

Autodesk Construction Cloud API アップデートと今後の予定

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米国カーネギーメロン大学で博士号を習得。
ゼネラルモータース人工知能認知システム
グループ、スイス連邦工科大学研究員を経て、
現在米国オートデスクForge AECマ
ネージャーとして世界中のパートナーを支
援する役割に従事。詳細 blog:
<https://fieldofviewblog.wordpress.com/>

免責事項

本セッションでは、当社の既存または新規の製品やサービスについて計画中、または今後の開発について述べる内容が含まれています。これらのステートメントは製品、サービス、または機能の将来の利用可能性について約束や保証を意図するものではありません。私たちに現時点で知らされている要因に基づいて、単に現在の計画を反映するものです。これらの計画的および今後の開発努力は、予告なしに変更されることがあります。購入に関する決定は、これらのステートメントに依存することがないようお願い申し上げます。このレコーディングは2021年8月に行われており、発生した事象またはそれらが作成された日以降に変更される状況を反映しているため、将来予想される変更に関して記述を更新する義務はないものとします。このプレゼンテーションが同日以降にレビューされた場合、ステートメントには最新の情報や正確な情報が含まれない可能性があります。

2021年8月

Agenda

- Autodesk Construction Cloud (ACC) 概要
- API ステータスとアップデート
- Takeoff API
- プロパティのインデックス (Property Indexing) v2 API
- リレーションシップ (Relationships) API
- 今後の予定

Autodesk Construction Cloud

概要



AUTODESK CONSTRUCTION CLOUD™

C AUTODESK®
BIM COLLABORATE

C AUTODESK®
BIM COLLABORATE PRO

T AUTODESK®
TAKEOFF

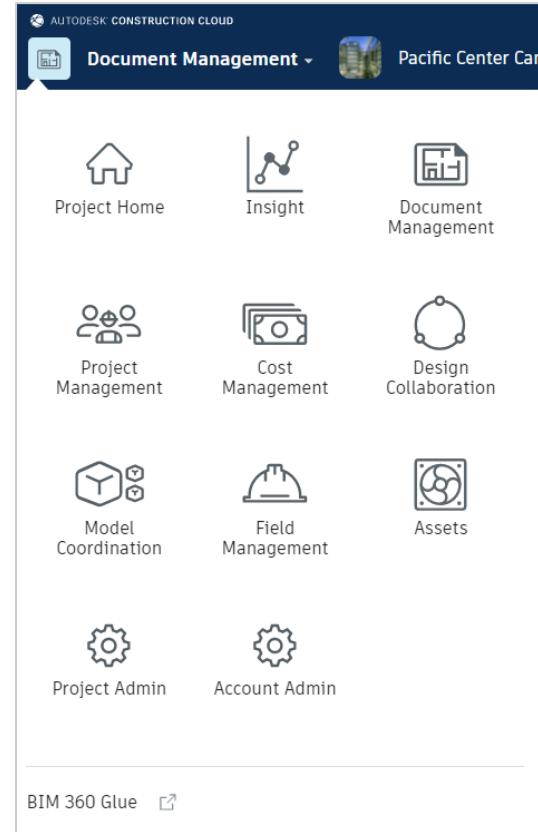
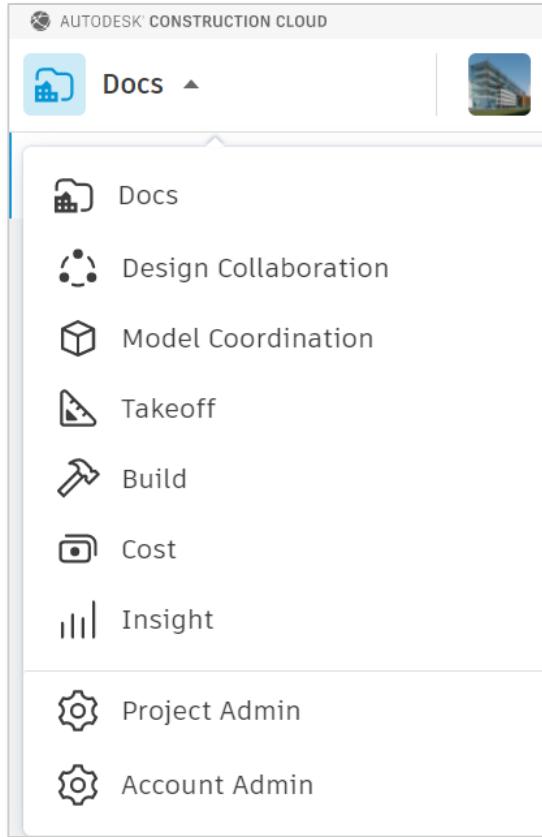
B AUTODESK®
BUILD



AUTODESK® DOCS

INSIGHTS

製品/サブスクリプション&モジュール



BIM 360 & ACC API

ステータスとアップデート

API アクセス

- BIM 360と同様
- アカウント管理>> BIM 360 管理 >> 設定
- カスタム統合タブは、すべてのアカウントでアクティブ

The screenshot illustrates the navigation path for API access across three levels of the Autodesk Construction Cloud interface:

- Top Level:** Shows the main navigation bar with "Docs" highlighted (circled in orange). Below it, the "Account administration" link is also circled in orange.
- Middle Level:** The "Project List" screen. A green arrow points down from the "Account administration" link in the top bar to the "Account Admin" tab in the left sidebar of this screen. The "Account Admin" tab is circled in orange.
- Bottom Level:** The "BIM 360 admin" screen. A green arrow points down from the "Account Admin" tab in the middle screen to the "BIM 360 admin" tab in the left sidebar of this screen. The "BIM 360 admin" tab is circled in orange. Within this screen, the "Settings" tab is also circled in orange.
- Final Level:** The "Custom Integrations" screen. A green arrow points down from the "Settings" tab in the bottom screen to the "Custom Integrations" tab in the top navigation bar of this screen. The "Custom Integrations" tab is circled in orange.

The "Custom Integrations" screen displays a list of applications developed by the user's company to expand BIM 360 capabilities. Examples shown include "AutoSpecs Test (Pype)" and "AutoSpecs Dev (Pype)".

API タイプの選択

Create App

APIs

Select the APIs you want to use in your app.

Autodesk Construction Cloud API	BIM 360 API	Data Management API	Design Automation API
Token Flex Usage Data API	Webhooks API		

使用するAPIとプロダクト	プロキシ・APIタイプ
BIM 360 	BIM 360 API 
BIM 360/ACC 互換性のあるAPIのみを使用  	BIM 360 API 
BIM 360/ACC. すべてのAPIを使用  	BIM 360 API & ACC API  
ACC ACC 固有のAPIのみを使用 	ACC API 

API の変更点



変更点

- 指摘事項 (Issues)
- 管理 (Admin)
- チェックリスト (checklist)

部分的な変更

- Docs 固有の API:
単一ページのpdf, プラン/シート,
権限.
- 情報提供依頼(RFI) : 添付/参照なし



変更なし

- コスト管理(Cost)
- アセット管理(Assets)
- データ コネクタ
- モデル コーディネーション

*) ベースurl に /bim360/ の代わりに /construction/ を提供するものもあります

モジュール別

ドキュメント管理

- Data Management API + Docs 固有の API

- 機能の変更

- ACC「プラン」フォルダの削除
- シングルページpdf (pdfエクスポート)

- ACC“現場向け”フォルダ

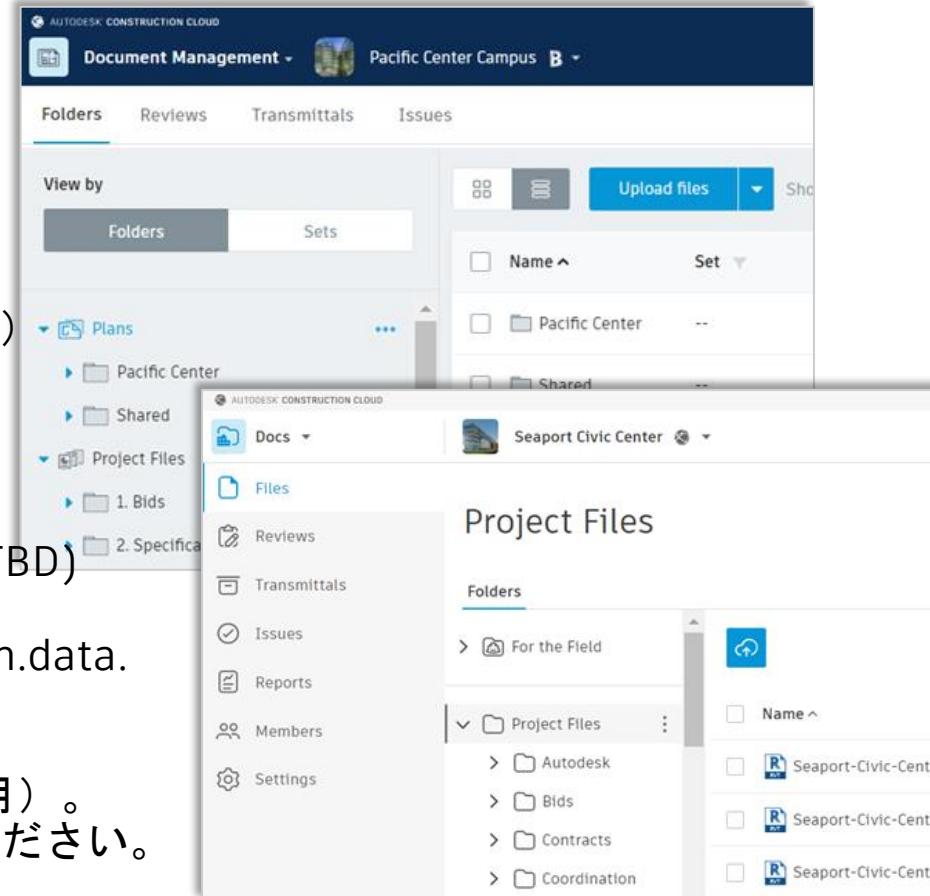
- 権限

- カスタム属性動作変更

2021年3月23日以降のプロジェクト (API TBD)

