CS468152

Release your hands - automate your BIM360 project setup with Forge

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Learning Objectives

- Discover the open-source "BIM 360 Project Setup Tool" and how to use it.
- Discover the capability of Forge and BIM 360 API as related to project setup.
- Learn the latest status of initialization-related APIs, including various services modules beyond BIM 360 Admin and BIM 360 Docs.
- Learn the process of setting up a BIM 360 project.

Description

While companies try to adapt BIM 360 software to their projects and integrate with their existing workflow, one of the challenges is setting up projects in scale. While using a product's web user interface may be enough for a few projects, tasks involved in setting up projects—such as adding users and building a standard folder structure with appropriate user permissions—can easily become time-consuming, tedious, error-prone manual labor. In this class, we will show you a tool that helps you set up projects in bulk by importing from CSV files. The tool consists of a collection of commands that you can run in combination. The features include: creating projects, populating users and company, setting up services, adding users to projects, and creating folders with user permissions. The tool is a desktop application written in .NET using Forge APIs. For those who wish to further customize the tool to integrate with their enterprise resource planning (ERP) systems, we will share the source code and explain implementation detail.

Speaker(s)

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Senior developer advocate in Autodesk, more than 10
years software development experiences in CAD area,
5 years experiences in Forge technology advocating,
consulting and supporting, currently mainly focus on AEC
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Mikako provides API technical support for AEC products,
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interactive techniques, optimization and layout synthesis.
More on her blog: https://fieldofviewblog.wordpress.com/

1 BIM 360 Project Setup Tool Overview

The command line tool supports the following functionality:

➢ Create Projects in Batch
➢ Copy Projects with Folders (including copy role permissions)
➢ Activate Services by Adding User as Admin
➢ Import Users to Project as Admin or User
➢ Update Project users' information (including access, company and role)

1.1 Pre-requisites

PR#	Title	Description	Note
1	Input CSV file	The sample input files defined in the spreadsheet structure must be maintained. All required fields must be filled in order to let the tool work properly.	Refer section 4.2 for details.

2 Step by Step Workflow

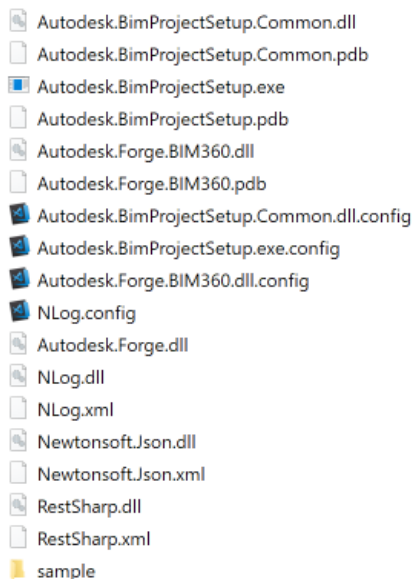| Nr.	Step	Tool	Result
0	Prepare BIM360 account for custom integration	Manual	Custom Integration activated
1.	Prepare CSV files with project and user information	Manual	Valid Input file
2.	Create the project in BIM 360(either from scratch or a template project)	BimProjectSetup.exe	Projects are created and set to inactive
3.	Assign Services	BimProjectSetup.exe	Services are assigned to the project. Admins related to the services are assigned.
4.	Import users to BIM 360 projects and assign industry roles	BimProjectSetup.exe	Users are added to the projects
5.	Update BIM 360 project users' information	BimProjectSetup.exe	Information of project users are updated

3 Setup

Before running the command line tools you need to get a Forge App **Client ID** and **Secret**. The client ID then needs to be provisioned with the BIM 360 account, so you can call the BIM 360 API.
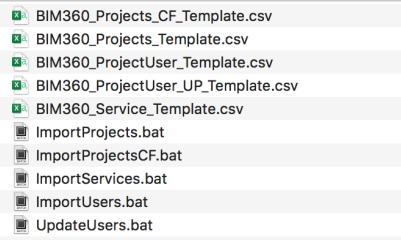
Please refer to the following doc for details:

1. Create Forge App
2. Get Access to a BIM 360 Account
3. Manage API Access to BIM 360 Services

3.1 Installation and configuration

The tool is provided as source code, download the code and open `BimProjectSetupTool.sln` solution on Visual Studio. The build process should download the required packages (**Autodesk.Forge** and dependencies). Compile and build the project, you should see the following files in the output folder:

