

Introduction to Model Derivative API

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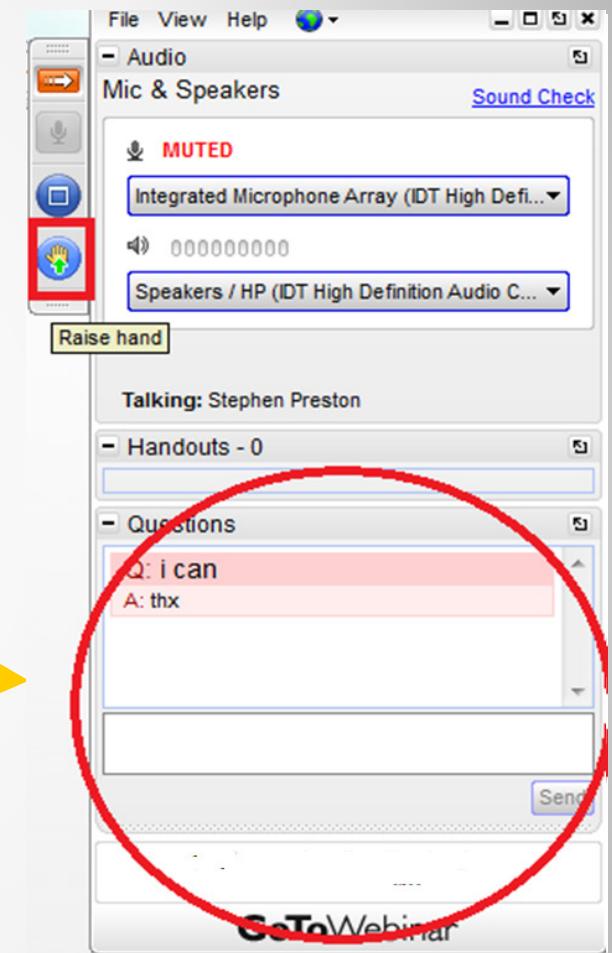
adamthenagy