- GET projects >> data[n].attributes.extension.data.
projectType = “ACC” | “BIM360”

- CreateFolder コマンドは非推奨 (~2022年1月)。
代わりにPOST projects/folders を使用してください。



デザイン コラボレーション

■ 機能の強化

- DWG サポート
- 変更分析 (rvt, dwg, ifc)^{*1}
- Pro: RCW, C3D, P3D

■ API

- 変更なし
-  変更表示 - Indexing API (TBD)

■ 関連事項

- Revit 2022 API – クラウドモデルの初期設定

^{*1} 3D DWG's, Revit からのIFC、ArchiCAD 、Tekla



モデルコーディネーション

機能の強化

- IFC サポートの強化
- rvt, dwg, ifc

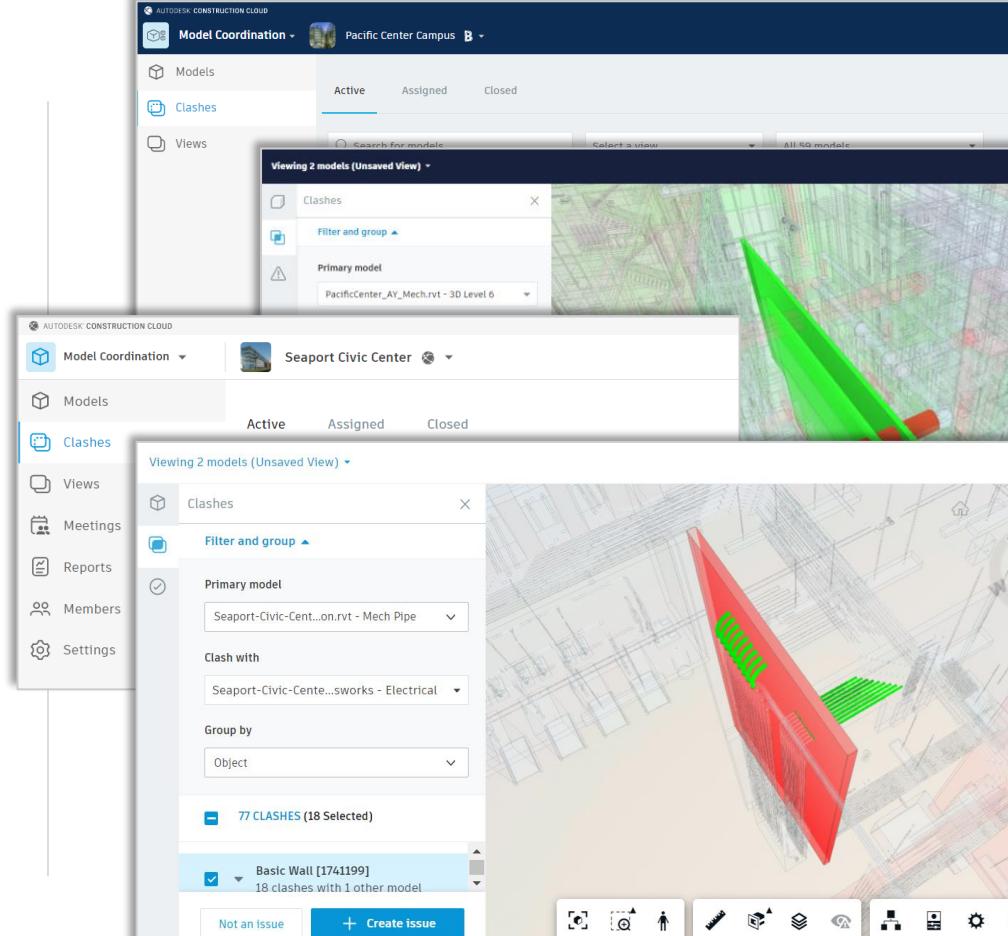
API

互換性有り

- v1 indexing – オンデマンド.
i.e., 60日以降でもアクセス可能

Indexing v2 API (TBD)

すべてのACC 統合製品で使用可能



Takeoff

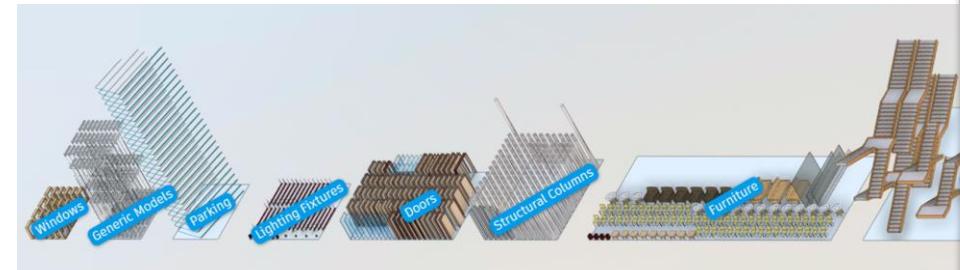
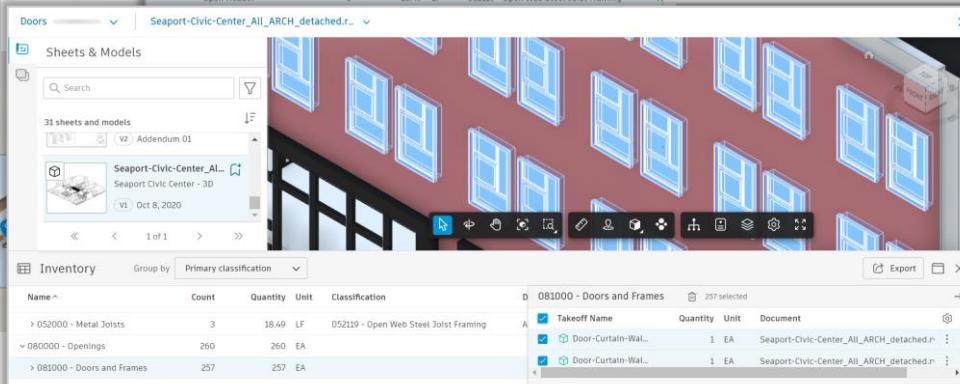
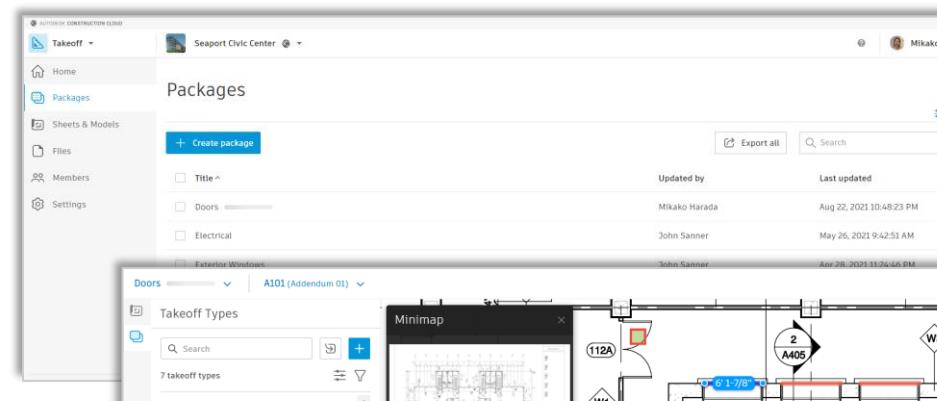


New!

- 2D、3Dでの定量化。 ACCのみ

- API

- 初期リリース - 目録(inventory) データのRead 近い将来公開予定
- その後の予定- 書き込みとプロジェクト設定(例：分類)
- Form Cluster ツール
viewer.loadExtension("Autodesk.VisualClusters")





■ アセット(Assets) API (ベータ2021年2月)

- 互換性あり

- ステータスセット、カスタム属性作成のための追加のクエリパラメータ(TBD)
- エラーコード(TBD)

■ 情報提供依頼 (RFI) API

- 互換性あり。添付、参照機能を除く

どちらもACC APIタイプを用いる/construction/エンドポイントを提供。バックエンドは同じ。



■ チェックリスト(Checklists) – BIM 360

- 読み込み API
- 互換性なし。

■ フォーム(Forms) – ACC

👍 ■ 読み込み API (2021年3月)

- pdf & web フォーム、チェックリスト
 - GET form-template
 - GET forms

■ 写真(Photos) – ACC



👍 ■ 読み込み API (2021年6月)

- POST photos:filter
- GET photos/:photoId

コスト管理



- カスタマイズ機能を含む多くの機能拡張

- API

- オフィシャルにリリース
- 互換性あり
- リクエストを歓迎

The screenshot displays the Autodesk Construction Cloud Cost Management interface across four panels:

- Pacific Center Campus:** Shows a budget list for "Main Contract". Items include Office Supplies, Fees/Legal/Insurances, Solicitors Fees, Bill Preparation, Testing and QA, Risk Contingency, 3D Printing, and Site Management Staff.
- Budget Trend:** A chart comparing Original, Revised, and Projected values for categories like Concrete Substructure, Risk Contingency, RC Frame, Solar Protection, and Electrical Services.
- Cost Trend:** A chart comparing Original and Forecast values for categories like Electrical Services, Solar Protection, Concrete Substructure, RC Frame, and Risk Contingency.
- Seaport Civic Center:** Shows a budget table with columns: Budget Code, Budget Name, Qty, Unit, Unit Cost, Amount, Internal Budget Transfer, Main Contract, Linked to Main Contract SOV, Supplier/Contra, and Actions. It includes filters for Cost, Change Management, Forecast, Files, Reports, Members, and Settings.
- Budget Trend:** A chart for the Seaport Civic Center comparing Original, Revised, and Projected values for categories like Concrete Substructure, Solar Protection, Electrical Services, Mechanical Services, and Envelope package.
- Cost Trend:** A chart for the Seaport Civic Center comparing Original and Forecast values for categories like Envelope package, Concrete Substructure, Mechanical Services, Electrical Services, and Solar Protection.

