AUTODESK UNIVERSITY

SD21005

Unleash Your Autodesk Data with Forge Platform Data Managemenet API

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Learning Objectives

- Review requirements to access Forge Platform Data Management
- Understand Forge Platform DM data structure
- Read, write, and share information hosted by Autodesk
- Learn how to mashup with other APIs

Description

Learn how to unleash data hosted on Autodesk, Inc., with the Forge Data Management API. We will cover how to access, create, and share using Node.js sample coding on web-based apps. You'll also learn how to integrate with other data providers, from both Autodesk and third parties. This session features Forge.

Your AU Expert(s)

Augusto Goncalves has been an API evangelist at Autodesk, Inc., since 2008. He works with all sorts of technologies, from classic desktop to modern mobile and web platforms, including .NET for AutoCAD software and Revit software, and JavaScript application programming interface for NodeJS.

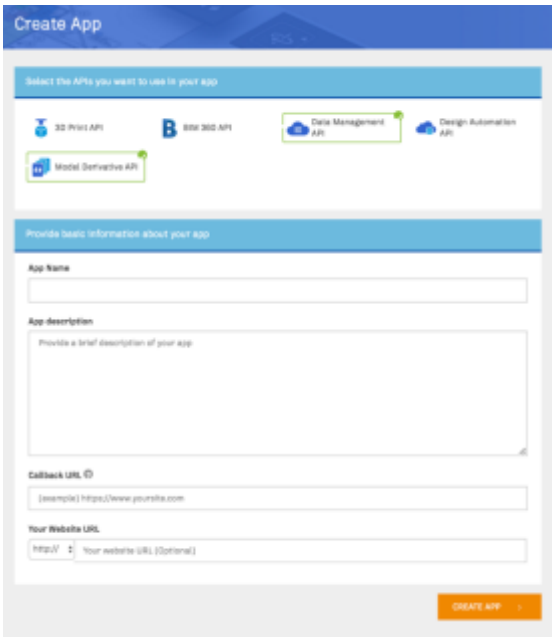
Sharmila Phadnis has been working in Autodesk for the last 4 years. She started as a Software Engineer in the Office of the CTO working for research projects such as Dreamcatcher and has recently ventured into Product management. She is currently working in cloud platforms group at Autodesk; her areas of interest include Data and Analytics, API Design, Cloud Computing, User Research. Prior to joining Autodesk, Sharmila was working as a Software developer on SaaS products.

Introduction

This class will present the Data Management API, part of the Autodesk Forge platform. In summary, it allows access to data hosted on OSS (Object Storage Service), which is the underlying storage. On top of it, there are two approaches to access the data: user data under A360 or Fusion hubs & project; and application buckets, used by 3rd party applications transparently. First, this material will list the requirements to use Data Management API. Then, second, go deep into how data is organized. Next point the main API endpoints to read, write and share the date. Finally, a few examples of integrations (also known as mashups).

The requirements to access Forge Platform Data Management

First, you'll need to create an account at the Developer Portal (http://developer.autodesk.com) and create an app. At this page, shown at the image on left, make sure to select Data Management API and, optionally, Model Derivative API. The *Callback URL* is used for 3-legged OAuth (when the data is stored under the end-user account), but is not used for 2-legged OAuth (when the data is stored on the application bucket). For more about differences between these 2 models, please review the respective tutorials at the Developer Portal.



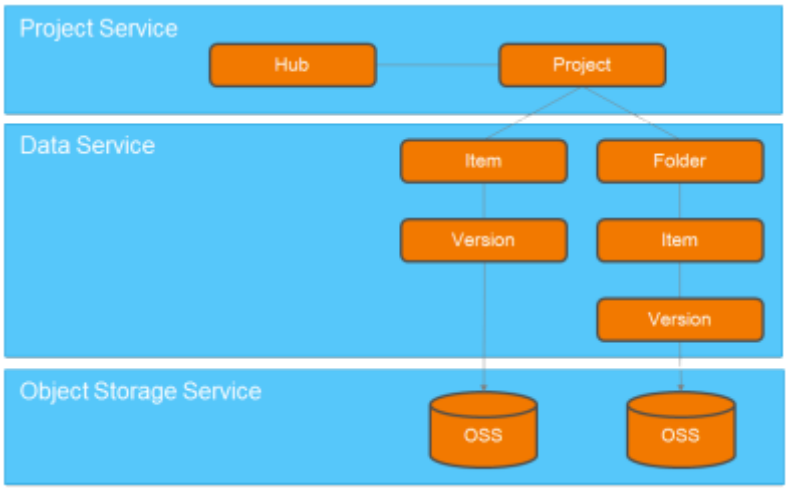
CREATE APP WEB PAGE

Forge Platform Data Management API data structure

Ultimetly eveything is stored under OSS (Object Storage Service), but would without an organization would be really hard to locate a specific file or resource. That's why the Data Management API introduces the Hubs, Projects, Folders, Items and Versions.

