

BIM 360 API Updates

Developer Days Online Webinar Series #6

Mikako Harada

*AEC Technical Lead and Americas Manager
Developer Technical Services, Autodesk*



Agenda

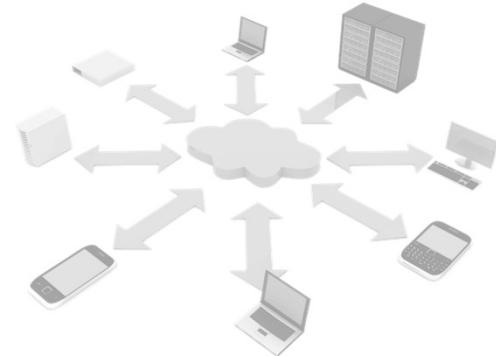
BIM 360 Docs and Family Products

BIM 360 Docs - API

- Overview
- Forge
 - Authentication
 - Account level (HQ) API
 - Data Management
 - Model Derivative
 - Viewer

Summary

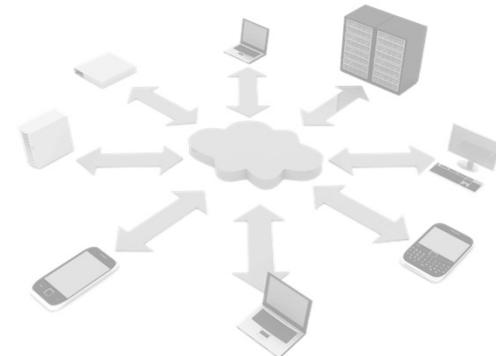
Q&A





BIM 360 Docs and Family Products

BIM 360 Family Products



Team



Glue



Layout



Docs



Field



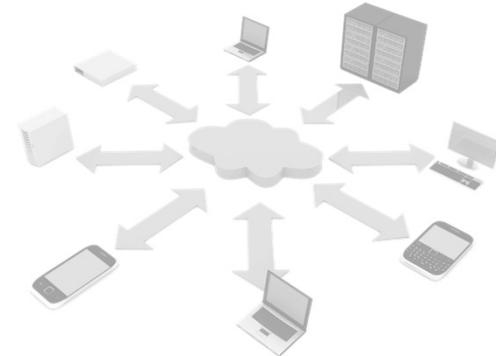
Plan



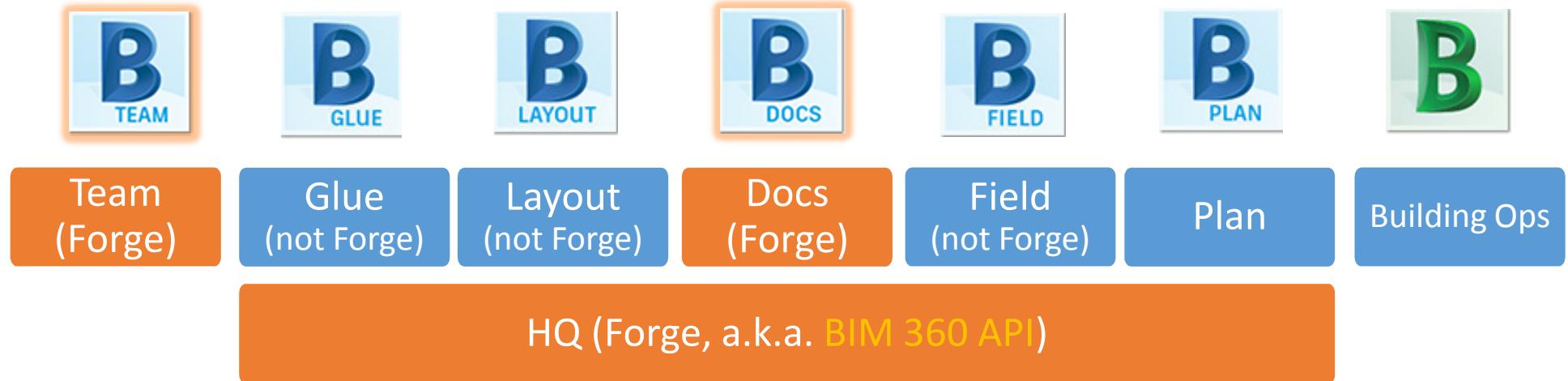
Building Ops

HQ

BIM 360 Family Products



Forge vs. non-Forge



Why BIM 360 Docs?

Docs as data at center
Seamless, unified future



Team
(Forge)

Glue

Layout

Docs
(Forge)

Field

Plan

Building Ops

HQ (Forge)

BIM 360 Team

A360 Team is evolving...

! ACTION REQUIRED

Select Edition

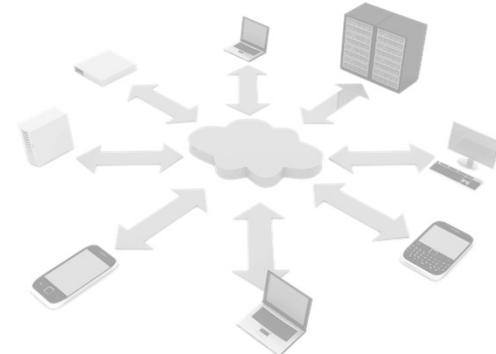
- BIM 360 TEAM**
For architecture, engineering, and construction teams and their project stakeholders
- FUSION TEAM**
For product design and manufacturing teams

If you don't want to choose now, we will select the best option for you by end of November.

○ ○ ●

 [Concerns? Talk to us...](#)

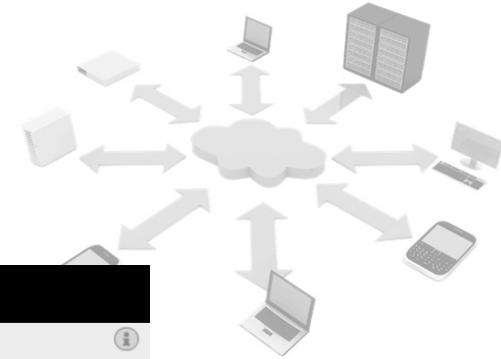
[Later](#) [Switch](#)