Insight



■ Data Connector API

- パブリックベータ 2021年1月
- API 自体は互換性あり
- データの種類は異なる場合あり
- JSON のスキーマ (TBD)
- プロジェクトレベル (TBD)
- Tip: Executive Overview 権限

schemas
admin_account_services.csv
admin_accounts.csv
admin_business_units.csv
admin_companies.csv
admin_project_companies.csv
admin_project_roles.csv
admin_project_services.csv
admin_project_user_companies.csv
admin_project_user_roles.csv
admin_project_user_services.csv

assets_asset_custom_attribute_values.csv
assets_asset_permissions.csv
assets_asset_statuses.csv
assets_assets.csv
assets_categories.csv
assets_category_custom_attributes.csv
assets_category_status_set_assignments.csv
assets_custom_attribute_defaults.csv
assets_custom_attribute_selection_values.csv
assets_custom_attributes.csv
assets_status_sets.csv

The screenshot displays the Autodesk Construction Cloud Insight interface across four main sections:

- Top Left:** Shows the "My Dashboard" section with a map of Boston, weather information (72°), and project status cards for Quality Risk and Safety Risk Today.
- Top Right:** Shows the "Data Connector" section with a "Run extraction" button and a "Schedule" button.
- Middle Left:** Shows the "Executive Overview" section with tabs for Risk, Cost, Design, and Quality.
- Middle Right:** Shows the "Project Controls" section with tabs for Cost, Schedule, Quality, and Safety, along with a "Data Connector" section.
- Bottom Left:** Shows the "Data Connector" section with a "Run extraction" button and a "Schedule" button.
- Bottom Right:** Shows the "Data Connector" section with a "Run extraction" button and a "Schedule" button.

アカウント・プロジェクト管理



■ API

⚠ ■ 部分的に互換性あり

- 例：ACCプロジェクトの作成不可
- アカウントのタイプを区別する方法なし
- 優先度の高いエリア

The screenshot shows the Autodesk Construction Cloud interface. At the top, there are navigation tabs: PROJECTS (which is selected), MEMBERS, COMPANIES, ROLES, ANALYTICS, SETTINGS, and APPS. Below this is a search bar labeled "Search project by name".

The main area is titled "Project Directory" with the sub-instruction "The Project Directory lists all projects in your account.". It shows a table with 185 current projects. The columns are "Name", "Members", "Companies", and "Project Status". Some examples listed are "00 Design Files" (0 members, 1 company, Active), "Accelerator Shanghai" (2 members, 3 companies, Active), and "AC JU" (0 members, 1 company, Active).

On the left, there is a sidebar with the following options: Projects (selected), Members, Templates, Library, Settings, Apps, and BIM 360 admin. The "Projects" option is highlighted with a blue background.

To the right, there is another section titled "Projects" with tabs for "Active" and "Archived". A "Create project" button is at the top. Below it is a table listing projects:

Name	Number	Type
000Woods	000	●
001_CDE_ITALY	001_2021	●
003_CDE_ITALY	1003	●
00-ADSK Docs	567483	●

指摘事項(Issues) ✓ ⚠

- 共有サービス
 - Docs, Build, Design Collaboration, Model Coordination, Revit, Navisworks
- API
 - ⚠ ■ 互換性なし
 - 優先度の高いエリア

The screenshot shows two views of the Autodesk Construction Cloud Field Management platform. The top view is the 'Issues' list page, which displays a table of issues with columns for ID, Type, Sub-type, and Title. The bottom view is a detailed view of issue #1505, titled 'Door hardware installation defect'. The detailed view includes sections for Details, Attachments, and Activity, along with specific fields for Assigned to, Due Date, Location, and Root Cause.

Autodesk Construction Cloud Field Management - Pacific Center Campus

ISSUES

ID	Type	Sub-type	Title
1509	Design	Building Code	wrong door
1508	Installation Defect	Installation Defect	Roy - test - B
1507	Design	Design	test
1506	Installation Defect	Installation Defect	dadas
1505	Installation Defect	Installation Defect	Door hardware

Issue #1505

Door hardware installation defect

Created by Nelli Gyongyosi (United Construction) on Jul 15, 2021

Assigned to Unspecified ✓

Type Installation Defect ✓

Owner Nelli Gyongyosi ✓

Due Date Unspecified ✓

Location Level 2 > Office 237 ✓

Root Cause Inadequate Training ✓

Location Details

Autodesk Construction Cloud Build - Seaport Civic Center

Issues

Title	ID	Status	Type	Assigned to
Drawing Discrepancy: Floor Finish	#230	Pending	Design	Leah Ho
Installation	#228	Open	Quality	-
Safety	#227	Open	Safety	Christine Acker
Loader backing up in the array without a spotter.	#226	Open	Safety	Bill Kagan
Forklift operator backed up in the ar...	#225	Open	Safety	Bill Kagan
Worker standing on mid rail of sciss...	#224	Open	Safety	Bill Kagan
Near miss getting injured	#223	Open	Safety	Bill Kagan

Issue #226

Details

Unpublish Delete

Title Loader backing up in the array without a spotter.

Status Open

Type Safety > Safety

Description Loader backing up in the array without a spotter.

Assigned to Bill Kagan (United Construction)

Location

共有サービス

▪ 位置(Locations)

- 読み込み API (July, 2021年 7月)
- 書き込み (TBD)

▪ リレーションシップ(Relationships) API

- 書き込み API (2021年 8月)
- 参照関係を定義
- BIM 360 & ACC. コンテキストは異なる場合あり

▪ インデックス (Indexing) API (TBD)

- プロパティインデックス(indexing)v2
- Diff バージョン

The screenshot displays the Autodesk Construction Cloud interface. At the top, there's a navigation bar with 'Add', 'Delete', 'Import', and 'Download Template' buttons. Below it is a table titled 'Locations' with columns for 'Name', 'Linked Documents', and 'Area'. The table lists various locations like Basement, Room 1, Room 2, apartment 1, bathroom, Room 3, Level 1, Level 2, Office 237, Office 306, and Office 271, along with their respective document counts and edit icons.

Below the table, a message says 'Total locations: 190'. To the right, there's a detailed view of a specific location entry (518530) with tabs for 'Details', 'References', and 'Activity log'. The 'References' tab is active, showing a modal dialog titled 'Add file reference' with a list of options: 'For the Field', 'Project Files', 'Autodesk', 'Bids', 'Contracts', 'Coordination', 'Correspondence', 'Crystal-Clear-Glazing', 'Delta-Engineers', 'Drawings', 'Files', 'Forms', 'Issues', 'Photos', 'Sheets', and 'Submittals'. The 'Issues' option is checked. On the far right, there's another smaller window showing a list of files and images related to a task.

リリースノート

- <https://blogs.autodesk.com/bim360-release-notes/2021/>
- <https://help.autodesk.com/view/DOCS/ENU/>
DOCS | COLLAB | COORD | TAKEOFF | BUILD
- API ブログ: forge.autodesk.com/blog
 - [New endpoint: get locations in BIM 360/ACC](#)
 - [Autodesk Build Photos API](#)
 - [Custom attributes projects created before and after March 23, 2021](#)
 - [First Autodesk Construction Cloud \(ACC\) specific API - Forms API](#)
 - [BIM 360 Assets API - public beta is here](#)
 - [BIM 360 Data Connector API - available as public beta](#)
- 前回のアップデートのレコーディング
 - [DevDays Online: Autodesk Construction Cloud and API Updates.](#)
(2021年3月). Data Connector, Assets & Relationships APIを含む

The screenshot shows the 'BIM 360 Release Notes' page. At the top, there's a header with the Autodesk logo and the title 'BIM 360 Release Notes'. Below the header, there's a grid of six cards, each representing a different release note:

- BIM 360 Model Coordination – August 2021** (Aug 17, 2021): Shows a screenshot of a 3D model with coordinate markers.
- BIM 360 Design Collaboration Update – Supported Documents ...** (Aug 16, 2021): Shows a stack of colorful documents.
- Cash Flow Forecasting In Cost Management** (Aug 11, 2021): Shows a screenshot of a financial chart.
- BIM 360 Design Collaboration Update – BIM 360 Change Analy...** (Aug 02, 2021): Shows a screenshot of a 3D model with change analysis tools.
- BIM 360 Document Management update — July 28** (Jul 28, 2021): Shows a stack of documents.
- BIM 360 Design Collaboration Update – Team Content Fol...** (Jul 27, 2021): Shows a screenshot of a content management interface.

