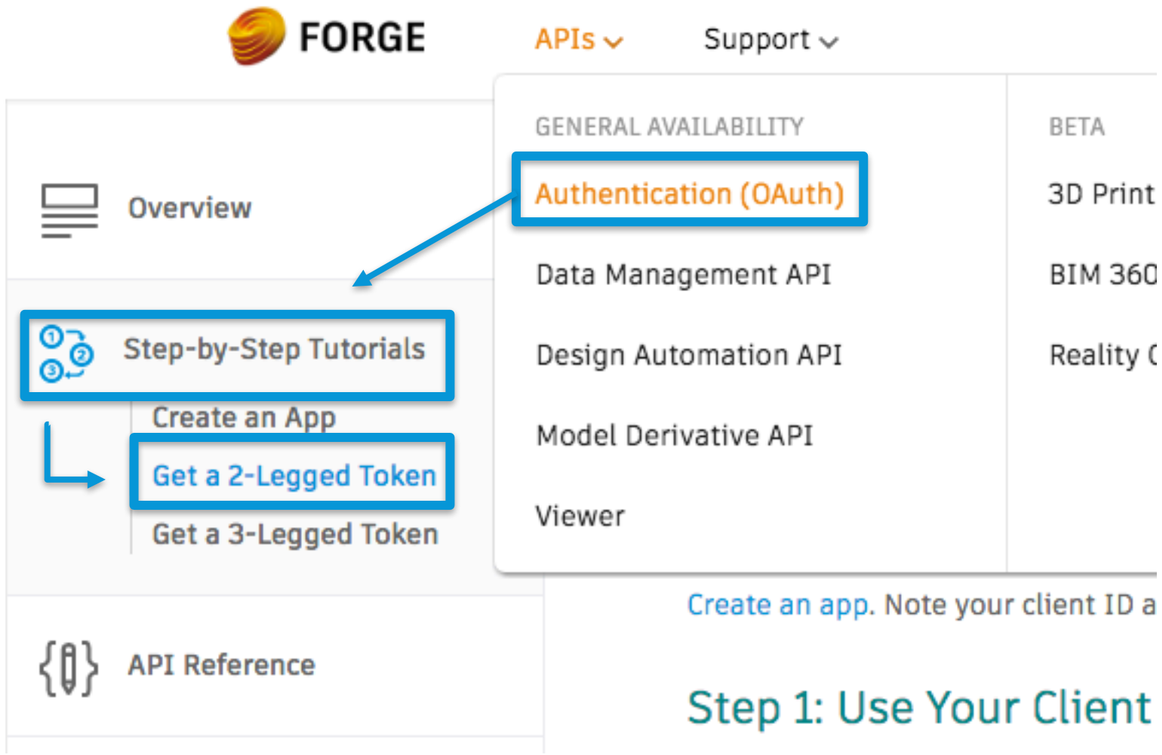
The green items can be used by the Model Derivative API

2-legged authentication

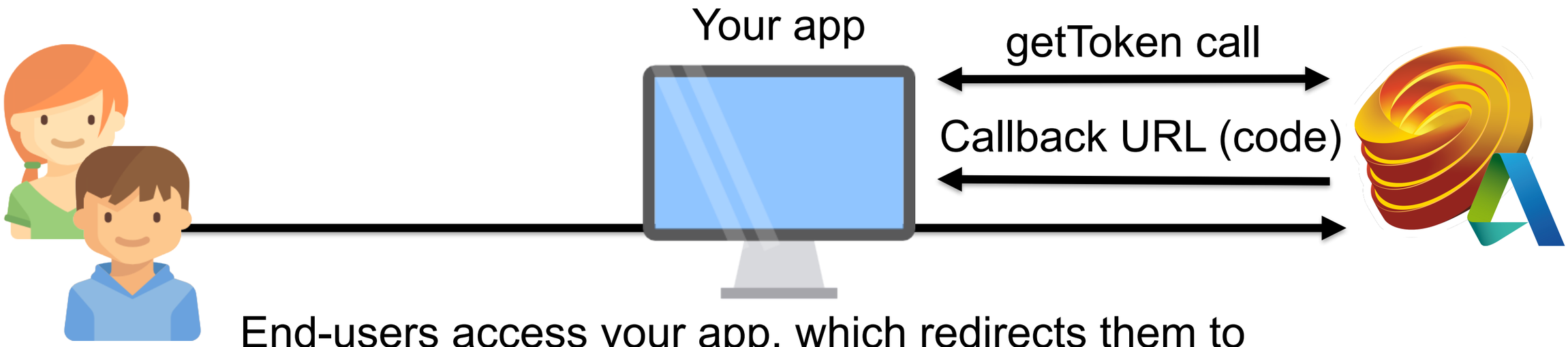


2-legged authentication

- Transparent to end-users (no Autodesk Forge brand appear)
- All files are stored under your developer account (OSS buckets)
- Get 2-legged token tutorial
  - /authentication/v1/authenticate