To ask questions

- Raise hand to speak

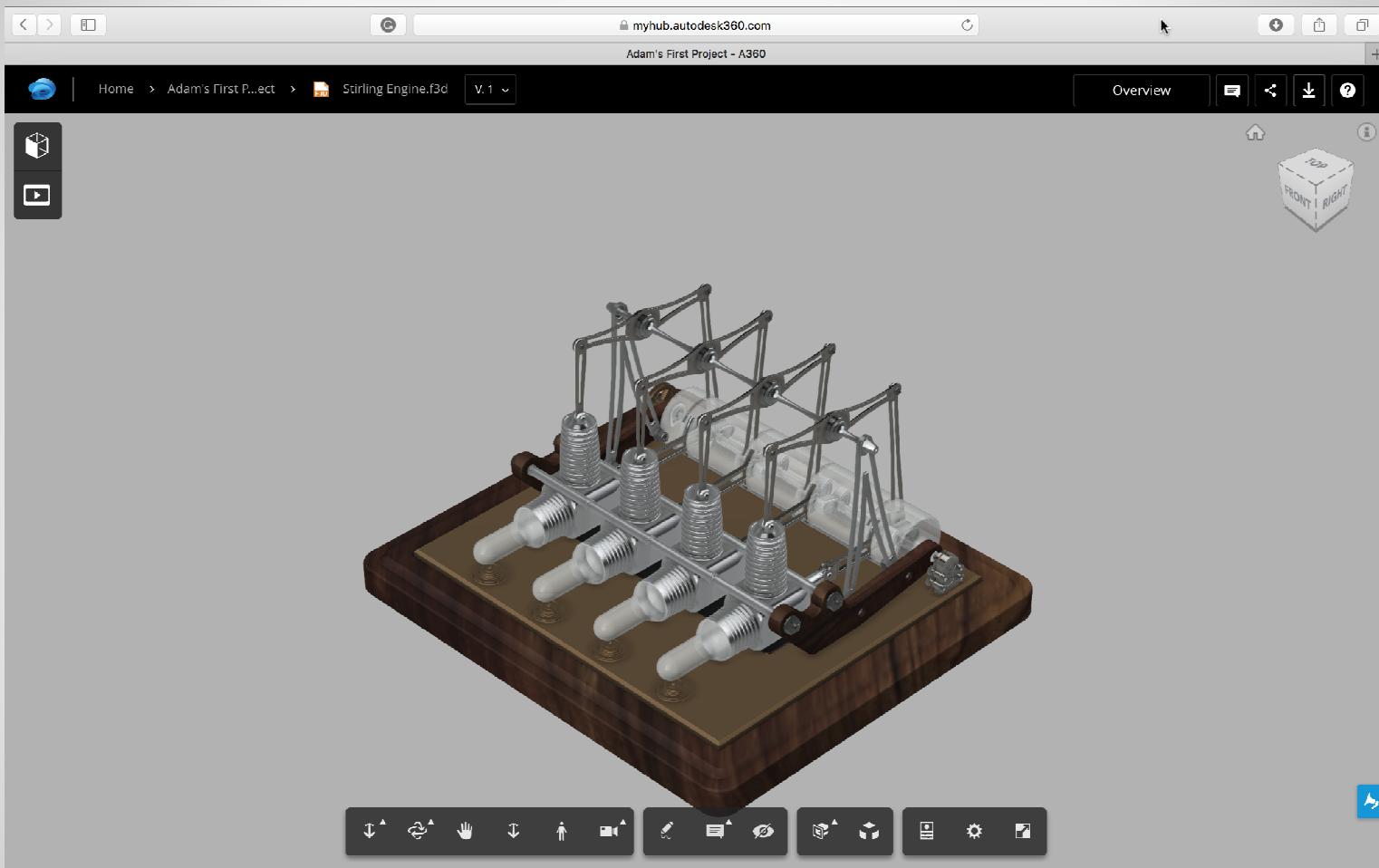
or

- Type a question



Viewer

(enabled by Model Derivative API)



“Introduction to Viewer API”
webcast next Tuesday
August 22nd

Model Derivative API

Model Derivative API

=

Design Data Extraction & Translation



Model Derivative API

Output



File Translation



Thumbnails



Geometry Extraction



Data Extraction

The screenshot shows the Autodesk Forge Model Derivative API documentation page. The left sidebar has sections for Overview, API Basics, Field Guide, and Supported Translations (which is selected). The main content area shows the 'Supported Translation Formats' section. It includes a brief description of the API's translation capabilities, a note about adding new formats, and a table of supported translations. The table lists source formats and their corresponding derivative formats.