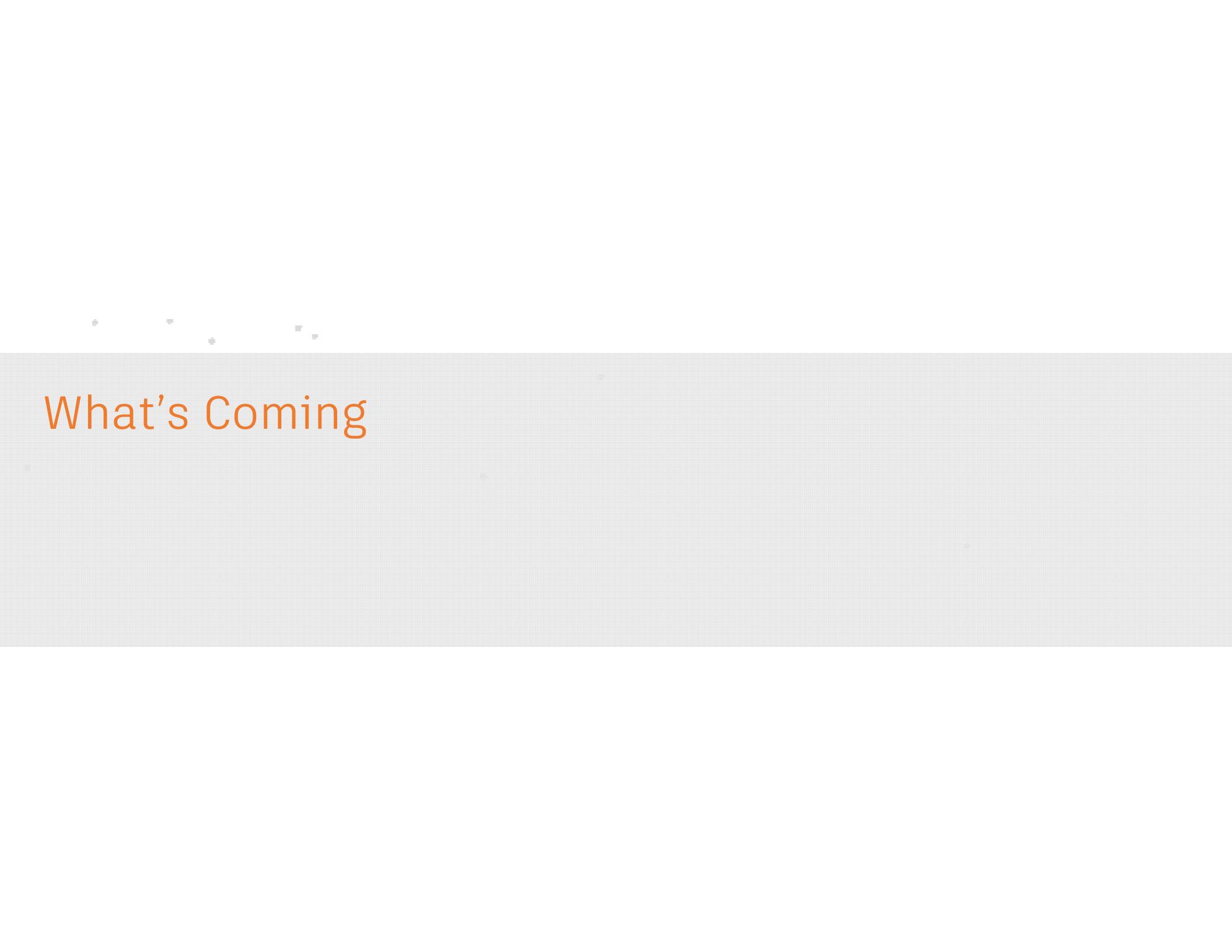


<http://www.autodesk.com/products/a360/overview>

BIM 360 Team Compare Changes

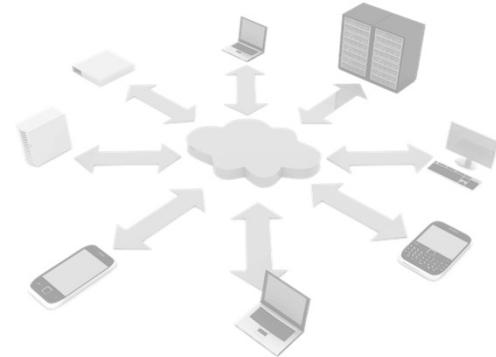
The screenshot shows the BIM 360 Compare Changes interface. At the top, it displays the file name "rac_basic-little_house-visualize change.rvt" and "Version 3 Vs. Version 1". Below this is a "Change" button. The main area features a 3D model of a house with a blue highlighted section. A tooltip box titled "INFORMATION" provides details about a "Basic Wall [428745]". It shows changes between versions 1 & 3: + Area by -1.020 m² and + Volume by -0.206 m³. It also notes that the shape of the object has been changed. A "Show in model" button allows switching between "Version 1" and "Version 3". To the right, a "CHANGES" panel lists modifications: "Added 6", "Removed 0", and "Modified 2". It includes tabs for "Disciplines affected" and "Modification type", and a search/filter bar. A list of changes includes: "4500_Kitchen Island [690286]", "Basic Wall [428745]" (highlighted in orange), "Dining Chair (3) [1087385]", "Dining Chair (3) [1087568]", and "Dining Chair (3) [1087627]. The bottom of the interface features a toolbar with various icons for navigation and management.





What's Coming

Docs Product Updates + Coming Soon:



Web

- Delete, Restore, and Make Current - extracted docs, folders, files
- Rename top-level folders
- Copy extracted docs / copy version
- View-only permission
- Linked RVT upload / processing
- Improved first use with sample project data

Mobile (iOS)

- Streamline trial sign-up experience
- Folder sync / offline improvements

BIM 360 Docs for Android

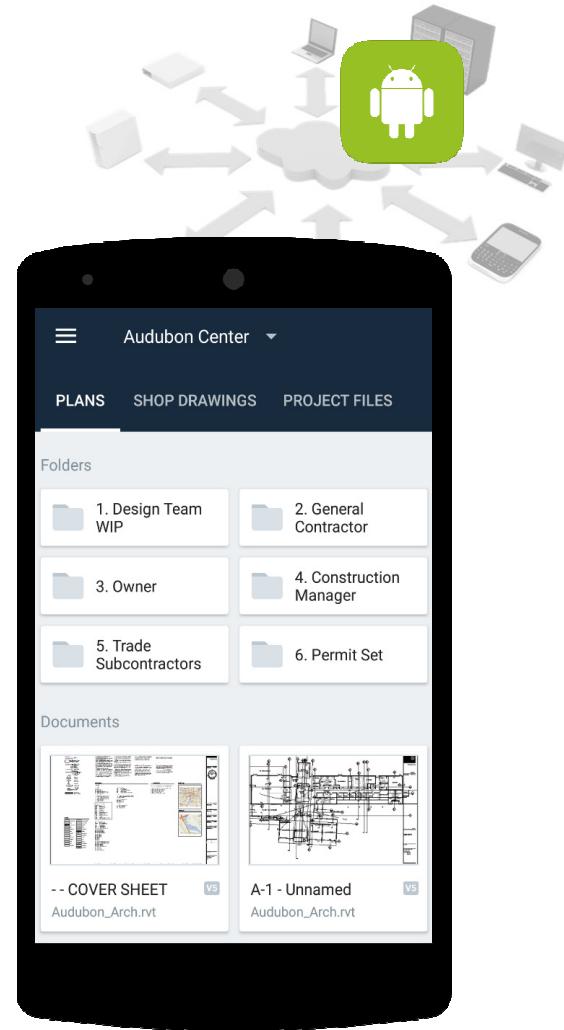
First (ever) BIM 360 Android app!

What's included?

