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Two new features by Forge Design Automation: Open Network and WebSocket API

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Learning Objectives

- Apply the new features to solve the problems that current workflows running at FDA may have
- Design and create new and more flexible work processes which can be supported well by FDA
- Implement or enhance Cloud Apps to gain efficiency with less energy usage
- Build better experience and deepen learning on Cloud service development

Description

Forge Design Automation (FDA) is Cloud service which allows the automation capabilities of AutoCAD, Inventor, Revit and 3dsMax. This presentation will explain and demo two new features which increase the capabilities of the service. First, the preview feature of Open Network Access breaks down a long-standing barrier that FDA disallows network access during the job running. Allowing customer's addin to access network through HTTP(S) calls will solve some problems of workflows currently running at FDA and extend the scope of work processes that FDA could support. WebSocket endpoints is another new offering which points back to the client devices (i.e., desktop, mobile phone or laptop), sending progress and completion responses, so the applications don't need to make repeated Get requests and no callback for onComplete argument is needed either to find the status of the job. Besides these two, we will also introduce, and demo other small but peppy features supported by FDA since last year.

Speaker(s)

Lijuan Zhu is a Principal Engineer for Revit team, joining Autodesk 9 years ago. She has a BS in Fluid Mechanics and a PhD in Mechanical Engineering. Lijuan has worked on Revit projects and features including Toposurface (Site), Revit Links, RFAAS framework, Integrating Desktop Connector into Revit, and the Revit API framework. Recently, Lijuan is working on connecting and migrating Revit to the Cloud by making Revit available on the Forge Design Automation API.

Albert Szilvasy is a software architect on the AutoCAD team. He has worked on many parts of AutoCAD over the years from AutoCAD OEM to .NET and JavaScript APIs and various end user features in between. Most recently he has been involved with bringing AutoCAD to the Cloud Forge Design Automation API and the browser and mobile platforms Project Fabric.

What is Forge Design Automation API

Design Automation API is a Forge service that will allow developers to access the “business logic” of AutoCAD, Revit, Inventor and 3dsMax on the cloud. Developers can create client applications which speak to the Revit engine, for example, via our REST API. Developers will be able to automate existing workflows or create new cloud workflows.

Because Design Automation API is a Forge service, you can take advantage of other Forge services to easily connect your applications together.

The existing documentation for Design Automation API is available here:

https://forge.autodesk.com/en/docs/design-automation/v3/developers_guide/overview/

Introduce WebSocket API

Use a 3-legged token for Safety

WebSocket API can be used for any client that can issue conforming WebSocket requests. It can be used from the browser or the command line (for example using wscat) by using the standard websocket API. You can use any other library or toolset you want. The websocket API is usually used on the client device (i.e. browser, mobile or desktop app) you should use a 3-legged OAuth token. This avoids having to expose the forge client secret on the user's device. Please also note that when you use a 3-legged token we also require that you sign the activityId that you pass in the workitem payload. For more information see the [documentation](#).

More on OnProgress

OnProgress won't be allowed in WorkItem argument for WebSocket API, but nothing is changed at addin and moreover no server implementation is needed for OnProgress endpoint anymore.

This is how OnProgress works nowadays:

- per 30 sec, back-end call OnProgress endpoint, on matter this endpoint is provided by front-end or customers
- whenever appbundles sends onProgress message, back-end call OnProgress endpoint, on matter this endpoint is provided by front-end or customers

Useful Resources:

- The forge docs for WebSocket API: https://forge.autodesk.com/en/docs/design-automation/v3/developers_guide/websocket-api/
- The forge docs for how to use 3-legged tokens with FDA: https://forge.autodesk.com/en/docs/design-automation/v3/developers_guide/3-legged-oauth-token-usage/
- GitHub repos for WebSocket API demo: <https://github.com/zhuliice/forge-designautomation-websocket-api>
- "WebSocket API with Forge Design Automation" lightning talk by Madhukar Moogala

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Introduce Open Network

Currently, Open Network feature is still under development, there still might be some changes related to this feature before it's officially released, please wait for our official announcement and we will share all the details and the demo source code when it's announced released.

Please contact **forge.help@autodesk.com** to require allow-list to try this new feature.

The protocols supported

Only HTTP(s) calls are allowed, no other protocols are supported.

About passing access token for Cloud service

You may need to pass the access tokens used to authenticate Cloud services via WorkItem payloads so the addin/plugin can access them during the job running.

You can define input parameters in the activity, then pass the access tokens in a json format as input arguments in the WorkItem payload.

Multi-thread issue for Design Automation for Revit

Currently, Revit API doesn't support multi-thread well. When the asynchronous calls are mixed with Revit API, you may get exceptions for Revit API complaining that the calling is not from main thread. We will fix this issue. As a workaround for now, you may wrap up the asynchronous call to be synchronous one before calling Revit API.