Model Derivative API > Overview > Supported Translations

Supported Translation Formats

The Model Derivative API enables you to translate over 60 different types of source file formats into derivatives (output files). Use the [GET formats](#) endpoint to return an up-to-date list of Forge-supported translations, which you can use to identify which types of derivatives are supported for each source file type.

Note that we are constantly adding new file formats to the list of Forge translations.

The following table shows a list of supported translations, **current as of 2016-06-05**:

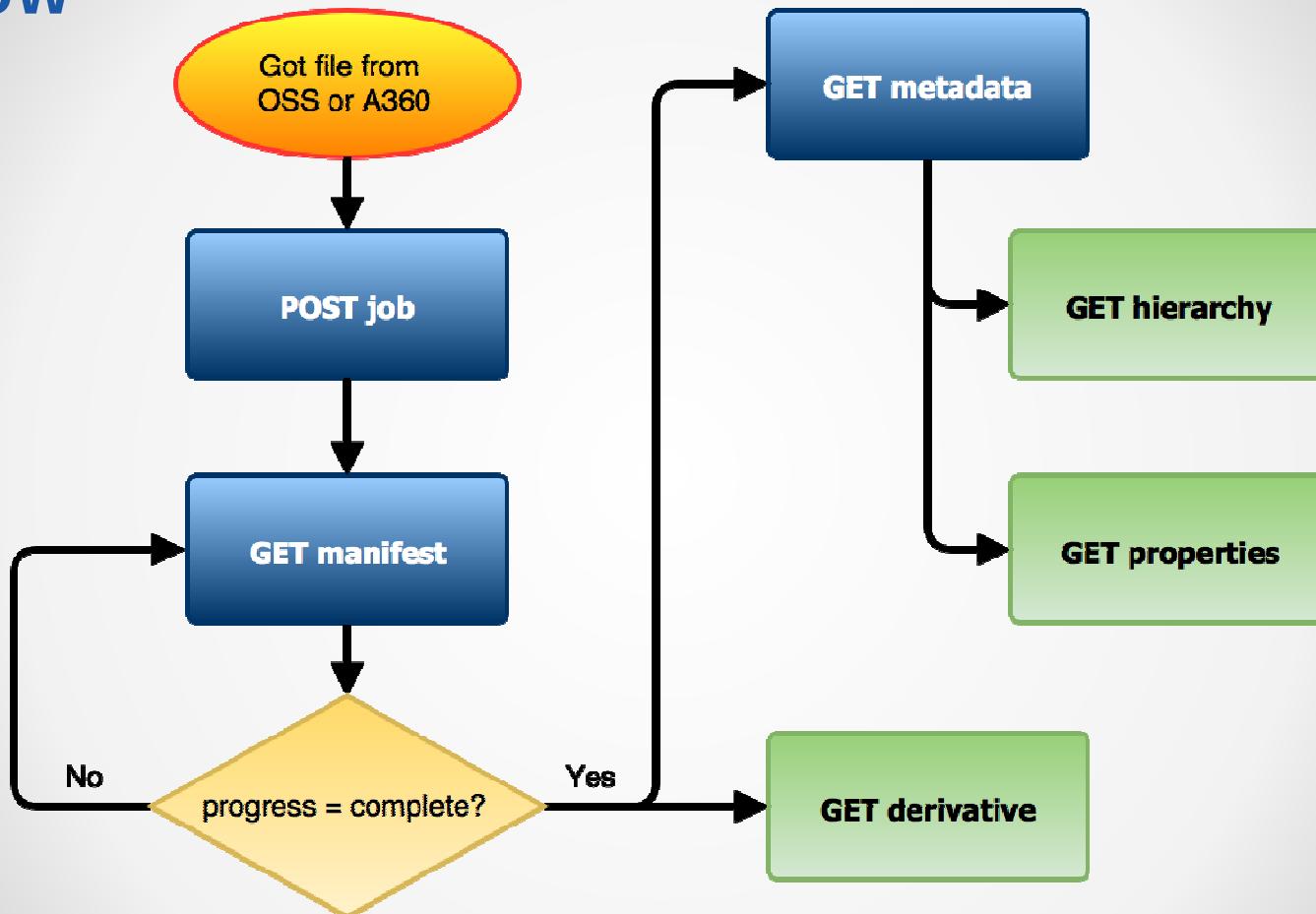
Source Format	Derivative Format
3ds	svf thumbnail
3dm	svf thumbnail
asm	svf thumbnail
asm\\d+\$	svf thumbnail
dwf	svf thumbnail
dwdx	svf thumbnail
dwg	svf thumbnail
xpr	svf thumbnail
wire	iges obj step stl svf thumbnail
zip	svf thumbnail