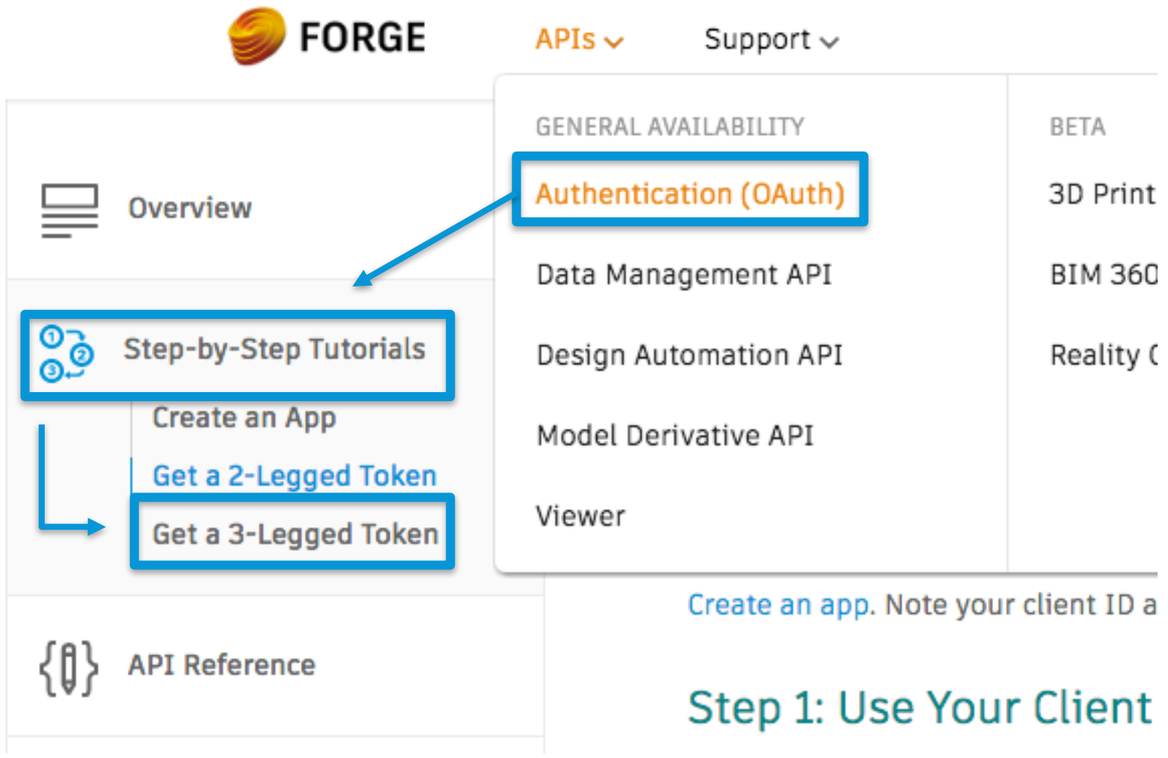
3-legged authentication



End-users access your app, which redirects them to Autodesk sign-in where they can allow access to their data

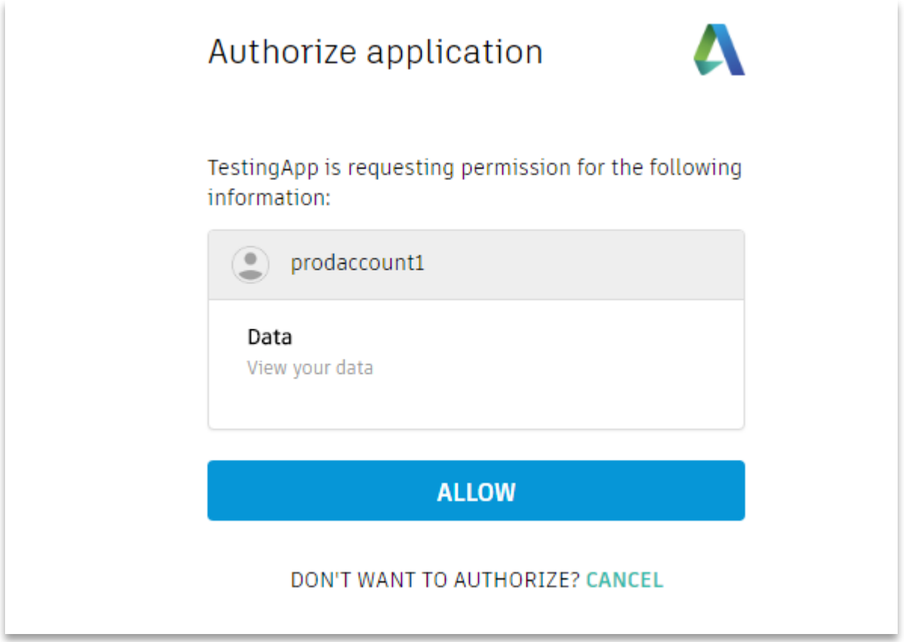
3-legged authentication

- End-use will need to enter his/her credentials and approve access at least once.
- All files are stored under the end-user account (hubs & projects)
- Get 3-legged token tutorial
  - /authentication/v1/authorize
  - [callback your app]
  - /authentication/v1/gettoken