- View projects
- Switch projects
- View data (Plans, Shop Drawings, Project files)
- Open 2D/3D/PDF drawings (using LMV Web)
- View issues list and issues details
- View markups list

Mid-December

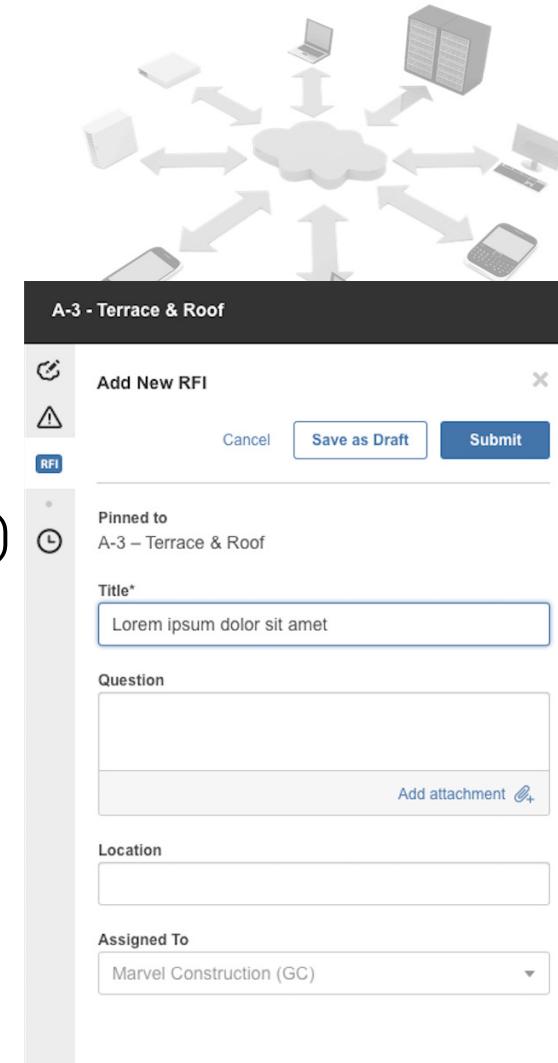
Phone and tablet support



RFIs

- RFIs support inside BIM 360 Docs
- **What's included?**
 - View and create RFIs (by extending Issues service)
 - Integrate Workflow service
 - RFI configuration (inside Project Admin)
- Mid-December

<https://forums.autodesk.com/t5/bim-360-docs-release-notes/bg-p/271>



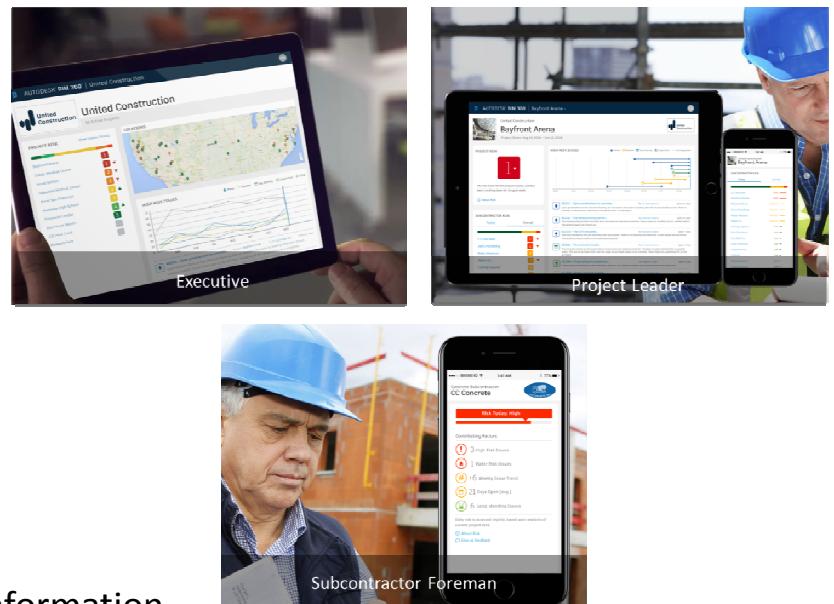
AUTODESK® Project IQ **BIM 360™ Predictive & Assistive Analysis**



BIM 360 IQ helps construction projects manage risk and improve performance every day by using connected data, machine learning, and data science to transform mountains of data into simple, assistive, and actionable insights.

Highlights:

-  Actionable insights for construction projects
-  Persona-based, assistive user experience
-  Applying machine learning in construction
-  Analytics improve with user validation
-  Leveraging Autodesk big data platform



And more ...

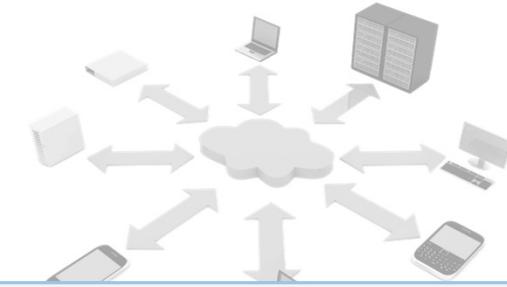


Next generation Glue and Field in pipeline



BIM 360 Docs and API – Big Picture

BIM 360 Docs – API Overview



Authentication (OAuth)

BIM 360 API
(Account/HQ Mgmt)

Data Management API

Model Derivative API

Viewer

Issues API

The screenshot shows the Autodesk BIM 360 Docs interface. On the left, there's a sidebar with 'Plans' selected, showing sub-folders like 'Shop Drawings' and 'Project Files' which contain items such as 'Project Expo', 'rfa', 'Pictures', 'Permission', 'Attribute', 'rvt', and 'Fort Mason'. A 'Recycle Bin' option is also present. The main area displays a table of documents with columns for 'File Name', 'Version', and 'Updated by'. The table includes rows for various files like 'rst_basic_sample_project.rvt' and 'S205 - Column Schedules'. On the right side, there's a large 3D model of a building complex with red roofs and green lawns. Below the model, a grid shows thumbnail previews for 16 documents, including 'Plans', 'A101 - Site Plan', 'A001 - Title Sheet', 'S001 - Title Sheet', 'S201 - Upper House F', 'S101 - Framing Plans', 'A103 - Elevations/Sec', and 'S206 - Elevations'.

Document Name	File Name	Version	Updated by
{3D}	rst_basic_sample_project.rvt	1	Mikako Harada
S205 - Column Schedules	rst_basic_sample_project.rvt	1	Mikako Harada
S204 - Footing Detail	rst_basic_sample_project.rvt	1	Mikako Harada
S203 - Central Pile Section	rst_basic_sample_project.rvt	1	Mikako Harada
A105 - Elev./Stair Set	{3D}		
A102 - Plans			
A101 - Site Plan			
A001 - Title Sheet			
S001 - Title Sheet			
S201 - Upper House F			
S101 - Framing Plans			
A103 - Elevations/Sec			
S206 - Elevations			

BIM 360 Docs – API Overview

Authentication (OAuth)