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

Translation

- Viewing/Data extraction: 60+ file formats
- OBJ:
 - all 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

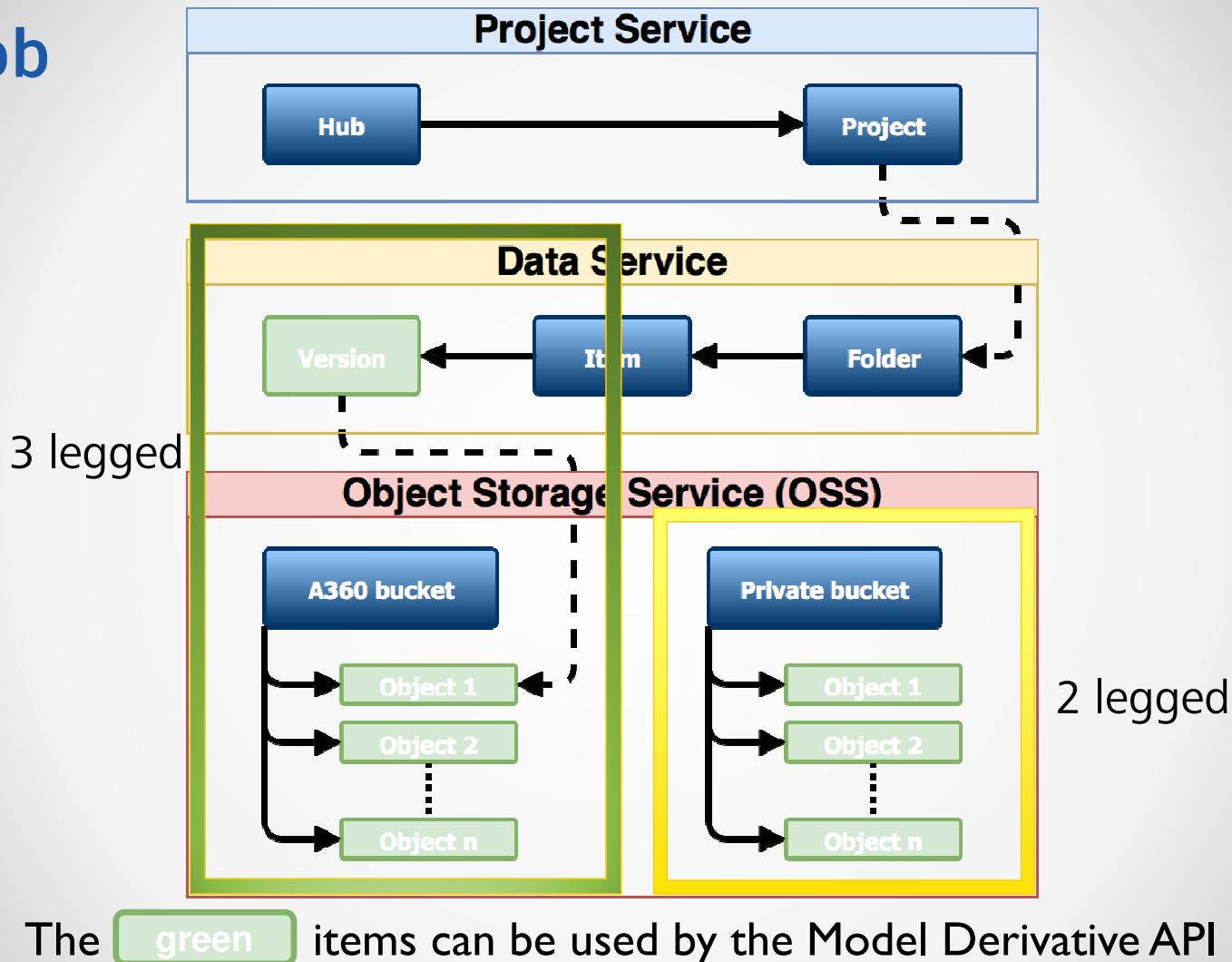
- component properties

Workflow

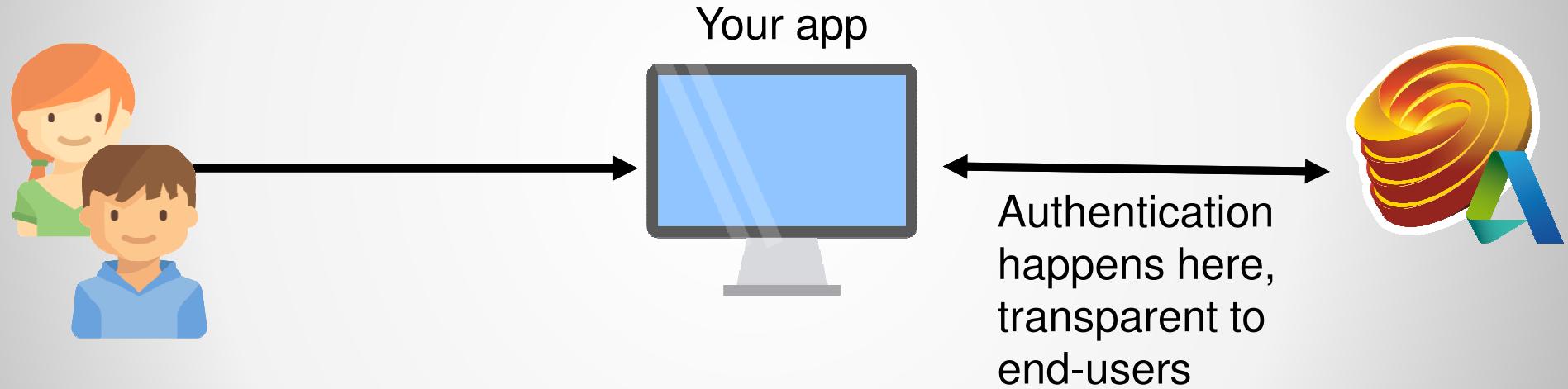
The screenshot shows the Autodesk Forge website interface. At the top, there is a navigation bar with the FORGE logo, 'APIs ▾', 'Support ▾', 'SIGN UP' (in orange), and 'SIGN IN' (in orange). Below the navigation bar, the main content area has a breadcrumb trail: 'Model Derivative API' > 'Step-by-Step Tutorials' > 'Translate a Source File into OBJ Format'. There is also a 'v2 ▾' dropdown menu. On the left, a sidebar contains links for 'Overview', 'Step-by-Step Tutorials' (which is currently selected, indicated by a blue border), and 'API Reference'. Under 'Step-by-Step Tutorials', there are several sub-links: 'Translate a Source File into OBJ Format' (also highlighted in blue), 'Translate a ZIP Source File into STL format', 'Prepare a File for the Viewer', 'Extract Data From a Source File', and 'Extract Geometry From a Source File'. The main content area title is 'Translate a Source File into OBJ Format'. It describes the tutorial: 'This tutorial demonstrates how to translate a source file into an OBJ output (derivative) file. The steps include encoding the source URN to Base64 format, translating the source file into an OBJ file, and downloading the OBJ file.' Below this, a section titled 'Before You Begin' lists requirements: 'Register an app', 'Successfully acquire an OAuth token with the `data:write` and `data:read` scopes.', and 'Upload a source file to OSS, as described in the [Create an App-Managed Bucket](#) and [Upload a File](#) tutorial, and note the source URN.' A note states: 'Note that the Model Derivative API uses 2 types of URNs. The source URN is generated when you upload the source file to Forge, and is used when calling most of the Model Derivative API endpoints. A derivative URN is generated for each translated output file format and is used for downloading the output files.' Finally, a section titled 'Step 1: Convert the Source URN into a Base64-encoded URN' provides instructions: 'First, you need to encode the source file URN (that you retrieved when calling the [PUT buckets/:bucket_key/objects/:object_name](#) endpoint) to Base64 format.'

