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Actualización de BIM 360 API's y más allá

Jaime Rosales D.

Senior Developer Advocate, Forge

Autodesk | @afrojme

Jaime Rosales

Senior Developer Advocate, Forge Developer, Advocacy & Support Autodesk

Dynamic, accomplished Sr. Developer Advocate with Autodesk, highly regarded for 8+ years of progressive experience in Software Development, Customer Engagement, and Relationship Building for industry leaders. He's part of the team that helps partners/customers create new products and transition to the cloud with the use of Autodesk's new Platform - Forge.

He has been recently involved in the development of AWS Quick Start to support Forge Applications.

Safe Harbor

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October 6, 2020

Agenda

- Autodesk Construction Cloud Overview
- BIM 360 & API Status and Updates
- Assets API
- Relationship API
- In Pipeline

Autodesk Construction Cloud

AUTODESK **CONSTRUCTION CLOUD**™

Assemble

BIM 360

BuildingConnected

PlanGrid

AUTODESK **CONSTRUCTION CLOUD**™

AUTODESK
BIM COLLABORATE

AUTODESK
QUANTIFY

AUTODESK
COORDINATE

AUTODESK
BUILD

AUTODESK **DOCS**

Models · Drawings · Issues · Specifications · RFIs · Cost · Assets · As-Builts · Photos · Videos

INSIGHTS

Dashboards · Reports · Construction IQ · Data Connector

ADMINISTRATION

User Management · Autodesk ID · Project Administration

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AUTODESK **CONSTRUCTION CLOUD**™

	AUTODESK **BIM COLLABORATE**	AUTODESK **COORDINATE**	AUTODESK **QUANTIFY**	AUTODESK **BUILD**				
Capabilities	Design Collaboration	Coordination	Quantification	Project Management	Cost Management	Quality	Safety	Project Closeout
Workflows	• Constructability Review • Change Visualization • Revit Collaboration	• Model Coordination • Constructability Review • Quality Planning • Issue Management	• Scope Analysis • 2D/3D Take Off	• RFIs • Submittals • Meeting Minutes • Daily Reports • Progress Tracking	• Contract Creation / Administration • Change Orders • Payment Applications • Forecasting	• Quality Planning • Quality Checking • Punchlists • Issue/Task Management	• Safety Planning • Safety Training • Safety Observations • Safety Inspections	• Commissioning • Turnover Documentation • Warranty Mgmt. • Final Completion • As-Built Survey
	Document Management	Document Control · Document Versioning · Document Approvals						
Unified Data		Models · Drawings · Documents · Cost Items · Assets · As-Builts · Photos · Videos						
Insights		Dashboards · Reports · Construction IQ · Data Connector						
Admin		Admin Console · Permissions · Project Setup · Templates · Notifications						

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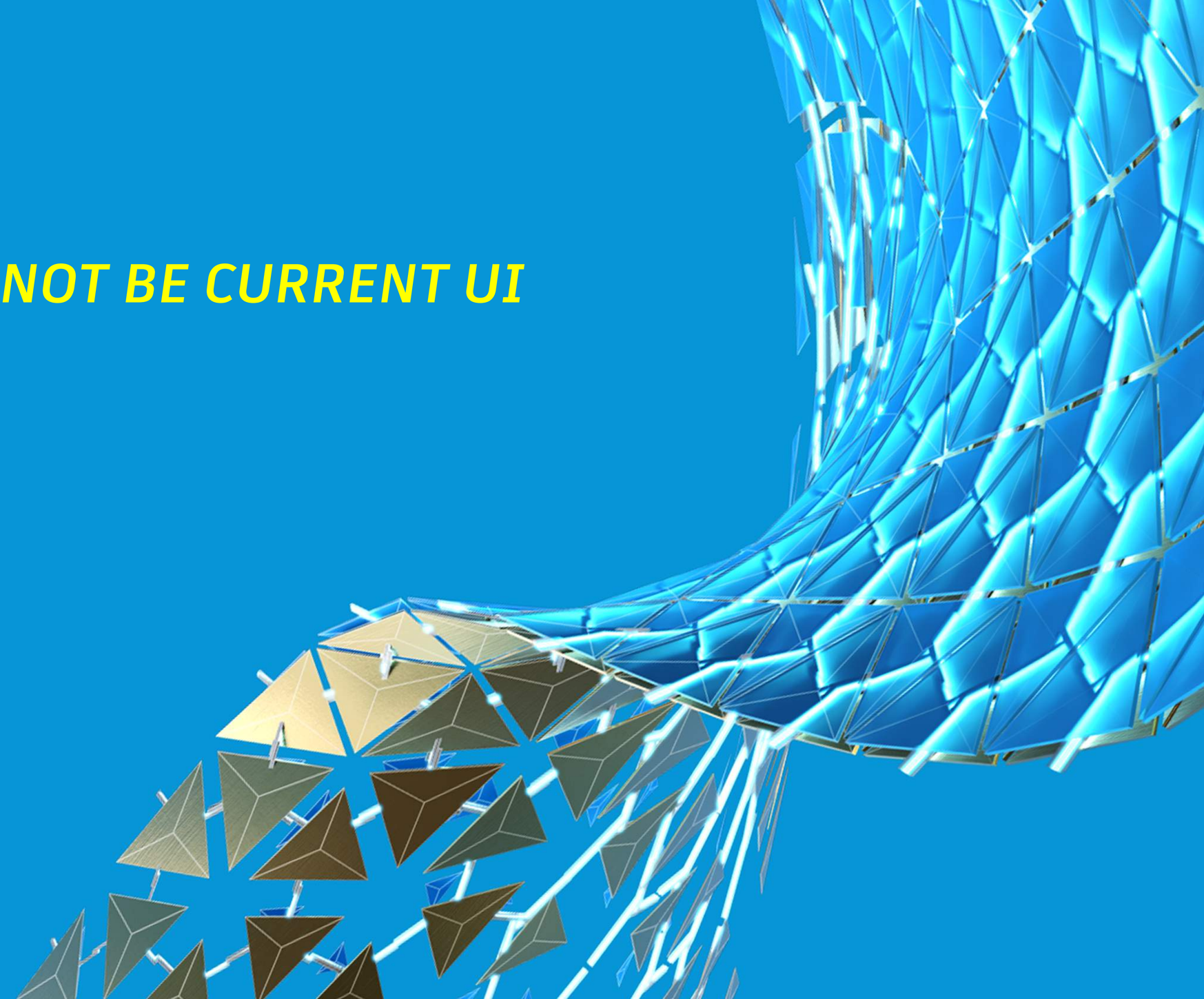
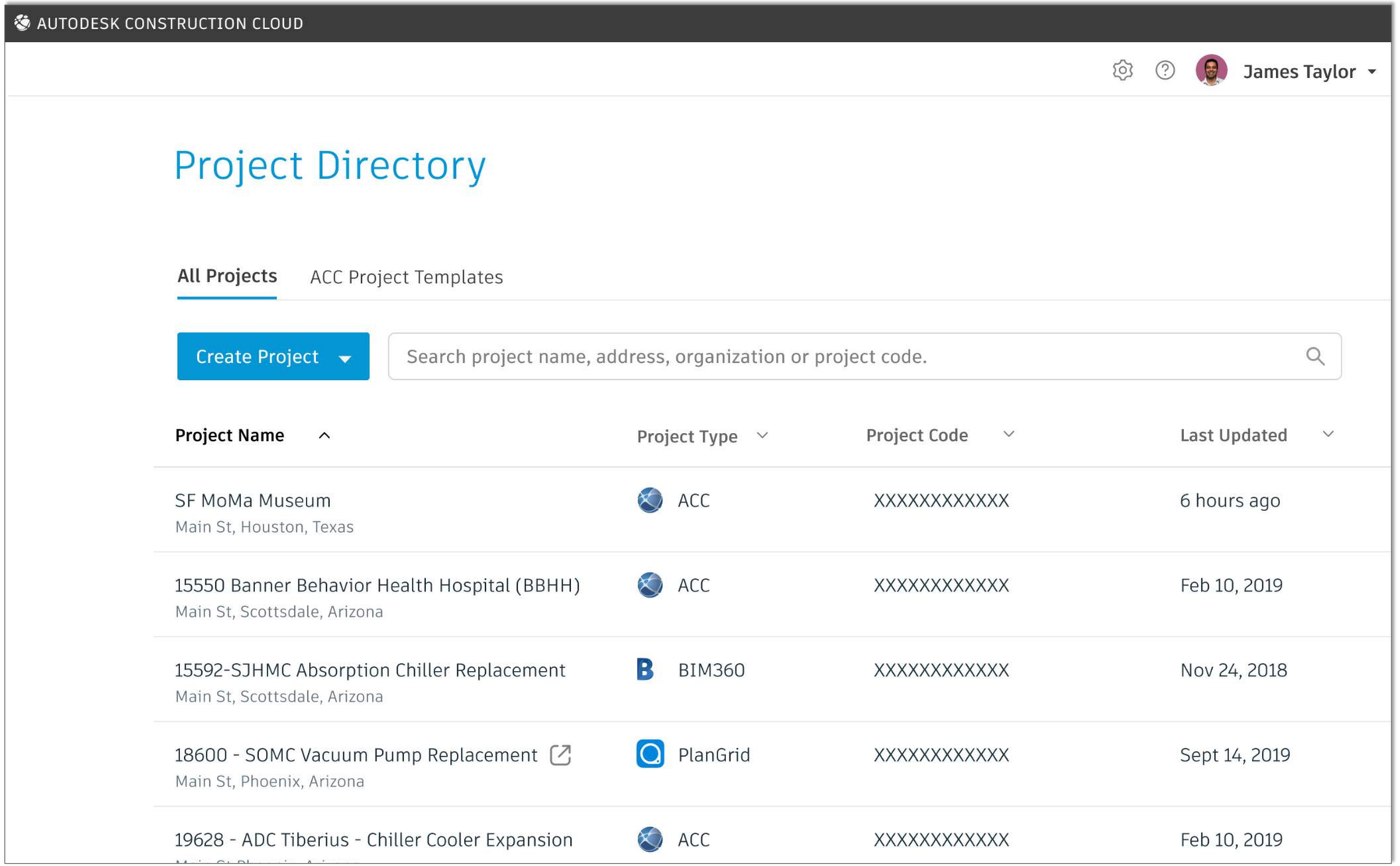
Product UI

Disclaimer: MAY NOT BE CURRENT UI





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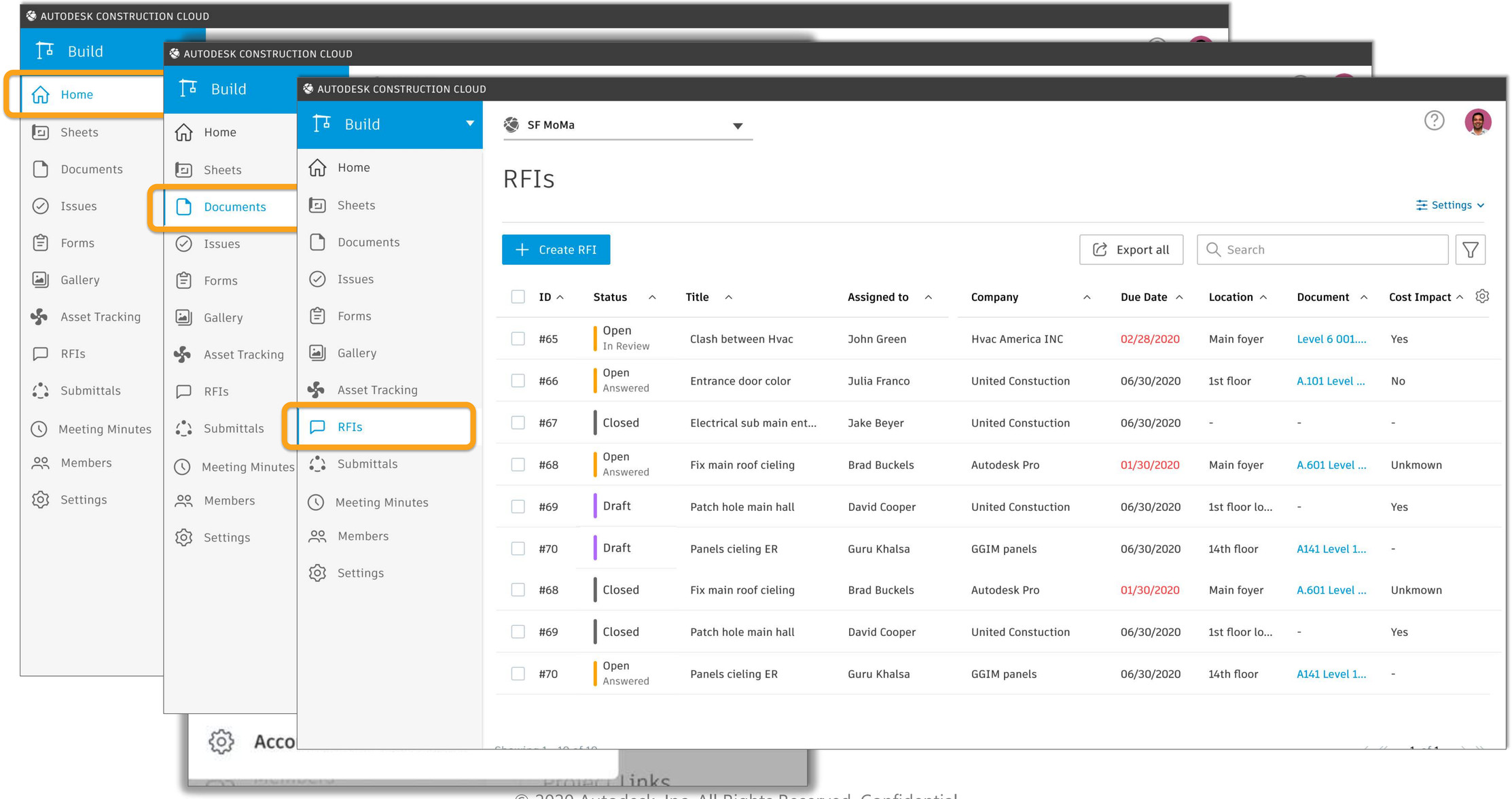

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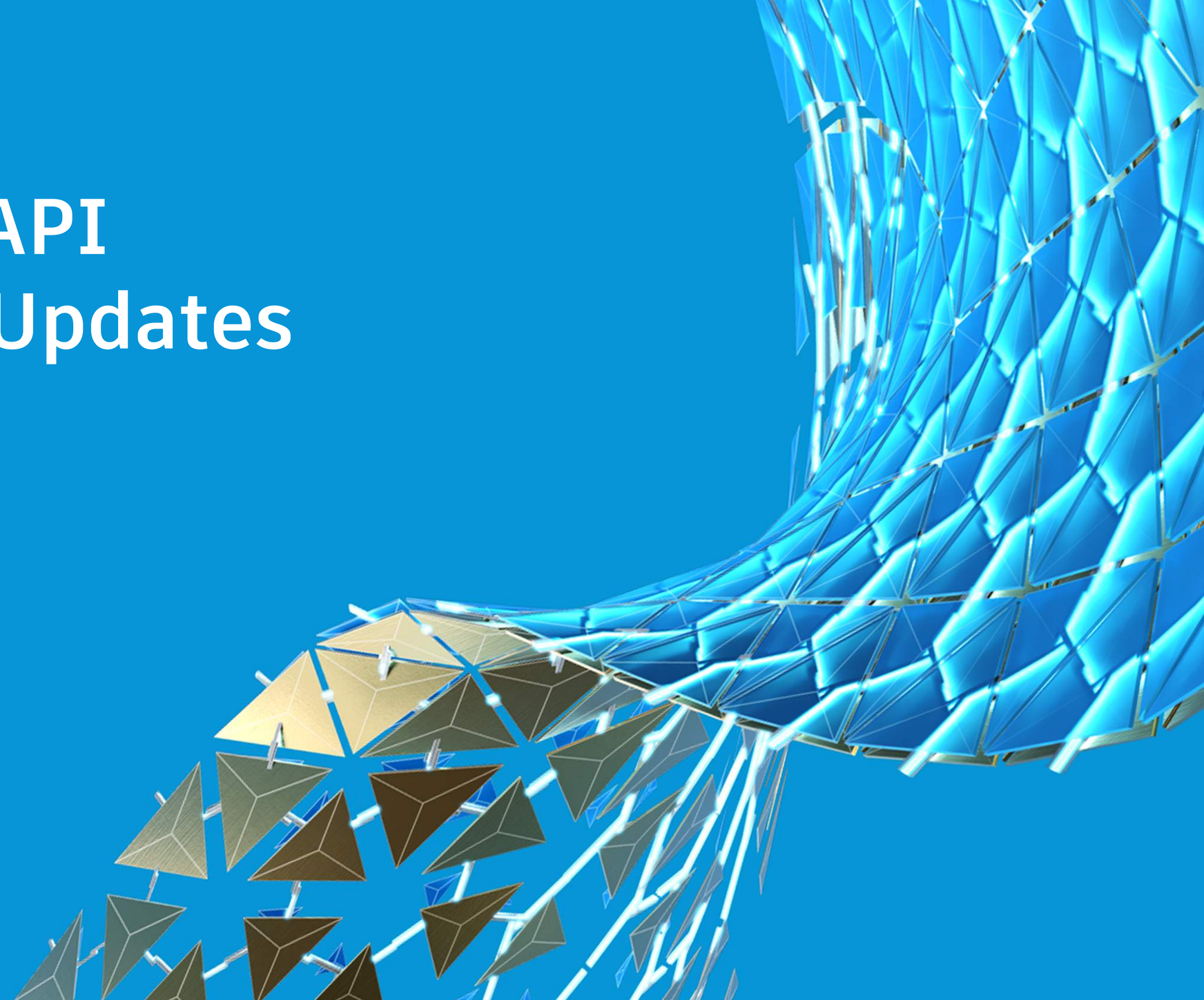
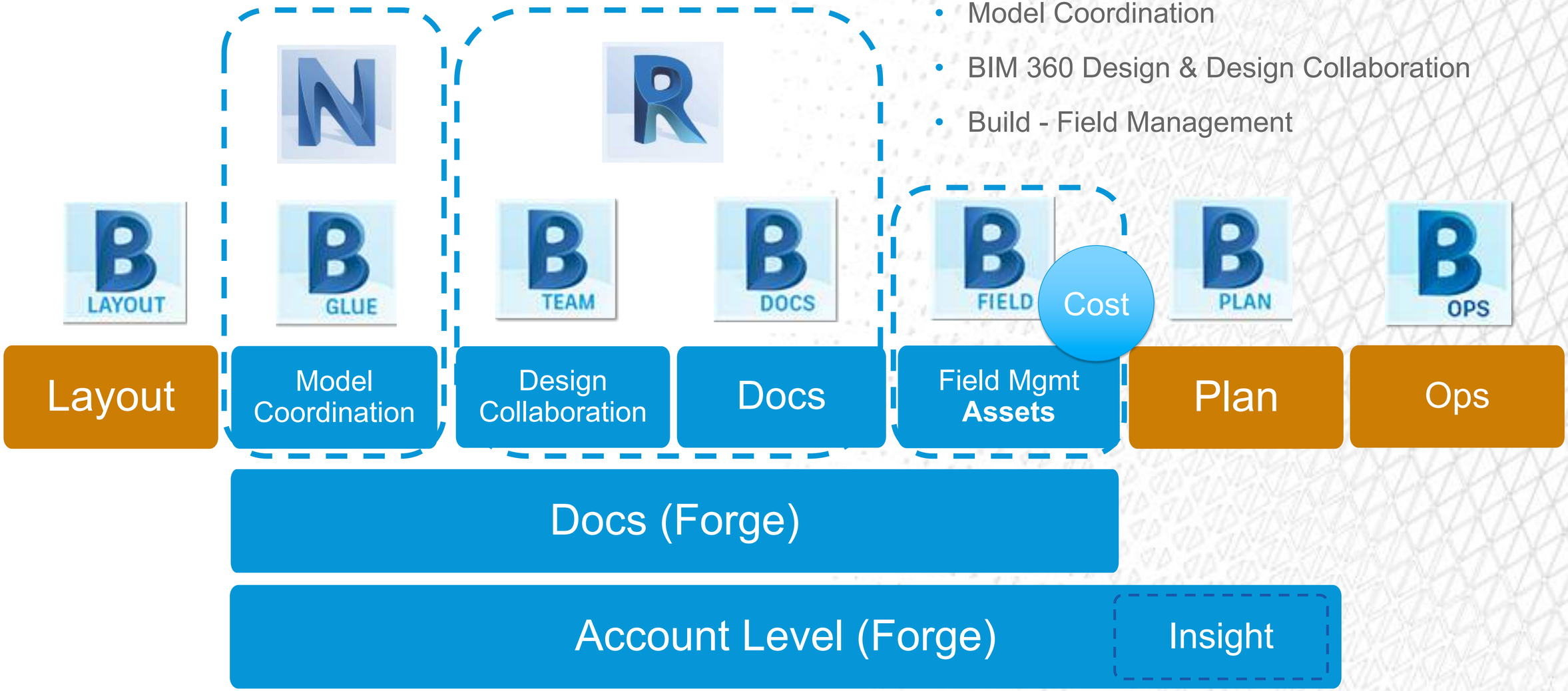
BIM 360 & API
Status and Updates