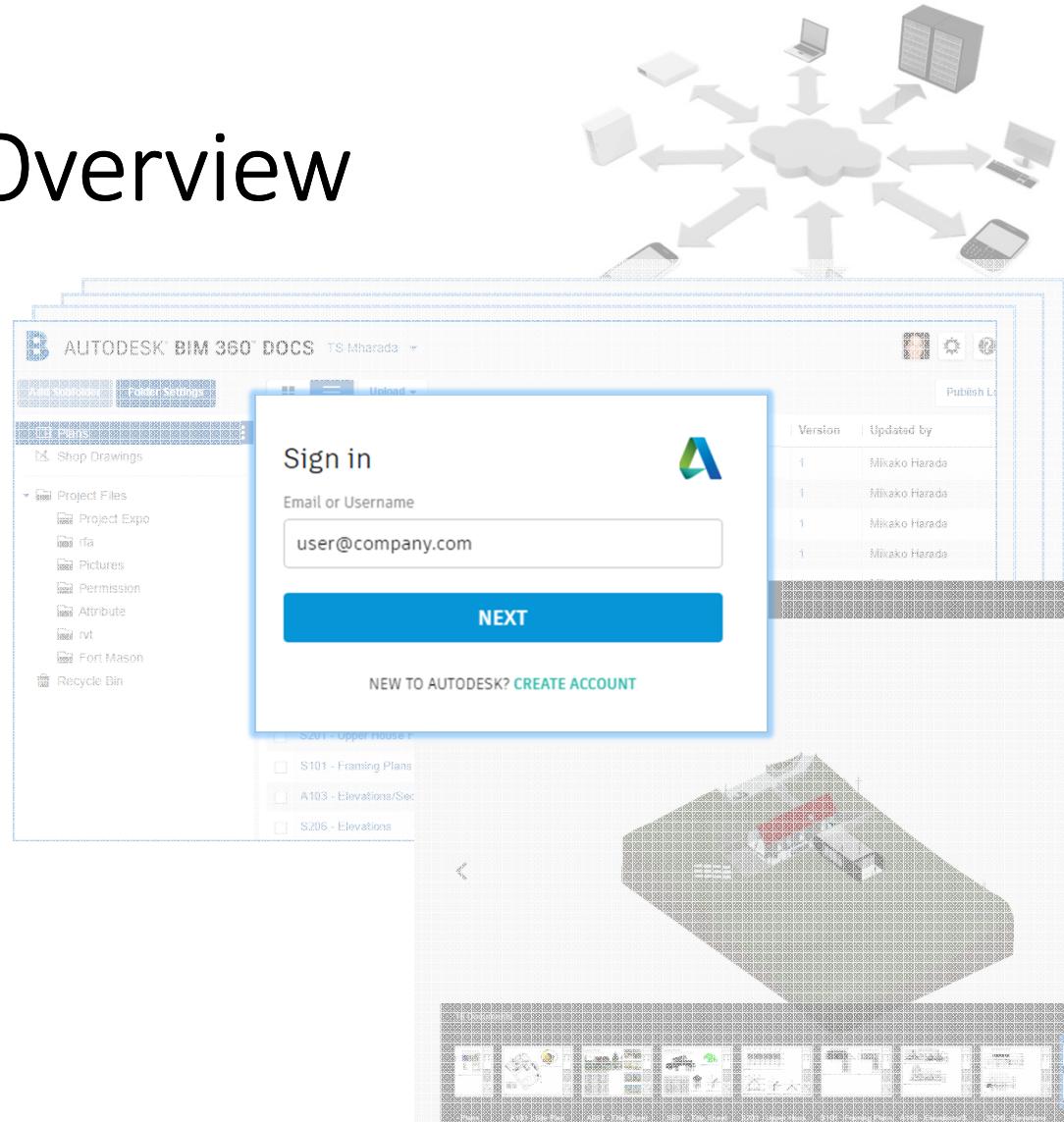
BIM 360 API
(Account/HQ Mgmt)

Data Management API

Model Derivative API

Viewer

Issues API



BIM 360 Docs – API Overview

Authentication (OAuth)

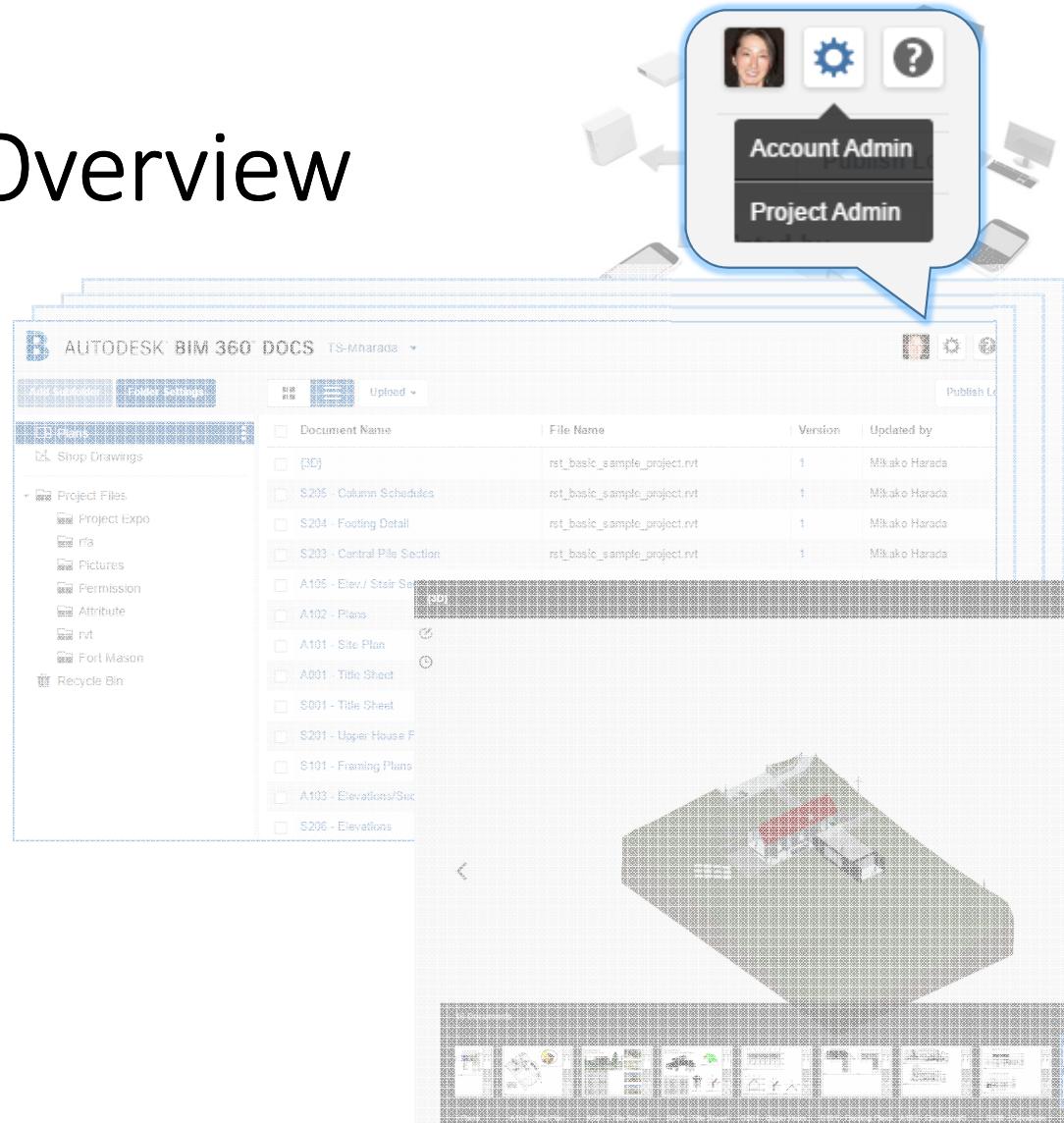
BIM 360 API
(Account/HQ Mgmt)

Data Management API

Model Derivative API

Viewer

Issues API



BIM 360 Docs – API Overview

Authentication (OAuth)

BIM 360 API
(Account/HQ Mgmt)

Data Management API

Model Derivative API

Viewer

Issues API

The screenshot displays the Autodesk BIM 360 Docs web application. On the left, there's a sidebar with navigation options like 'Add Subfolder' and 'Folder Settings'. The main area shows a list of files under the 'Plans' category. The table has columns for Document Name, File Name, Version, and Updated by. Most files are named 'rst_basic_sample_project.rvt' or 'rac_basic_sample_project.rvt', with versions 1 and updated by 'Mikako Harada'. Below the table, there's a large thumbnail of a 3D architectural model of a house.