- Autodesk.BimProjectSetup.Common.dll
- Autodesk.BimProjectSetup.Common.pdb
- Autodesk.BimProjectSetup.exe
- Autodesk.BimProjectSetup.pdb
- Autodesk.Forge.BIM360.dll
- Autodesk.Forge.BIM360.pdb
- Autodesk.BimProjectSetup.Common.dll.config
- Autodesk.BimProjectSetup.exe.config
- Autodesk.Forge.BIM360.dll.config
- NLog.config
- Autodesk.Forge.dll
- NLog.dll
- NLog.xml
- Newtonsoft.Json.dll
- Newtonsoft.Json.xml
- RestSharp.dll
- RestSharp.xml
- sample

The sample directory contains batch files and samples of csv files which you use as a base for setting up your own batch files.

- BIM360_Projects_CF_Template.csv
- BIM360_Projects_Template.csv
- BIM360_ProjectUser_Template.csv
- BIM360_ProjectUser_UP_Template.csv
- BIM360_Service_Template.csv
- ImportProjects.bat
- ImportProjectsCF.bat
- ImportServices.bat
- ImportUsers.bat
- UpdateUsers.bat

4 Command Line Options

Most parameters are optional, however the once without brackets are always required.

Autodesk.BimProjectSetup.exe -c -s -a [-p] [-x] [-u] [-b] [-t] [-z] [-e] [-d] [-r] [-h] [--CF] [--AR] [--EU] [--UP]

  -c   Forge client ID
  -s   Forge client secret
  -a   BIM 360 Account ID
  -p   Path to CSV input file for project creation
  -x   Path to CSV input file for service activation
  -u   Path to CSV input file with project user information
  -b   Base Url   (default= "https://developer.api.autodesk.com")
  -t   Separator character   (default = ';')
  -z   Second Separator character   (default = ',')
  -e   Encoding   (default = UTF-8)
  -d   Date time format pattern   (default = yyyy-MM-dd)
  -r   Trial run [true/false]   (default = false)
  -h   BIM 360 Account admin Email address, required when Copy folders
  --CF   Copy folders (used together with "**-p**")
  --AR   Admin Industry Role
  --EU   Use the EU region account
  --UP   Update Project User information (used together with "**-u**")

Most arguments require a value after the argument. E.g.
-p "C:\myFolder\projects.csv"

Arguments and their values must be separated by a space and values must be enclosed in parenthesis like shown above.

The exception is the -r argument which value can be true or false without any parenthesis.

The arguments –CF, --EU, --UP don't require any value.

- --CF is used as indicators for copy folders, no folders copied if not present.

- --EU is used to specify whether the account is hosted on EU servers, US servers are applied if not present.

- --UP is used to specify updating project user, the users will be imported if not present.

Please note that **at least one path to an input file must be provided** with the -p, -x, or -u options. You can provide multiple file paths within the same call, but we recommend to run step by step and create projects first, then activate required services and in a third step add users, update project users as last step.

After successfully processing the CSV input file, a result file of the requested action will be written to the path where the input files reside with '_processed' as a suffix for the file name.
The results for each row of the input file are written to columns that are added at the end of the input file.

Please note that the '<inputfile_name>_processed.csv' file will not be created for the following tasks:

1. Copy folder
2. Add project users

Logging can be configured in the Nlog.config file. Further information can be found here: https://github.com/nlog/NLog/wiki/Configuration-file

4.1 Examples

When copying one of the command lines below make sure you remove all line end characters, so everything is in one line.

4.1.1 Create projects

This example command line creates projects from the file .\sample\BIM360_Projects_Template.csv in the BIM 360 Account.

Autodesk.BimProjectSetup.exe -c "your-client-id" -s "your-client-secret" -a "your-account-id"
-p ".\sample\BIM360_Projects_Template.csv" -t ";" -z ","
 -e "UTF-8" -d "yyyy-MM-dd" -r false

4.1.2 Create projects and copy folders(including Role permission)

Same as above, but add the --CF argument at the end and make sure in the CSV file contains a template project name.