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

POST job



2-legged authentication



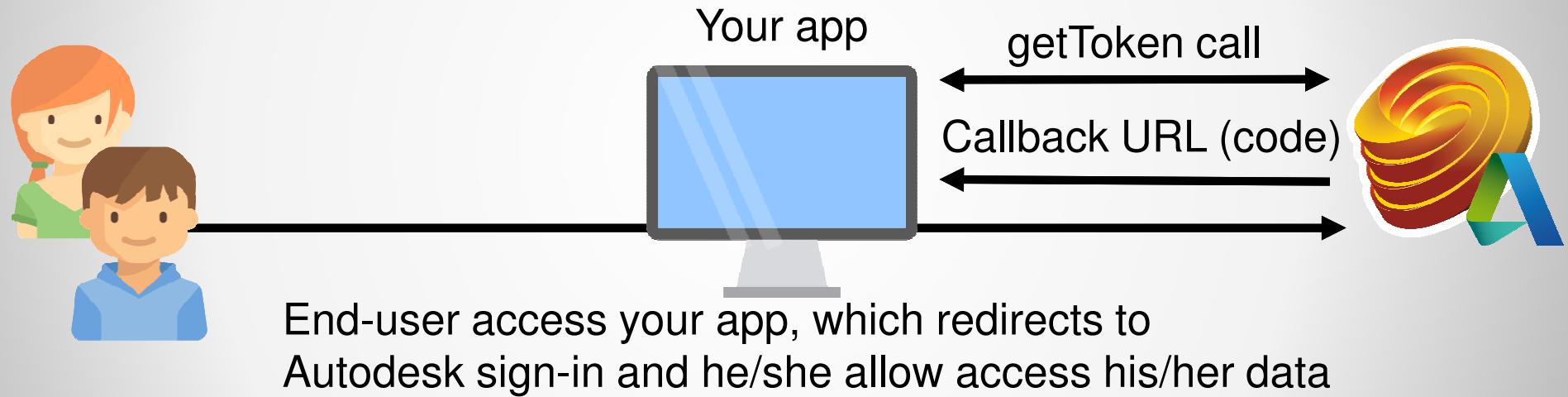
2-legged authentication

- 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

The screenshot shows the Autodesk Forge API landing page. At the top right, there are links for 'APIs' and 'Support'. Below that, a sidebar lists 'GENERAL AVAILABILITY' and 'BETA' APIs. The 'Authentication (OAuth)' section is highlighted with a blue box and an arrow pointing to it from the left. On the left side, there are sections for 'Overview', 'Step-by-Step Tutorials' (which is also highlighted with a blue box), 'Create an App', 'Get a 2-Legged Token' (also highlighted with a blue box), and 'Get a 3-Legged Token'. At the bottom left, there's an 'API Reference' section. A callout at the bottom right says 'Create an app. Note your client ID a' and 'Step 1: Use Your Client'.



3-legged authentication



3-legged authentication

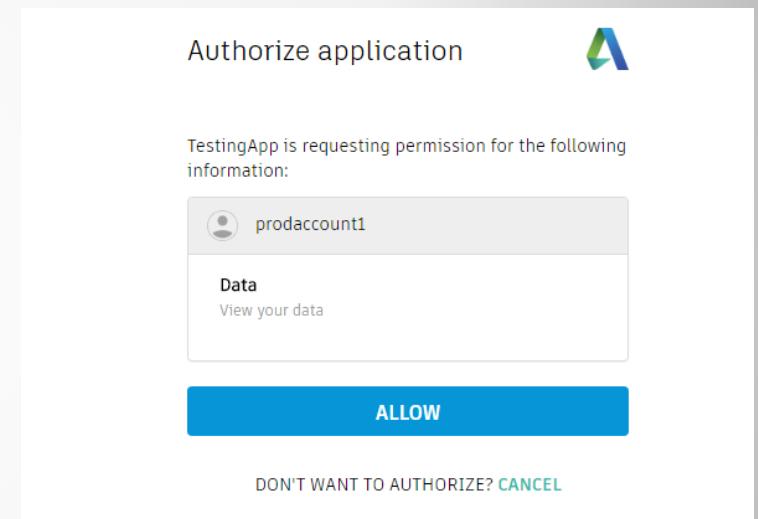
- End-user will need to enter his/her credentials and approve access at least once.
- All files are stored under the end-user account (hubs & projects)
- Get 3-legged token tutorial
 - /authentication/v1/authorize
 - [callback your app]
 - /authentication/v1/gettoken

The screenshot shows the Autodesk Forge API documentation homepage. At the top, there's a navigation bar with the FORGE logo, APIs dropdown, and Support dropdown. Below the navigation, there's a grid of API categories. The 'GENERAL AVAILABILITY' column contains 'Authentication (OAuth)' (which is highlighted with a blue box and has an orange arrow pointing to it from the left), 'Data Management API', 'Design Automation API', 'Model Derivative API', and 'Viewer'. The 'BETA' column contains '3D Print', 'BIM 360', and 'Reality'. In the center, there's a 'Step-by-Step Tutorials' section with three buttons: 'Create an App', 'Get a 2-Legged Token' (which is highlighted with a blue box and has a blue arrow pointing to it from below), and 'Get a 3-Legged Token'. At the bottom, there's an 'API Reference' section with a table of contents icon and the text 'Create an app. Note your client ID a...'. A large green banner at the bottom right says 'Step 1: Use Your Client'.



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

The screenshot shows the Autodesk Forge API Reference page for the Model Derivative API. The left sidebar has a navigation menu with icons for Home, APIs, Support, and Help. The main content area shows the 'POST job' endpoint under the 'Derivatives' category. The endpoint details include:

- Method and URI:** POST <https://developer.api.autodesk.com/modelderivative/v2/designdata/job>
- Authentication Context:** app only
- Required OAuth Scopes:** `data:read and(data:write or data:create)` (highlighted with a yellow box)
- Data Format:** JSON

Below the endpoint details, there are sections for 'Request' and 'HTTP Headers'.