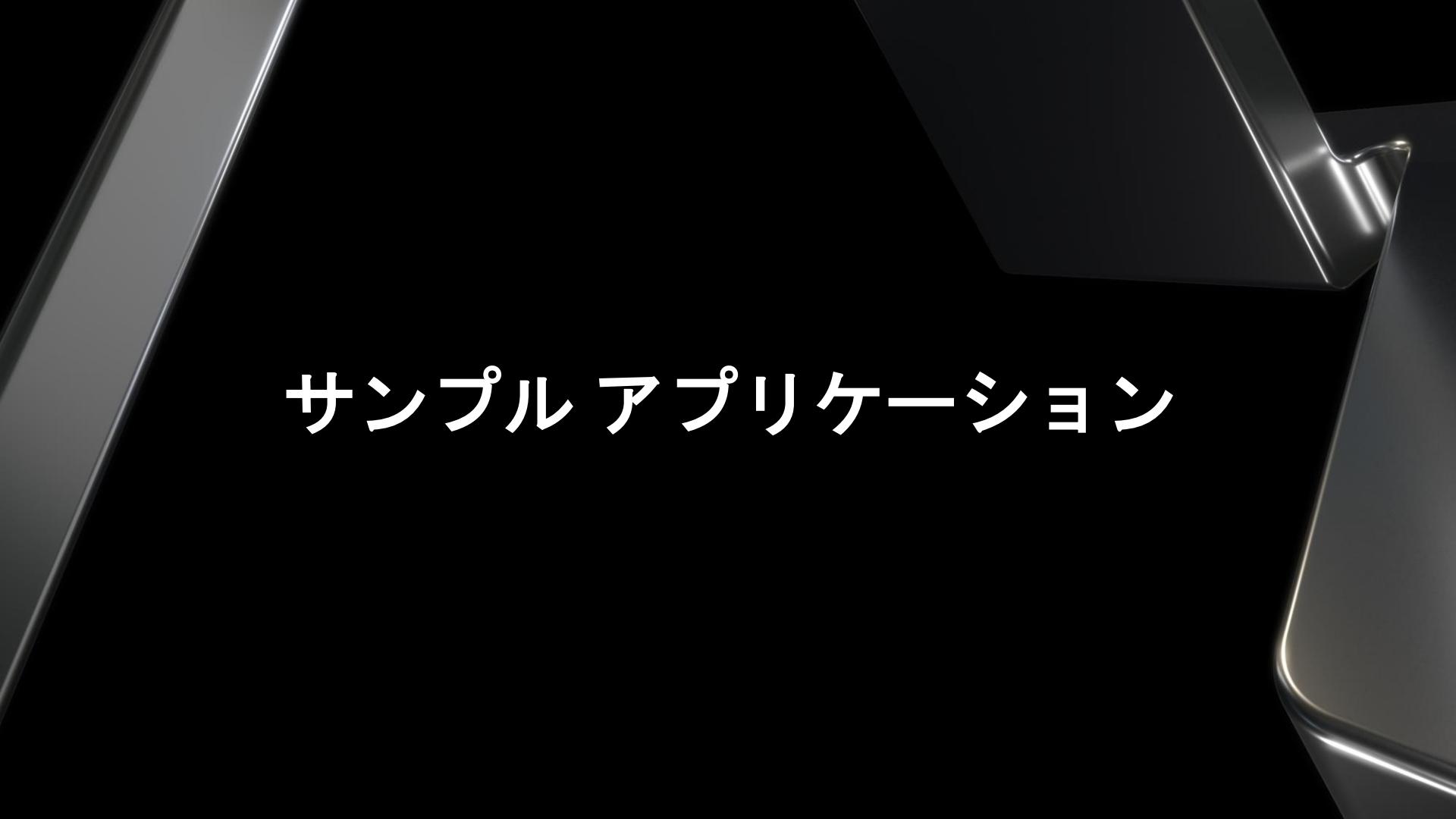
Takeoff API

Takeoff API

- 初期リリース – レビュー中
 - 商品目録(inventory)データ読み込み
 - パッケージ (Packages)
 - Takeoff タイプ
 - Takeoff アイテム
 - 測定システム
 - コンテンツビュー (モデル/シート)
- その後のリリース
 - 書き込み、プロジェクトの設定 (分類など)

The screenshot displays the Autodesk Construction Cloud Takeoff API interface. At the top, there's a navigation bar with 'Takeoff' and project information. Below it is a sidebar with 'Home', 'Packages', 'Sheets & Models', 'Files', 'Members', and 'Settings'. The main area has tabs for 'Packages' (selected), 'Doors', and 'Inventory'.
Packages: Shows a table with columns for 'Title', 'Doors', and 'Electrical'. It includes buttons for 'Create package', 'Export all', and 'Search'.
Doors: Shows '7 takeoff types' including '030000 - Concrete' and '72" x 53"'. It features a 'Minimap' view of a building floor plan with various rooms labeled.
Inventory: Shows an 'Inventory' table with columns for 'Name', 'Count', 'Quantity', 'Unit', 'Classification', 'Open Header', 'Takeoff Name', 'Quantity', 'Unit', and 'Distance (LF)'. The table lists items like '050000 - Metals', '052000 - Metal Joists', and '052100 - Steel Joist Fram...'.

Below the main interface is another window titled 'Sheets & Models'. It shows a 3D rendering of a building's interior with multiple windows. A table below it lists 'Inventory' items with columns for 'Name', 'Count', 'Quantity', 'Unit', 'Classification', and 'Document'. Items include '052000 - Metal Joists', '080000 - Openings', '081000 - Doors and Frames' (with a count of 257), and '083000 - Specialty Doors a...'. The table also includes columns for 'Takeoff Name', 'Quantity', 'Unit', and 'Document'.



サンプル アプリケーション

CSV エクスポート

機能 : Takeoffモジュールの目録データをカスタムWebページに、さらにcsvにエクスポートします。このサンプルは、Takeoff APIを使用した基本的な読み取りアクセスを示すものです。

ソースコード: GitHub サンプル (TBD)

Author: João Martins, Autodesk



The screenshot shows the Autodesk Takeoff software interface. On the left, the 'ACC Project List' pane shows a tree structure with 'Takeoff Imperial 1 (All Products)' selected. The 'PACKAGE' section lists various division codes. The 'INVENTORY' section is the main focus, displaying a table of items:

name	count	quantity	unit	classification	document
A1	11	9590.20	SF	C2030.20 - Tile Flooring	A1
A2	13	8624.35	SF	C2030.20 - Tile Flooring	A2
Instruction Rm Finishes	11	6200.82	SF	C2030.20 - Tile Flooring	A2
Administrative Rm Finishes	2	2393.53	SF	C2030.75 - Carpeting	A2
A102	9	1729.58	SF		A102
Office Finishes	7	824.61	SF	C2030.75 - Carpeting	A102
Conference Rm Finishes	2	904.97	SF	C2030.75 - Carpeting	A102

Below the table, there are buttons for 'Data Setting', 'Display data style', and 'Export to csv'. The 'Export to csv' section has options for 'Raw data' (unchecked) and 'Human readable form' (checked). The 'Execute' button is at the bottom right.

The 'Sheets & Models' section shows a list of sheets and models for 'Division 09 - Finishes' and 'A1 (version 2)'. It includes icons for each sheet and version information. To the right, a detailed floor plan of a building is displayed, with specific rooms or areas highlighted in purple.

Packages

[+ Create package](#)[Export all](#)[Search](#)[Settings](#) Title ^

Updated by

Last updated

 Division 01 – General Requirements

Dave Wilson

Mar 26, 2021 10:29:22 AM

 Division 02 – Existing Conditions

Dave Wilson

Mar 26, 2021 10:29:28 AM

 Division 03 – Concrete

Sarah Cunningham

Aug 12, 2021 1:49:37 PM

 Division 04 – Masonry

Dave Wilson

Mar 26, 2021 10:29:38 AM

 Division 05 – Metals

Dave Wilson

Mar 26, 2021 10:29:43 AM

 Division 06 – Wood, Plastics, and Composites ⚠️ Updates

Dave Wilson

Jun 3, 2021 5:59:44 PM

 Division 07 – Thermal and Moisture Protect...

Dave Wilson

Mar 26, 2021 10:29:53 AM

 Division 08 – Openings ⚠️ Updates

Dave Wilson

Aug 3, 2021 4:17:30 PM

 Division 09 – Finishes

Joao Martins

Aug 18, 2021 2:06:32 PM

 Division 10 – Specialties

Dave Wilson

Mar 26, 2021 10:30:12 AM

 Division 11 – Equipment

Dave Wilson

Mar 26, 2021 10:30:16 AM

 Division 12 – Furnishings

Chico Membreno

Aug 11, 2021 6:59:44 PM

 Division 13 – Special Construction

Dave Wilson

Mar 26, 2021 10:30:28 AM

 Division 14 – Conveying Equipment

Dave Wilson

Mar 26, 2021 10:30:33 AM

 Division 20 – Mechanical Support

Dave Wilson

Mar 26, 2021 10:30:39 AM

ビューアー & コスト管理との統合

機能：Takeoffモジュールから数量データを抽出し、コストモジュールの予算にインポートします。また、設計モデルのどこから数量データが取得されているかもビューア上で示します。

ソースコード: GitHub サンプル (TBD)

作者: Zhong Wu, Autodesk



The screenshot displays the Autodesk Construction Cloud interface with several windows open:

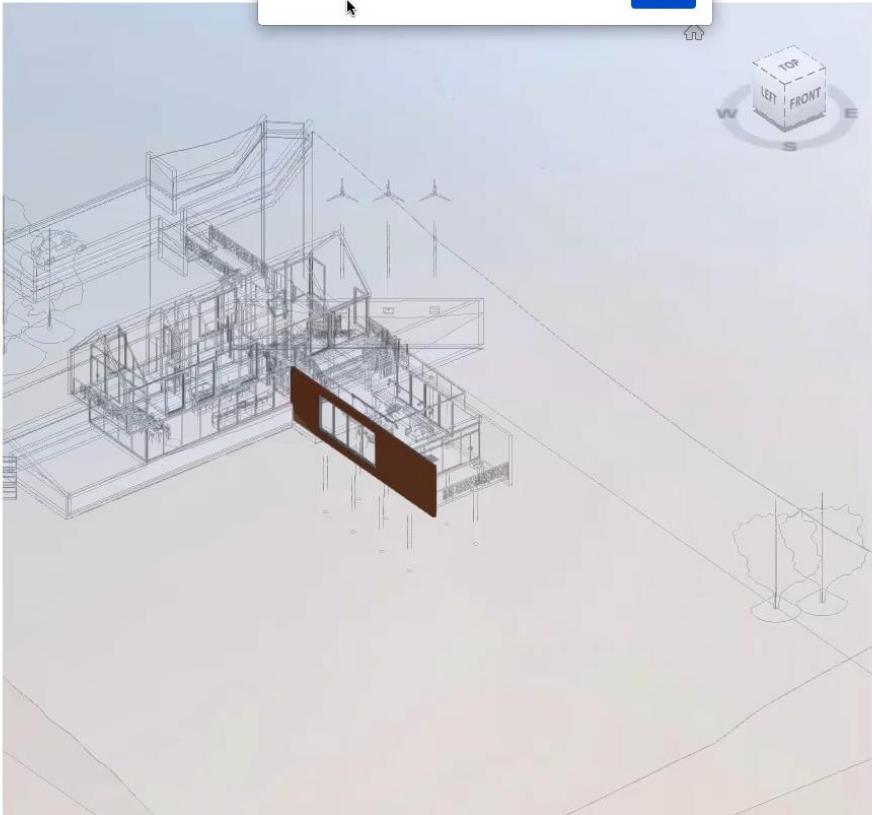
- Income:** A table showing budget items with columns for Budget Code, Budget Name, Qty, Unit, Unit Cost, Amount, Internal Budget Transfer, Main Contract, and Linked to Main Contract SOV. Data includes:

Budget Code	Budget Name	Qty	Unit	Unit Cost	Amount	Internal Budget Transfer	Main Contract	Linked to Main Contract SOV
01651.600	Glass	6	nr	230.00	1,380.00	0.00	No	
09716.997	Window	8	nr	553.00	4,424.00	0.00	No	
14259.806	Door	2	nr	836.00	1,672.00	0.00	No	
68081.172	Floor	88	m ²	136.00	11,968.00	0.00	No	
71164.300	Wall	116	m ²	467.00	54,172.00	0.00	No	
- Content Viewer:** A 3D architectural model of a building structure.
- Takeoff Package Budget:** A table showing takeoff packages with columns for Element, Quantity, Unit, Unit Price(\$), and Amount(\$). Data includes:

Element	Quantity	Unit	Unit Price(\$)	Amount(\$)
Door	2.00	nr	836	\$1,672.00
Floor	88.00	m ²	136	\$11,874.59
Glass	6.00	nr	230	\$1,380.00
Wall	116.53	m ²	467	\$54,417.78
Window	8.00	nr	553	\$4,424.00

ACC|BIM360 Project List

- B** Developer Advocacy Support
- AU ACC TakeOff Sample Project
 - Package: Living Room
 - Door- COUNT
 - Door- COUNT
 - Floor- AREA
 - Glass- Glazed
 - Wall- Cavity wall_sliders
 - Wall- Wall - Timber Clad
 - Wall- Wall - Timber Clad
 - Wall- Wall - Timber Clad
 - Window- COUNT
 - Window- COUNT
 - Package: Windows Level 1
 - Package: Windows Level 2
- JM ACC Test
- Xiaodong-Test-Project



Enable my BIM 360 Account

Sign Out Zhong Wu

Price Book (US\$)

Show 10 entries Search:

Type	Unit Price(\$)	Unit
Door	836	nr
Floor	136	m2
Glass	230	nr
Wall	467	m2
Window	553	nr

Showing 1 to 5 of 5 entries Previous Next

Takeoff Package Budget

Show 10 entries Search:

Element	Quantity	Unit	Unit Price(\$)	Amount(\$)
Door	2.00	nr	836	\$1,672.00
Floor	88.05	m2	136	\$11,974.59
Glass	6.00	nr	230	\$1,380.00
Wall	116.53	m2	467	\$54,417.78
Window	8.00	nr	553	\$4,424.00

Showing 1 to 5 of 5 entries Previous Next

Send to ACC Cost



Takeoff API デベロッパリソース



準備中

- ドキュメンテーション
- GitHubのコードサンプル
- Postman コレクション

The screenshot shows the Autodesk Forge API Reference page for the Takeoff API. The left sidebar lists various API endpoints under categories like HTTP Specification, Takeoff, and Content Views. The main content area details the `v1/projects/{projectId}/packages` endpoint, which retrieves project packages. It includes sections for Resource Information, Method and URI (GET https://developer.api.autodesk.com/construction/takeoff/v1/projects/{projectId}/packages), Authentication (user context required), Required OAuth Scopes (data:read), and Data Format (JSON).

Get Project Packages

`GET v1/projects/{projectId}/packages`

Retrieves the Packages for a given Project. This endpoint accepts optional pagination parameters. If they are omitted it will either return the first page, or all the entire result if it is small enough. If you would like to specify the page offset and size you can use the query parameters.

Resource Information

Method and URI `GET https://developer.api.autodesk.com/construction/takeoff/v1/projects/{projectId}/packages`

Authentication user context required

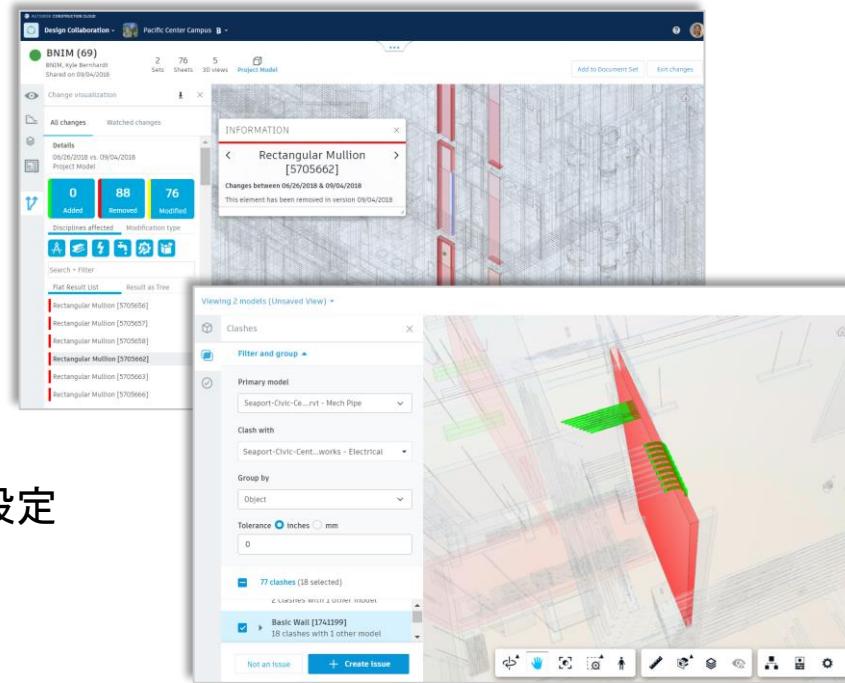
Required OAuth Scopes `data:read`

Data Format JSON

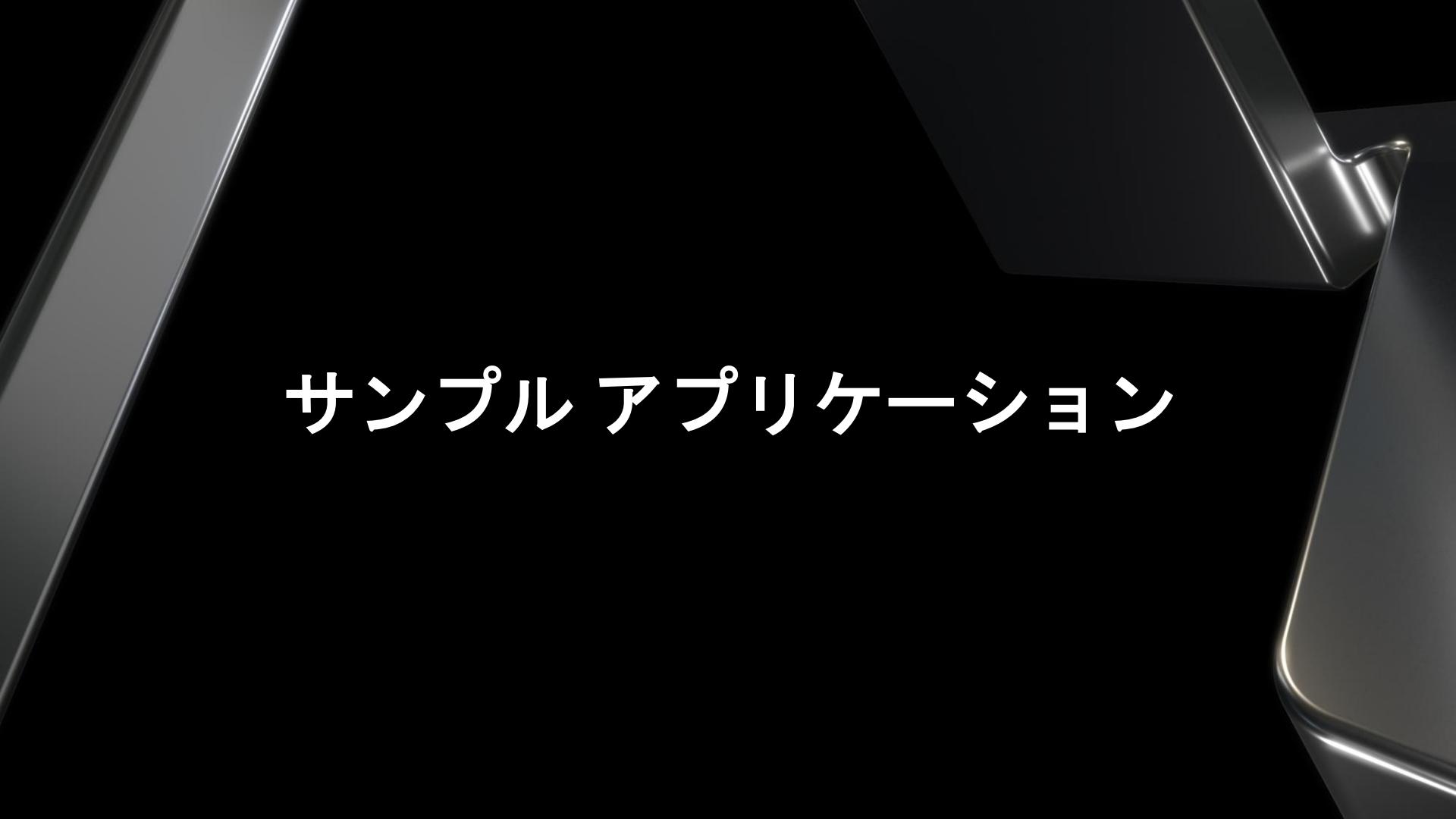
インデックス(Indexing) API

プロパティのインデックス(Indexing) v2 API

- Derivative Servicesを基に、BIMモデルの分析のためにプロパティデータを拡張
 - Index - プロパティ検索
 - “Diff” - 2つのバージョンを比較
- 使用事例
 - デザインコラボレーションにおける変更分析
 - 干渉分析(可能性 TBD)
- 検索/クエリの詳細な制御を提供
(SQL AST/バイナリ表現)
- BIM 360とACCのモデルで動作。有効期限を長く設定
- **近日公開！**



*) 用語は変更される可能性があります



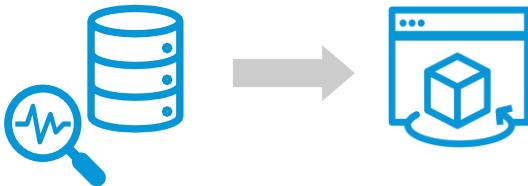
サンプル アプリケーション

2つのバージョンを比較

機能：モデルの2つのバージョンを比較し、違いをForge Viewer上で視覚化します。形状とプロパティの違いを抽出します。要素は、追加、削除、変更に分類されます。

ソースコード: GitHub サンプル (TBD)

作者: Xiaodong Liang, Autodesk



The screenshot shows the Forge Viewer interface with two 3D models of a duct system side-by-side. The left model is blue, and the right model is grey. Below the viewer are three buttons: "All Added" (blue), "All Removed" (red), and "All Changed" (green). The "All Changed" button is selected. Below the buttons is a table with three sections: "Added Items (25)", "Removed Items (30)", and "Changed Items (284)".

