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Forge-ing Ahead with .NET

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Learning Objectives

- Understand the general capabilities of Forge Platform
- Learn how to use .NET to connect and execute Forge Platform functionality
- Discover the business advantage of using Forge Platform
- Learn how to apply simple patterns to accelerate Forge Platform development

Description

Autodesk, Inc., has developed a new platform to power the Future of Making Things. Autodesk is providing an unprecedented ability to capitalize on their years of "design and make" expertise though the computing revolution that is the cloud. In this lecture, I'll demonstrate how you can capitalize on this revolution using your existing .NET skills.

Your AU Expert(s)

MARK PERROTT
Mark Perrott is a solution architect in the Autodesk Consulting Team at Autodesk, Inc. Coming from a software development and systems integrations background, Mark has experience in a range of Autodesk products and APIs. He specializes in utilities and data management, and he has successfully architected and deployed Autodesk software into large organizations building on Vault software, Infrastructure Map Server, Revit software, and AutoCAD software. Mark holds a master of information technology degree and a bachelor's degree in multimedia (networks and computing).

What is Forge and What is the Benefit to my Business?

"The Forge Platform contains an expanding collection of web service components that can be used with Autodesk cloud-based products or your own technologies. From visualizing data to 3D printing, take advantage of Autodesk's expertise in design and engineering."

Forge is Autodesk's new development platform providing the following capabilities via cloud services:

Forge Capabilities

- Data Management

The Data Management API provides a unified and consistent way to access data across A360, Fusion 360, and the Object Storage Service.

With this API, you can accomplish a number of workflows, including accessing a Fusion model in A360 and getting an ordered structure of items, IDs, and properties for generating a bill of materials in a 3rd-party process. Or, you might want to superimpose a Fusion model and a building model to use in the Viewer.

- Design Automation

Formerly known as the "AutoCAD I/O API", the Design Automation API provides the ability to run scripts on your design files, leveraging the scale of the Forge Platform to automate repetitive tasks.

At present, the API provides the ability to run scripts on AutoCAD DWG files, with plans in the works to expand to file types generated by other design software.

Imagine you have thousands of DWG files stored in the cloud, and you need them all converted to PDF files. Ordinarily, you would have to download all the files, run a script on them in the AutoCAD desktop software, and then potentially upload them all back to the cloud. Your efficiency would be bottlenecked by the processing power of your computer and your network bandwidth, and you would have to instrument logging and retry logic in your code to ensure that the entire job completed.

With the Design Automation API, you can offload all that processing to the Forge Platform, which can process those scripts at a much greater scale and efficiency.

- Model Derivative

The Model Derivative API enables users to represent and share their designs in different formats, as well as to extract valuable metadata. (Its translation functionality was previously bundled as part of the "View and Data API".)

- Web Viewing

The Viewer (formerly part of the "View and Data API") is a WebGL-based, JavaScript library for 3D and 2D model rendering. 3D and 2D model data may come from a wide array of applications, such as AutoCAD, Fusion 360, Revit, and many more.

Forge Benefits
- Currently Free

Forge is currently a free offering from Autodesk, so the only thing you have to lose is time.

- View Collaboration

The View APIs provide a rapid way of creating web base custom model viewers allowing for advanced collaboration work flows and demonstrations.

- Data Liberation

The Model derivative APIS allow you to access your model information without having requiring the modelling application. This allows you to provide quick access to product and project information to users who would otherwise need to rely on a CAD professional for assistance.

- Only the Beginning!

This is only the beginning of the Forge API. Autodesk is rapidly releasing new services and capabilities.

How can I utilize my .NET capabilities with Forge?

The Forge API is based on REST. REST is a popular semi-standardized communication protocol for interacting with web service. .Net provides the ability to communicate with REST services out of the box, and the open source community has created several packages to enhance the development experience.

General Outline
- Sign Up to Forge

Head to https://developer.autodesk.com/ and sign up with an Autodesk Id.

- Create an Application

Create a 'Forge Application'.

- Get a Key

Get you applications keys.

- Prototype Capabilities

Test out the forge API using prototyping tools (curl & Postman)

- Build Out Functionality

Create a visual studio application utilizing RestSharep and JSON.net

Sign Up to Forge
- https://developer.autodesk.com/
- Create an Autodesk Account

Create an Application
- Read the Forge API
- What's a curl?

https://curl.haxx.se/
- Get Postman

https://www.getpostman.com/
- Test in Postman

Build Out Functionality
- Get Visual Studio 2015
- Get RestSharp & Json.Net from NuGet

RestSharp - http://restsharp.org/
JSON.Net - http://www.newtonsoft.com/json

- Build your RestSharp Command
- Build your Test Harness
- Build Your Application

Code from the lecture can be found at:
https://github.com/mperrott-adsk/forgefun