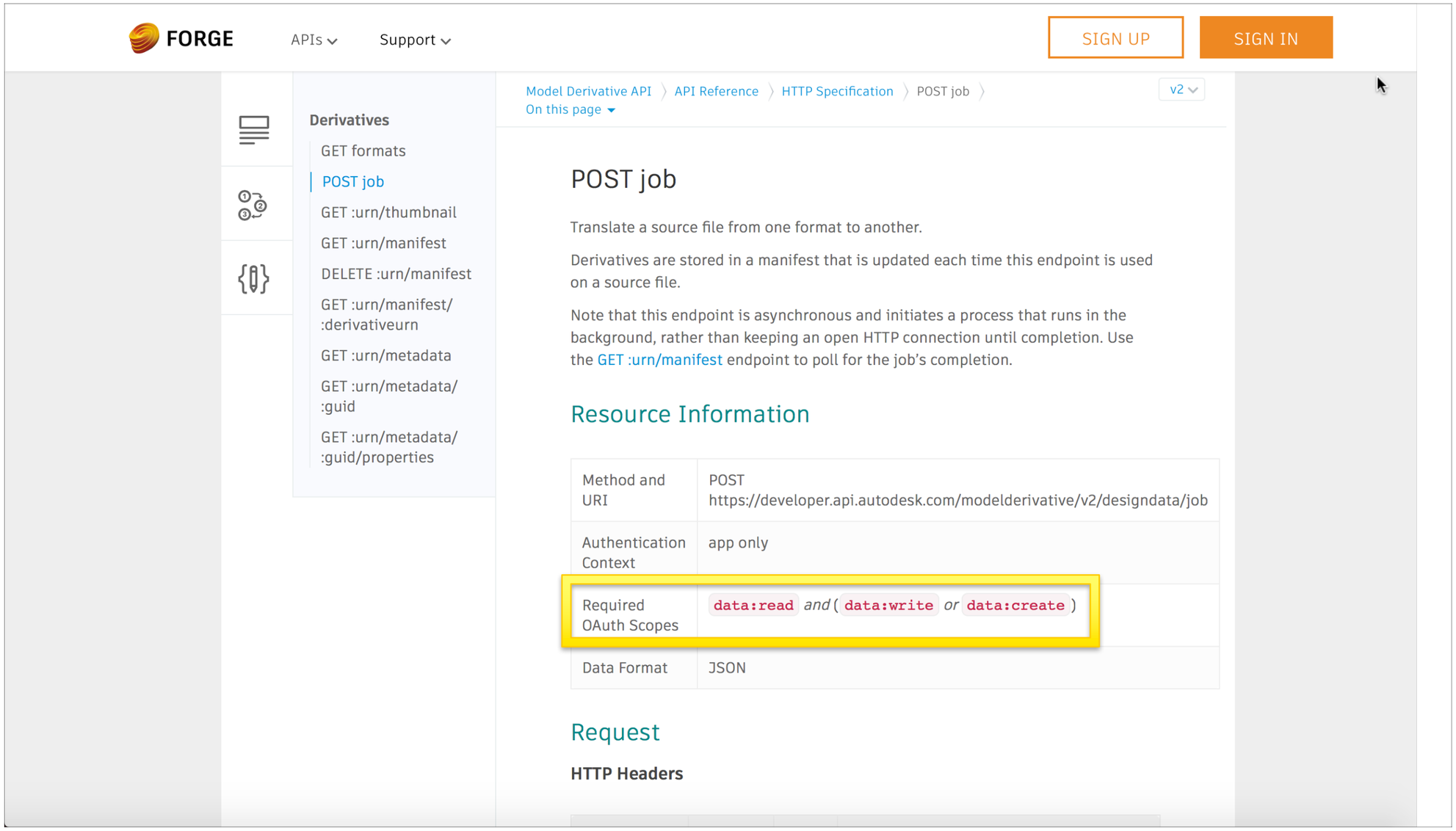


OAuth scopes

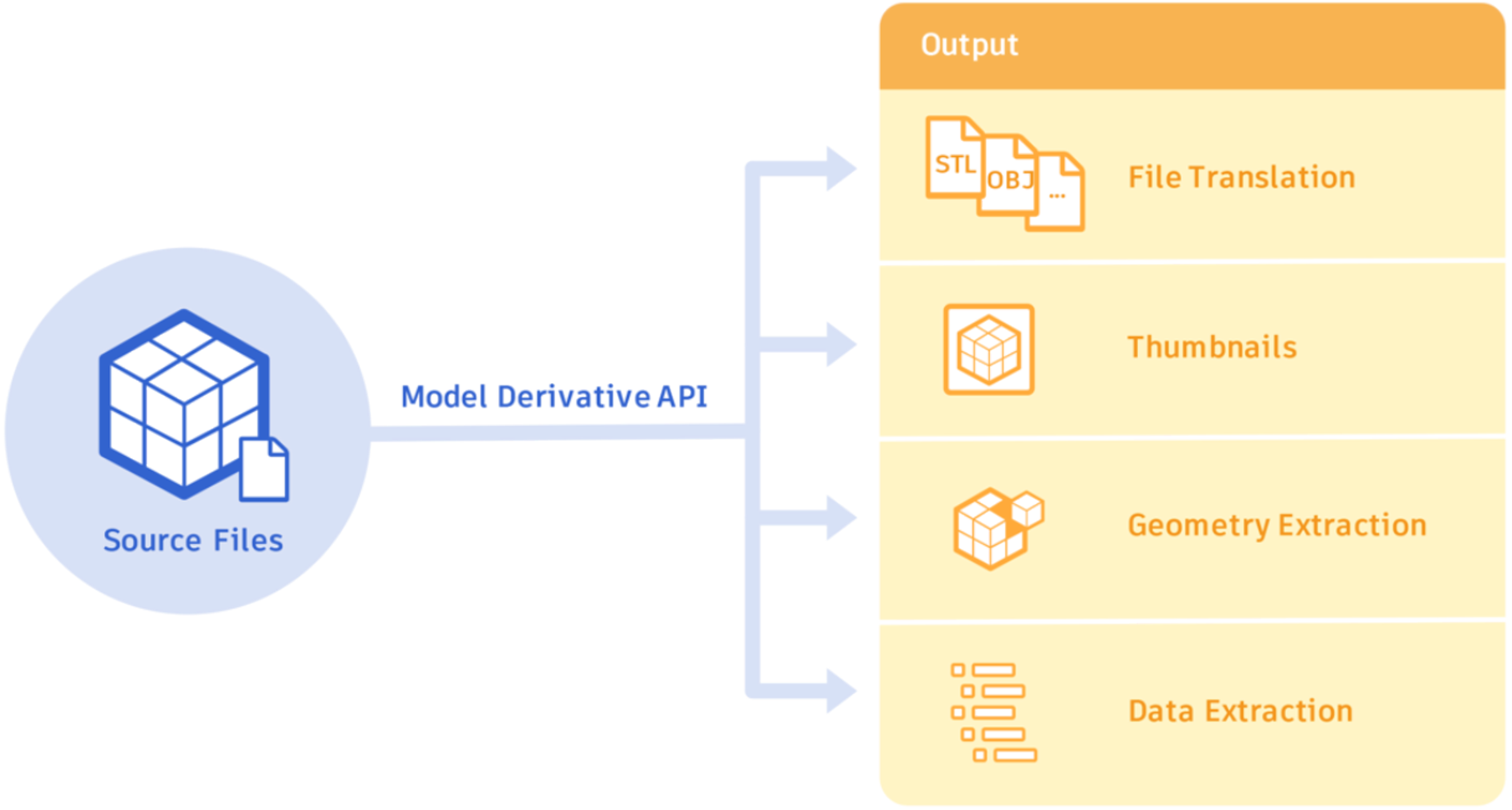
- Define which data is accessible for the token (both 2- or 3-legged)
- On 3-legged, the scope define the permissions the end-user will need to approve on the consent page.
- IMPORTANT: if the end-user have access to the token, create a token with restricted access (e.g. read-only).
  - Malicious end-user with a write-enabled token can modify data directly on your account (e.g. your buckets)