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”

Complex models

Private buckets

application specific storage

2-legged authentication

zip files only (references coming)

VS

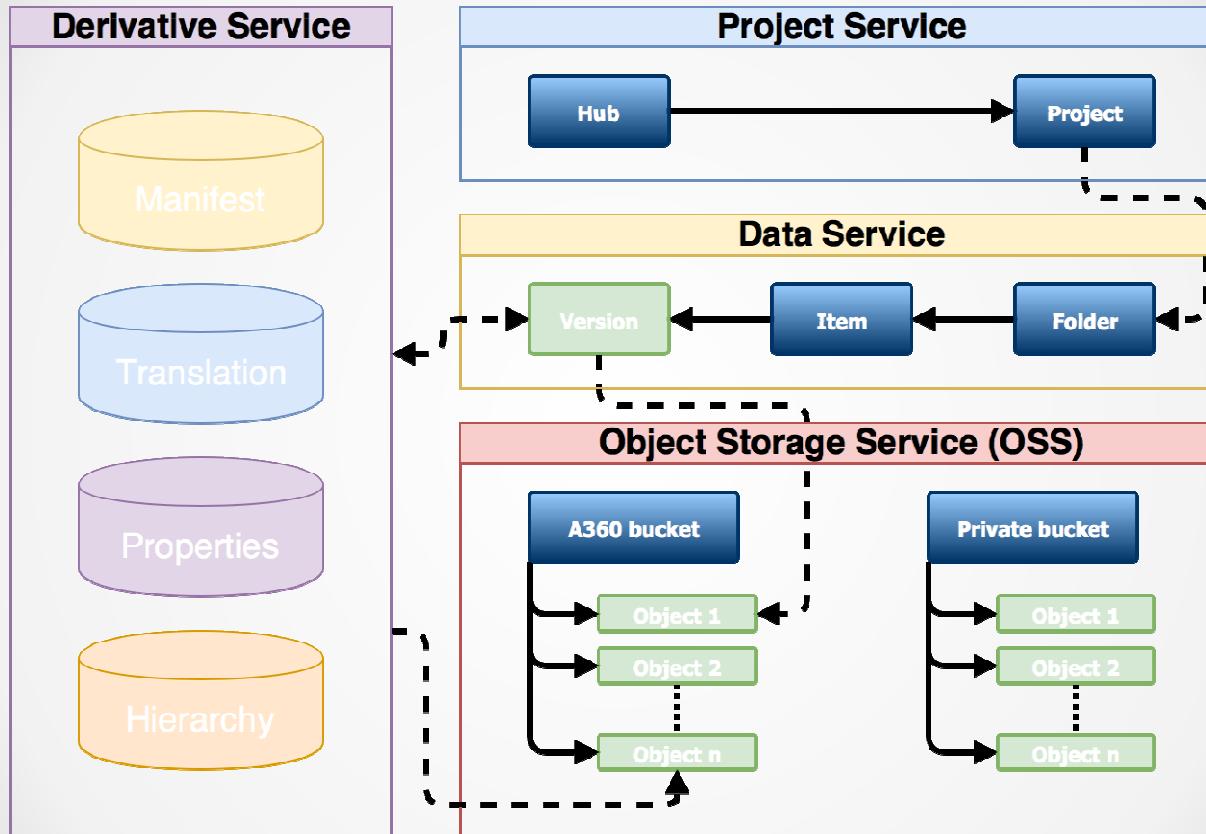
A360 type storage

user specific storage

3-legged authentication

zip files or single files with references

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

The screenshot shows the Postman application interface. The top navigation bar includes 'Runner', 'Import', 'Builder' (which is selected), 'Team Library', and user information for 'Adam Nagy'. Below the navigation is a toolbar with various icons and a dropdown for 'Public Prod A360'. The main area is divided into two sections: 'Collections' on the left and the 'GetHubs' request details on the right.

Collections:

- All
- Me
- Team
- Forge - 3 legged (selected)

GetHubs:

Request Details:

- Method: GET
- URL: https://developer.api.autodesk.com/project/v1/hubs
- Params
- Send
- Save

Authorization:

- Type: No Auth

Request List:

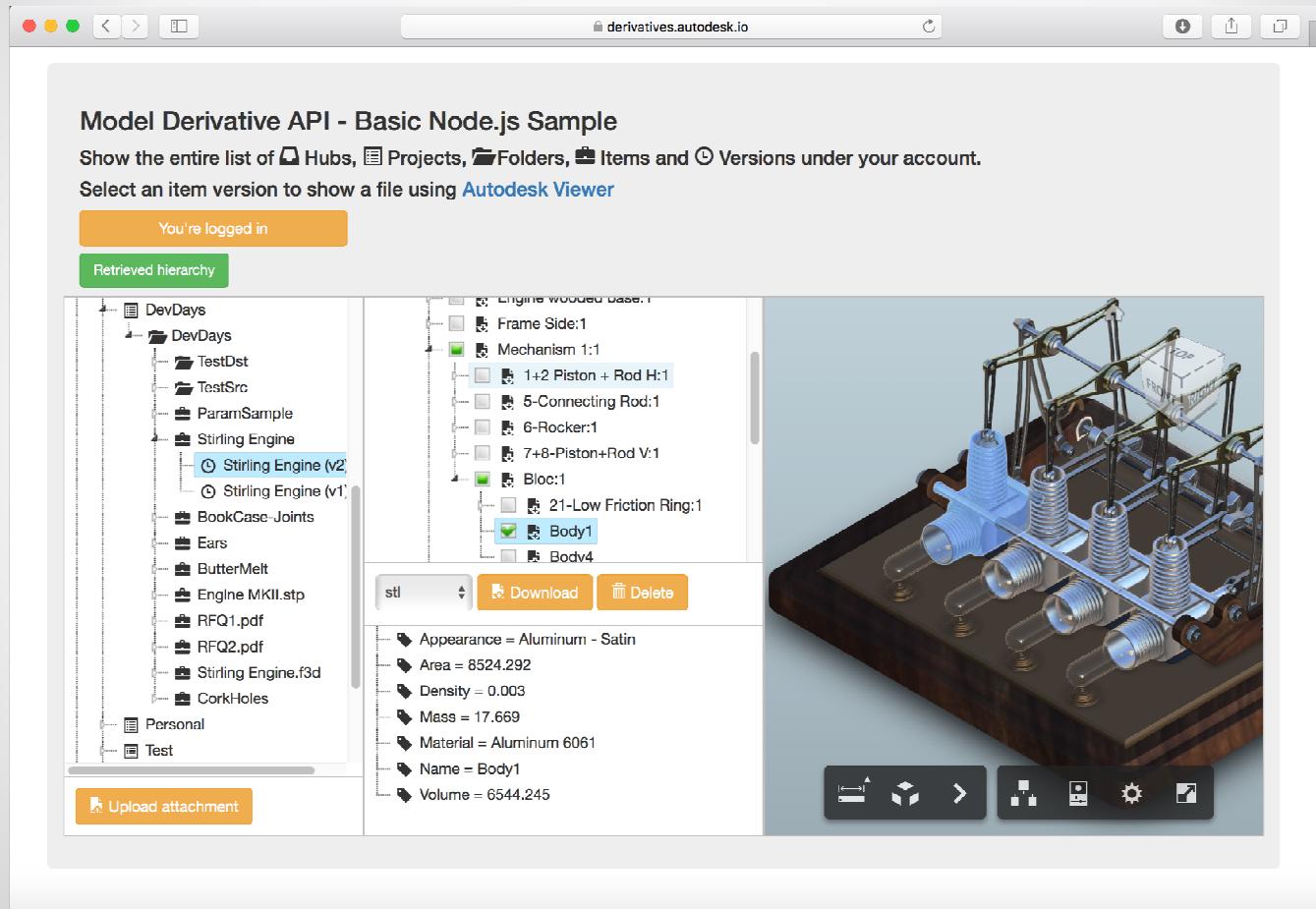
- GET GetHubs
- GET GetProjects of "Adam Nagy" hub
- GET GetContents of "Adam's First Project"
- GET GetVersions of "Adam's First Project..."
- GET GetVersion 8 of "Adam's First Proj..."
- GET GetManifest of "Adam's First Project..."
- POST PostJob obj of "Adam's First Project"...
- GET Download obj of "Adam's First Proj..."
- GET Download obj of "Adam's First Proj..."
- DEL DelManifest of "Adam's First Project..."
- POST PostJob of "Adam's First Project" >> ...
- GET Get Metadata of "Adam's First Proj..."