Autodesk.BimProjectSetup.exe -c "your-client-id" -s "your-client-secret" -a "your-account-id"
-p ".\sample\BIM360_Projects_Template.csv" -t ";" -z ","
 -e "UTF-8" -d "yyyy-MM-dd" -r false -h "admin@company.com" –CF

4.1.3 Activate Services

Autodesk.BimProjectSetup.exe -c "your-client-id" -s "your-client-secret" -a "your-account-id"
-x ".\sample\BIM360_Service_Template.csv" -t ";" -z ","
-e "UTF-8" -d "yyyy-MM-dd" -r false

4.1.4 Add Users

Autodesk.BimProjectSetup.exe -c "your-client-id" -s "your-client-secret" -a "your-account-id"
-u ".\sample\BIM360_ProjectUser_Template.csv" -t ";" -z ","
-e "UTF-8" -d "yyyy-MM-dd" -r false -h admin@compny.com

4.1.5 Update Users

Autodesk.BimProjectSetup.exe -c "your-client-id" -s "your-client-secret" -a "your-account-id"
-u ".\sample\BIM360_ProjectUser_Template.csv" -t ";" -z ","
-e "UTF-8" -d "yyyy-MM-dd" -r false -h admin@compny.com

5 CSV input files
5.1 CSV Preparation

All input data must be provided as CSV files and must follow the pre-defined structure.

- ➤ All **required fields** must have values. Options fields can be empty.
- ➤ **Semicolon** should be used as **separator** between fields.
  If another separator character is used the **-t** command line option can be used to specify
  the separator char (e.g. "|")
- ➤ Fields that allow multiple values should use **comma** as a **separator between values** in
  the same column.
  If another character is used to separate multiple values of the same field the **-z**
  command line argument must be used to specify the character used.
- ➤ All **date fields** must use the same date format, e.g. dd-MM-yyyy and the format string
  provided in the **command line argument -d** of the project setup tool must match the
  format.
  Please note that the project setup utility doesn't recognize the windows regional settings.
  It only uses the provided format string to parse the values provided in the CSV files into
  date values.
  See this link for more information about date format strings:
   https://msdn.microsoft.com/de-de/library/8kb3ddd4(v=vs.110).aspx
- ➤ The input files must use a suitable **encoding** that contains all characters used in the file.
  We recommend using **UTF-8** character set.
- ➤ Certain input fields only allow values from a parameter list - see the following link for
  further
  information: https://developer.autodesk.com/en/docs/bim360/v1/overview/parameters/
    - o service_type
    - o construction_type
    - o contract_type
    - o project_type
    - o currency
    - o timezone
    - o trade
    - o country
    - o state_or_province

Special care must be taken when editing the file in Microsoft Excel:

1: Make sure that Excel does not alter the date formatting to the System format on the machine
which the file is edited. By default the dd/MM/yyyy is used in the CSV to format the date. When
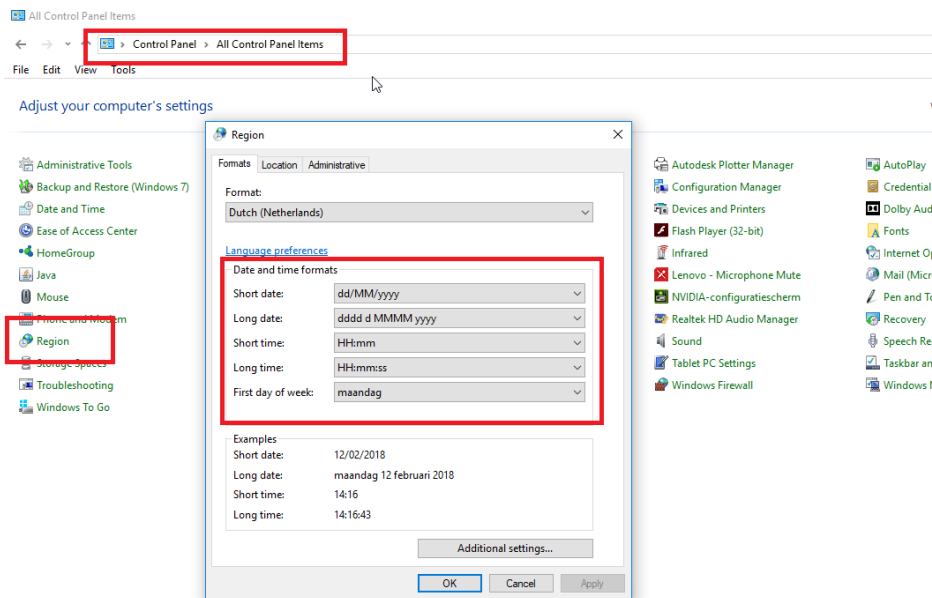
the Windows system uses a different time/date format, this sometimes causes Excel to save the date to the default Windows system format. This format can be changed in Configuration Panel | Regional Settings