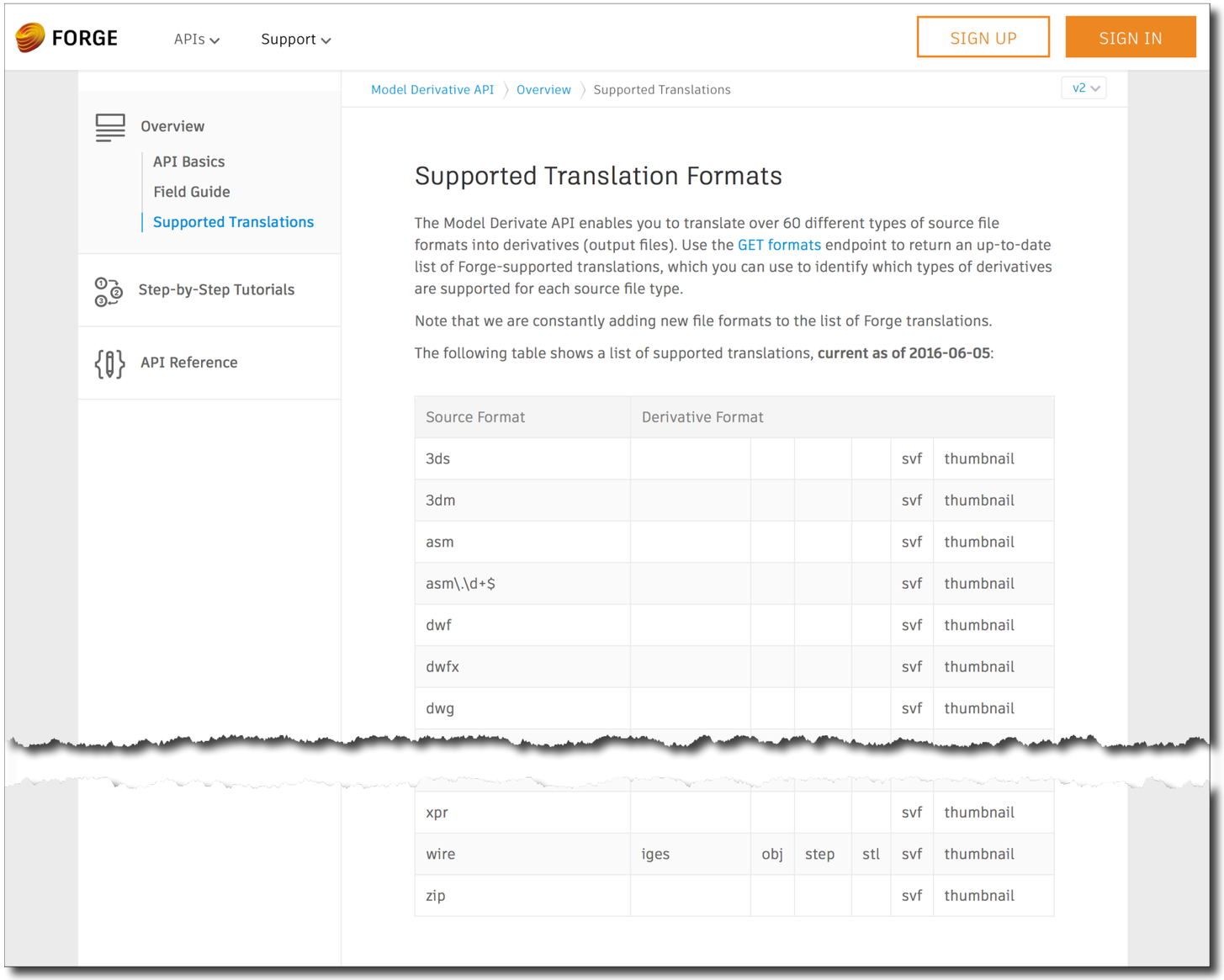


OAuth scopes



Model Derivative API


Source Files
Model Derivative API
Output
STL
OBJ
...
File Translation
Thumbnails
Geometry Extraction
Data Extraction

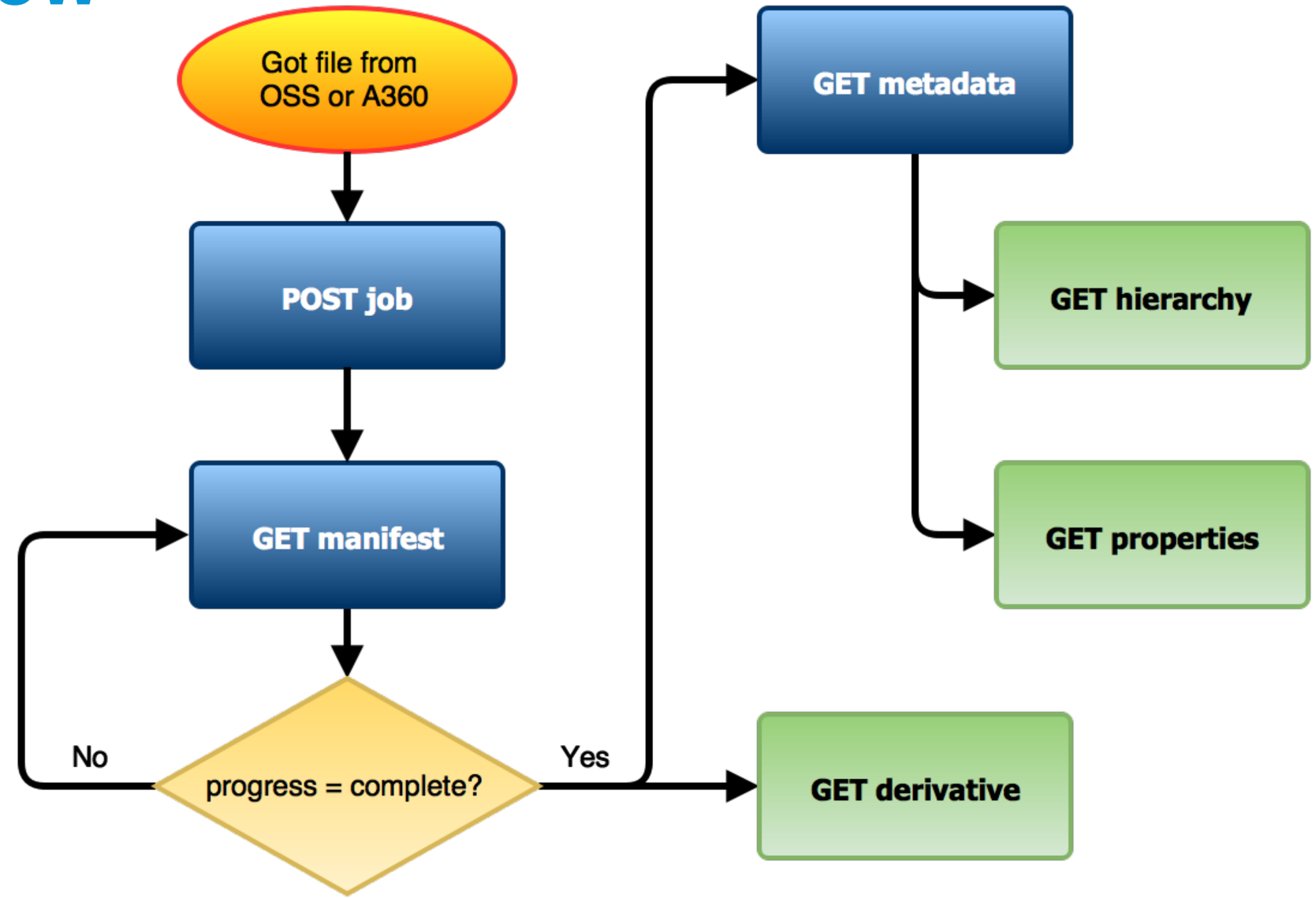


https://developer.autodesk.com/en/docs/model-derivative/v2/overview/supported-translations/

Translation

- Viewing/Data extraction: 60+ file formats
- OBJ:
  - all file formats at component level
- STEP, IGES, STL:
  - fewer file types and only at file level
- Let us know what you need! ☺