Added Items (25)					Removed Items (30)					Changed Items (284)		
name	category	level	RC	Free	name	category	level	RC	Free	name	geometry changed?	property ch.
Round Elbow [1187817]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	16"ø-	Round Elbow [853203]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	4"ø-	Round Elbow [839567]	yes	yes
Round Elbow [1187825]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	16"ø-	Round Elbow [914477]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	4"ø-	Round Elbow [839569]	yes	yes
Round Elbow [1187827]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	16"ø-	Round Elbow [914480]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	4"ø-	Round Elbow [839571]	yes	yes

Xiaodong Liang

B Autodesk Forge Partner Development

- Daimler POC Project
- Endymion
- Flow Test
- Forge Concert Hall
- Forge Infraworks
- Pacific Center Hospital v2
- Xiaodong Tes & Patch
- Xiaodong-test-MC
- xiaodong-new -project

Plans

Project Files

C4R

Name Standards

Project Files.1

Audubon_Architecture.rvt

Audubon_Mechanical.rvt

① v1: 8/4/2021, 7:16:41 PM by Xiao

② v2: 8/4/2021, 7:20:54 PM by Xiao

③ v3: 8/7/2021, 5:28:32 PM by Xiao

Audubon_Structure.rvt

① v1: 5/27/2021, 8:27:30 PM by Xiao

② v2: 8/9/2021, 3:43:06 PM by Xiao

STEEL_TEST.nwd

rac_advanced_sample_project.rvt

① v1: 8/8/2021, 11:14:22 PM by Xiao

rac_basic_sample_project.rvt

① v1: 8/9/2021, 11:57:47 AM by Xiao

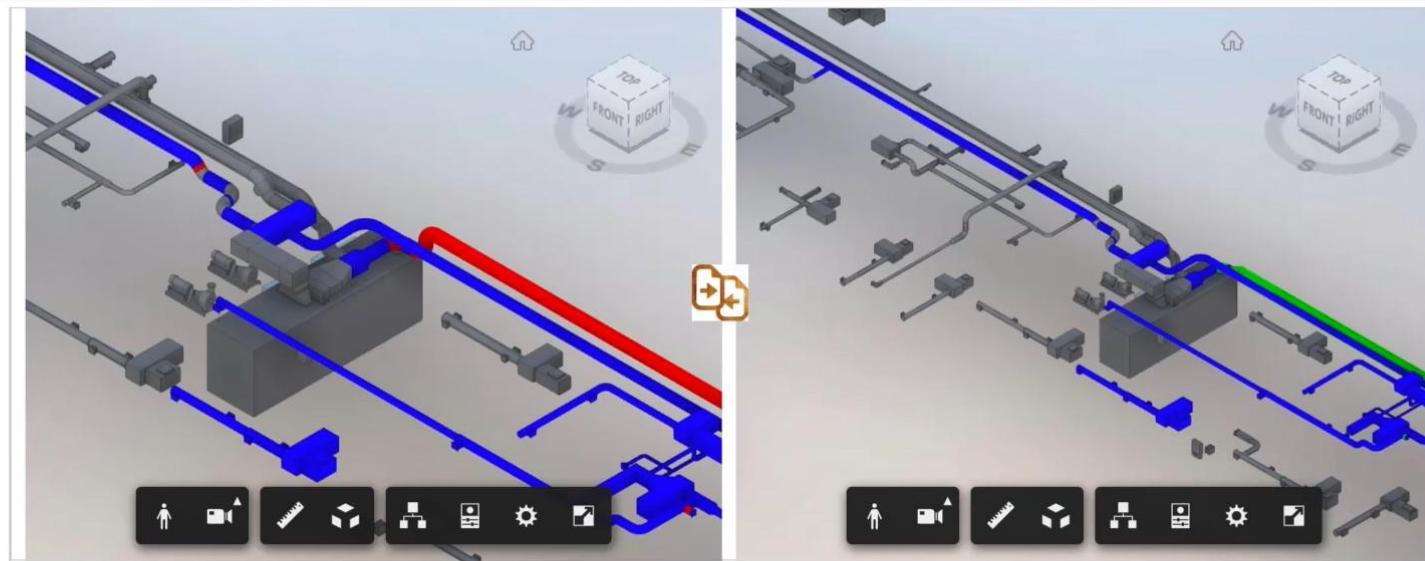
② v2: 8/9/2021, 12:02:38 PM by Xiao

③ v3: 8/9/2021, 12:38:16 PM by Xiao

rme_basic_sample_project.nwd

xiaodong-old-project

xiaodong-test-project

 All Added

Added Items (25)

name	category	level	RC	Free
Round Elbow [1187817]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	16"ø-
Round Elbow [1187825]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	16"ø-
Round Elbow [1187827]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	16"ø-

 All Removed

Removed Items (30)

name	category	level	RC	Free
Round Elbow [853203]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	4"ø-
Round Elbow [914477]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	4"ø-
Round Elbow [914480]	Revit Duct Fittings	Arch-FIRST FLOOR	Duct Fittings	4"ø-

 All Changed

Changed Items (284)

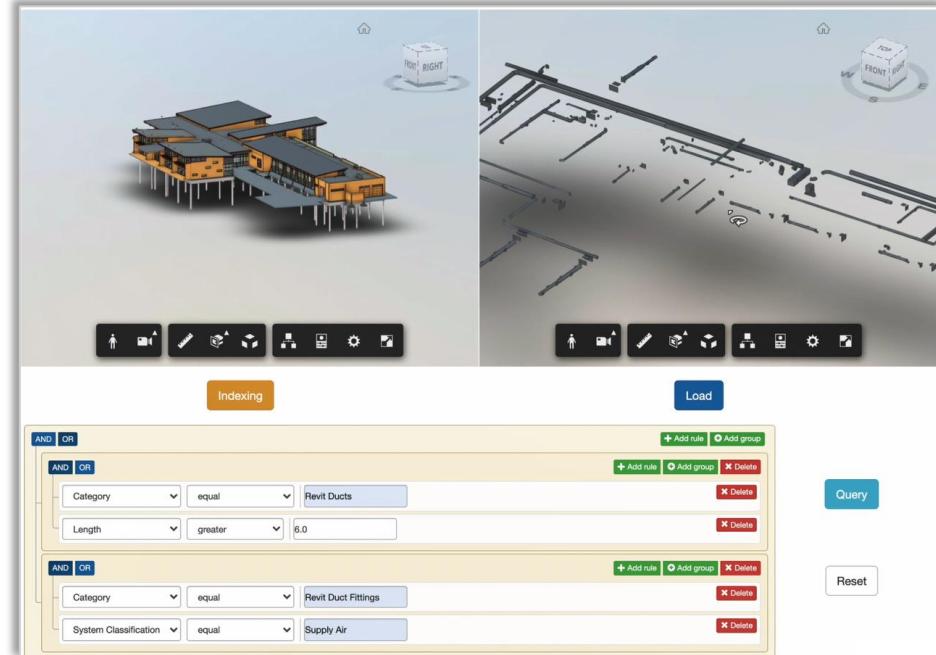
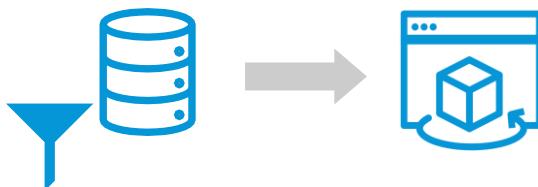
name	geometry changed?	property ch:
Round Elbow [839567]	yes	yes
Round Elbow [839569]	yes	yes
Round Elbow [839571]	yes	yes

要素のフィルタとモデルの部分ロード

機能：要素をプロパティでフィルタリングします。プロパティは、長さや高さなどの幾何学的な情報も含みます。フィルタ条件はバイナリ形式で表現され、AND / ORで組み合わせることができます。結果はForgeビューアで視覚化されます。

ソースコード: GitHub サンプル (TBD)

作者: Xiaodong Liang, Autodesk



Xiaodong Liang ↗

- Forge Sandbox MH Indexing
- Pacific Center Hospital v2
- Xiaodong Tes & Patch
- Xiaodong-test-MC
 - Plans
 - Project Files
- xiaodong-new -project
 - Plans
 - Project Files
- C4R
- Indexing
 - Audubon-Merged.nwd
 - Audubon_Architecture-2022-Root.rvt
 - v1: 8/17/2021, 2:40:11 PM by Xiaodong Liang
 - Audubon_Mechanical-2022.rvt
 - Audubon_Structure-2022.rvt
 - BIM 360 Sample Assembly.rvt
- Name Standards
- Project Files.1
- Project Files.4
- non-C4R
 - Audubon_Architecture.rvt
 - Audubon_Mechanical.rvt
 - Audubon_Structure.rvt
 - Audubon_Structure_assembly.rvt
 - STEEL_TEST.nwd
- rac_advanced_sample_project - Floor Plan - 01 - Entry
 - rac_advanced_sample_project.rvt
 - v1: 8/8/2021, 11:14:22 PM by Xiaodong Liang
 - rac_basic_sample_project.rvt
 - rme_basic_sample_project.nwd
- xiaodong-old-project
- xiaodong-test-asset

Developer Advocacy Support

- AU ACC TakeOff Sample Project
 - For the Field
 - Project Files
 - Shared
 - Zhong
 - Consumed

Indexing Load

Query Reset

AND OR

Category equal Revit Ducts

Length greater 6.0

AND OR

Category equal Revit Duct Fittings

System Classification equal Supply Air

インデックス(Indexing) API デベロッパリソース

作業中...