Each end-user account have, by default, at least his own hub named with the same end-user name. Inside this hub, the end-user can create projects. To access this, the Data Management API have the **Project Service** end-points for hubs and projects. As end-users can create new hubs and share team (e.g. for team work), an account can have multiple hubs. Next, inside each project, an end-user can create items (i.e. a file) with multiple versions. Every item will have, at

least, the first version. The project have a root folder, by default, and this can have as many subfolders as needed, in order to organize it better. This is accessible by **Data Service** end-points. The image below show a schematic version of this data structure.

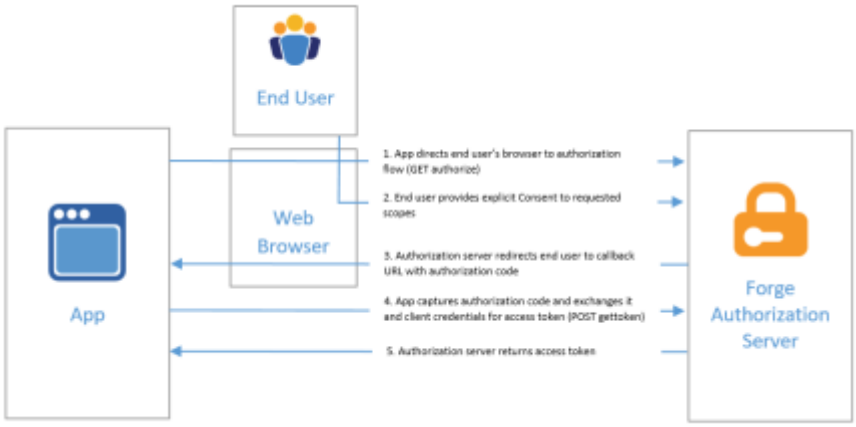


HUBS & PROJECTS ABSTRACTION ON TOP OF OSS

The actual file is not stored under this structure, but on a storage location on **Object Storage Service** (OSS). The item version has a storage attribute that defines this location, used to upload or download files.

Read, write, and share information hosted by Autodesk

Any file stored on OSS is encrypted and bounded to the account, either application or end-user. For application data we'll use 2-legged OAuth, which is authenticated by the developer client ID & secret and generated the access token. For end-user data we'll use 3-legged OAuth, where the end-user (via his/her login and password) authorize the developer to access the data on a predefined scope via the access token. The image below describes the OAuth 3-legged flow, which is an industry standard.



OAUTH 3-LEGGED FLOW

The developer portal has an updated list of all end-points available to read (view, download) & write (upload) an item version. As of today (November, 2016), there are end-points for read/list

hubs and project, read/list and create folders, items and versions. Please check at the portal for new features.

Learn how to mashup with other APIs

The Data Management API can be used to integrate A360 & Fusion hubs and projects with any other API that handle files, like storage providers. To demonstrate the idea, you can find a JavaScript/NodeJS sample that transfers files from A360 back and to Box storage.

Source-code:
https://github.com/Developer-Autodesk/data.management-nodejs-integration.box

Running sample:
https://forgedmboxintegration.herokuapp.com

For this sample you'll need developer accounts on Autodesk and Box (see more information at https://developer.box.com). On both cases, as the files are stored under end-user accounts, you'll need to implement 3-legged OAuth flows (as mentioned before, this is an industry standard). Finally, for testing, you'll need end-users accounts on A360 and Box with a few files (e.g. design drawings, such as .DWG or .RVT). On the sample, select a folder on one provider and right-click on a file on the other provider to transfer.

Conclusion

Data Management API, part of Forge platform, is evolving fast, including new features on every development cycle. Due that, this handout does not have a list of what's possible, but rather focus on explaining the overall concept that drives the API.

Hub and Projects are the main organization units, including then folders, items and respective versions. All of these are abstractions on top of OSS, but important to organize the data in a way that makes sense for our industry.

Everything is heavily encrypted and bounded to accounts, so developer authentication or end-user authorization is required to access anything. With that it's possible to read and write data, including download (read) and upload (write), which is key to integrate with other services.

Go to the Developer Portal, that's the source of truth on Forge services and have an updated list of everything that is available.

And, finally, thank you for attending this session! I hope you found the class enjoyable and valuable.