Workflow



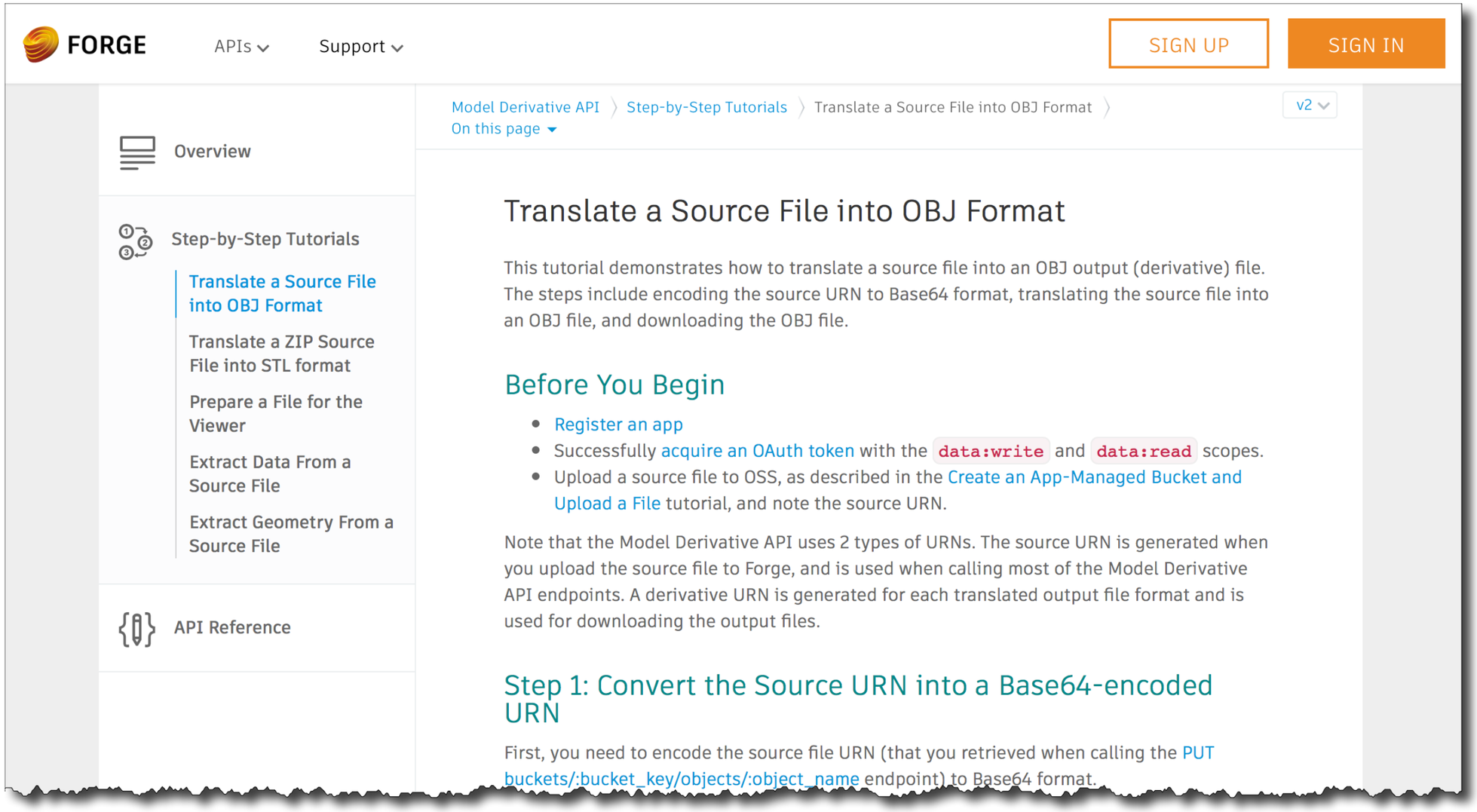
(OSS = Object Storage Service)

Endpoints

https://developer.api.autodesk.com/modelderivative/v2/designdata/ ...

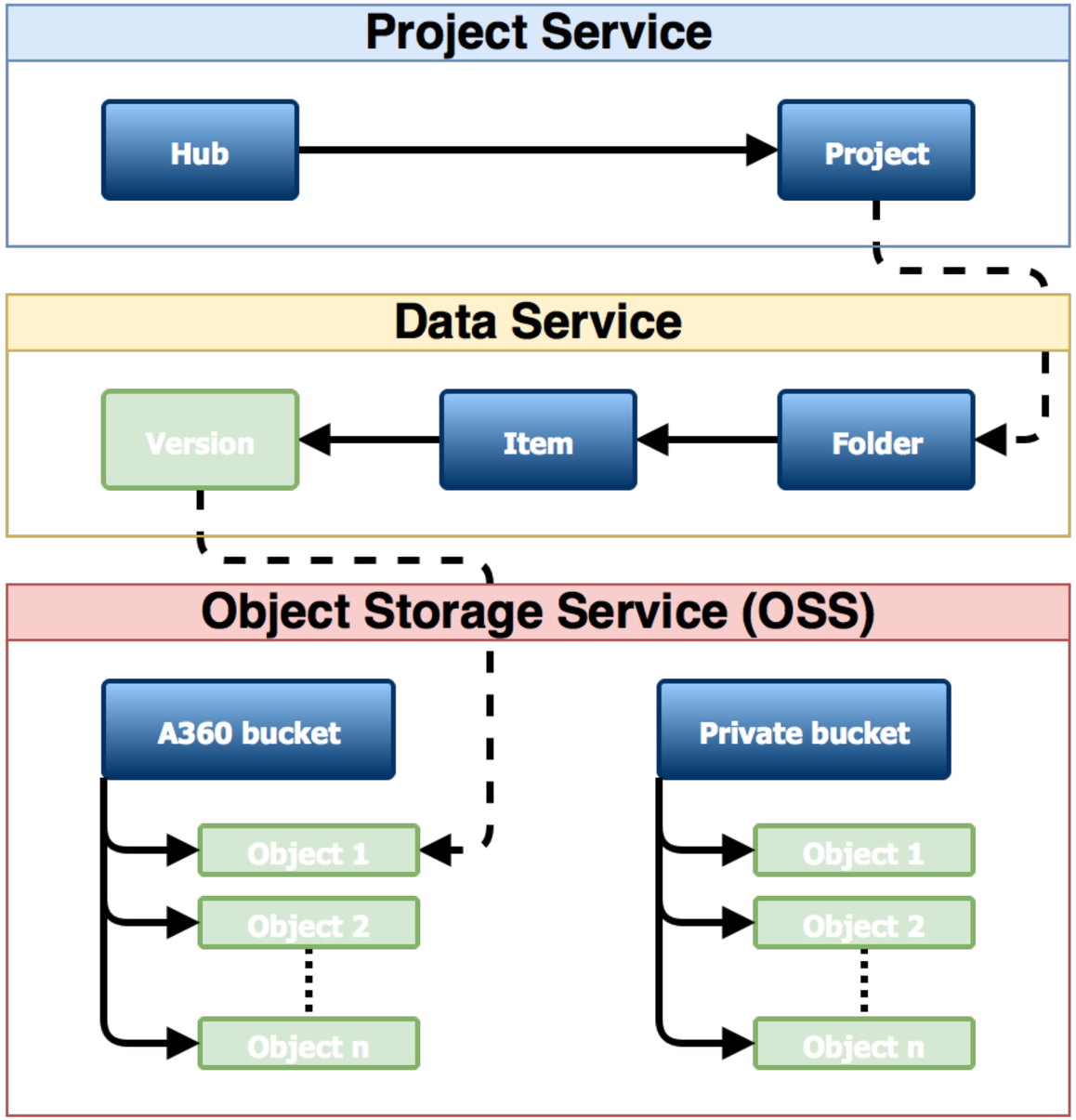
GET	formats	- get table of supported translations
POST	job	- start a translation
GET	:urn/ thumbnail	- get thumbnail
GET	:urn/ manifest	- get manifest (info about translations)
DELETE	:urn/ manifest	- delete manifest
GET	:urn/ manifest/ :derivativeurn	- download a derivative (translation)
GET	:urn/ metadata	- get view GUID's
GET	:urn/ metadata/ :guid	- hierarchy
GET	:urn/ metadata/ :guid/ properties	- component properties