Document Name	File Name	Version	Updated by
{3D}	rst_basic_sample_project.rvt	1	Mikako Harada
S205 - Column Schedules	rst_basic_sample_project.rvt	1	Mikako Harada
S204 - Footing Detail	rst_basic_sample_project.rvt	1	Mikako Harada
S203 - Central Pile Section	rst_basic_sample_project.rvt	1	Mikako Harada
A105 - Elev./Stair Sections	rac_basic_sample_project.rvt	1	Mikako Harada
A102 - Plans	rac_basic_sample_project.rvt	1	Mikako Harada
A101 - Site Plan	rac_basic_sample_project.rvt	1	Mikako Harada
A001 - Title Sheet	rac_basic_sample_project.rvt	1	Mikako Harada
S001 - Title Sheet	rst_basic_sample_project.rvt	1	Mikako Harada
S201 - Upper House Framing	rst_basic_sample_project.rvt	1	Mikako Harada
S101 - Framing Plans	rst_basic_sample_project.rvt	1	Mikako Harada
A103 - Elevations/Sections	rac_basic_sample_project.rvt	1	Mikako Harada
S206 - Elevations	rst_basic_sample_project.rvt	1	Mikako Harada

BIM 360 Docs – API Overview

Authentication (OAuth)

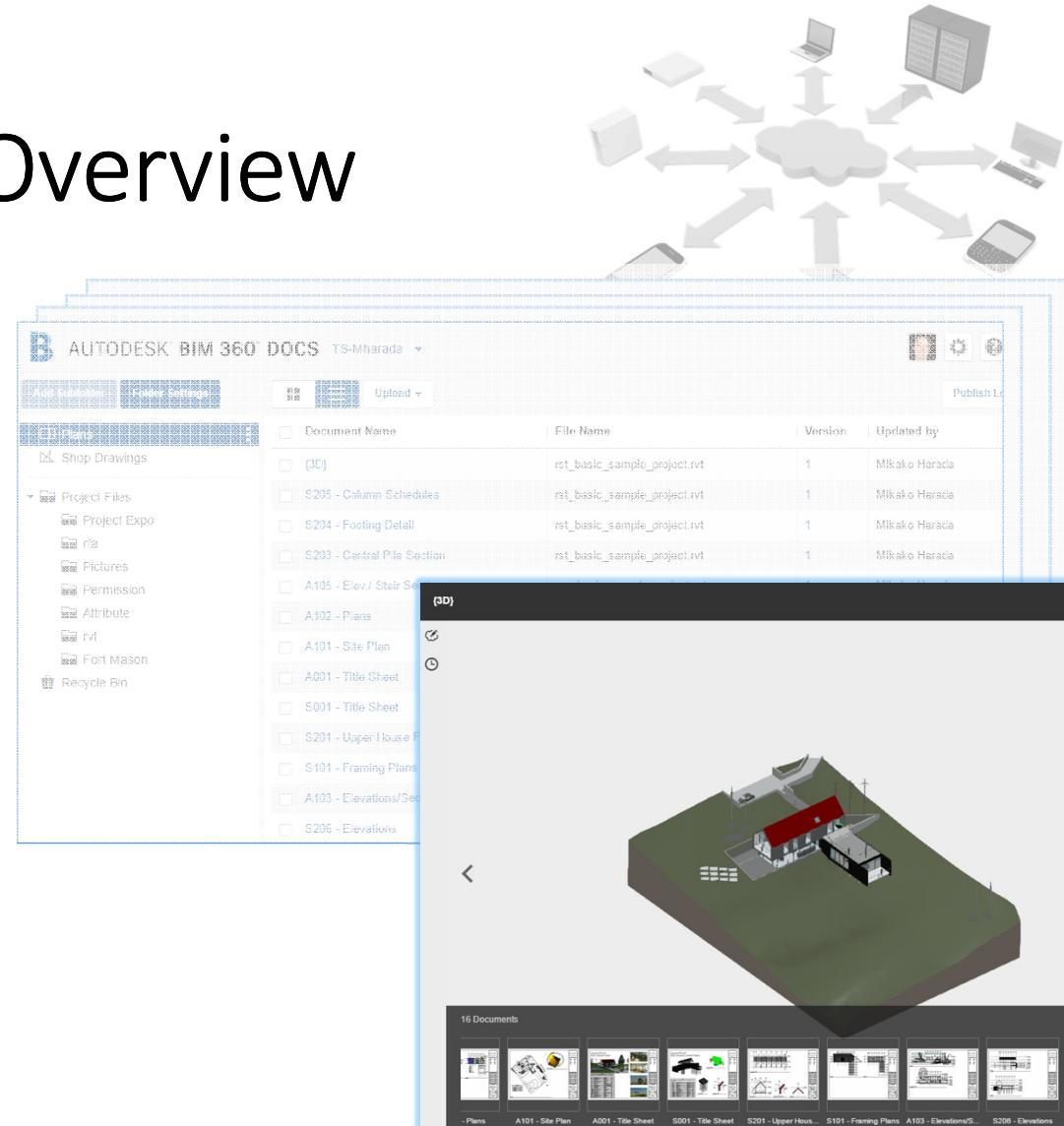
BIM 360 API
(Account/HQ Mgmt)

Data Management API

Model Derivative API

Viewer

Issues API



BIM 360 Docs – API Overview

Authentication (OAuth)

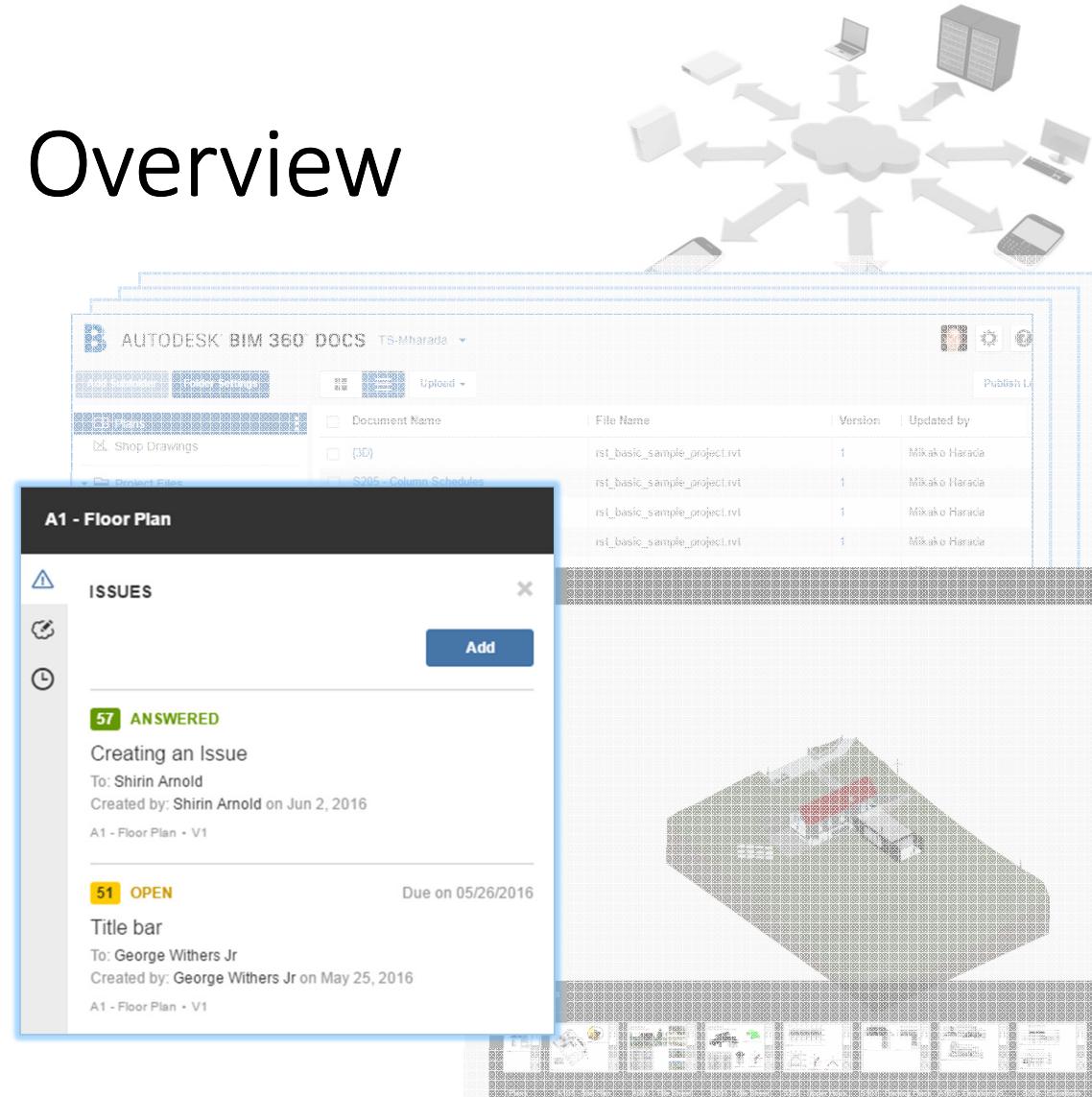
BIM 360 API
(Account/HQ Mgmt)