- ドキュメンテーション
- GitHubのコードサンプル
- Postman コレクション

The screenshot shows the Autodesk Forge API documentation for the Indexing API. The left sidebar contains a navigation tree with sections like Model Properties, Index, Diff, and others. The main content area is titled "Index" and features a prominent "GET projects/:projectId/indexes/:indexId/fields" endpoint. Below the endpoint, there is a brief description: "Retrieve a specific fields dictionary associated with a properties index. Since the fields dictionary, once created, is immutable the response will set a long expiration HTTP header for efficient client side caching." A note below states: "Note that this endpoint is compatible with both BIM 360 and Autodesk Construction Cloud (ACC) projects." The "Resource Information" section includes details such as the method and URI, authentication context, required OAuth scopes, and data format. The "Request Headers" section specifies the Authorization header.

Index

GET projects/:projectId/indexes/:indexId/fields

Retrieve a specific fields dictionary associated with a properties index. Since the fields dictionary, once created, is immutable the response will set a long expiration HTTP header for efficient client side caching.

Note that this endpoint is compatible with both BIM 360 and Autodesk Construction Cloud (ACC) projects.

Resource Information

Method and URI `GET https://developer.api.autodesk.com/construction/index/v2/projects/:projectId/indexes/:indexId/fields`

Authentication Context user context required or app context required

Required OAuth Scopes data:read

Data Format

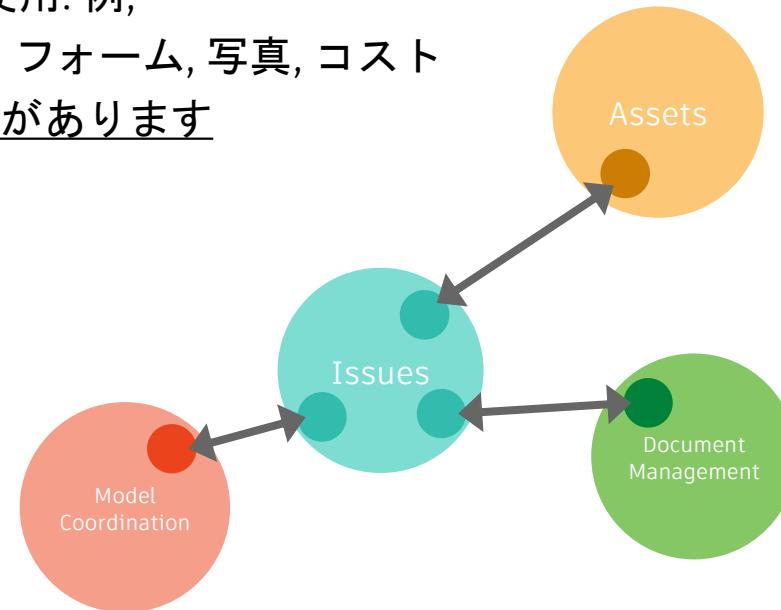
Request Headers

Authorization * Must be Bearer <token> where <token> is obtained via a two-legged or a three-legged OAuth flow.

リレーションシップ (Relationships) API

リレーションシップ (Relationships) API

- 異なる機能コンポーネント（ドメイン）に存在するアイテム（エンティティ）間の参照/リンクを実装
- BIM 360およびACCで様々なモジュール間で使用: 例,
 - モデル コーディネーション, アセット, フォーム, 写真, コスト
 - 古い実装では使用されていない可能性があります
- 読み込み & 書き込み *New!*
- すでに公開済み



リレーションシップ (Relationships) API

Example

The screenshot illustrates the Autodesk Construction Cloud interface, specifically the Assets management screen.

Left Sidebar: Contains icons for Home, Projects, Assets, Forms, Issues, Photos, Sheets, Submittals, and Help.

Top Bar: Shows the project name "Seaport Civic Center" and user "Mikako Harada".

Assets Page: Displays a list of assets under "All Categories". A dashed orange box highlights a specific asset entry:

Category	Status	Linked references	Description	Location
... > Lighting and Ap...	Specified	-	250 A	
... > Lighting and Ap...	Specified	-	400 A	
... > Lighting and Ap...	Pre-Start-Up	3 references	100 A	Level 1 > L
... > Lighting and Ap...	Specified	-	100 A	
... > Lighting and Ap...	Installed	3 references	400 A	Level 1
... > Lighting and Ap...	Ordered	-	400 A	
... > Lighting and Ap...	Installed	-	600 A	

Right Panel (Asset Detail View): Shows the asset ID 625048. The "References" tab is selected (circled in orange). A modal window titled "Add references" lists categories: Files, Forms, Issues, Photos, Sheets, and Submittals. An image of a metal cabinet is shown under the Photos section.

リレーションシップ (Relationships) API – 追加

カテゴリ	エンドポイント
Utilities	POST relationships: writable
Modify	PUT relationships
	POST relationships: delete

リレーションシップ (Relationships) API – 追加

カテゴリ	エンドポイント
Utilities	POST relationships: writable
	PUT relationships
Modify	POST relationships: delete

- 作成/削除が可能な互換性のあるエンティティタイプを取得
- サポートされているドメイン/エンティティタイプ:
 - アセット/アセット カテゴリ
 - ドキュメント/ファイルlineage/version
 - 指摘事項 (Issue)
 - フォーム/フォーム フィールド/フォームテンプレート
 - 写真
- サポートされていないタイプ – 回避策が提供されている場合あり。例、アセット API
- 今後さらに適応される予定

リレーションシップ (Relationships) API – 追加

カテゴリ	エンドポイント
Utilities	POST relationships: writable
Modify	PUT relationships POST relationships: delete

- 2つのエンティティ間にリレーションシップを作成
 - 双方のエンティティは書き込み可能
 - エンティティが存在する必要あり
 - 両方のエンティティへの書き込みアクセス権が必要
- 特定のリレーションシップを削除
 - “ソフト” 削除
 - 両方のエンティティへの書き込みアクセス権が必要

リレーションシップ(Relationships) API デベロッパリソース

ドキュメンテーション

AUTODESK FORGE Success Stories Solutions ▾ Getting Started Documentation Community ▾ Support ▾ Pricing 🔍

> Data Connector (beta)
> Document Management
> Locations
> Model Coordination
 ▼ Relationships
 ▼ Relationship: Utilities
 [GET utility/relationships:writable](#)
 ▼ Relationship: Modify
 PUT relationships
 POST relationships:delete
 ▼ Relationship: Sync
 POST relationships:syncStatus
 POST relationships:sync
 ▼ Relationship: Search
 POST relationships:batch
 GET relationships:search
 POST relationships:intersect
 GET relationships:relationshipId
 > RFIs (beta)

Relationship: Utilities

GET [utility/relationships:writable](#)

Retrieves a list of entity types that are compatible with each other, to establish whether you can create relationships between to delete those relationships. For example, between an asset and a document.

Note that some entity types belong to a `bim360` domain, and others to a `construction` domain.

To learn how this endpoint is used, see the [Create a Relationship tutorial](#).

Note that this endpoint is compatible with both BIM 360 and Autodesk Construction Cloud (ACC) projects.

Resource Information

Method and URI	GET https://developer.api.autodesk.com/bim360/relationship/v2/utility/relationships:writable
Authentication Context	user context required
Required OAuth Scopes	<code>data:read</code>

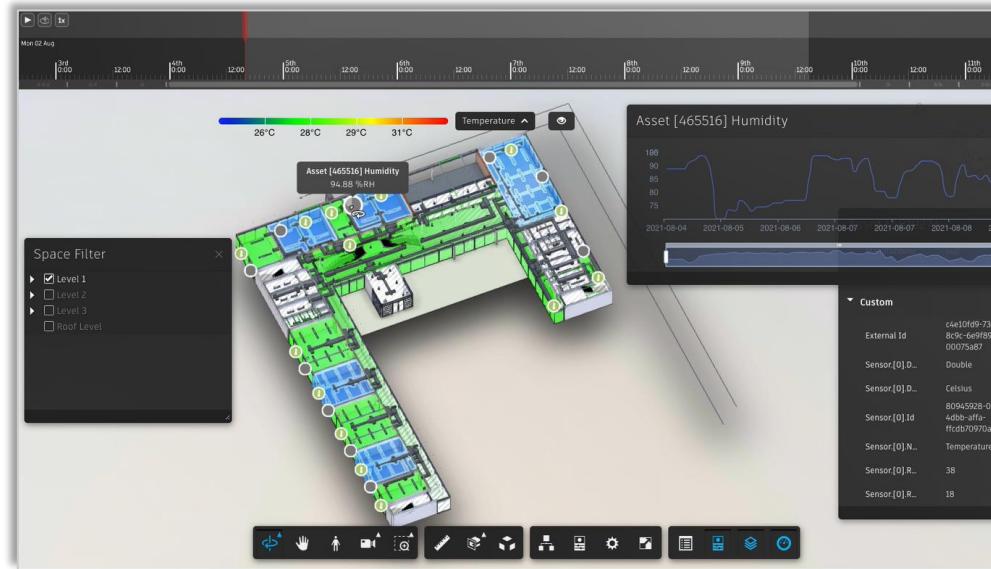
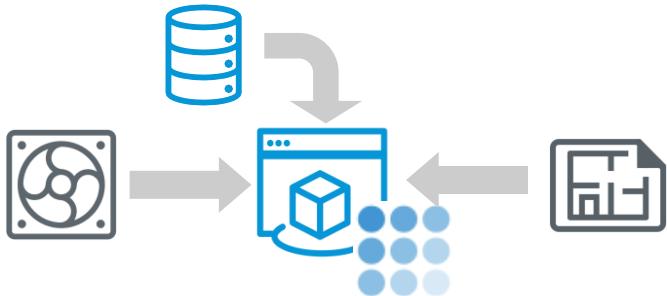
One more ...
インテグレーションサンプル