Workflow



https://developer.autodesk.com/en/docs/model-derivative/v2/tutorials/

POST job



The green items can be used by the Model Derivative API

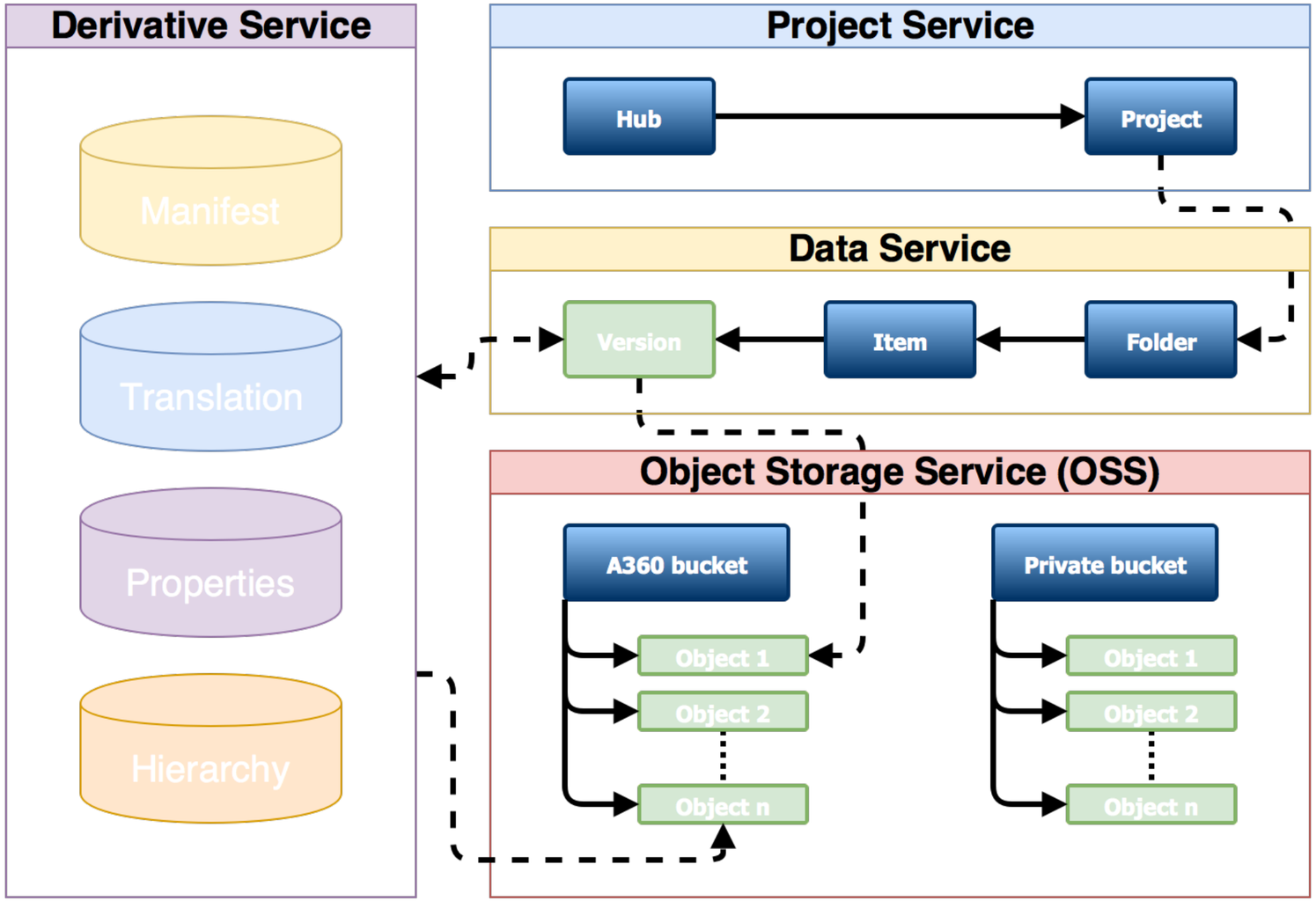
POST job

- Complex models are uploaded in a zip
  - e.g. **main.iam**, **part1.ipt**, **part2.ipt** >> **main.zip**
  - automatic reference resolution
  - set input.**compressedUrn** = **true**
  - set input.**rootFilename,** e.g. **main.iam**

- Simple models are uploaded in their own file format
  - e.g. **part1.ipt**
  - input.**compressedUrn** = **false**

Important: keep the extension! – e.g. a part file should end with ".ipt"