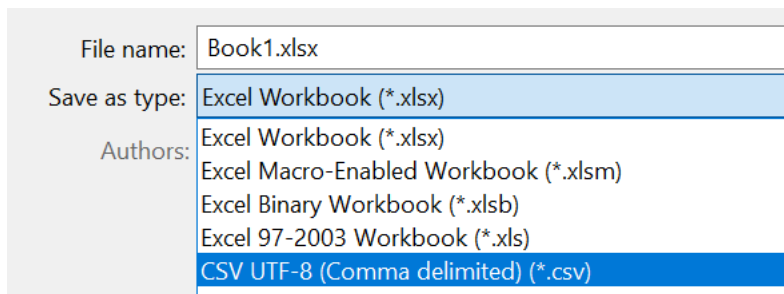2: **Make sure the .CSV file is formatted in UTF-8 code.**

3. Open the file in a text editor such as Notepad++ after it was saved to check

- Correct file encoding
- Proper and consistent date format is used
- Delimiters

Windows regional settings

Save file from Excel as UTF-8 encoded and semicolon delimited file.

5.2 Format of input files

5.2.1 Project Creation CSV

Fields in bold are required. See notes below.

- **name*** (invalid characters: \, /, **?**, **[,]**, **>**, *, :, **<**, **"**, **|**, ,.)
- **start_date***
- **end_date***
- **project_type***
- **value***
- **currency***
- **folders_created_from**** (project name of the project from which folder structure is copied from only when you want to copy a projects folder structure)
- job_number
- address_line_1
- address_line_2
- city
- state_or_province
- postal_code
- country
- business_unit_id
- timezone
- language
- construction_type
- contract_type

*: required

**: required for '--CF' command. To create project by copying existing project with their folder structure(including Role permission), --CF command is used. To make this command work properly, the field 'folders_created_from' must filled with valid project name from existing projects in the account.

Details about the fields are specified in the API documentation of the PUT projects call:

https://forge.autodesk.com/en/docs/bim360/v1/reference/http/projects-POST/

Scroll down to the chapter "Body Structure" to read the specifics about the fields.

If no value is provided in the resulting CSV file you will see two semicolon (;;) characters after each other.

5.2.2 Service Activation CSV

All fields shown in the table below are required.

The company must match the users default company in BIM 360.

project_name	service_type	Email	Company
Project1	admin	admin@company.com	Autodesk
Project1	doc_manager	admin@company.com	Autodesk

Note: Each row should contain only one service type

The service_type parameter supports the following string values:

Value	Description
admin	BIM 360 Project Administration Service
doc_manager	BIM 360 Document Management Service
pm	BIM 360 Project Management Service
Fng	BIM 360 Field Management Service
collab	BIM 360 Design Collaboration Service
cost	BIM 360 Cost Management Service
gng	BIM 360 Model Coordination Service
plan	BIM 360 Plan Classic Service
field	BIM 360 Field Classic Service
glue	BIM 360 Glue Classic Service

5.2.3 Project Users CSV

Sample of an input file structure for importing|updating users.

project_name	email	pm_access	docs_access	company_name	industry_roles
Project1	admin@company.com	admin	admin	Company	architect, project-coordinator

Company name should match the users default company in the BIM 360 members directory. Make sure to provide a company name for each user. An empty field will delete the user's company according to the API documentation.
https://forge.autodesk.com/en/docs/bim360/v1/reference/http/projects-project_id-users-import-POST/

6 Constraints and restrictions

6.1 Value and Currency

Not mandated anymore in the BIM360 product but mandated in the Forge API and thus this Setup Tool

6.2 Language support

1. **BIM 360 product** supports
   o English,
   o German,
   o Dutch,
   o Chinese,
   o French
   o Swiss German
   o English and
   o German (en/de)
2. **API** supports only
   o English and
   o German (en/de)

6.3 Contract type

- BIM360 product has **Design-Build**
- API has **Design-Bid** instead – Design-Build is rejected by the API

6.4 Unique Business Units

Currently only unique business units are supported. The BIM 360 product allows to have the same business unit name multiple times. In this case the project setup tool finds one of them and uses it.

6.5 No Custom Roles

In BIM 360 custom roles can be added.

Currently the Forge API for adding users and thus this tool doesn't support custom roles.

6.6 Copy Folder

Only **Plan** and **Project File** folders are supported, will fail if you rename the 2 folders' name.