BIM 360 Family Products

Next generation modules

- Model Coordination
- BIM 360 Design & Design Collaboration
- Build - Field Management



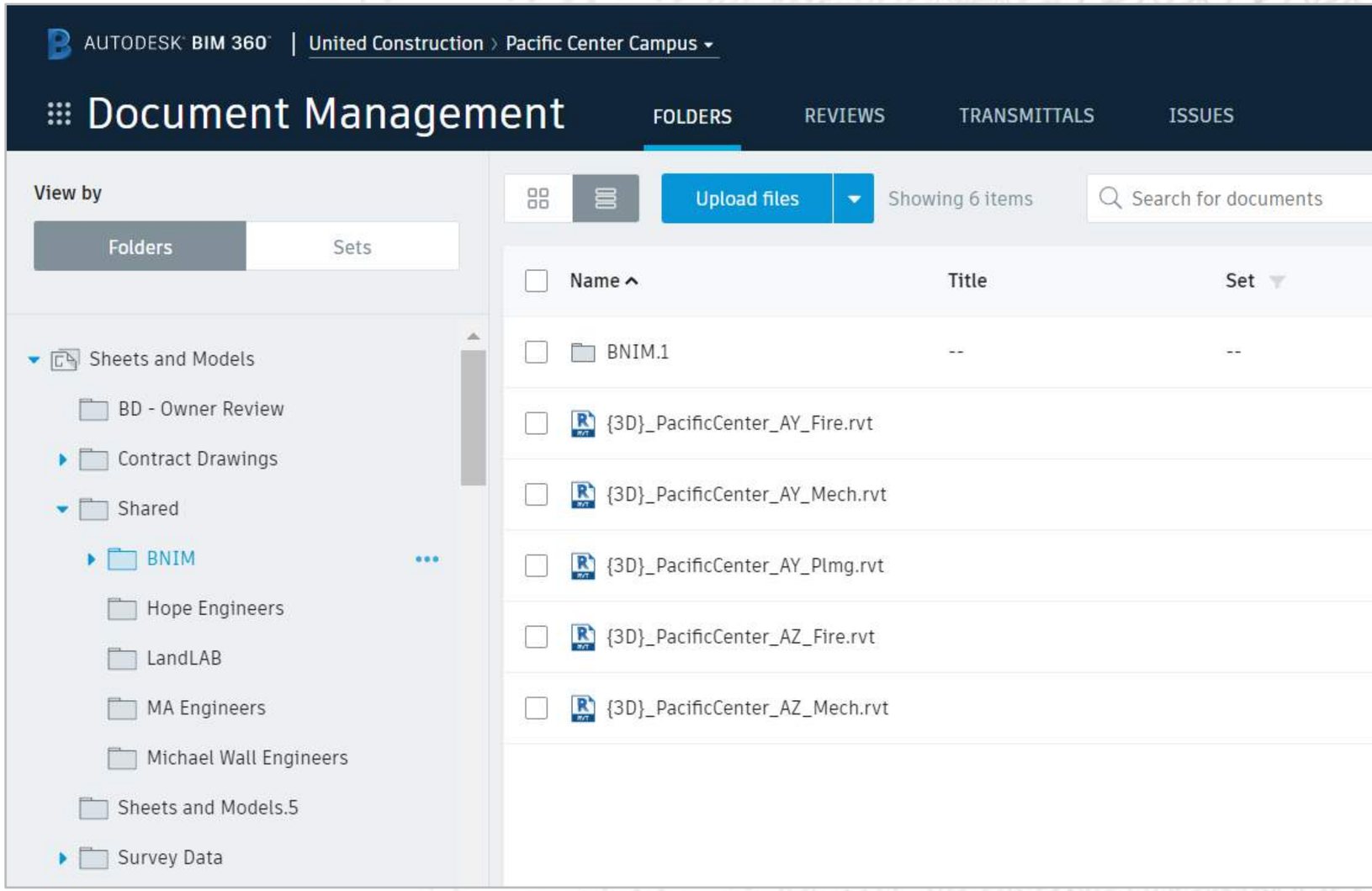
BIM 360 Modules

Document Management

Document Management

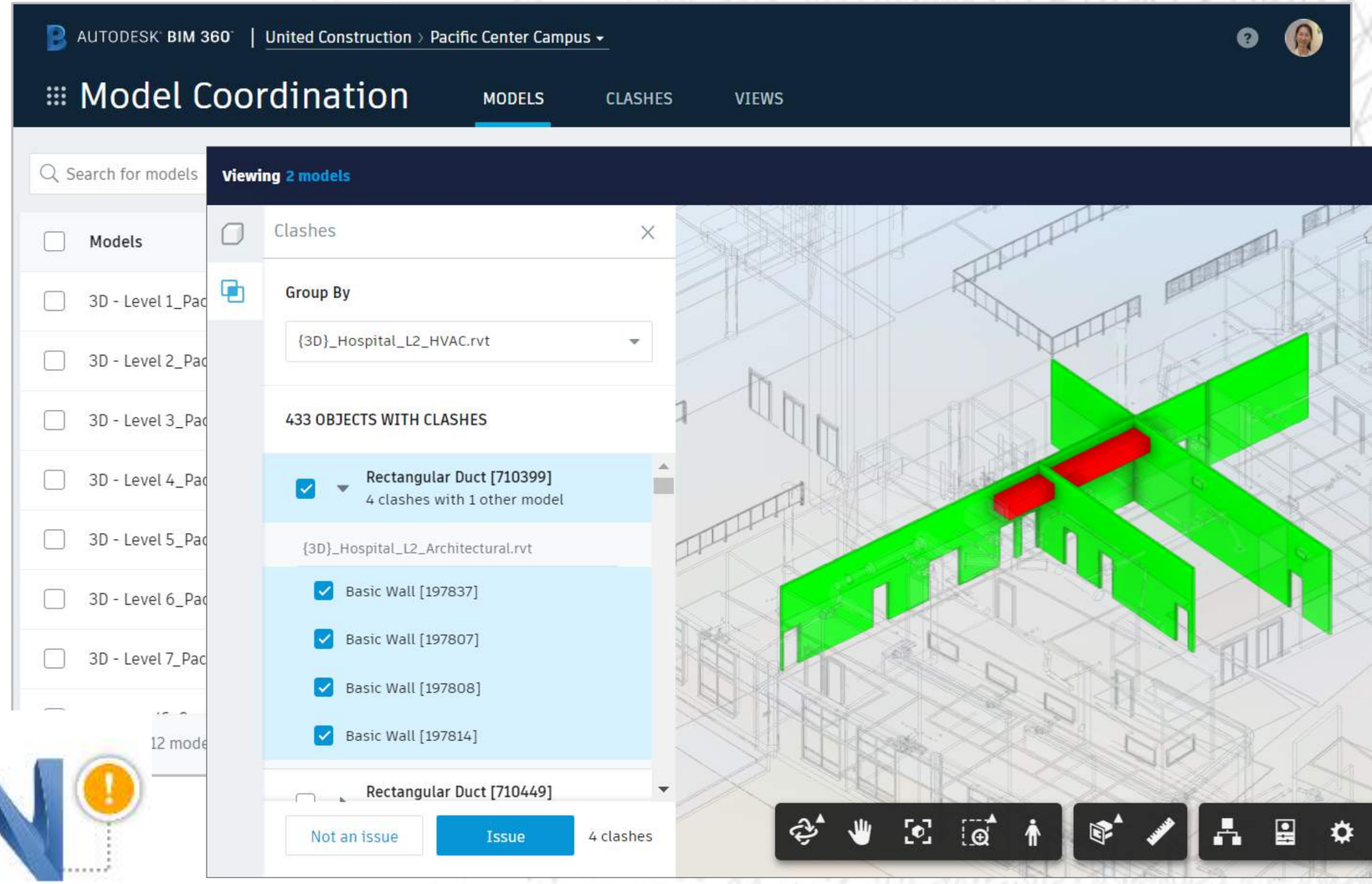
- **Data Management API**
- **API Enhancements:**
  - Folder permissions (r/w)
  - Custom attribute values (r/w)*1

*1) Definition next



Model Coordination

- Navisworks + Model Coordination integration
- **API Enhancements**
  - *Officially out of beta!*
  - Project Files folder support
  - Relationship API



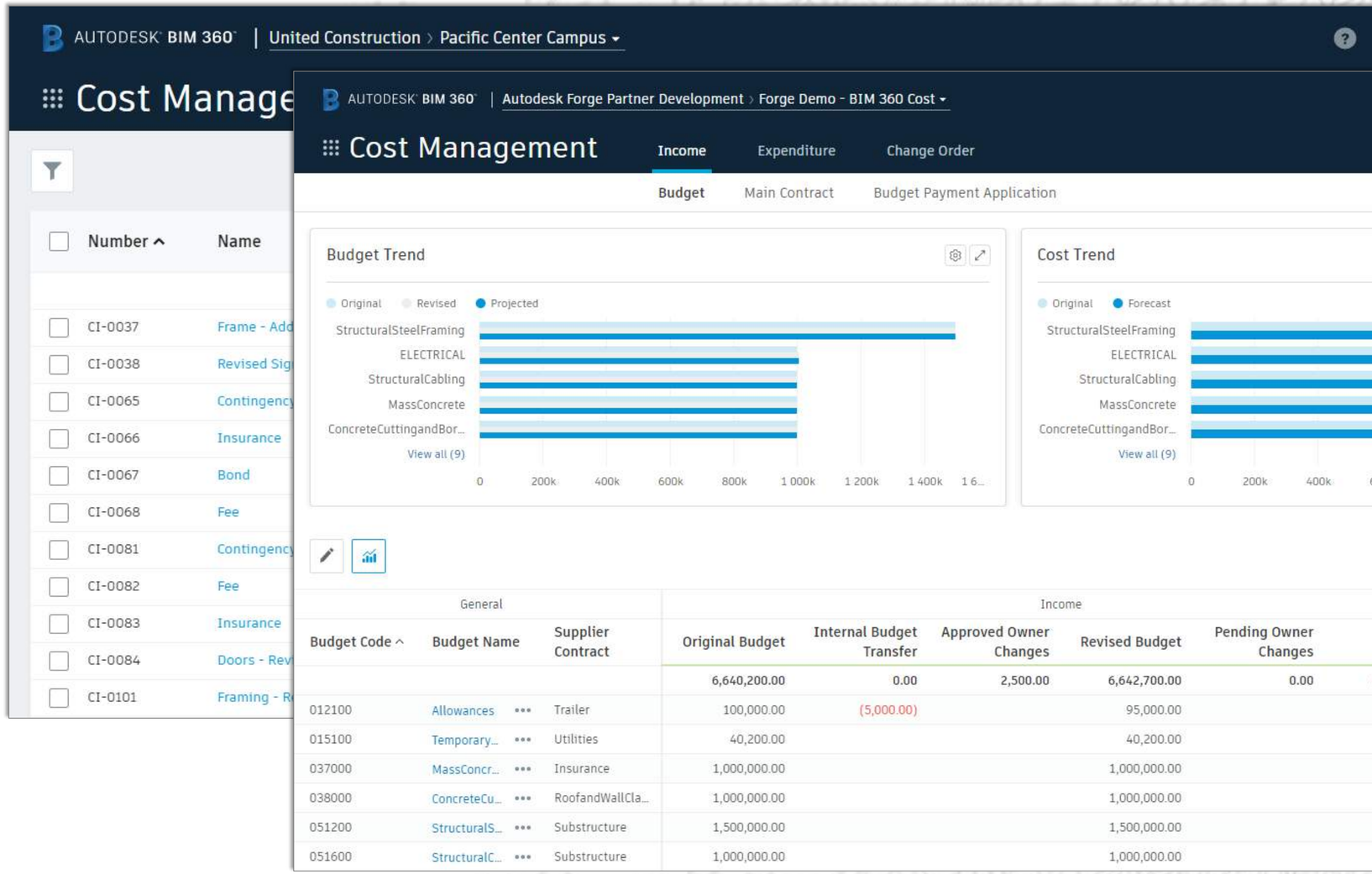
Cost Management

Cost Management

API Enhancement

- Budget code template
- Create/update/search external relationships*1

👍 Both based on requests!



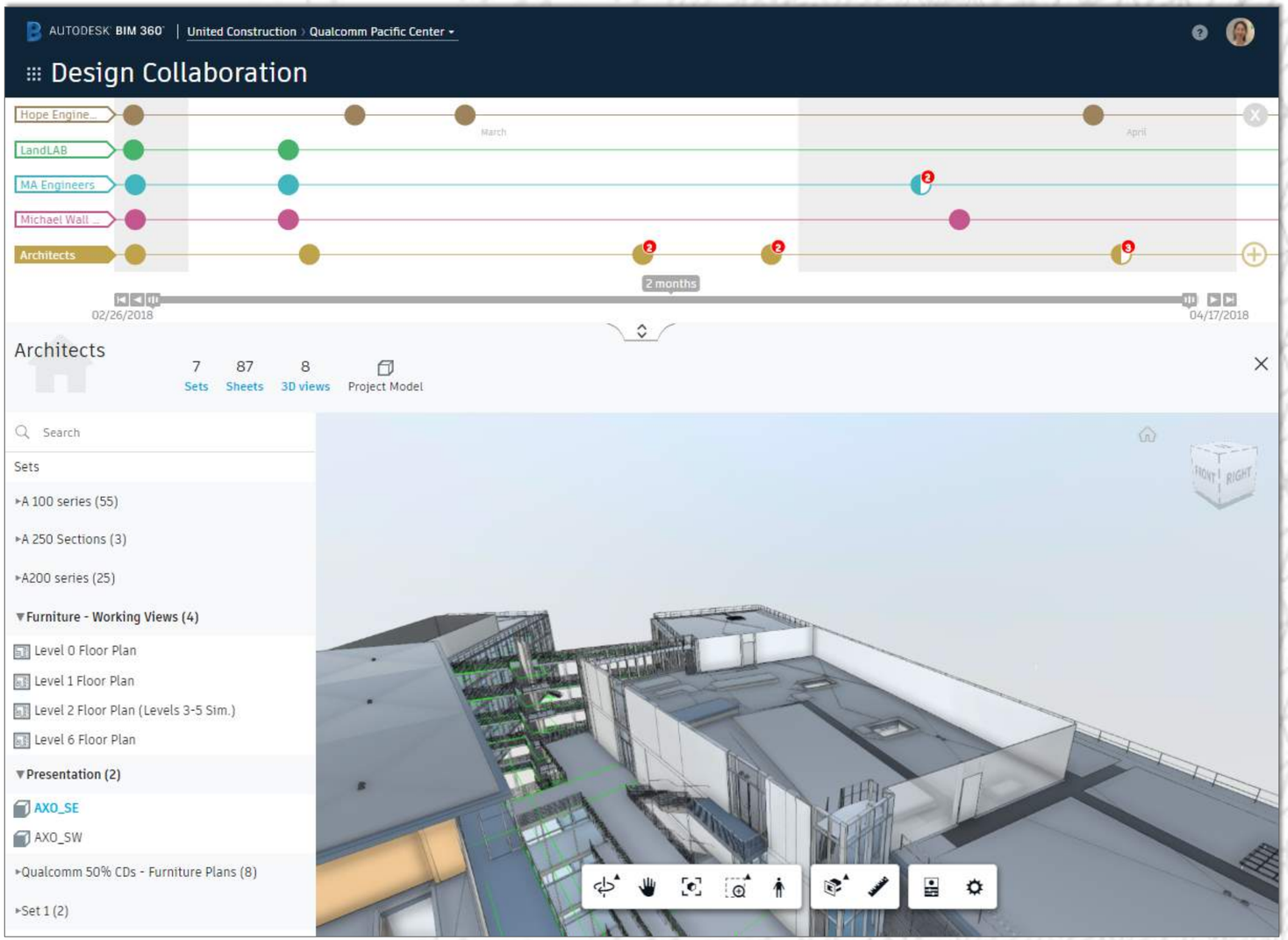
*1) waiting for documentation updated

Design Collaboration

Design Collaboration

Update

- A sample with Revit Cloud Worksharing webhooks events: https://github.com/Autodesk-Forge/forge-bim360notifier
- European data center support