GET manifest, hierarchy, properties



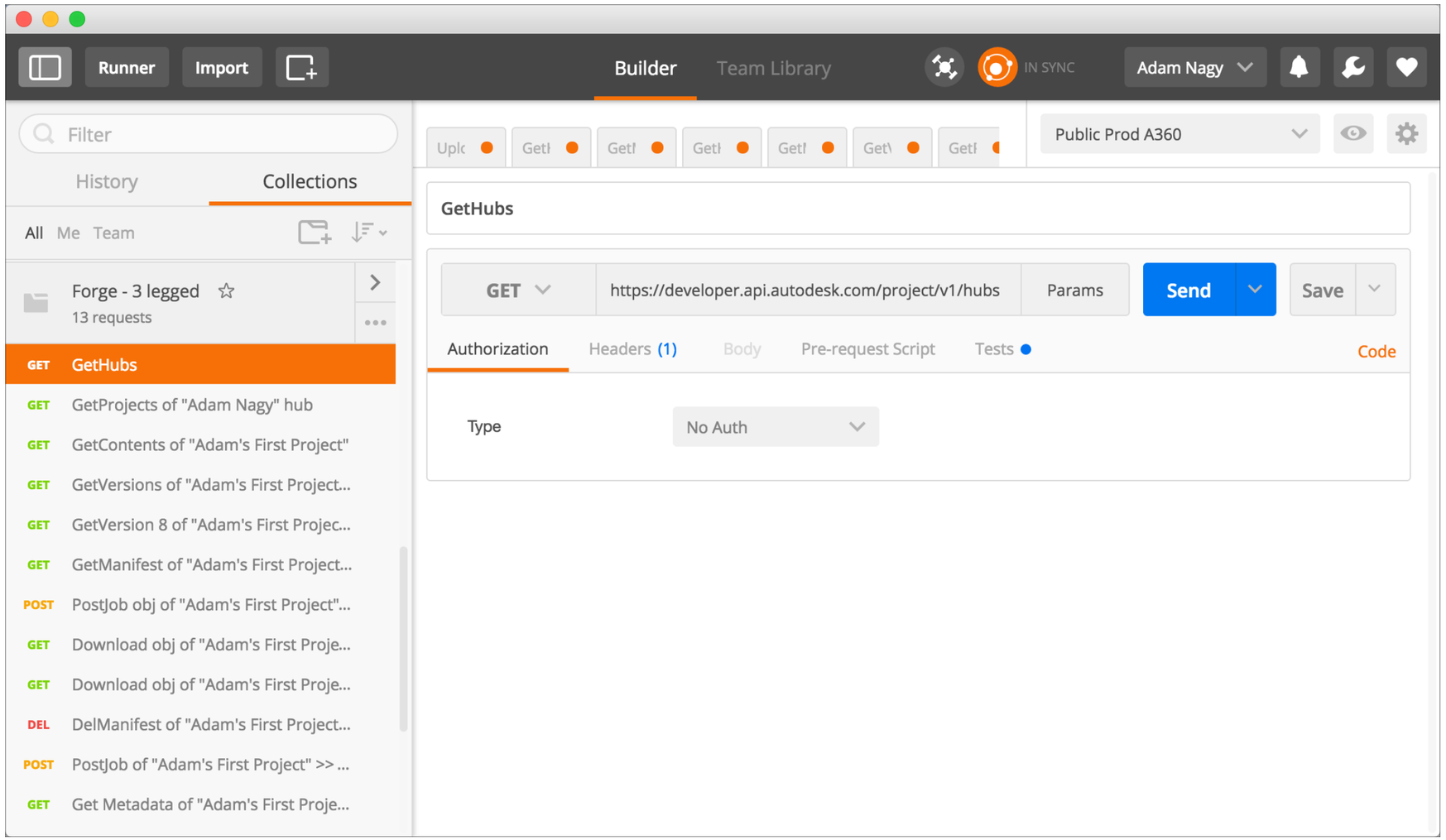
The green items can be used by the Model Derivative API

Version link to manifest

https://developer.api.autodesk.com/data/v1/projects/:project_id/versions/:version_id


```
"derivatives": {
  "data": {
    "type": "derivatives",
    "id":
"dXJuOmFkc2sud2lwcHJvZDpmcy5maWxlOnZmLkNjQUNLT2gwUi02YjV2anJXcE4tcXc_dmVyc2lvbj04"
  },
  "meta": {
    "link": {
      "href":
"https://developer.api.autodesk.com/modelderivative/v2/designdata/dXJuOmFkc2sud2lwcHJvZDpmcy5maWxlOnZmLkNjQUNLT2gwUi02YjV2anJXcE4tcXc_dmVyc2lvbj04/manifest"
    }
  }
},
```