Data Management API

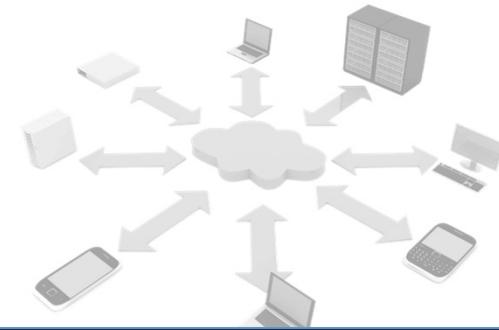
Model Derivative API

Viewer

Issues API*



BIM 360 Team – API Overview



Authentication (OAuth)

~~BIM 360 API
(Account/HQ Mgmt)~~

Data Management API

Model Derivative API

Viewer

~~Issues API*~~

The screenshot shows the BIM 360 Team Test Project interface. At the top, there's a navigation bar with 'Home', 'BIM 360 Team Test Project', and 'RVTs'. Below the navigation, a 3D model of a house is displayed. A specific wall is highlighted in blue, and a tooltip window titled 'INFORMATION' appears, showing details about a 'Basic Wall [428745]'. The tooltip lists 'Changes between versions 1 & 3': '+ Area by -1.020 m²' and '+ Volume by -0.206 m³'. It also notes that 'The shape of this object has been changed'. Below the tooltip, there are buttons for 'Version 1' and 'Version 3'. To the right of the 3D model, a 'CHANGES' panel is open, showing a summary of modifications: 'Added 6', 'Removed 0', and 'Modified 2'. The panel also lists 'Disciplines affected' and a 'Search + Filter' bar. A sidebar on the left shows a list of files with icons and names like 'rac_bas'.



Forge API

Forge API

Authentication (OAuth)

BIM 360 API
(Account/HQ Mgmt)

Data Management API

Model Derivative API

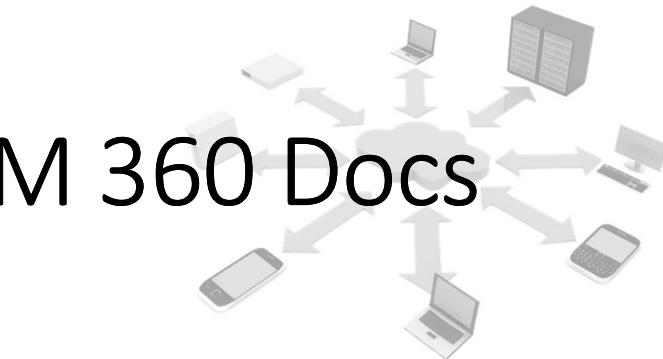
Viewer



Authentication Methods for BIM 360 Docs

OAuth2

- 2-legged
 - Application-only
- 3-legged
 - User context
 - Re-direct to accounts.autodesk.com



Sign in

Email or Username

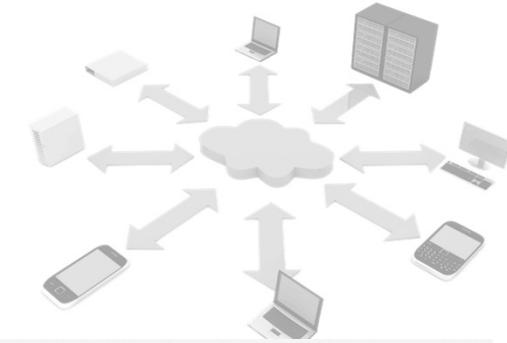
user@company.com

NEXT

NEW TO AUTODESK? [CREATE ACCOUNT](#)

<https://developer.autodesk.com/en/docs/oauth/v2/overview/>

Account Admin API (BIM 360 API)

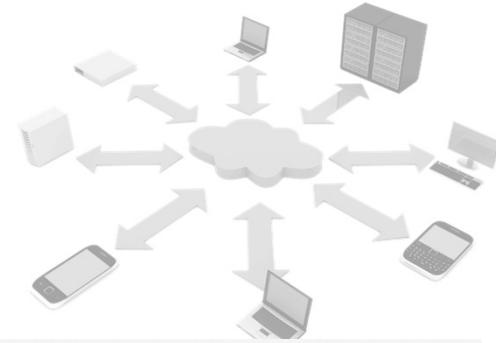


- bim360enterprise
- Projects
- Members
- Companies
- HQ provisioning extends to Docs

Integration	Description	Status
CRM Integration Test	Visit BIM 360 APIs on Forge Platform for details about the account level APIs.	Active
Sharepoint Integration Test		Active
Forge DevCon ERP App		Active
test		Active
test2		Approve
DM-Docs Test		Active

<https://developer.autodesk.com/en/docs/bim360/v1/overview/>

Account Admin API (BIM 360 API)



- bim360enterprise
 - Projects
 - Members
 - Companies
-
- HQ provisioning extends to Docs

The screenshot shows the 'Add Integration' screen in the Autodesk BIM 360 web interface. The main title is 'Add Integration'. Below it, the 'Select Access' section contains two checked checkboxes:

- BIM 360 Account Administration**
Read and write access to Account Administration functionalities including project creation, service activation, business partner directory, and member directory.
- BIM 360 Docs**
Read and write access to Document Management functionalities including access to folders, documents, and models.

On the right side of the screen, there is a sidebar with user information and a 'Next' button at the bottom right.