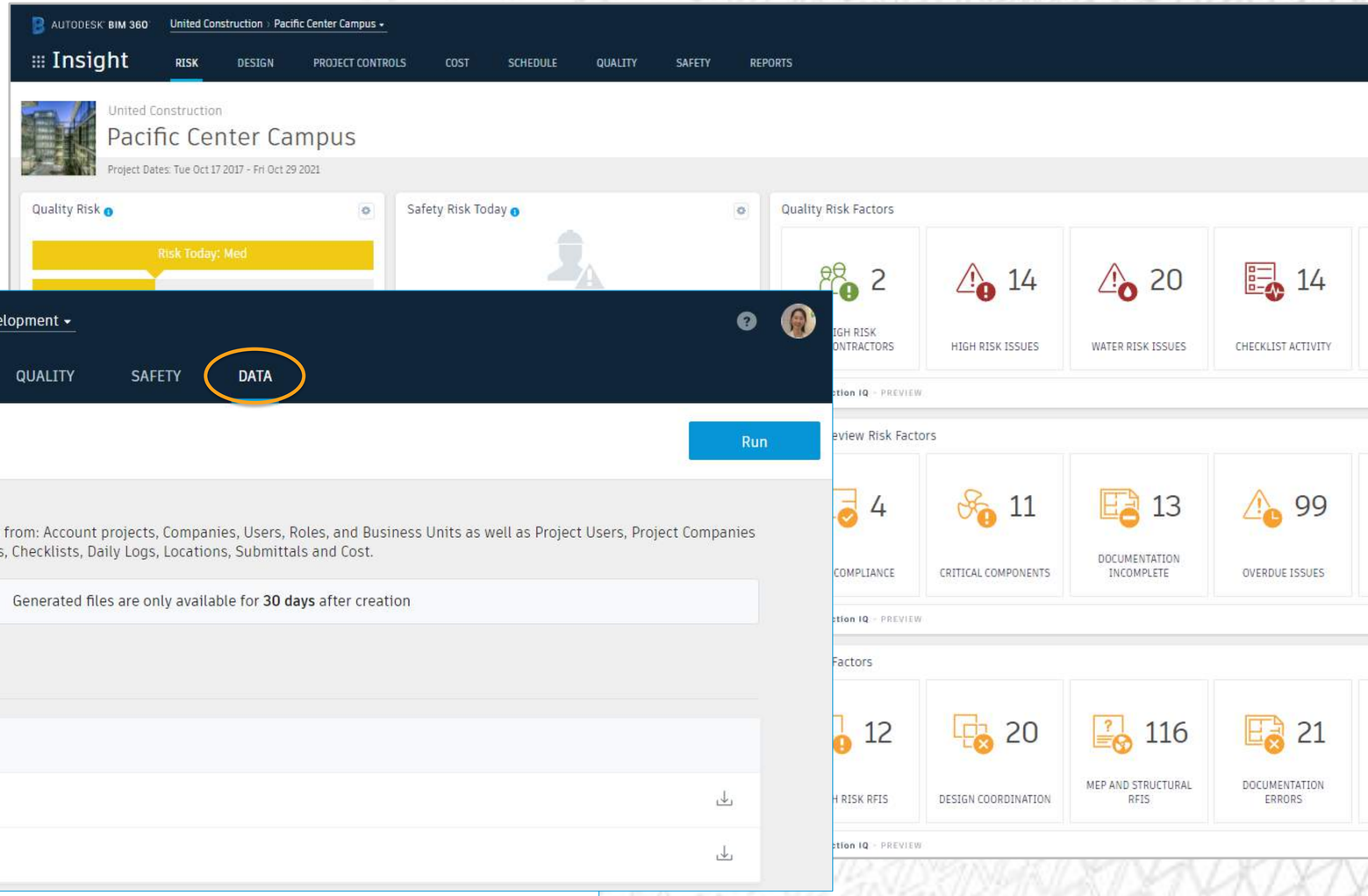
Project Home

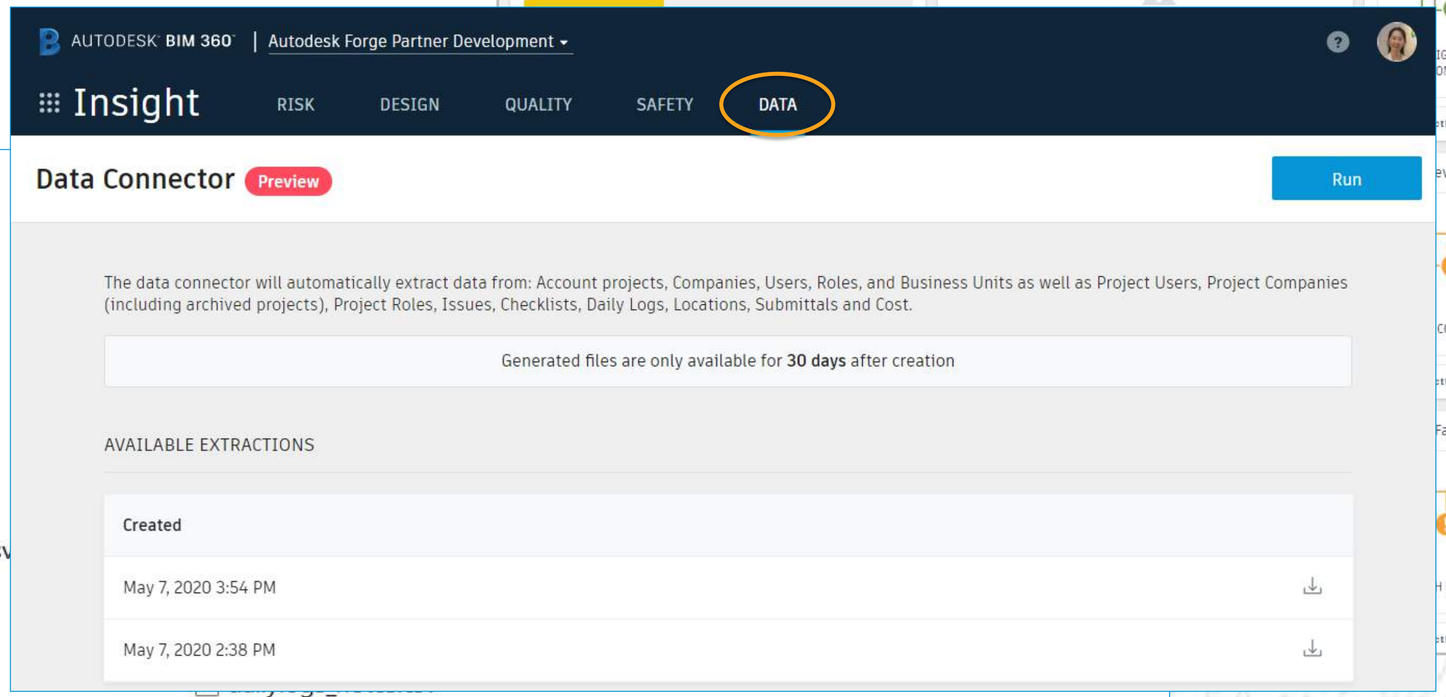
Partner Card

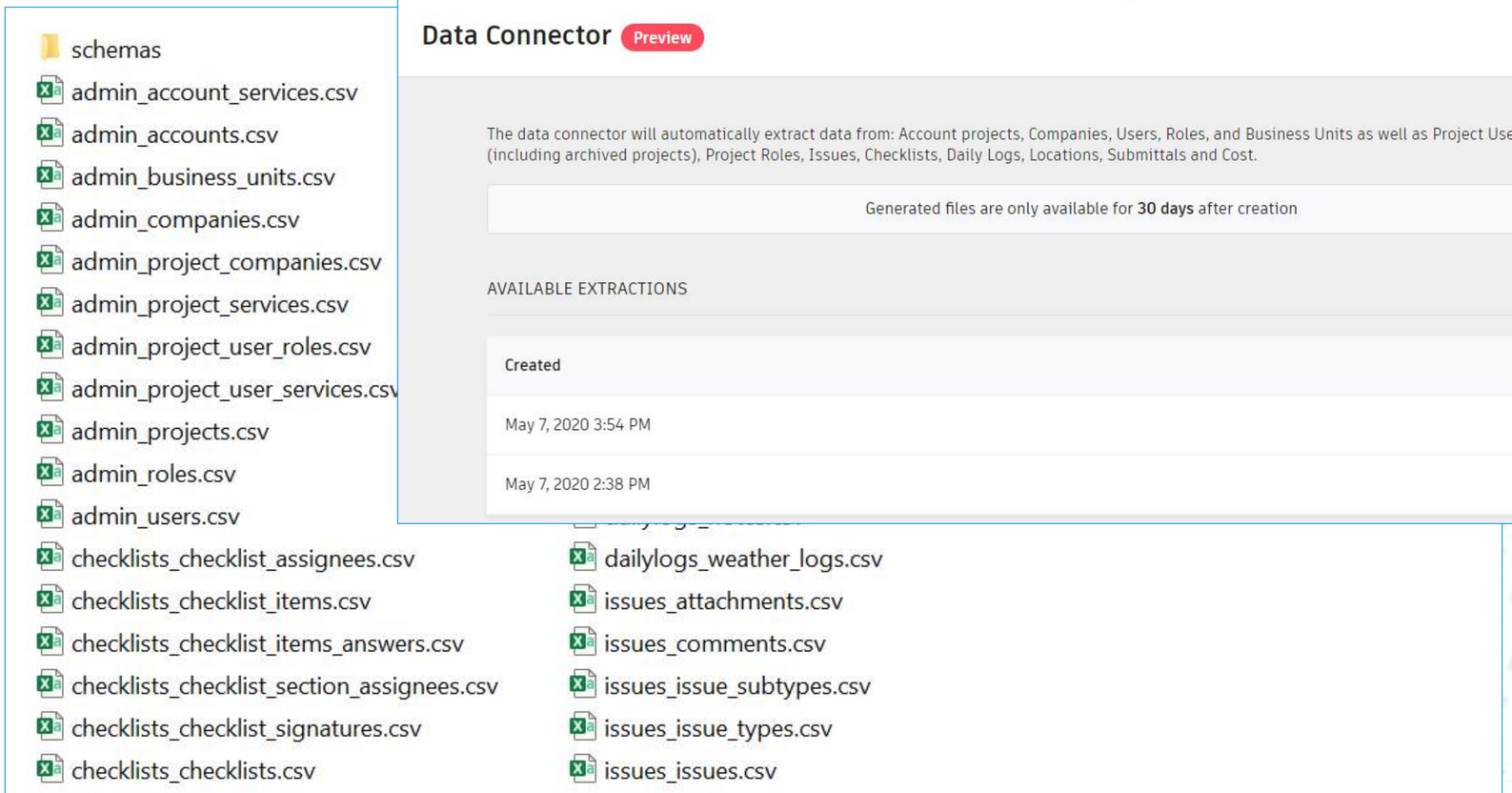
E-mail to:

bim360partnercard@autodesk.com

Insight

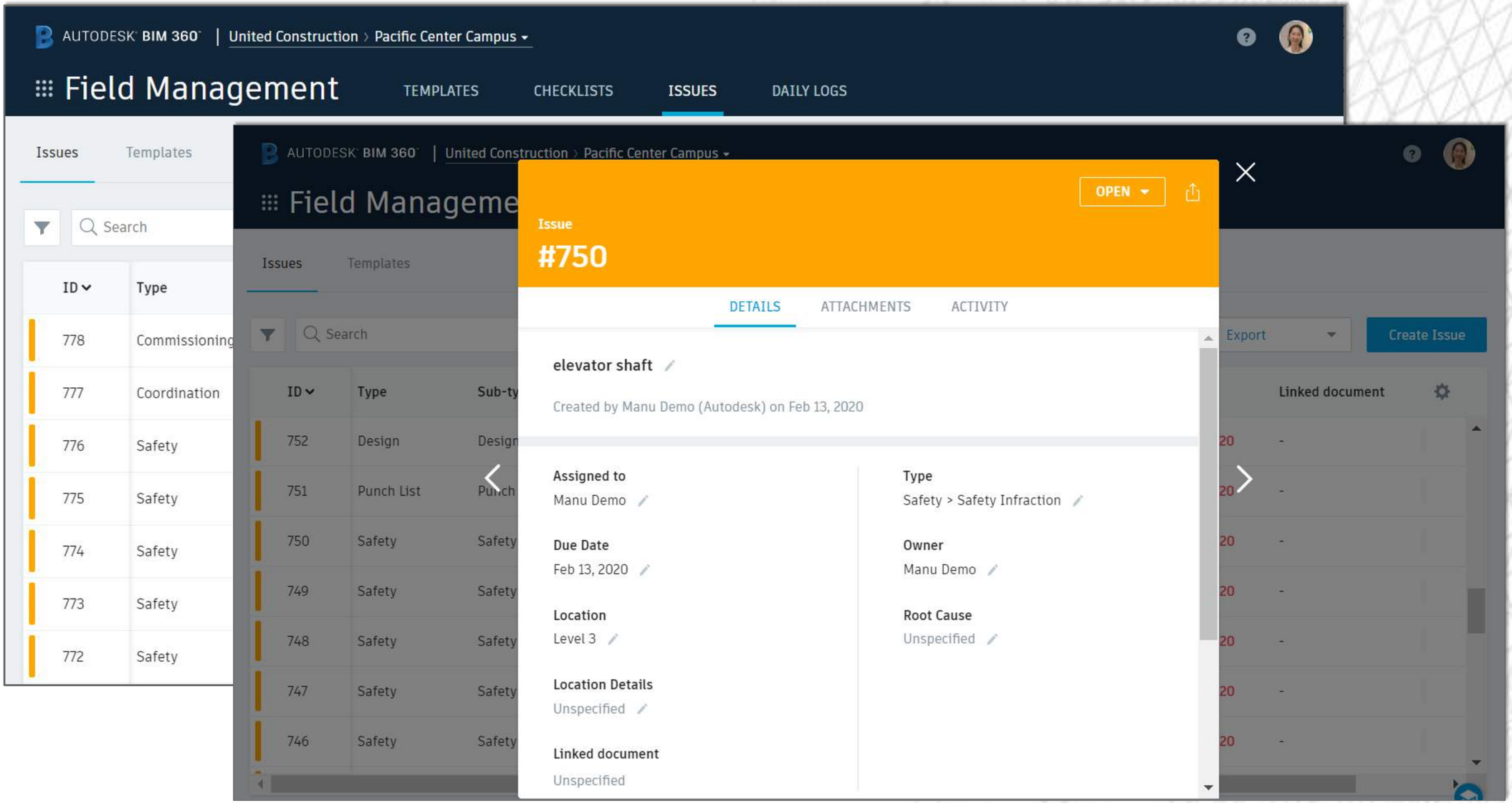

AUTODESK BIM 360
United Construction › Pacific Center Campus
Insight
RISK
DESIGN
PROJECT CONTROLS
COST
SCHEDULE
QUALITY
SAFETY
REPORTS
United Construction
Pacific Center Campus
Project Dates: Tue Oct 17 2017 - Fri Oct 29 2021
Quality Risk
Risk Today: Med
Safety Risk Today
Quality Risk Factors
2
14
20
14
HIGH RISK ISSUES
WATER RISK ISSUES
CHECKLIST ACTIVITY
4
11
13
99
CRITICAL COMPONENTS
DOCUMENTATION INCOMPLETE
OVERDUE ISSUES
12
20
116
21
DESIGN COORDINATION
MEP AND STRUCTURAL RFIS
DOCUMENTATION ERRORS


AUTODESK BIM 360
Autodesk Forge Partner Development
Insight
RISK
DESIGN
QUALITY
SAFETY
DATA
Data Connector
Preview
Run
The data connector will automatically extract data from: Account projects, Companies, Users, Roles, and Business Units as well as Project Users, Project Companies (including archived projects), Project Roles, Issues, Checklists, Daily Logs, Locations, Submittals and Cost.
Generated files are only available for 30 days after creation
AVAILABLE EXTRACTIONS
Created
May 7, 2020 3:54 PM
May 7, 2020 2:38 PM


schemas
admin_account_services.csv
admin_accounts.csv
admin_business_units.csv
admin_companies.csv
admin_project_companies.csv
admin_project_services.csv
admin_project_user_roles.csv
admin_project_user_services.csv
admin_projects.csv
admin_roles.csv
admin_users.csv
checklists_checklist_assignees.csv
checklists_checklist_items.csv
checklists_checklist_items_answers.csv
checklists_checklist_section_assignees.csv
checklists_checklist_signatures.csv
checklists_checklists.csv
dailylogs_weather_logs.csv
issues_attachments.csv
issues_comments.csv
issues_issue_subtypes.csv
issues_issue_types.csv
issues_issues.csv

Field Management

Field Management

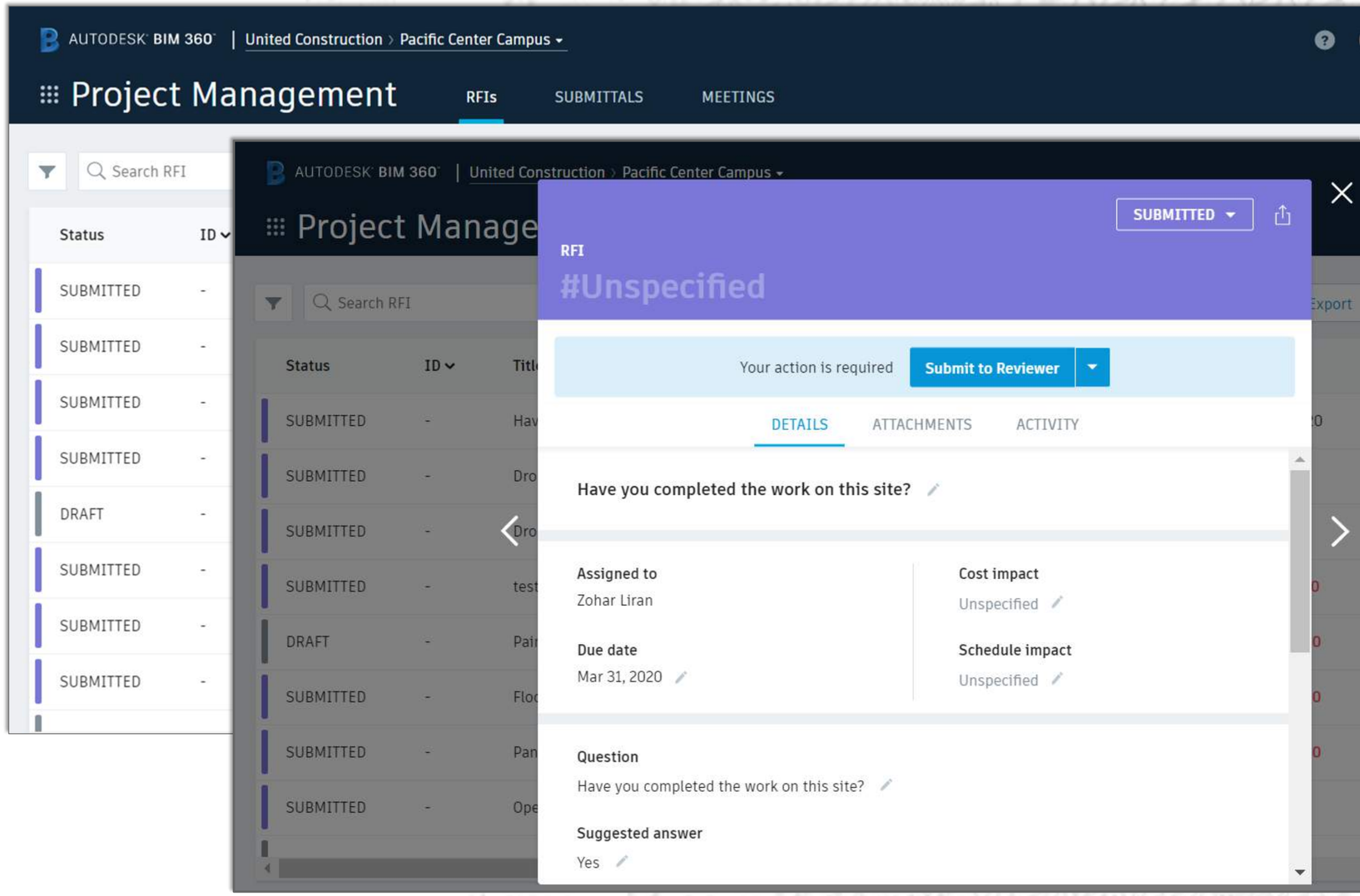


Project Management

Project Management

API Update

- RFI v2



Assets

AUTODESK BIM 360 | Autodesk Forge Partner Development › Forge Sandbox MH

Assets

ASSETS

Asset Tree

All Categories

- Air Handling Units (AHU's)
- Electrical Equipment
- Lighting Devices
- Lighting Fixtures
- Mechanical Equipment
- Plumbing Fixtures
- Pumps