<http://www.getpostman.com/>

Postman

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

Demo

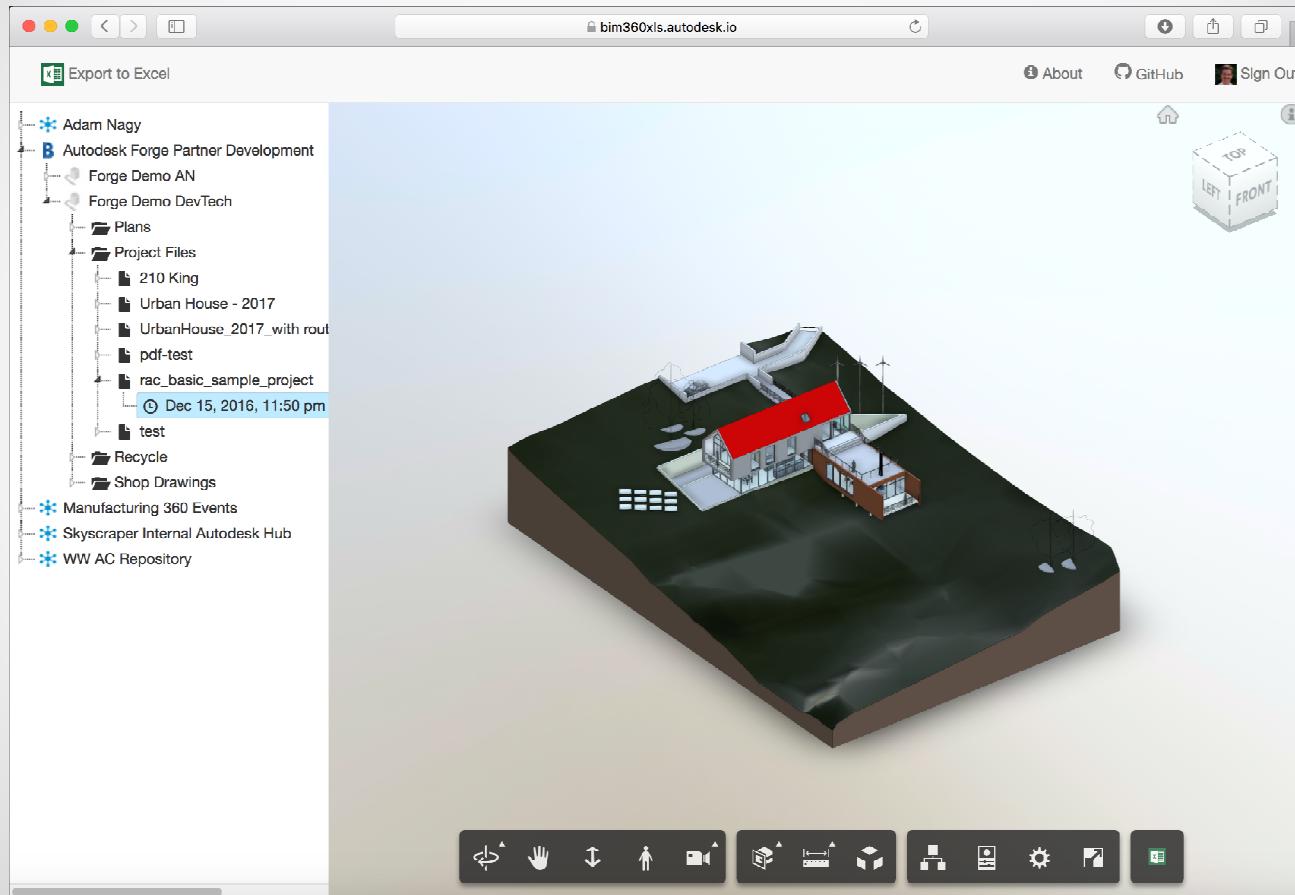


Live:
<https://derivatives.autodesk.io>

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

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

Demo



Live:
<https://bim360xls.autodesk.io>

Source-code
<https://github.com/Autodesk-Forge/bim360appstore-model.derivative-nodejs-xls.exporter>

Libraries?



- Sample model.derivative-nodejs-sample
- npm install forge-apis@0.4.1





- Sample model.derivative-csharp-context.menu
- Install-Package Autodesk.Forge -Version 1.0.2

- Java github.com/Autodesk-Forge/forge-api-java-client
- PHP github.com/Autodesk-Forge/forge-php-client

What's next?

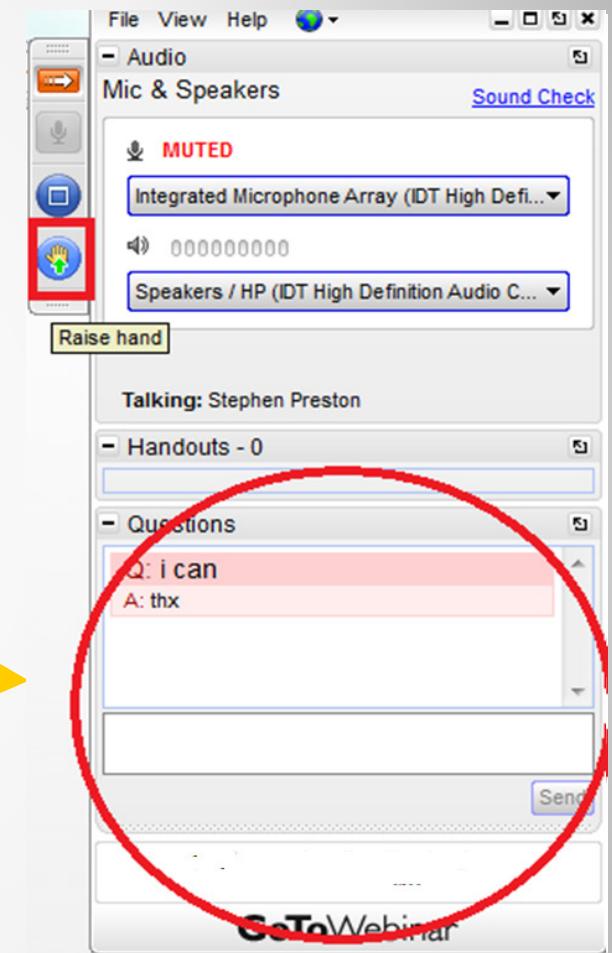
- Register & get a key
developer.autodesk.com
- See documentation & tutorials
developer.autodesk.com/en/docs/model-derivative/v2/overview/
- Reuse code  GitHub
github.com/Autodesk-Forge
- Ask questions  stackoverflow
TAG: [autodesk-model-derivative](#)

To ask questions

- Raise hand to speak

or

- Type a question



Thank you!



@adamthenagy
@AutodeskForge