<https://developer.autodesk.com/en/docs/bim360/v1/overview/>

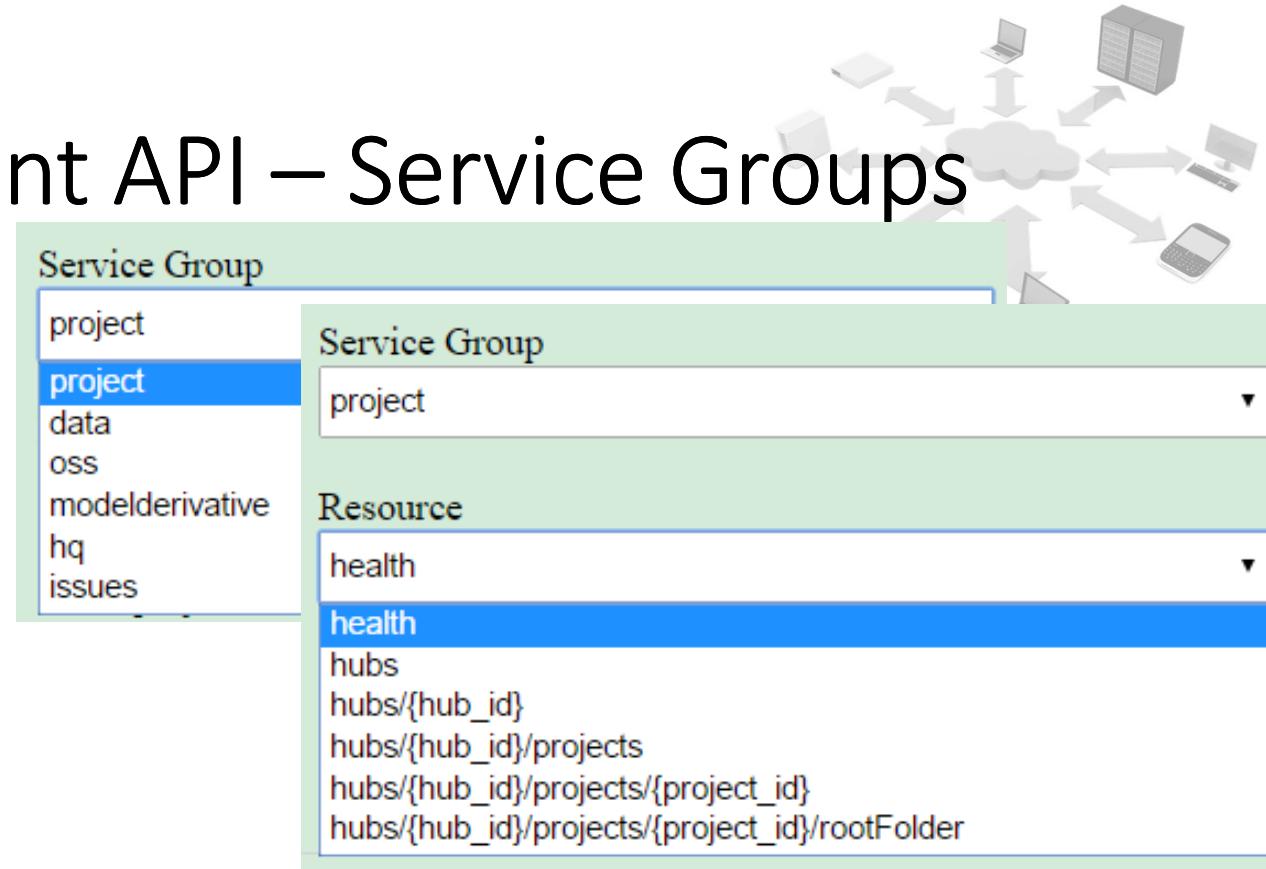
Data Management API – Overview



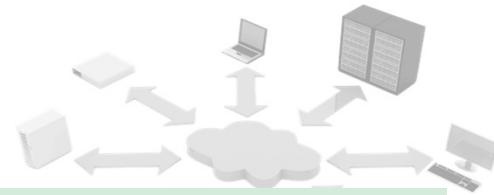
- Document Management
- Common across Autodesk products
 - A360
 - Fusion/Life Cycle
 - BIM 360 Docs
 - Consumer products (Tinker CAD)
 - ...

Data Management API – Service Groups

- Project service
- Data service
- Object storage service (OSS)
- Schema services



<https://developer.autodesk.com/en/docs/data/v2/overview/>



Data Management API

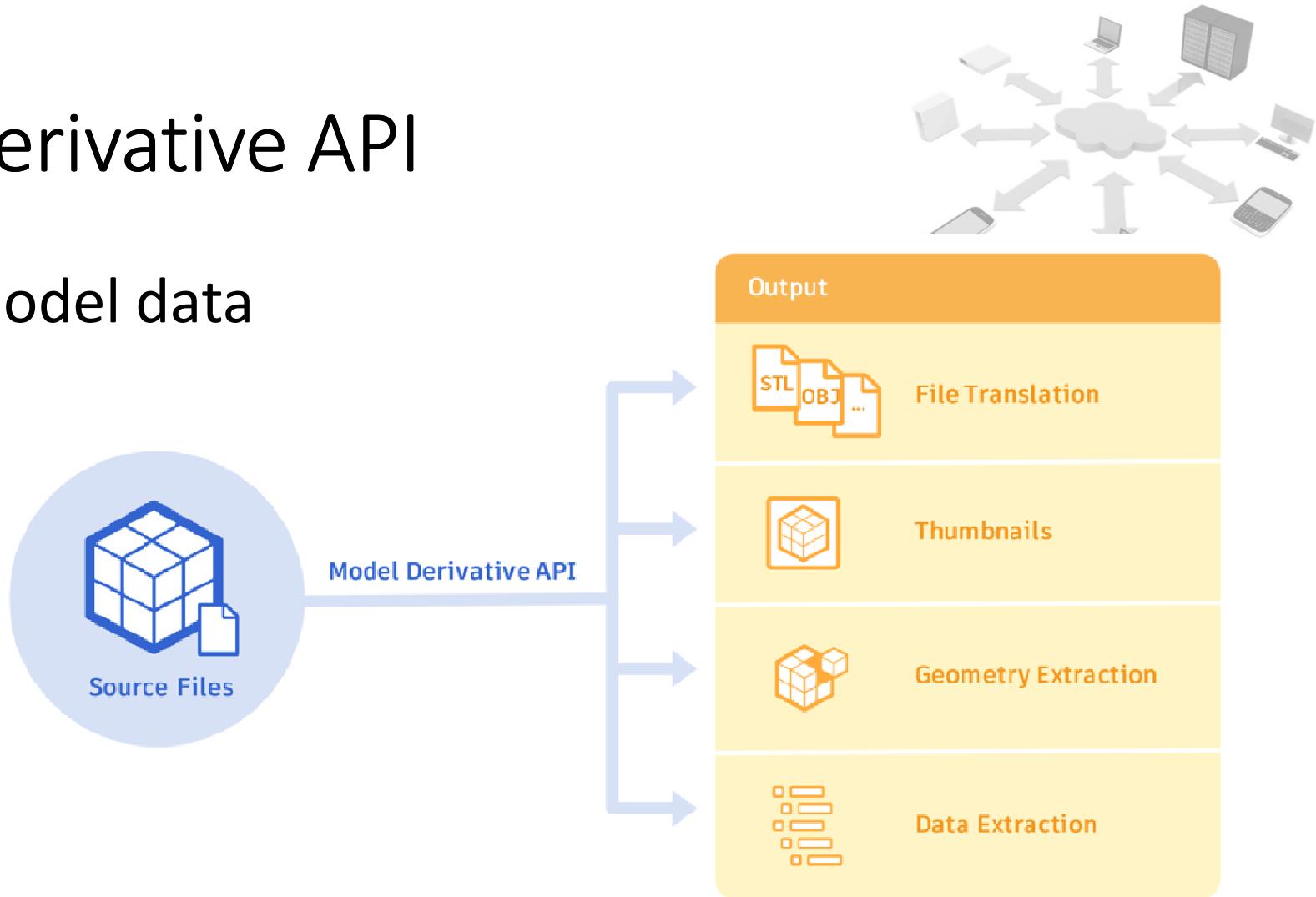
JSON API
{json:api}

<http://jsonapi.org/format/>



Model Derivative API

All about model data



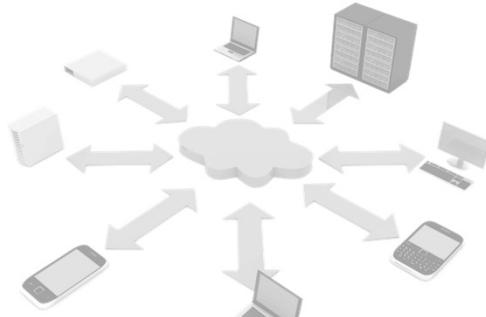
Data Management API

- Drill down with Test Harness

The screenshot shows a REST client interface with the following sections:

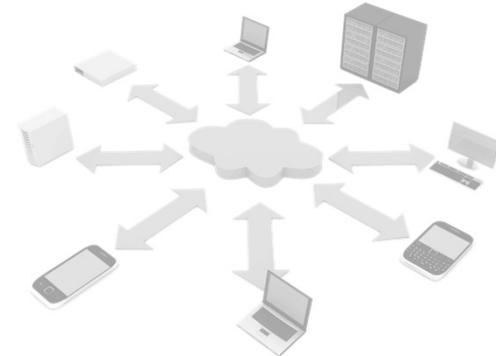
- Request:** URL: `https://developer-stg.api.autodesk.com/data/v1/projects/b.e9074a8c-60a1-4546-aea4-6c60c10e44d2/folders/urn%3Aadsk.wipstg%3Afs.folder%3Aco.CkAYk1sRTxmIExHXVckw80/contents?`
- Service Group:** `data`
- Resource:** `projects/{project_id}/folders/{folder_id}/contents`
- Method:** GET
- Parameters:**
 - `detailed`
 - `filter[id]`
 - `filter[attributes.name]`
 - `filter[attributes.extension.type]`
 - `hub_id`: `b.0db98458-a803-49fd-89c8-e753`
 - `limit`
 - `offset`
 - `sort`
 - `field`
 - `account_id`
 - `project_id`: `b.e9074a80-80a1-4546-aea4-6c60`
 - `filter[type]`
 - `folder_id`: `urn:adsk.wipstg%3Afs.folder%3Aco.CkAYk1sRTxmIExHXVckw80`
- Tree View:** Shows the JSON structure of the response, expanded to show the `data[8]` array and its nested `included` objects.
- View:** Displays a 3D model of a building with a red roof, set on a green base.

BIM 360 Docs & Forge



- Basic workflow is identical to A360 Personal & Team Hubs
- A few differences:
 - Docs support 2-legged and 3-legged.
 - “Hubs” is equivalent of “Accounts” in BIM 360.
 - Docs requires an additional step for provisioning or activating API access in HQ.
 - Look for the use of extension types, such as ***:autodesk.bim360:*** instead of ***:autodesk.core:***

BIM 360 Docs & Forge



- Uploading files
 - In [Step 5 of tutorial](#), use `*:autodesk.bim360:*` instead of `*:autodesk.core:*`
 - Use topFolders relationships (most user does not have access to rootFolder)
 - If you upload to Plans folder, it will automatically create Documents.
 - Pdf in Plans – appear as review documents. Still needs to manually review.

Model Derivative API – Basic Node.js Sample

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

Retrieved hierarchy

Mikako Test

Mikako Test2

Boston Build Space

Mikako Sandbox

DirectShapeSample.rvt

Urban Innovation Festival

Autodesk Cloud Accelerator

DevTech AEC

Revit Collaboration

Samples

- Golden Bridge Gate.dwg
- House Design.rvt
- Office Building.nwc
- Robot.iam
- Sports Car.sldasm
- V8 Engine.iam

Upload Delete

svf Download Delete

Roof Components

- Roofs
 - Basic Roof
 - Typical Roof
 - Basic Roof [143181]
 - Basic Roof [145079]
 - Basic Roof [177761]
 - Basic Roof [186659]
 - Slab Edges
 - Specialty Equipment
 - Stairs

Analytical Properties

- Constraints
- Construction
- Dimensions
 - Area = 387.871206
 - Slope = 5.093698
 - Thickness = 0.541667
 - Volume = 209.458295

RIGHT BACK

Upload Delete

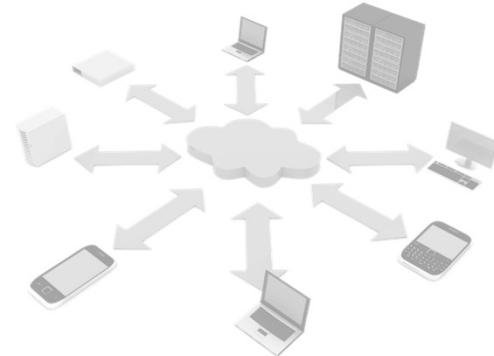
3D View

File View

Properties

Dimensions

Annotations



Learn more

<https://developer.autodesk.com/>

<https://autodesk-forge.github.io/>

<https://fieldOfViewBlog.wordpress.com/forge>

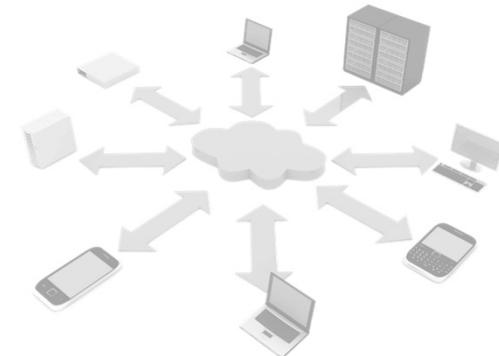
- look for materials from DevCon, Forge Hackathon, AU

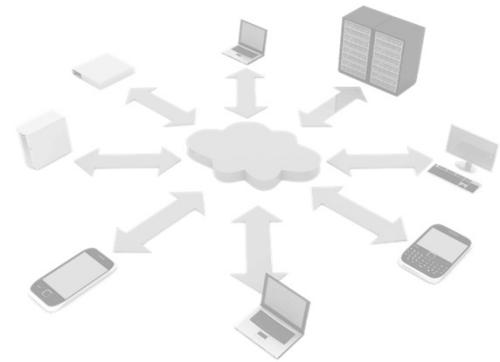
Summary

BIM 360 and Family Products

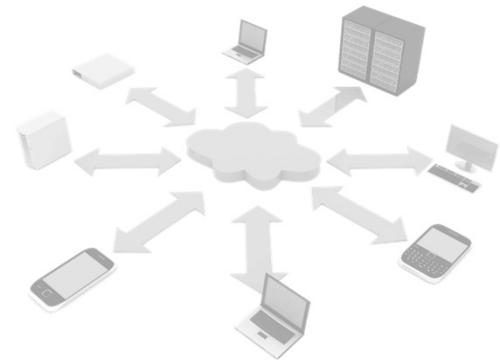
BIM 360 – API

- Overview
- Forge
 - Authentication
 - Account level (HQ)
 - Data Management
 - Model Derivative
 - Viewer





Questions?



Thank you!



Autodesk is a registered trademark of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.

© 2016 Autodesk. All rights reserved.