Details

Asset ID	Category	Location	Model
621642	Lighting Fixtures > Rece...	... > Rm 212	-
621643	Lighting Fixtures > Rece...	Tower 2 > 1 Floor	-
621644	Lighting Fixtures > Rece...	... > Rm 116	-
694117	Lighting Fixtures > Rece...	... > Rm 115	-
694251	Lighting Fixtures > Rece...	... > Security Of...	-
694268	Lighting Fixtures > Rece...	... > Elevator Lo...	-
694269	Lighting Fixtures > Rece...	... > Facility Offi...	-

Asset

621642

INSTALLED

DETAILS | ISSUES | CHECKLISTS | ATTACHMENTS

Create Issue

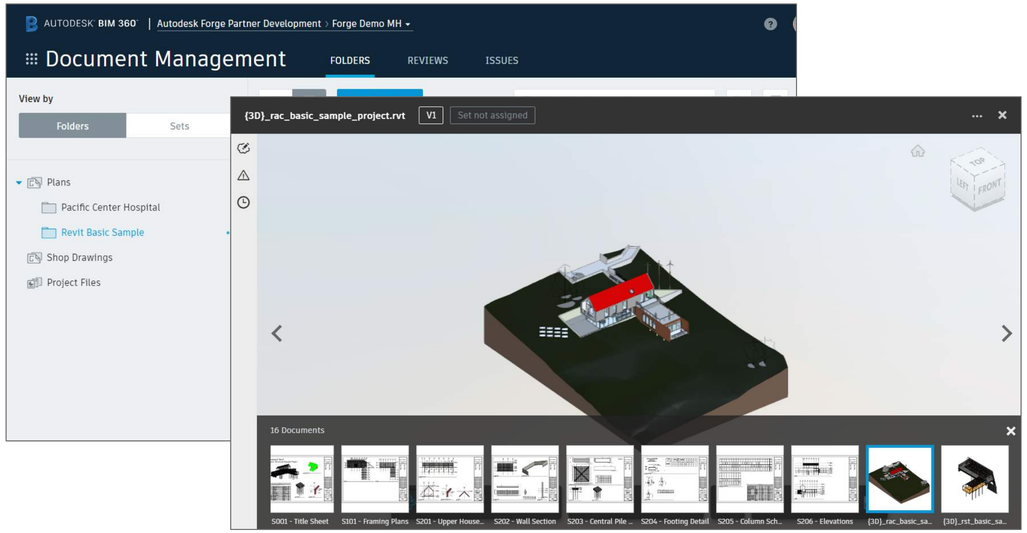
Linked references

Add reference

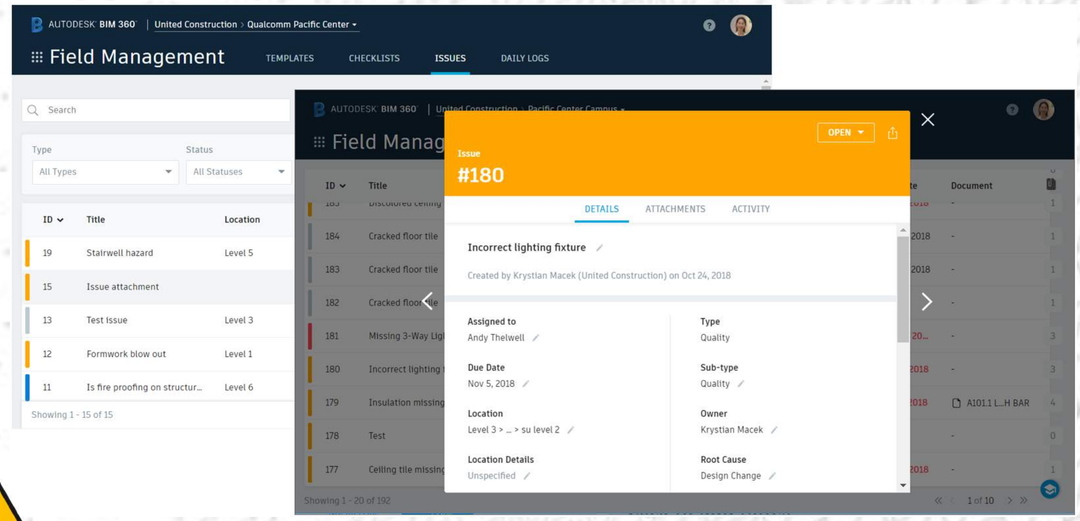
Issue OPEN #35 air handler installation issue

Issues

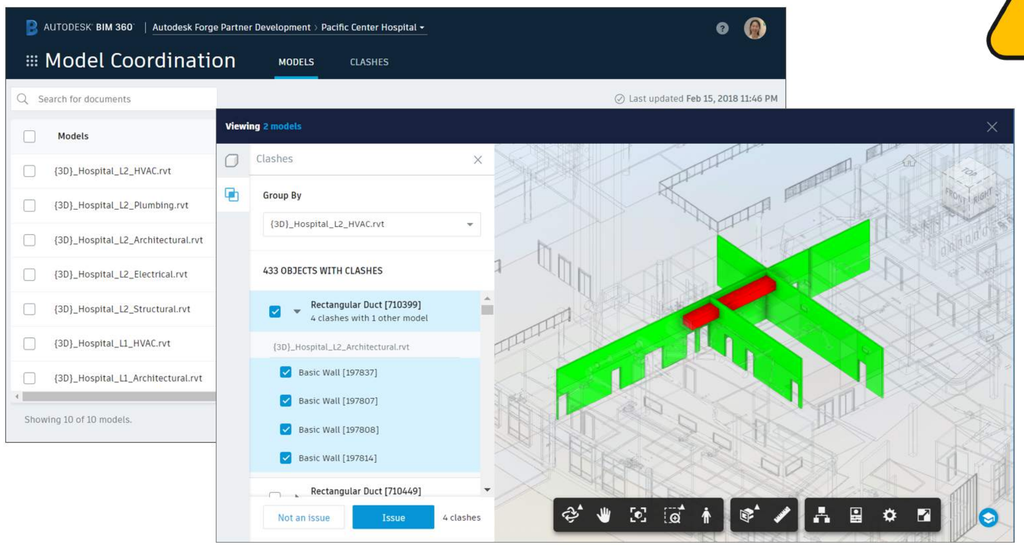
Document Management



Field Management



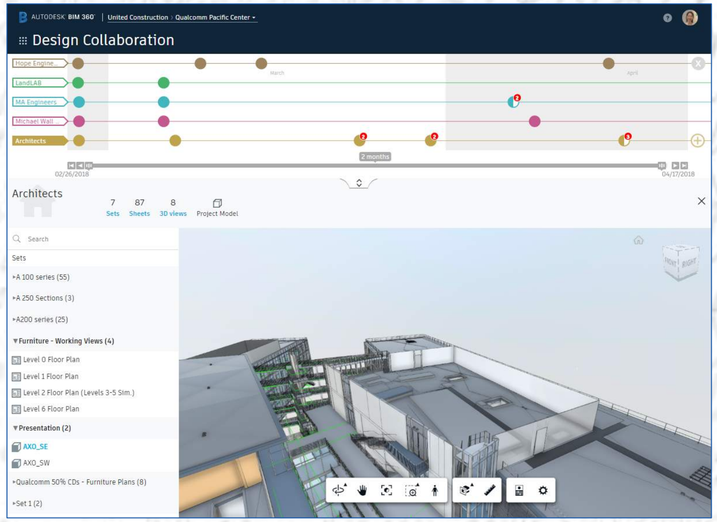
Model Coordination



Navisworks BIM 360 Issues

Revit Issues Add-in

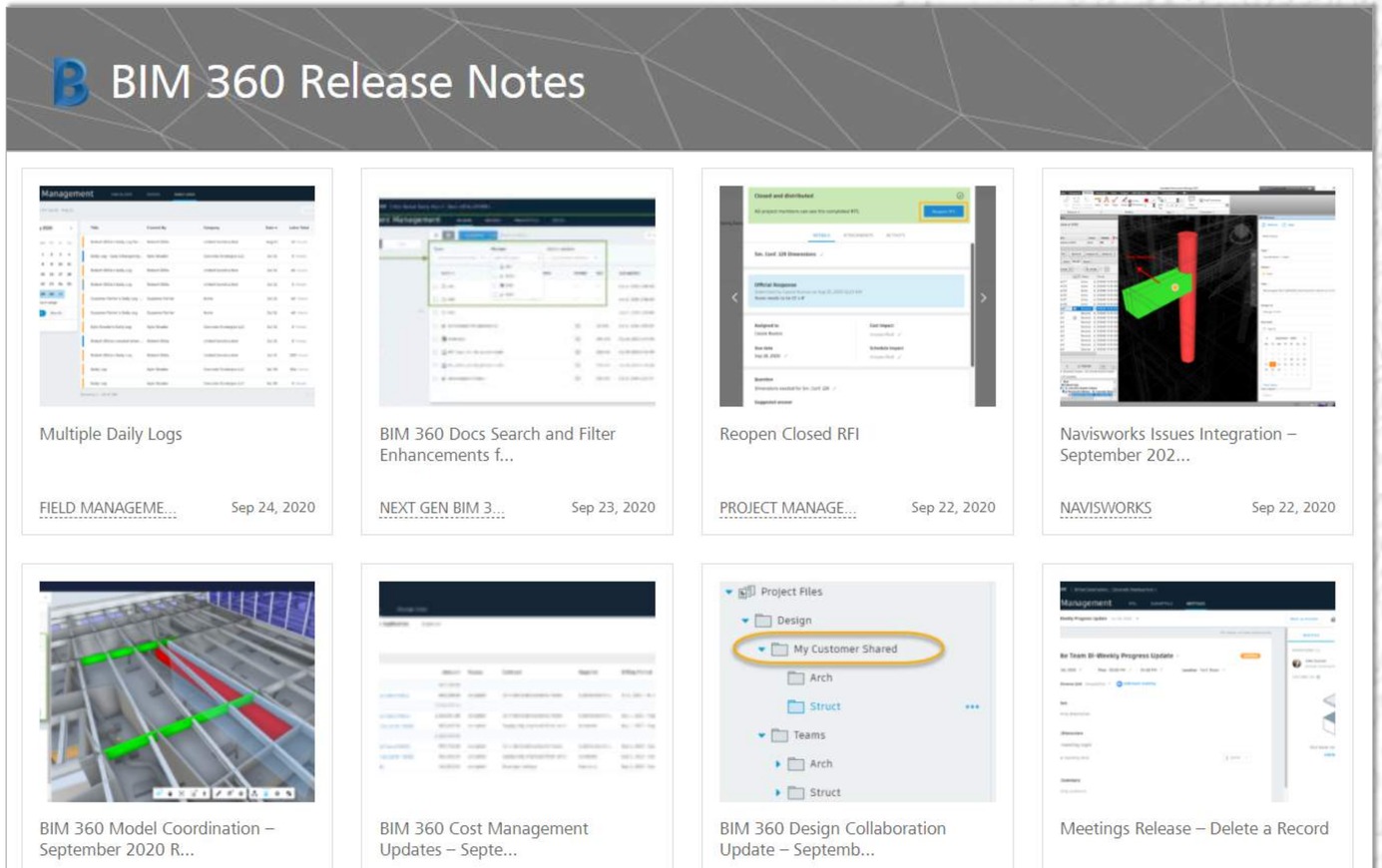
Design Collaboration



BIM 360 Release Notes

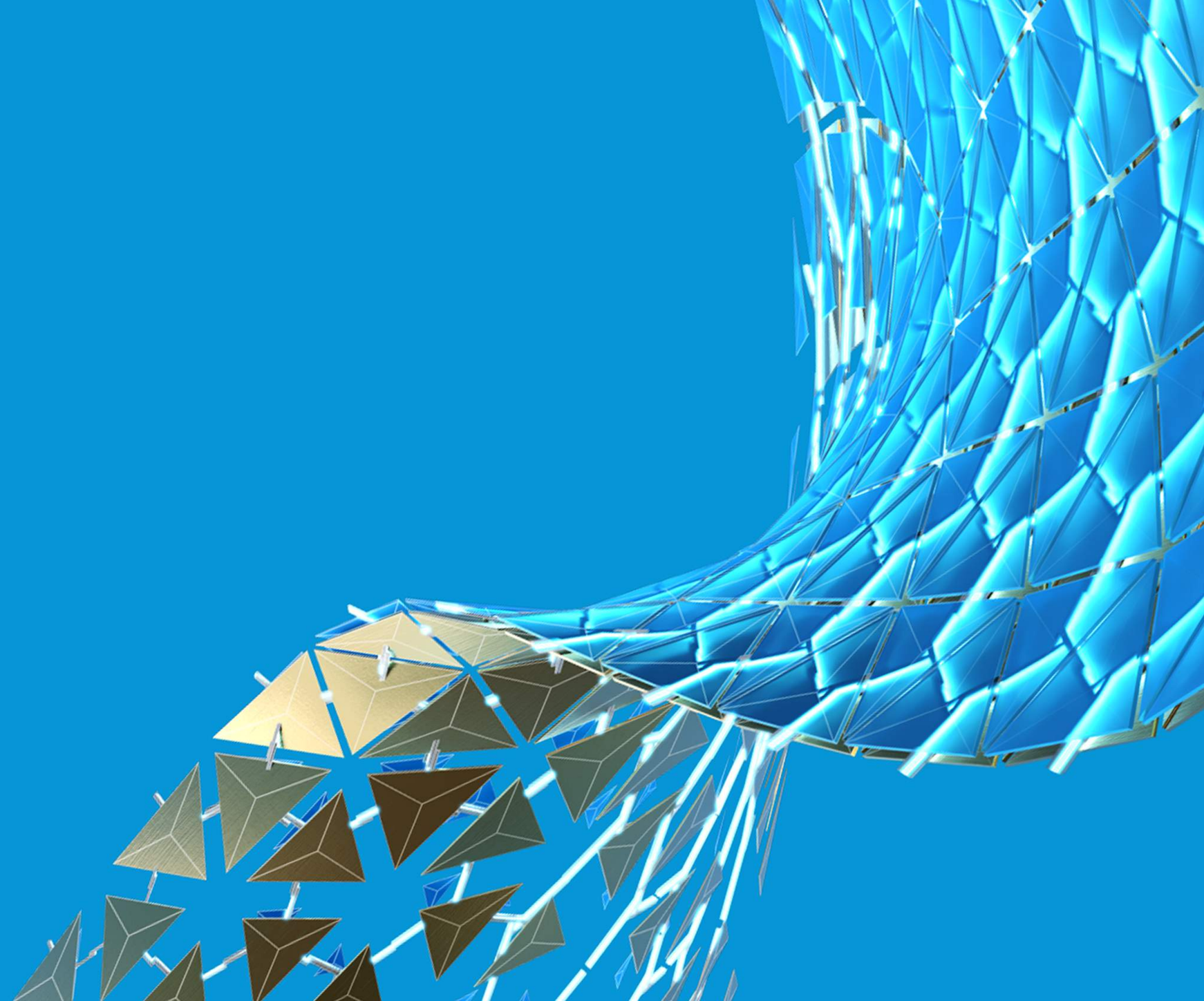
https://blogs.autodesk.com/bim360-release-notes/2020