アセット(Assets) & Data Visualization

機能：「モデルビューアでアセットを表示する」サンプルの拡張。新しいData Visualization Extension、別名Hyperionを利用します。センサーデータの保存場所とモデル要素との関連付けに、センサー情報をカスタム属性として機器に添付します。

ソースコード: GitHub サンプル(TBD)

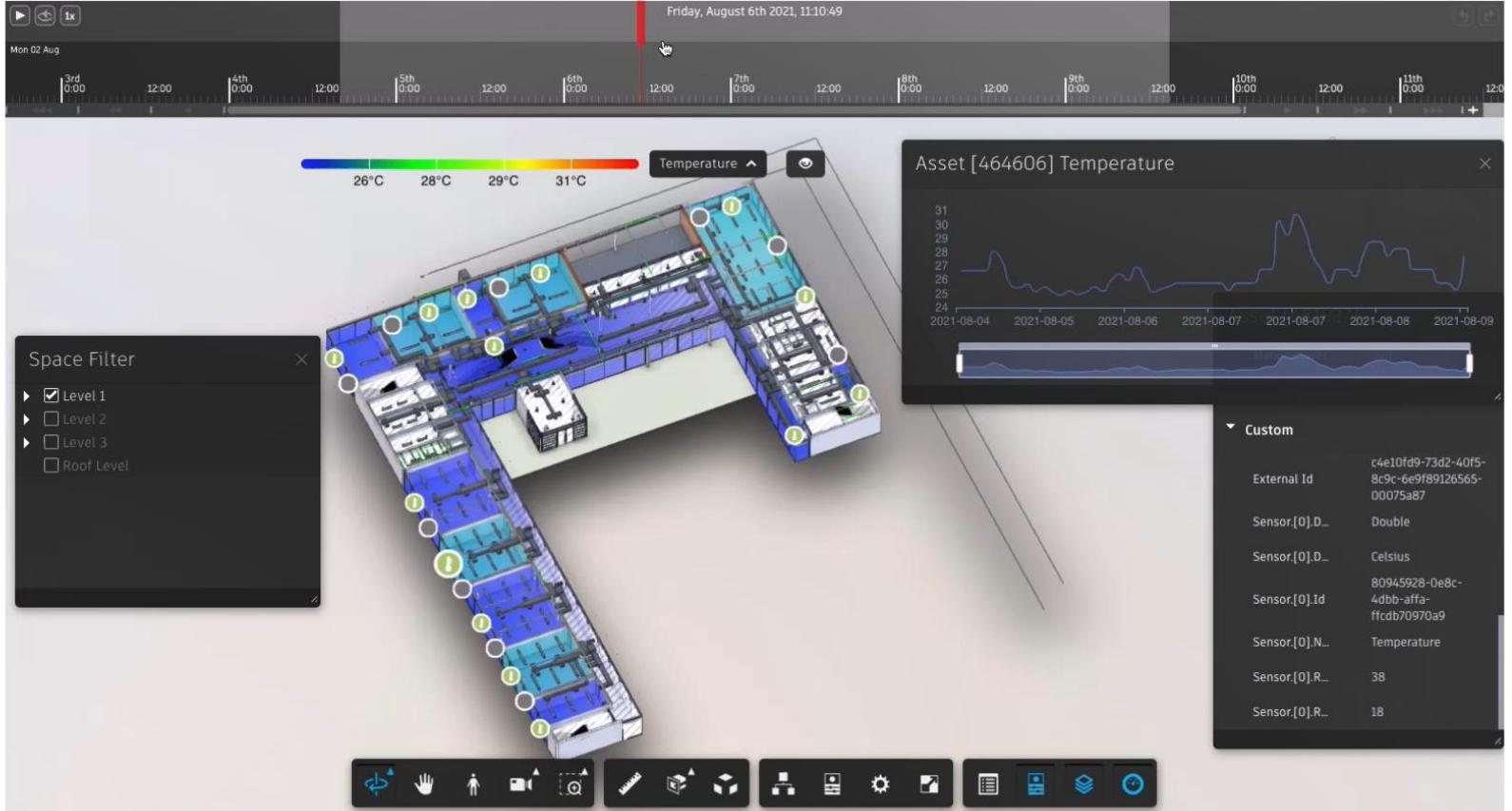
作者: Eason Kang, Autodesk



Eason Kang

- Autodesk ADN Taiwan
 - Assets API Review
 - Assets Demo
 - C4R & Field
 - C4R Test
 - C4R Test2
 - Classic Field
 - Cloud Model Demo
 - Data Viz Demo
 - Project Files
 - asset_rme_advanced_sar
 - Plans
- Design Collab
- Design Demo
- Docs Only
- Locations API Review
- Sample Project

v1: 10/08/21 14:44:03



今後の予定

今後の予定

Docs

- セット(Sets)
- レビュー(Review)
- カスタム属性
- ISO 19650 ファイル名基準

Build

- ギャップを埋める: チェックリスト, 情報提供依頼 (RFI), 指摘事項, 位置(Location)
- フォーム、写真、シート
- アセット : リクエストWelcome!

Cost

- フィードバックに基づく優先順位付け
- リクエスト Welcome!

Takeoff

- 初回リリース !
- Write API はその後と

Insight

- Data Connector API
- プロジェクトレベル
- JSON形式

Admin

- Docs 以外のサービスへのユーザーの追加
- アクティビティ
- テンプレートからプロジェクトを作成

今後の予定

Model Coordination

- インデックス作成-近日公開
- アラインメント、アグリゲーション、2LO、
webhooks

Design Collaboration

- 設定へのアクセス
- リクエスト welcome



“Forge Roadmap” AU クラス, by Jim Quanci, Cyrille Fauvel and Jim Gray

まとめ

- Autodesk Construction Cloud 概要
- API ステータスとアップデート
- Takeoff API
- プロパティのインデックス (Property Indexing) v2 API
- リレーションシップ (Relationships) API
- 今後の予定

Forge リソース

- Forge ポータル - ドキュメント、チュートリアル、リファレンス
<http://forge.autodesk.com>
- チュートリアル - 利用可能言語 : Nodejs, .NET, Java, PHP, Go
<http://learnforge.autodesk.io>
- Doctor is in – Forgeのエキスパートとの 1 – 1 ミーティング
<http://calendly.com/autodeskforge>
- アクセラレータ – 最初のプロジェクトをスピードィーに立ち上げましょう
<http://forge.autodesk.com/accelerator-program>

Forge at Autodesk University 2021

今後の予定

Forge ロードマップクラス

短編テクニカル概要

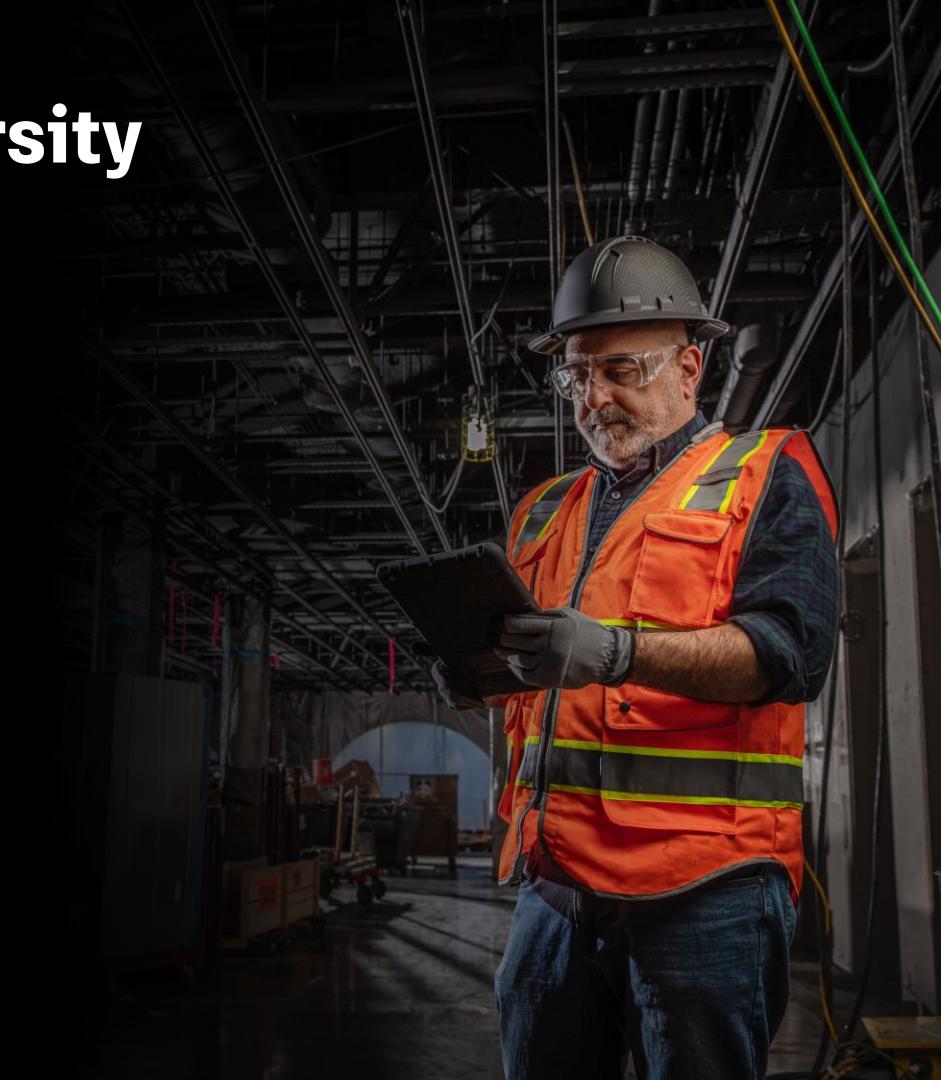
Forge ライトニングトーク

Forge APIのあゆみ

Forge ドキュメンタリー

受賞アプリを見てみる

Forge ハッカソン ショーケース



Thank you!



@autodeskforge @mikako_harada



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