Postman

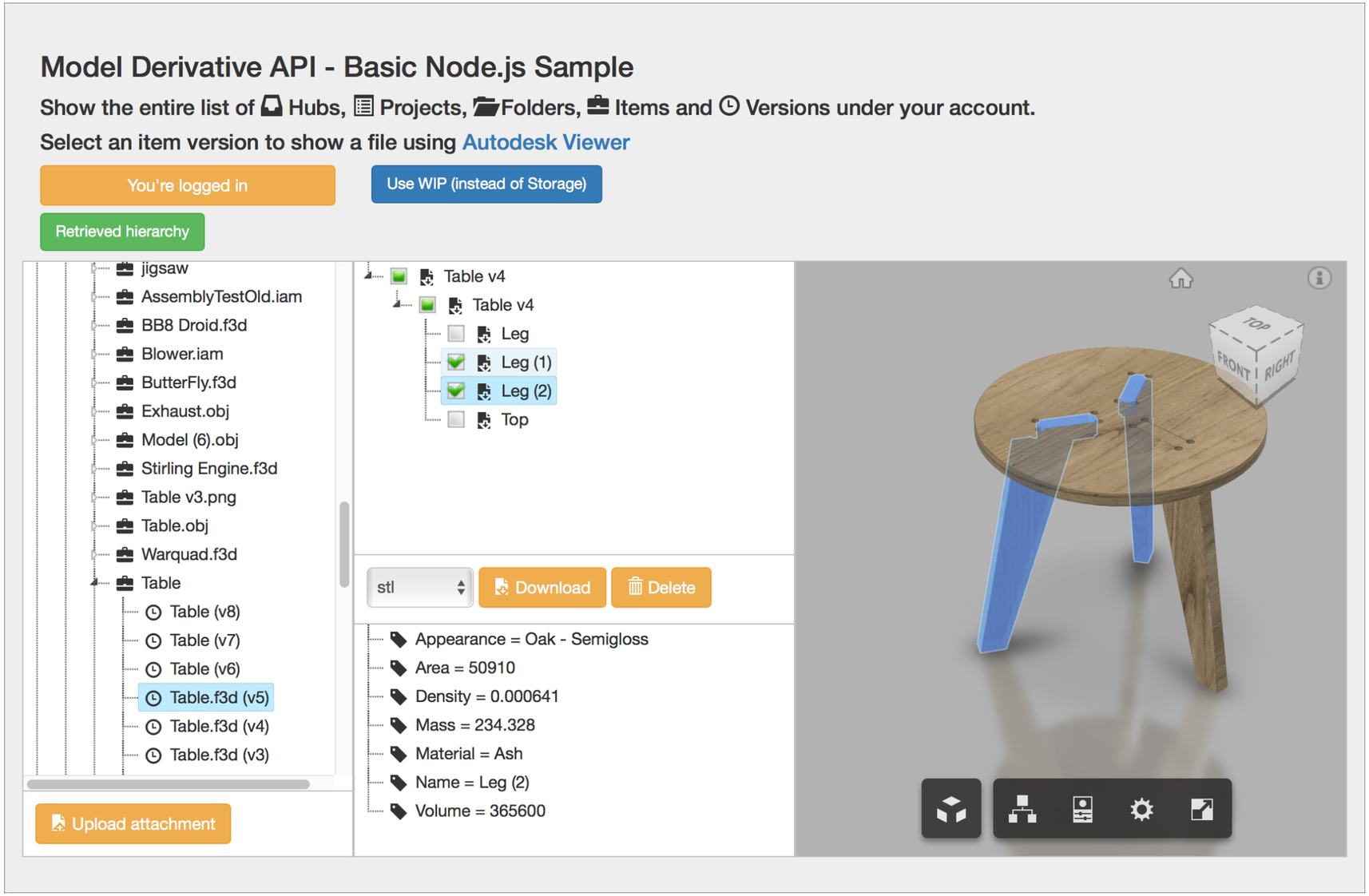


http://www.getpostman.com/

Postman

- http://adndevblog.typepad.com/cloud_and_mobile/2016/06/using-postman-for-testing-restful-apis.html
- http://adndevblog.typepad.com/cloud_and_mobile/2016/06/using-3-legged-oauth-for-forge-apis-with-postman.html

Demo


Model Derivative API - Basic Node.js Sample
Show the entire list of Hubs, Projects, Folders, Items and Versions under your account.
Select an item version to show a file using Autodesk Viewer
You're logged in
Use WIP (instead of Storage)
Retrieved hierarchy
jigsaw
AssemblyTestOld.iam
BB8 Droid.f3d
Blower.iam
ButterFly.f3d
Exhaust.obj
Model (6).obj
Stirling Engine.f3d
Table v3.png
Table.obj
Warquad.f3d
Table
Table (v8)
Table (v7)
Table (v6)
Table.f3d (v5)
Table.f3d (v4)
Table.f3d (v3)
Upload attachment
Table v4
Table v4
Leg
Leg (1)
Leg (2)
Top
stl
Download
Delete
Appearance = Oak - Semigloss
Area = 50910
Density = 0.000641
Mass = 234.328
Material = Ash
Name = Leg (2)
Volume = 365600
TOP
FRONT
RIGHT

Demo

Live
https://derivatives.autodesk.io

Source-code
https://github.com/Autodesk-Forge/model.derivative-nodejs-sample

http://www.youtube.com/watch?v=v8ngEnN3qZk

Libraries?

npm install forge-oauth2, forge-oss, forge-data-management,forge-model-derivative

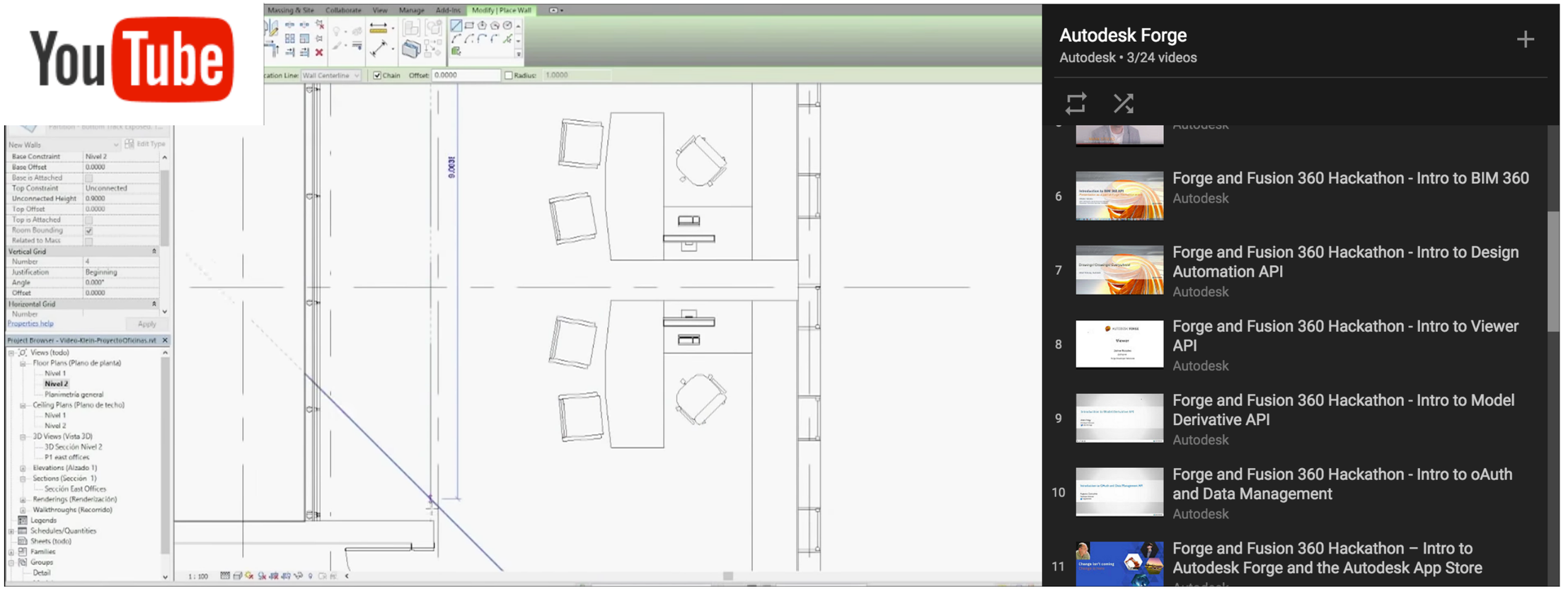
OR

forge-api-nodejs-client

What's next?

- Register & get a key
  developer.autodesk.com
- See documentation & tutorials
  developer.autodesk.com/en/docs/data/v2
- Reuse code from GitHub
  github.com/Developer-Autodesk & github.com/Autodesk-Forge
- Ask questions on stackoverflow
  TAG: autodesk-model-derivative & autodesk-data-management

What’s next?



https://www.youtube.com/playlist?list=PL_6ApchKwjN9CZCqUl4RZrsyDvnTV1Jgb

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