https://help.autodesk.com/view/BIM360D/ENU/



Assets API

In Pipeline



Assets API

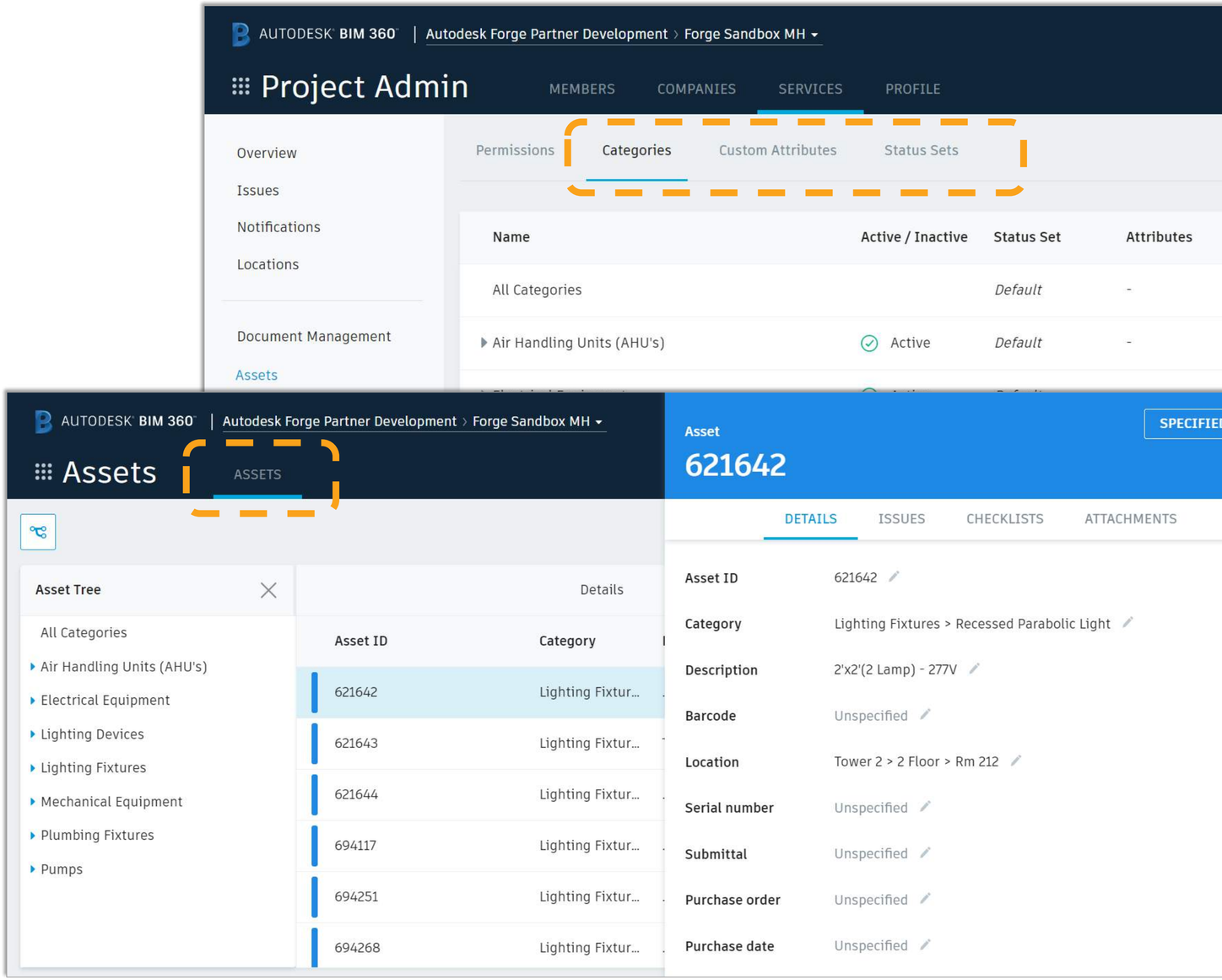
Private beta (read) current

- asset items
- custom attributes
- categories
- status sets

Public beta near future

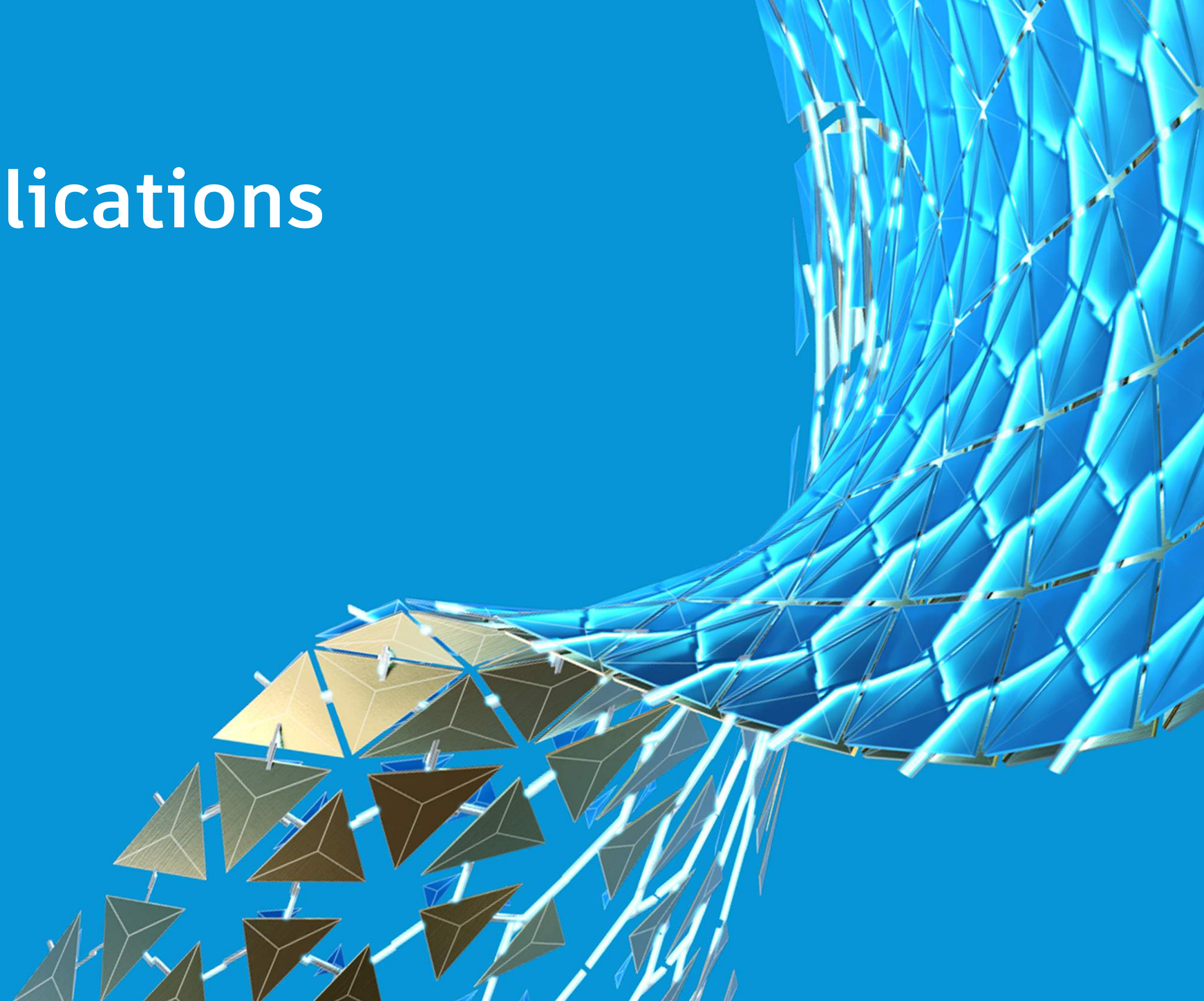
- Read + write items, batch, import*1

Priority feedback welcome!



*1) prioritize based on feedbacks

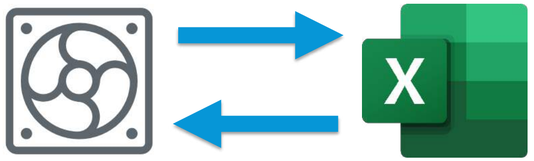
Sample Applications

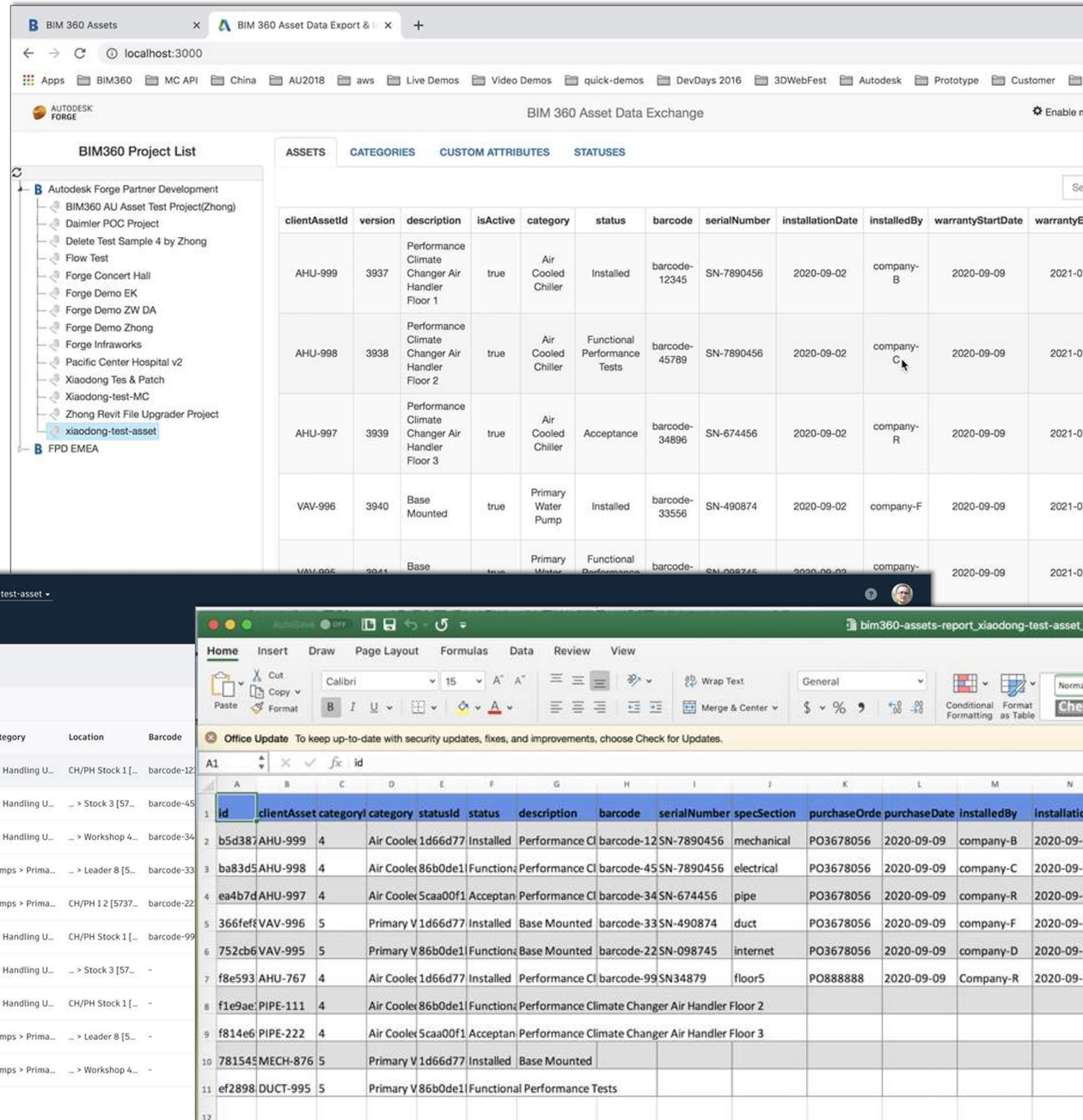


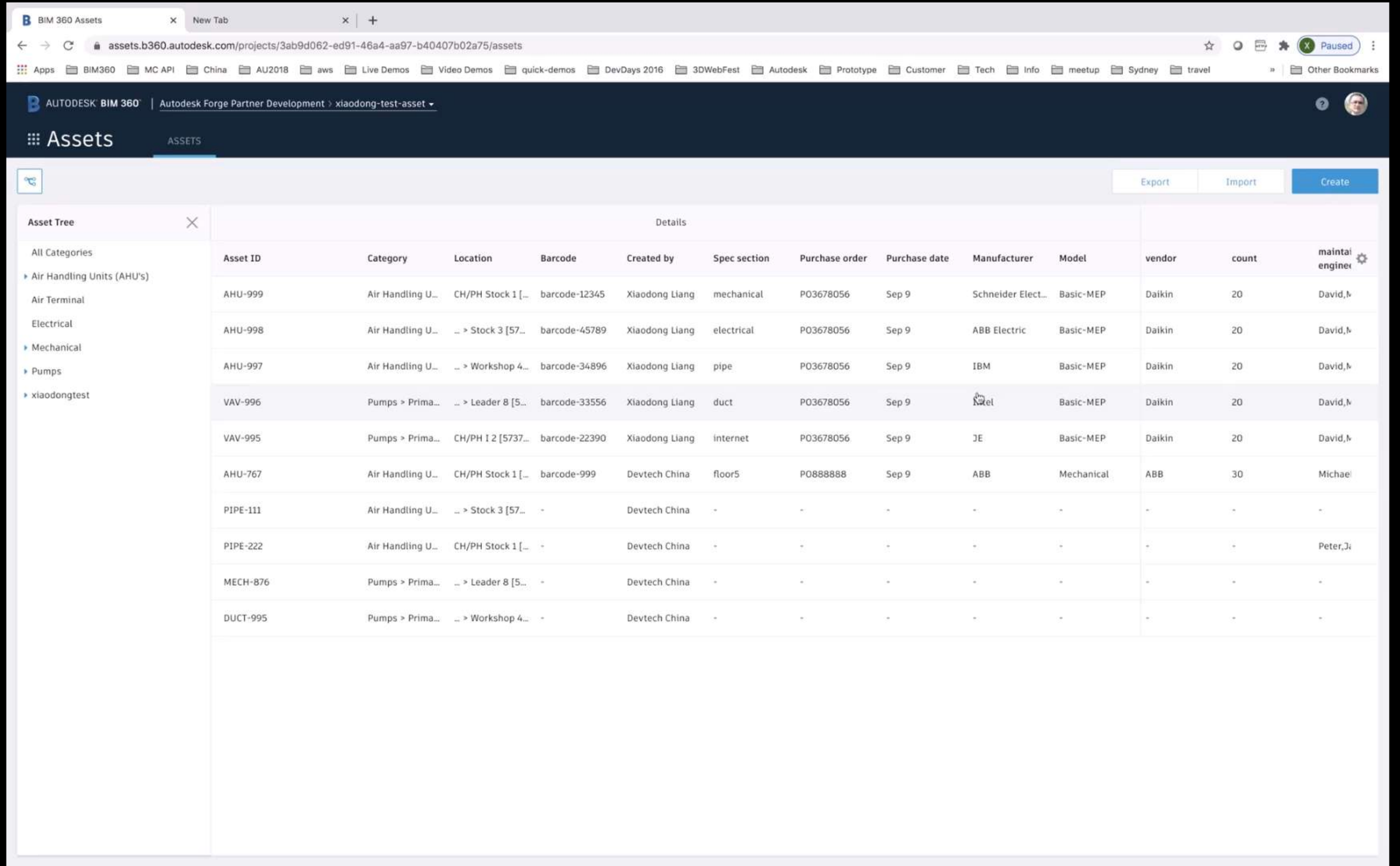
Export/Import to/from Excel

- **What it does:** Export all the Assets data in BIM 360 Assets module to a custom web page with links, then to Excel sheet. Modification in Excel is import back to Assets. This sample is to demonstrate the basic read/write access with Assets module.

- **Code:** GitHub Sample (TBD)
- **Author:** Xiaodong Liang, Autodesk





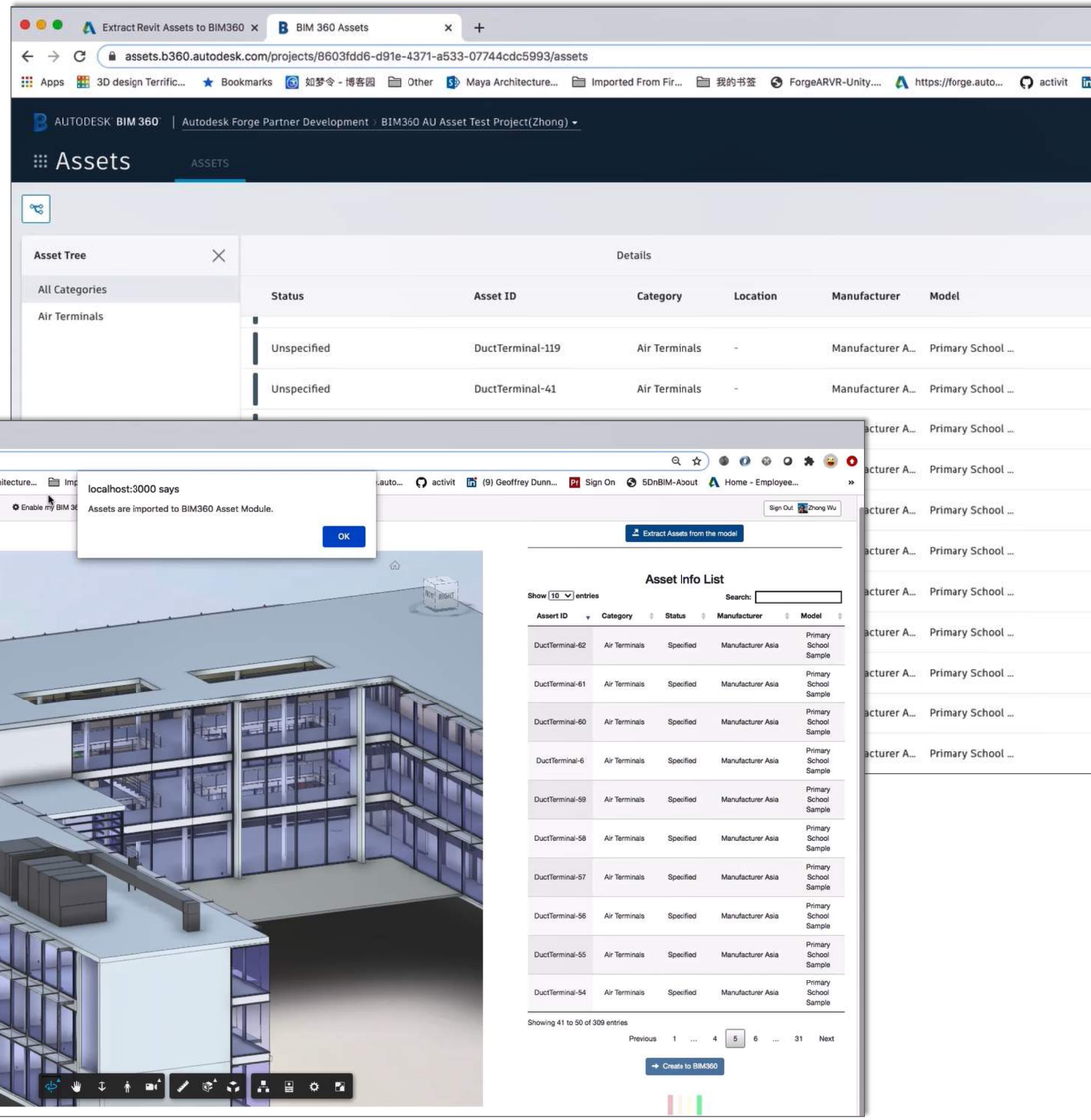

BIM 360 Assets
New Tab
assets.b360.autodesk.com/projects/3ab9d062-ed91-46a4-aa97-b40407b02a75/assets
Paused
Apps BIM360 MC API China AU2018 aws Live Demos Video Demos quick-demos DevDays 2016 3DWebFest Autodesk Prototype Customer Tech Info meetup Sydney travel Other Bookmarks
AUTODESK BIM 360 | Autodesk Forge Partner Development › xiaodong-test-asset
Assets
ASSETS
Export
Import
Create
Asset Tree
All Categories
Air Handling Units (AHU's)
Air Terminal
Electrical
Mechanical
Pumps
xiaodongtest
Details
Asset ID | Category | Location | Barcode | Created by | Spec section | Purchase order | Purchase date | Manufacturer | Model | vendor | count | maintai engine
AHU-999 | Air Handling U... | CH/PH Stock 1 [... | barcode-12345 | Xiaodong Liang | mechanical | PO3678056 | Sep 9 | Schneider Elect... | Basic-MEP | Daikin | 20 | David,M
AHU-998 | Air Handling U... | ... > Stock 3 [57... | barcode-45789 | Xiaodong Liang | electrical | PO3678056 | Sep 9 | ABB Electric | Basic-MEP | Daikin | 20 | David,M
AHU-997 | Air Handling U... | ... > Workshop 4... | barcode-34896 | Xiaodong Liang | pipe | PO3678056 | Sep 9 | IBM | Basic-MEP | Daikin | 20 | David,M
VAV-996 | Pumps > Prima... | ... > Leader 8 [5... | barcode-33556 | Xiaodong Liang | duct | PO3678056 | Sep 9 | Nitel | Basic-MEP | Daikin | 20 | David,M
VAV-995 | Pumps > Prima... | CH/PH I 2 [5737... | barcode-22390 | Xiaodong Liang | internet | PO3678056 | Sep 9 | JE | Basic-MEP | Daikin | 20 | David,M
AHU-767 | Air Handling U... | CH/PH Stock 1 [... | barcode-999 | Devtech China | floor5 | PO888888 | Sep 9 | ABB | Mechanical | ABB | 30 | Michael
PIPE-111 | Air Handling U... | ... > Stock 3 [57... | - | Devtech China | - | - | - | - | - | - | - | -
PIPE-222 | Air Handling U... | CH/PH Stock 1 [... | - | Devtech China | - | - | - | - | - | - | - | Peter,Ja
MECH-876 | Pumps > Prima... | ... > Leader 8 [5... | - | Devtech China | - | - | - | - | - | - | - | -
DUCT-995 | Pumps > Prima... | ... > Workshop 4... | - | Devtech China | - | - | - | - | - | - | - | -

Set up Assets from a Design Model

What it does: Extract assets from a design model in BIM 360 Docs, using **Design Automation for Revit**, and import to Assets module. Optionally filter/verify assets before importing to Assets module. (We save Revit unique element ids as custom attributes to keep the association between assets to elements in Revit.)

Code: GitHub Sample (TBD)

Author: Zhong Wu, Autodesk



Chrome File Edit View History Bookmarks People Tab Window Help

Extract Revit Assets to BIM360 | BIM 360 Assets

localhost:3000

Apps | 3D design Terrific... | Bookmarks | 如梦令 - 博客园 | Other | Maya Architecture... | Imported From Fir... | 我的书签 | ForgeARVR-Unity.... | https://forge.auto... | activit | (9) Geoffrey Dunn... | Sign On | 5DnBIM-About | Home - Employee...

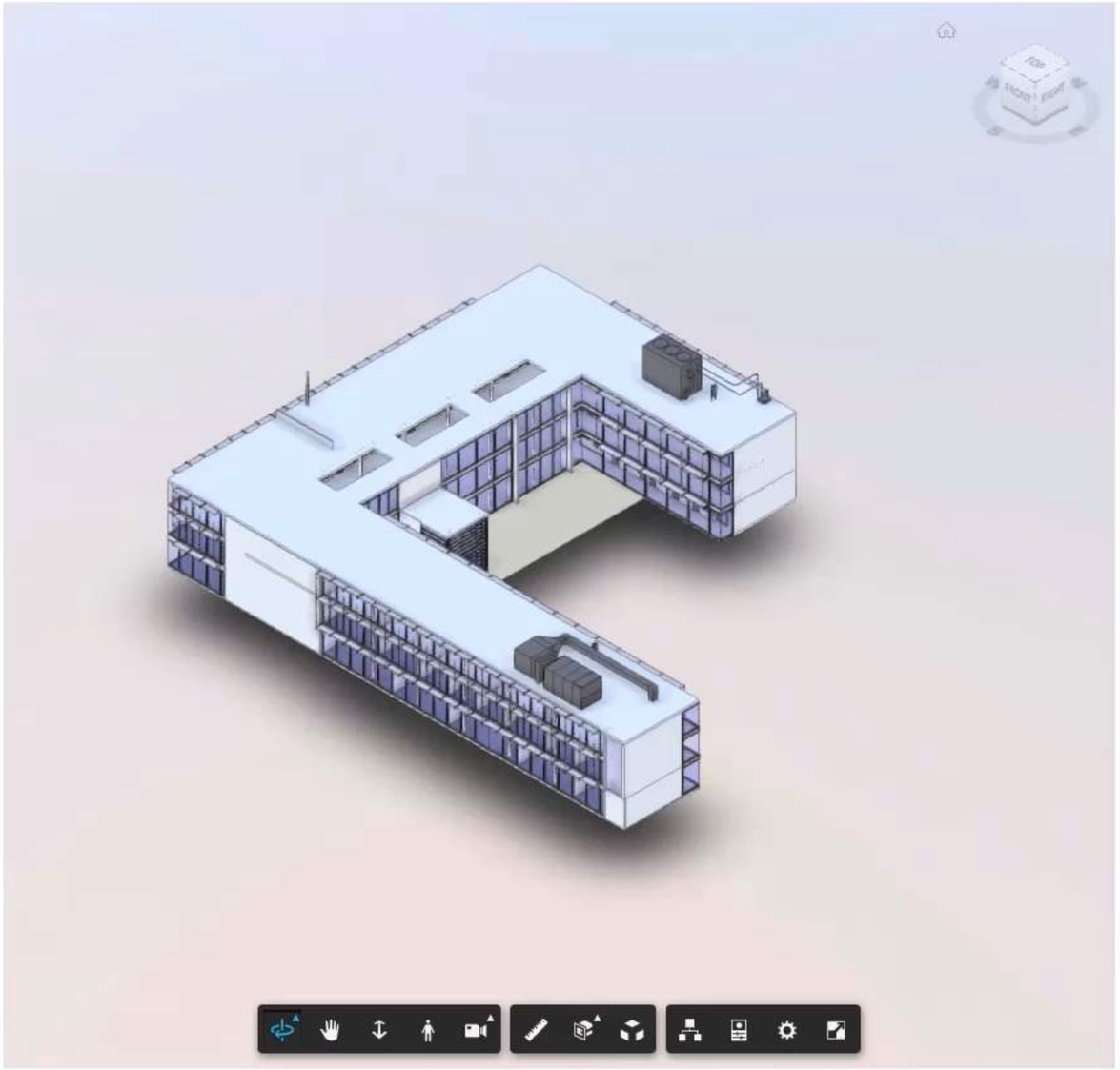
AUTODESK FORGE

Enable my BIM 360 Account | Configure | Sign Out Zhong Wu

Select Revit File

- Autodesk Forge Partner Development
  - Accelerator Shanghai
  - BIM 360 Cost Sample Project (Zhong)
  - BIM360 AU Asset Test Project(Zhong)
    - Plans
    - Project Files
      - rac_basic_sample_project.rvt
        - v1: 2020-9-16 10:00:32 by Zhong Wu
      - rme_school_project.rvt
        - v1: 2020-9-17 11:56:47 by Mikako Harada
        - v2: 2020-9-17 22:16:30 by Zhong Wu
  - Cost Test Sample by Zhong
  - Daimler POC Project
  - DeleteMeSoon
  - Forge Concert Hall
  - Forge Demo - BIM 360 Cost
  - Forge Demo ZW DA
  - Forge Demo Zhong
  - Infraworks
  - Sample for Phil by Zhong2
  - Sample for Phil by Zhong4
  - Xiaodong-test-MC
  - Zhong Revit File Upgrader Project

Model Viewer



Extract Assets from the model

Asset Info List

Show 10 entries Search:

Assert ID	Category	Status	Manufacturer	Model
No data available in table				

Showing 0 to 0 of 0 entries Previous Next

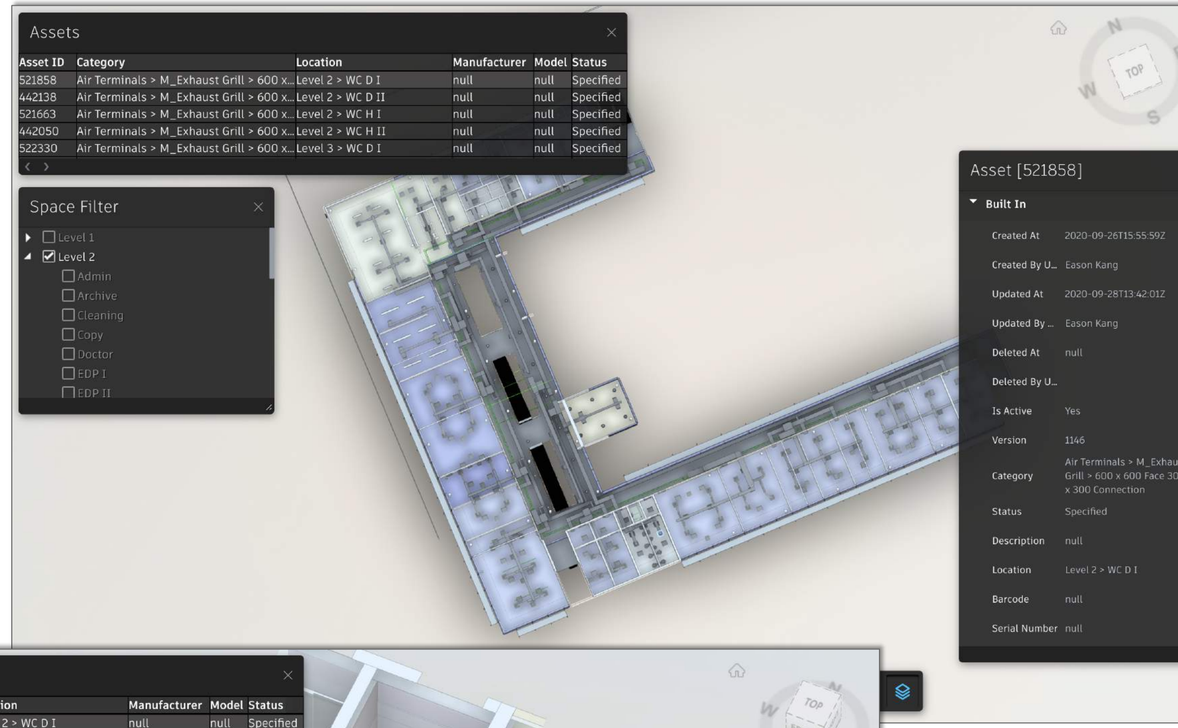
Create to BIM360

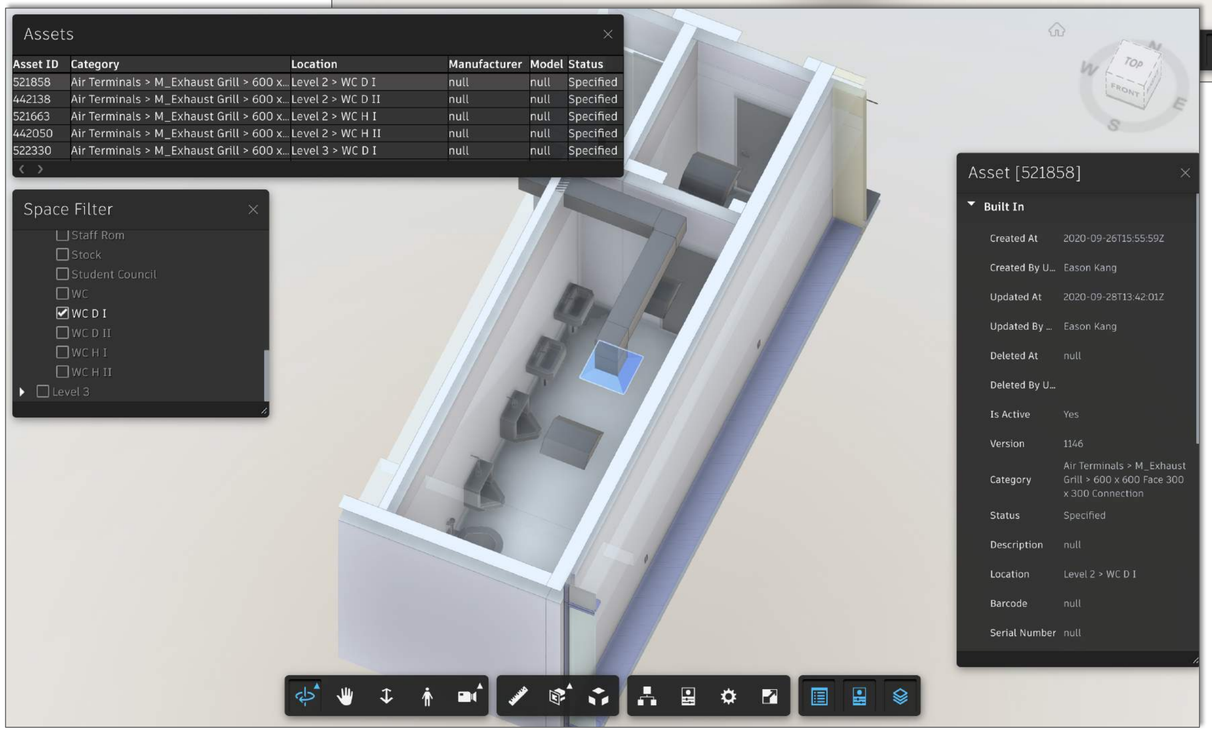
View Assets in Design Model

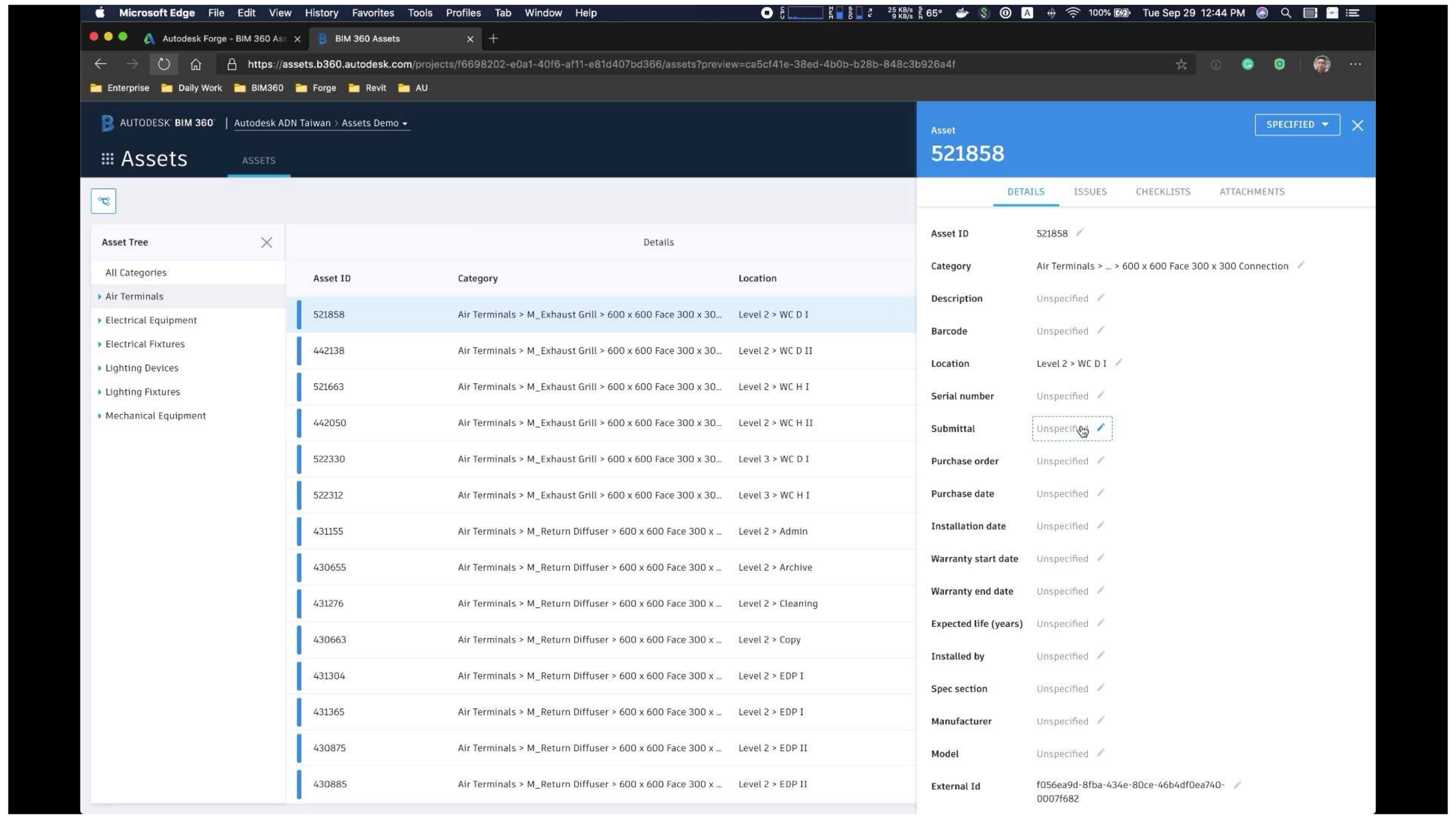
What it does: View asset data in the model viewer. You can filter assets by level and room. (We use Revit unique element ids saved as custom attributes to keep the association between assets to elements in Revit.)

Code: GitHub Sample (TBD)

Author: Eason Kang, Autodesk

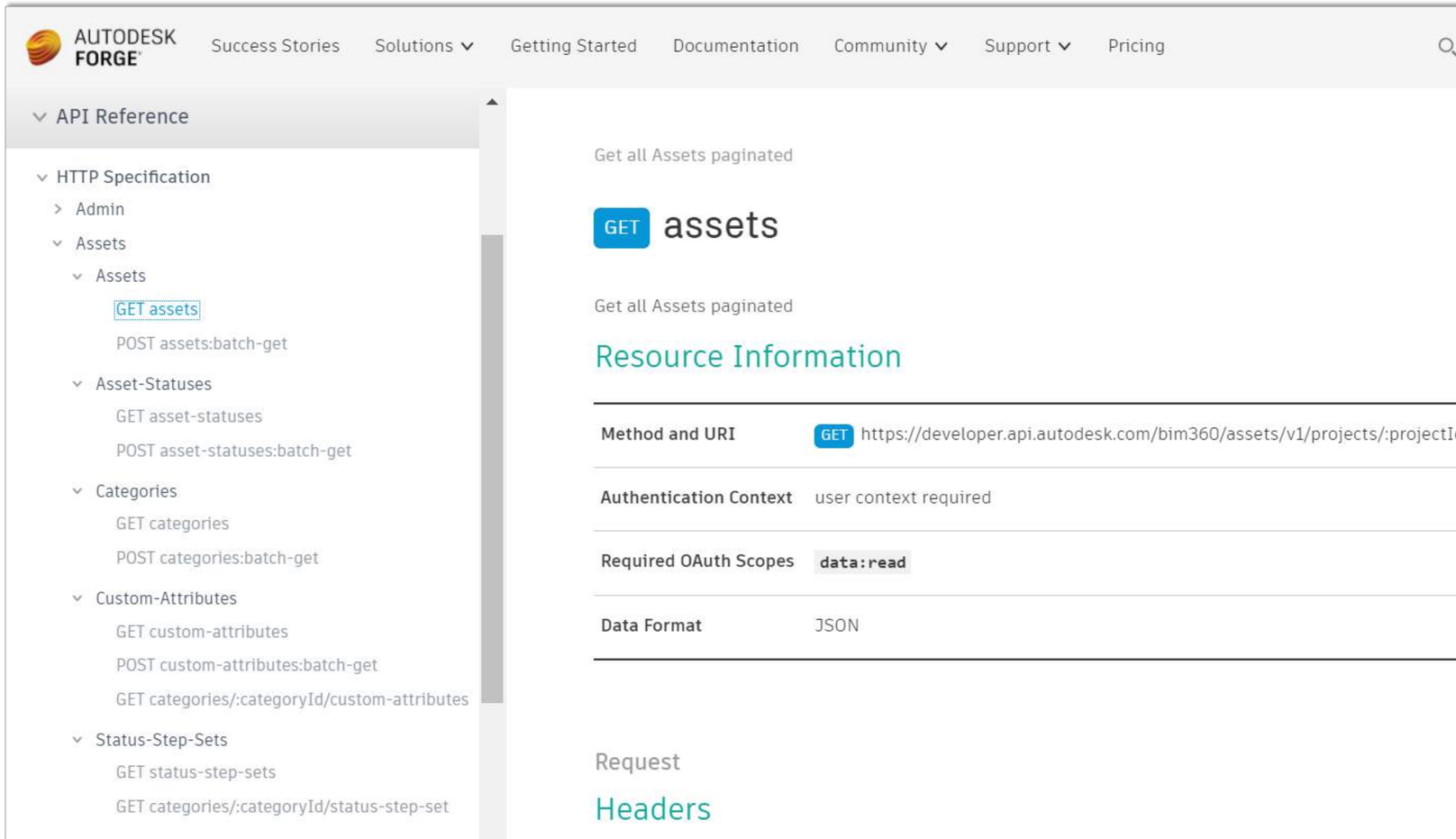





Microsoft Edge File Edit View History Favorites Tools Profiles Tab Window Help
Tue Sep 29 12:44 PM
Autodesk Forge - BIM 360 Ass
BIM 360 Assets
https://assets.b360.autodesk.com/projects/f6698202-e0a1-40f6-af11-e81d407bd366/assets?preview=ca5cf41e-38ed-4b0b-b28b-848c3b926a4f
Enterprise
Daily Work
BIM360
Forge
Revit
AU
AUTODESK BIM 360
Autodesk ADN Taiwan › Assets Demo
Assets
ASSETS
Asset Tree
All Categories
Air Terminals
Electrical Equipment
Electrical Fixtures
Lighting Devices
Lighting Fixtures
Mechanical Equipment
Details
Asset ID
Category
Location
521858 Air Terminals > M_Exhaust Grill > 600 x 600 Face 300 x 30... Level 2 > WC D I
442138 Air Terminals > M_Exhaust Grill > 600 x 600 Face 300 x 30... Level 2 > WC D II
521663 Air Terminals > M_Exhaust Grill > 600 x 600 Face 300 x 30... Level 2 > WC H I
442050 Air Terminals > M_Exhaust Grill > 600 x 600 Face 300 x 30... Level 2 > WC H II
522330 Air Terminals > M_Exhaust Grill > 600 x 600 Face 300 x 30... Level 3 > WC D I
522312 Air Terminals > M_Exhaust Grill > 600 x 600 Face 300 x 30... Level 3 > WC H I
431155 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > Admin
430655 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > Archive
431276 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > Cleaning
430663 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > Copy
431304 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > EDP I
431365 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > EDP I
430875 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > EDP II
430885 Air Terminals > M_Return Diffuser > 600 x 600 Face 300 x ... Level 2 > EDP II
Asset
521858
SPECIFIED
DETAILS
ISSUES
CHECKLISTS
ATTACHMENTS
Asset ID 521858
Category Air Terminals > ... > 600 x 600 Face 300 x 300 Connection
Description Unspecified
Barcode Unspecified
Location Level 2 > WC D I
Serial number Unspecified
Submittal Unspecified
Purchase order Unspecified
Purchase date Unspecified
Installation date Unspecified
Warranty start date Unspecified
Warranty end date Unspecified
Expected life (years) Unspecified
Installed by Unspecified
Spec section Unspecified
Manufacturer Unspecified
Model Unspecified
External Id f056ea9d-8fba-434e-80ce-46b4df0ea740-0007f682

Developer Resources

- Documentation
- Code samples on GitHub
- Postman collection



What's Next

Private Beta

We are here

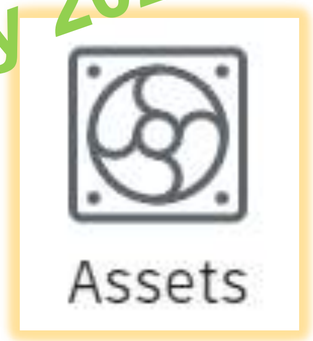
Fine tuning

Documentation

Samples

Select partnership

Early 2021



Public Beta

Almost there

Open API access to all partners

Get feedback

Webinars/Accelerators

Public Release

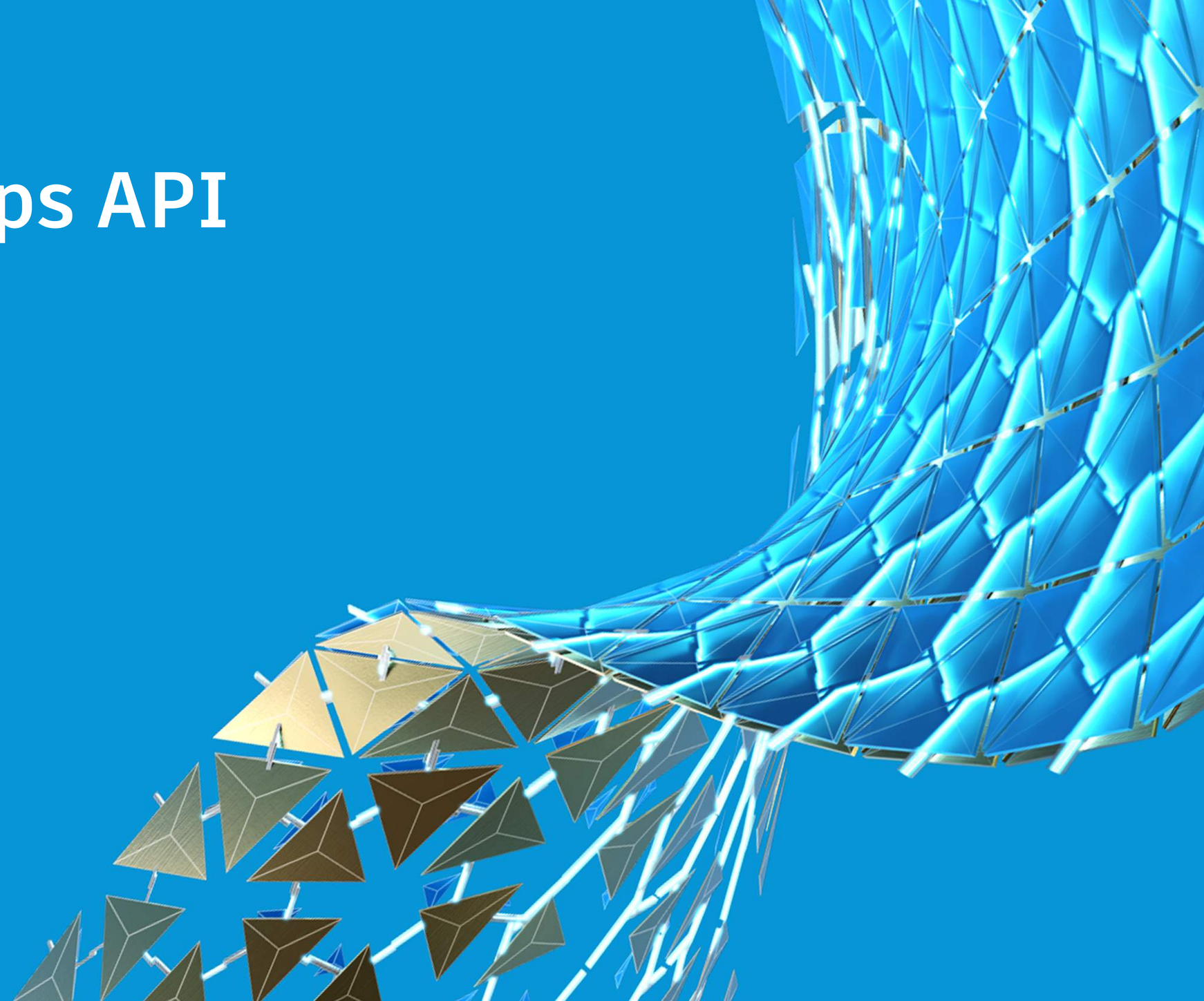
TBD

Production level release

Post Release

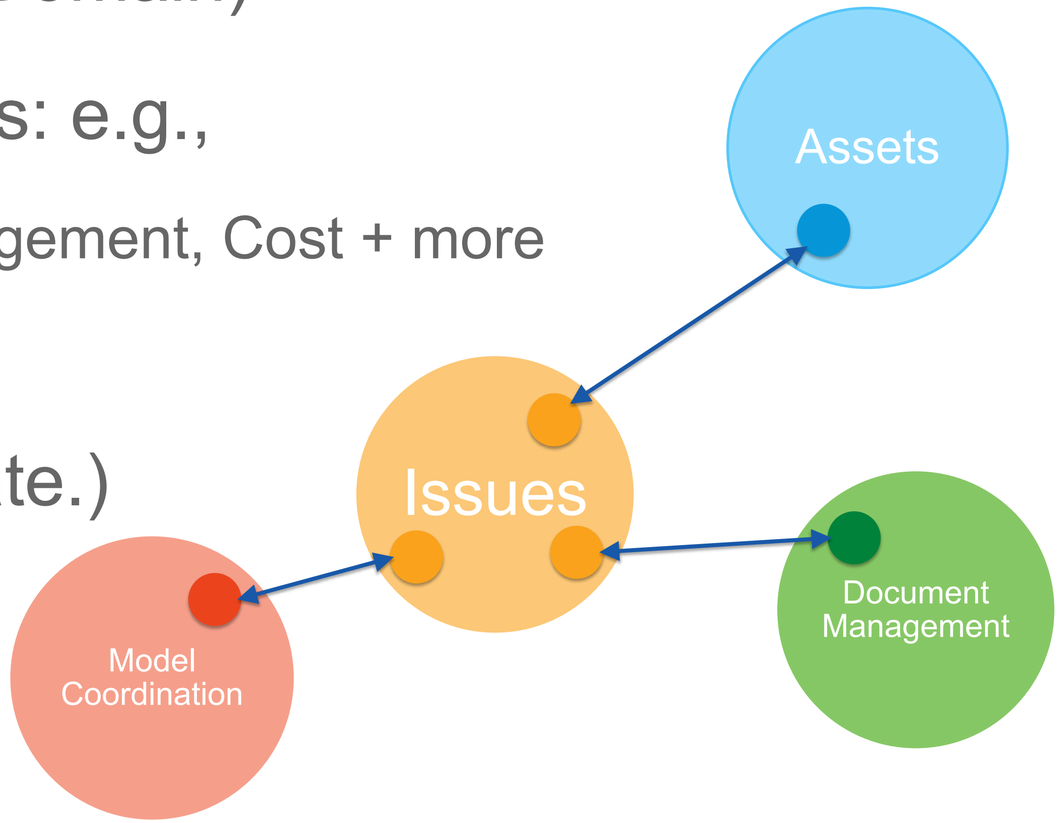
Continuous Updates and enhancement

Relationships API



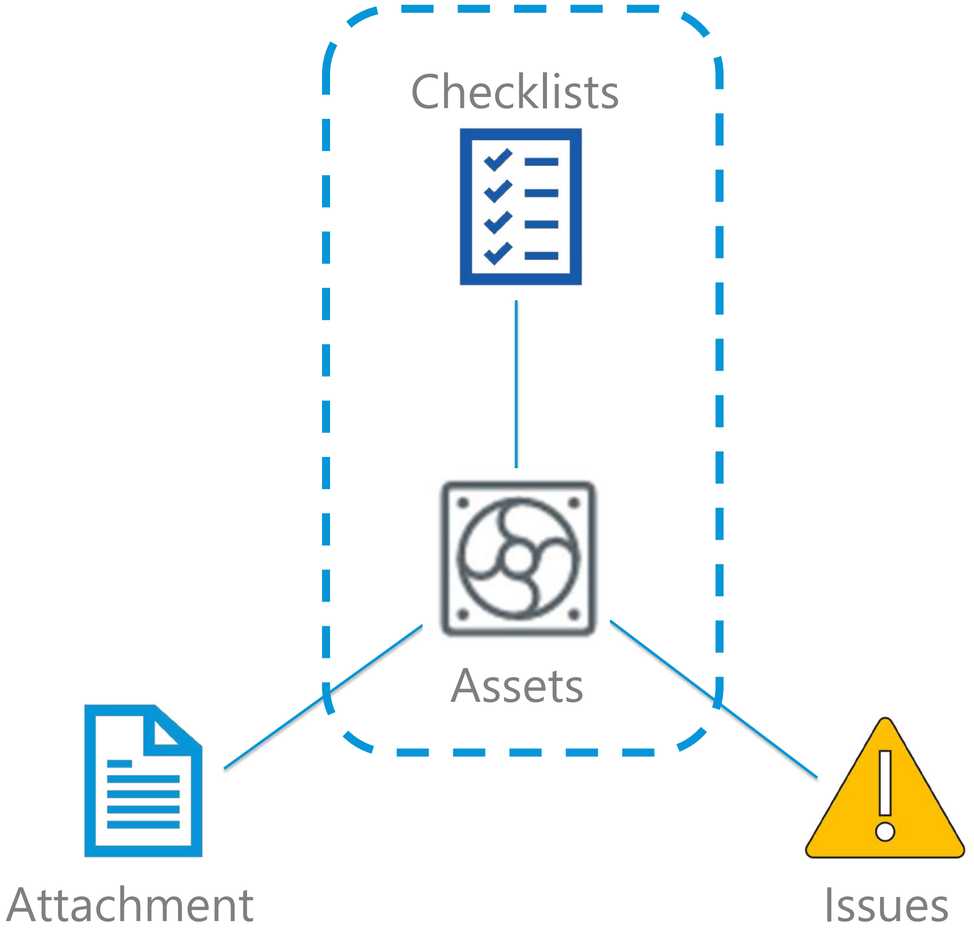
Relationships API

- Represent links between items (Entity) that reside in different functional components (Domain)
- Used in BIM 360 by various modules: e.g.,
  - Model Coordination, Assets, Field Management, Cost + more
  - Older implementation may not
- Read-only. (Domain function to create.)
- Publicly available today

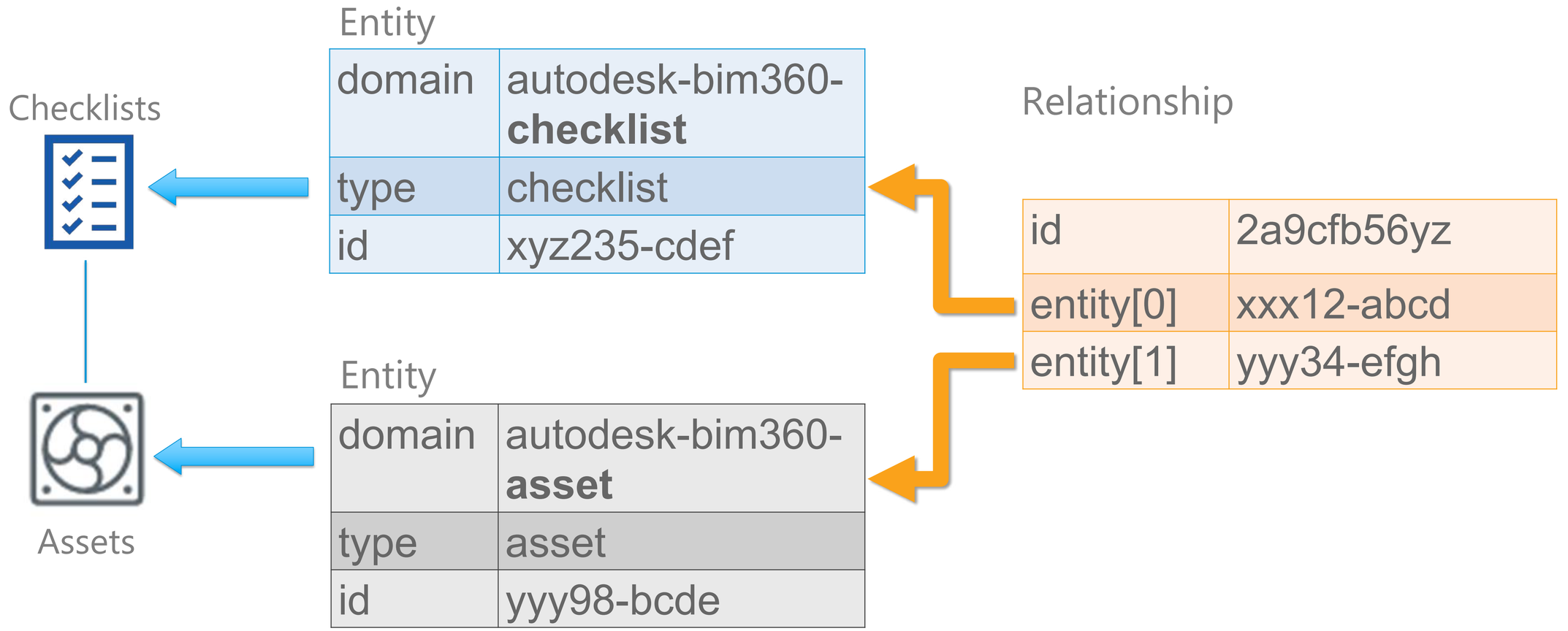


Relationships API

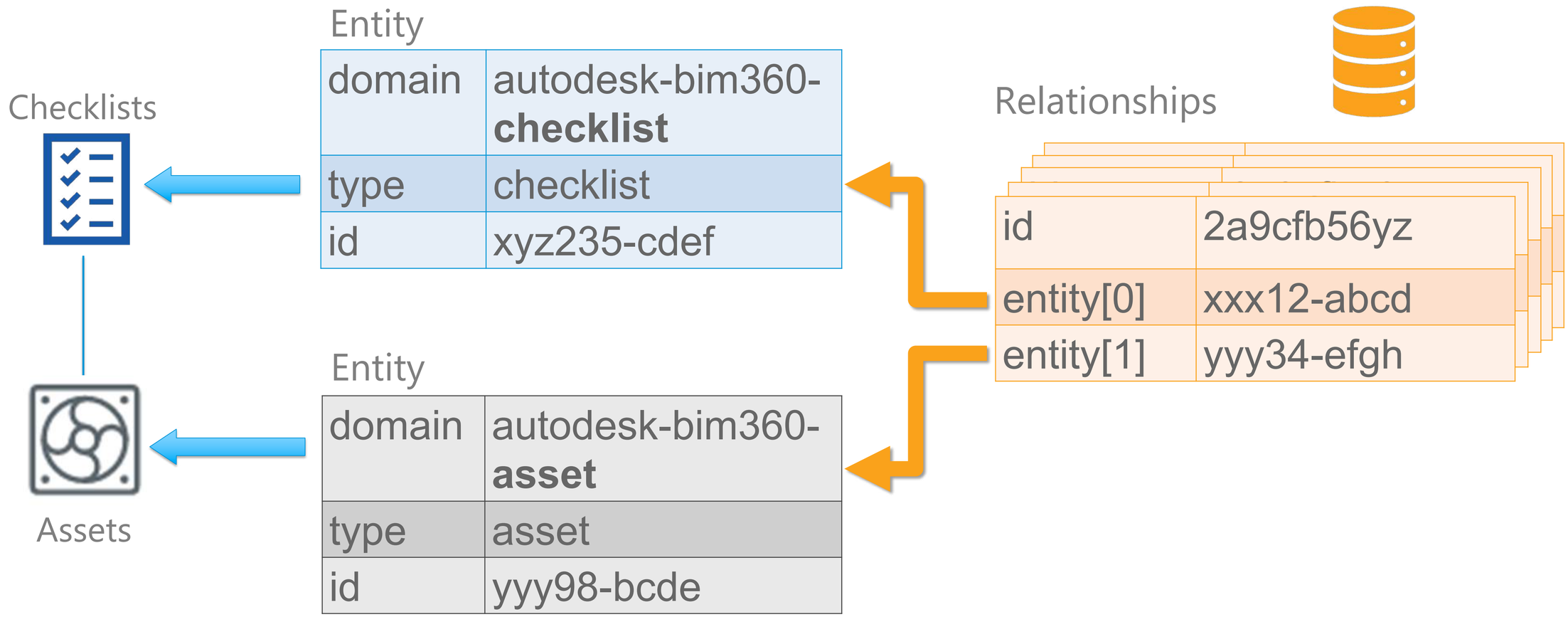
Example



Relationships API



Relationships API



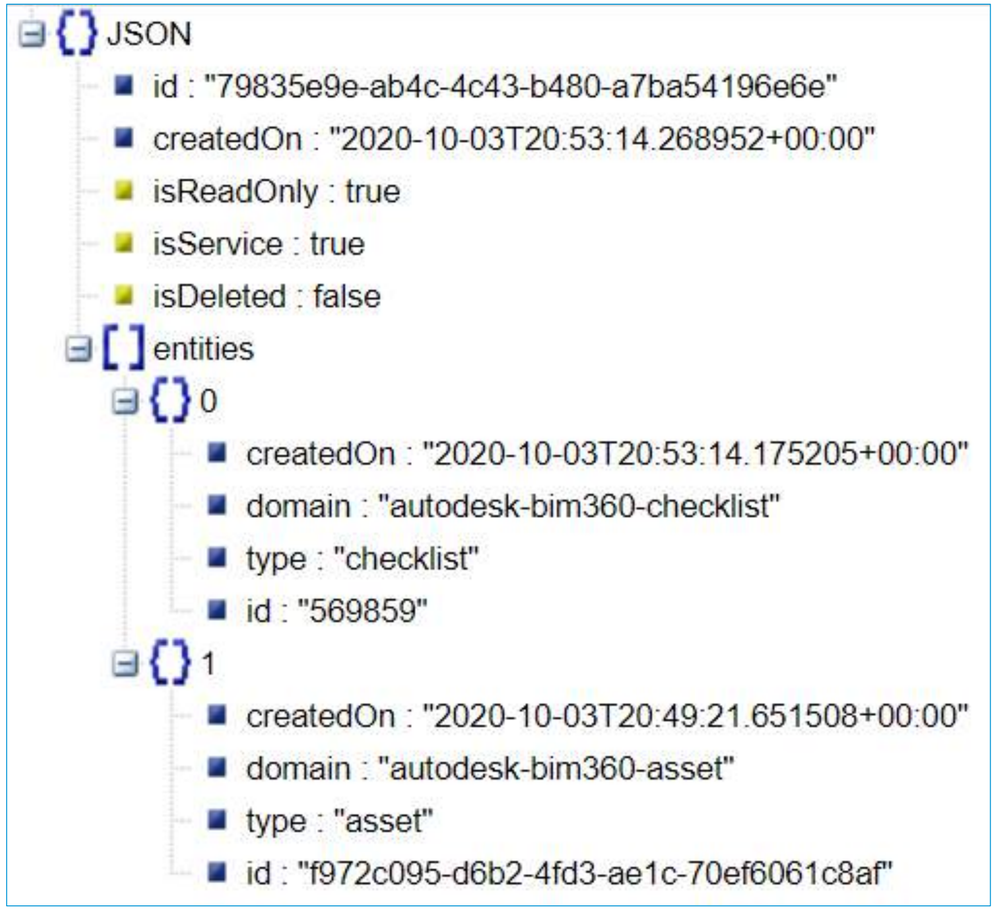
Relationships API

Category	Endpoints
Search	GET relationships/:**relationshipId**
	POST relationships:**batch**
	GET relationships:**search**
	POST relationships:**intersect**
Sync	POST relationships:**sync**
	POST relationships:**syncStatus**

Relationships API

Category	Endpoints
Search	GET relationships/:**relationshipId**
	POST relationships:**batch**
	GET relationships:**search**
	POST relationships:**intersect**
Sync	POST relationships:**sync**
	POST relationships:**syncStatus**

Get relationship(s) from id(s)



Relationships API

Category	Endpoints
Search	GET relationships/:**relationshipId**
	POST relationships:**batch**
	GET relationships:**search**
	POST relationships:**intersect**
Sync	POST relationships:**sync**
	POST relationships:**syncStatus**

Search rel's that match the given criteria (domain, type, ids, date). e.g.,

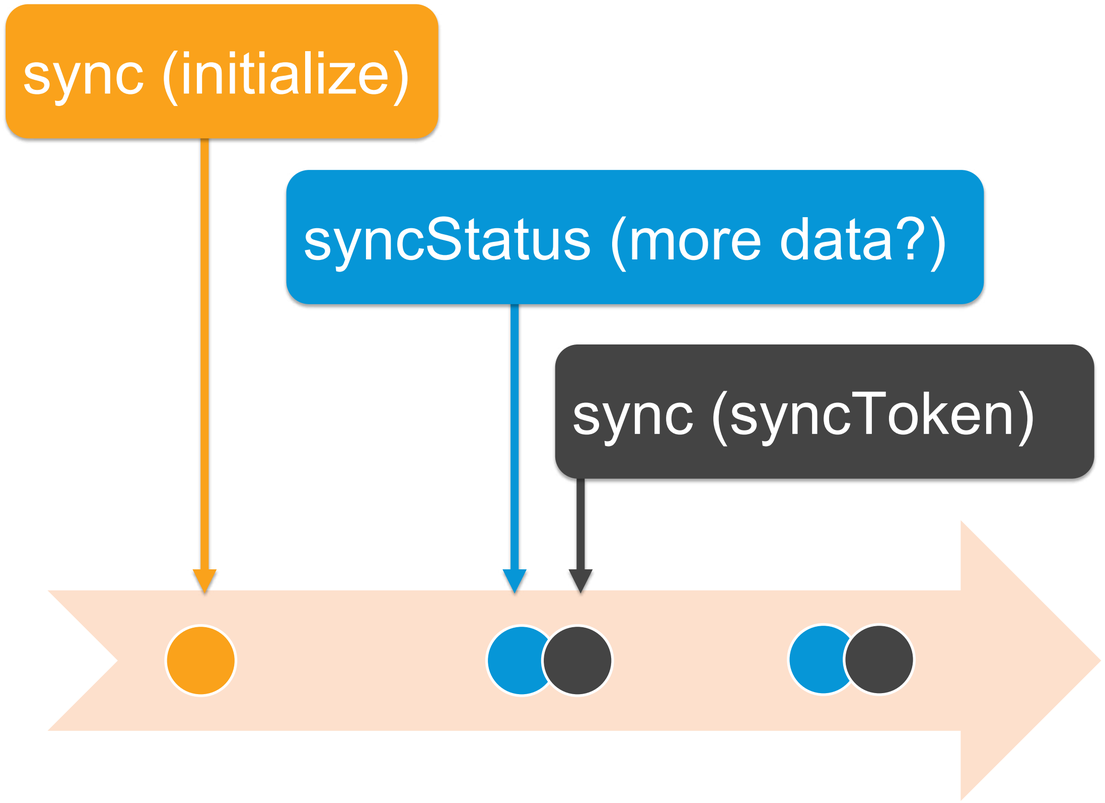
"Give me all the relationships between assets and checklists"

```
GET relationships:/search?
domain=autodesk-bim360-asset
&withDomain=autodesk-bim360-
checklist
```

Relationships API

Category	Endpoints
Search	GET relationships/:**relationshipId**
	POST relationships:**batch**
	GET relationships:**search**
	POST relationships:**intersect**
Sync	POST relationships:**sync**
	POST relationships:**syncStatus**

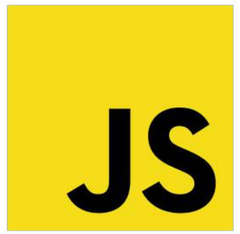
Used to sync rel. data and external repository.



Developer Resources

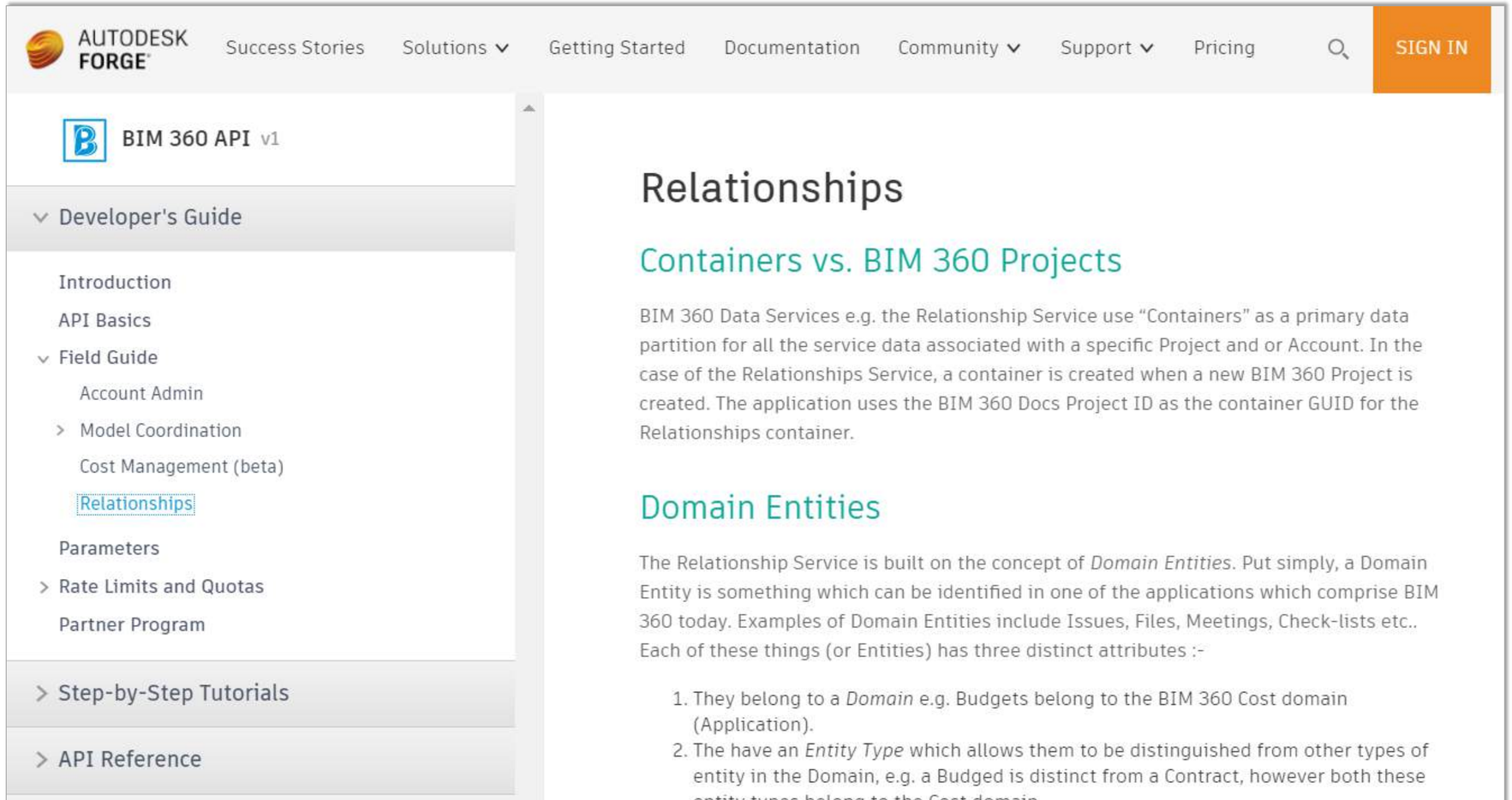
Relationship API SDK

- .NET Core nuget packages
- JavaScript and Node.js

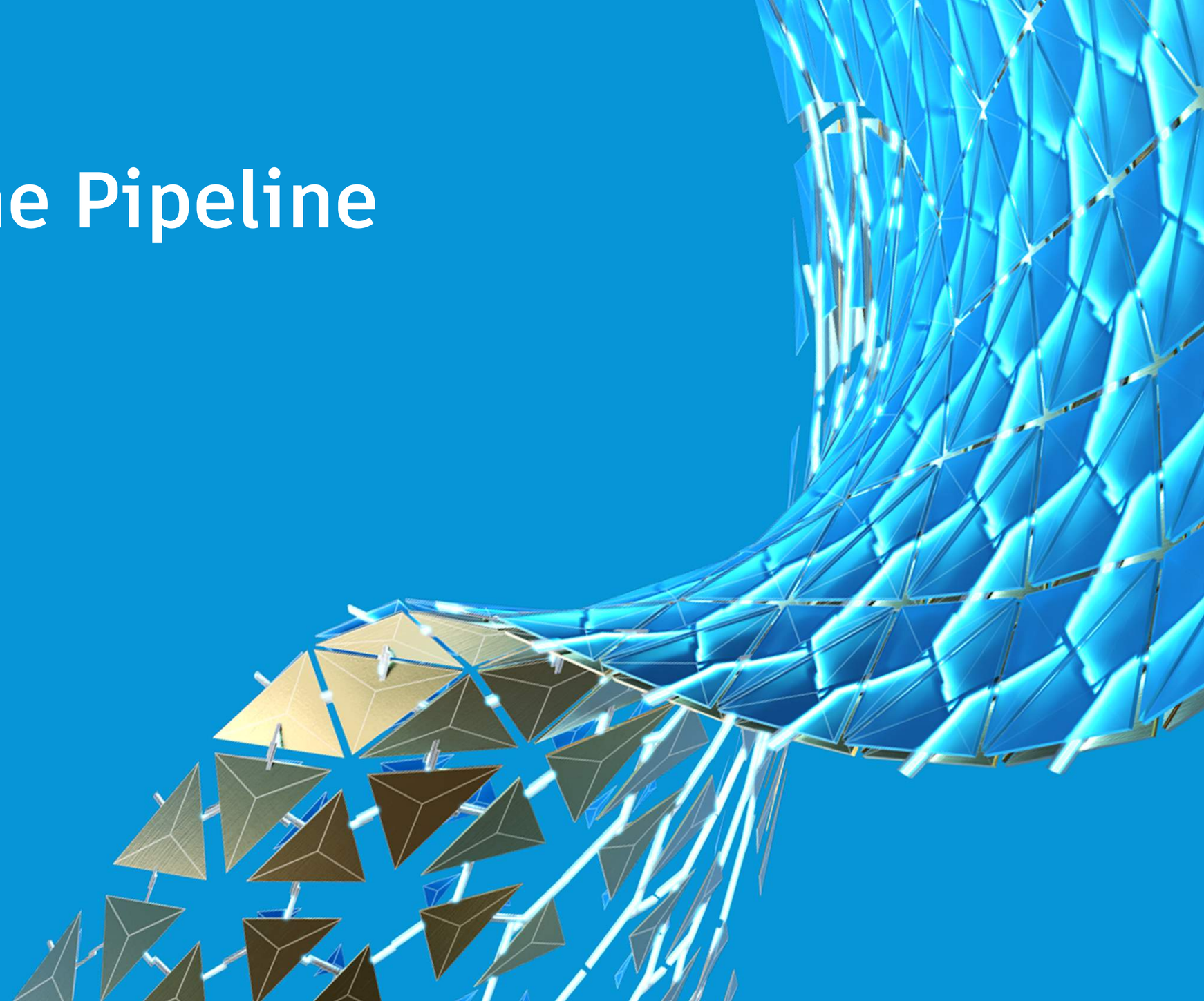


Developer Resources

Documentation



What’s in the Pipeline



What’s in the Pipeline

Document Management

- Custom attributes definition, review, controls on translation/viewables

Assets

- Initial release!

Cost Management

- Payments, billing period, main contracts, schedule of values, expenses*1

Admin

- Project API: fill gaps, add users, update companies
- Activities

Model Coordination

- Alignments, aggregation, indexing enhancements*1
- 2LO, webhooks

Field Managements

- Fill gaps: checklists, RFI, issues

*1) prioritize based on feedbacks

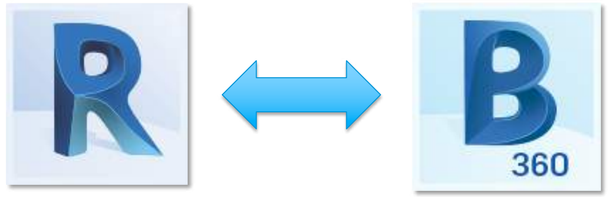
What’s in the Pipeline

Insight

- Data connecter

Design

- cloud model/ worksharing*2



*2) Revit API

AUTODESK CONSTRUCTION CLOUD™

Qué sigue?

Pre AU

This recording

Development

AU Virtual

11/17~ We are here

Share the latest at class QA session and Answer Bar

Product Release

Early 2021

Webinars

API Release

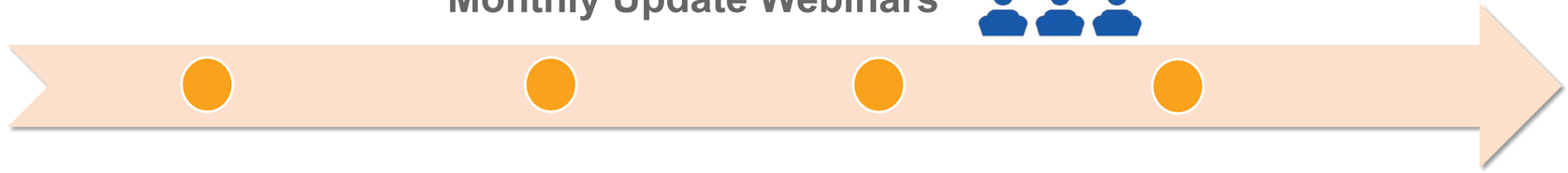
Shortly after product release

Webinars

Accelerators

Get feedback

Monthly Update Webinars



Resumen

- Autodesk Construction Cloud
- BIM 360 & API Status and Updates
- Assets API
- Relationship API
- In Pipeline

Preguntas?

Join me at

Class Q&A session (CS471435)

Forge Answer Bar

Muchas Gracias!

@autodeskforge @afrojme

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