FDC319155

Building a Business on Forge

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Learning Objectives

- Understand the details of the Forge pricing model.
- Understand the most common business models for building on Forge.
- See examples of applications and businesses built by Forge customers.

Description

Thinking of building a business on Forge—as a Systems Integrator, or a Consultant, or by creating a SaaS application for your customers? Then this is the class for you! We'll walk you through the nuances of the Forge pricing model; then we'll discuss the most common business models that build on top of Forge; and we'll finish by presenting examples of the Forge-related businesses that have been created by our customers, resellers, and software development partners—to help kickstart your imagination for building on the Forge platform

Speaker(s)

Ron Locklin
Ron is based in the Autodesk Boston office. He has worked at Autodesk for almost eight years on business strategy for multiple Autodesk products, and is now responsible globally for the Forge (Autodesk Cloud Platform) business. Before Autodesk, Ron worked at Dassault, The MathWorks, and PTC; and has a long history in Product Lifecycle Management. Ron is also an Adjunct Professor at Boston University.

Stephen Preston
Based in the Autodesk Portland office, Stephen is Autodesk Senior Manager for Forge Business Strategy and Marketing, and is responsible for developing the business models, pricing and go-to-market strategies for all Forge services. Prior to his current role, Stephen led the Autodesk Developer Technical Services team – the Autodesk engineers helping customers and partners discover, learn and use Autodesk platforms – from desktop to cloud – around the world.

Introduction

Thank you for attending our class at Forge DevCon. During this 60 session, we plan to cover a broad agenda:

- What is Forge?
- Who uses Forge and Why?
- The Forge Business Model Explained
- Business Opportunities and Examples
- Q&A

Of these topics, the one that causes the most confusion is the Forge business model – how you pay for Forge and how much the different APIs cost you (as a Forge customer) to access – which is why we're making it the focus of this handout. The basic model is very simple, but there are a few nuances that can make a big difference to your costing estimations if you don't understand them.
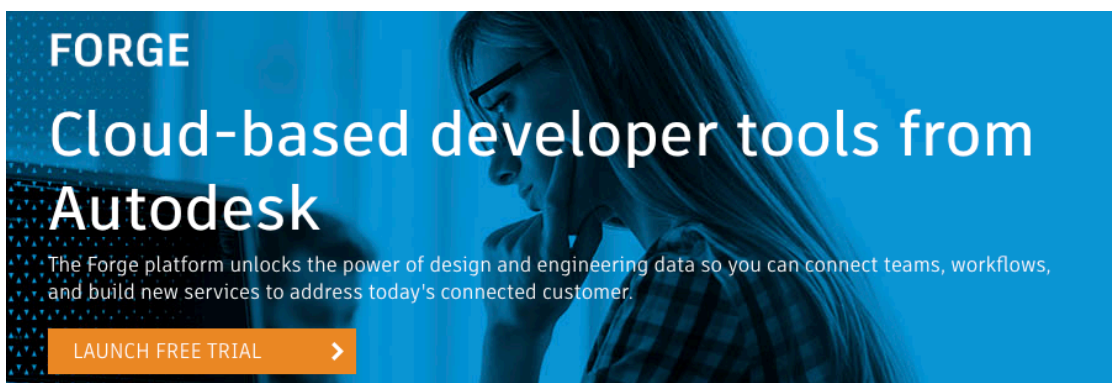
This handout and the class itself will assume that you have a basic understanding of Forge and its capabilities. If you don't, then we recommend that you either spend a few minutes browsing forge.autodesk.com; or (if you're a programmer) work your way through the tutorials at learnforge.autodesk.io.

How to access Forge

Forge Trials

Before you start working with Forge (and having to worry about the business model), you'll want to experiment with the API to make sure that it provides what you need. To help you with your evaluation, we provide you with a free Forge trial that lasts for either one year or until your 100 trial Cloud Credits are consumed (more on Cloud Credits and consumption later).

Starting your Free Trial is easy – just go to forge.autodesk.com and click the Launch Free Trial button.

Once you've finished your evaluation and decided that you want to start building online experiences around your design data, then it's time to start a Forge 'subscription'. How you do that depends on your relationship to Autodesk and how you want to use Forge.

EBA Customers

If your company has an Enterprise Business Agreement with Autodesk, then you can 'subscribe' to Forge by asking your Customer Success Manager to add a Forge entitlement to your EBA contract. There is no cost to do this, but once this is correctly setup your Forge usage will start to consume your EBA Tokens.

(Hint: If you're not sure if your company has an EBA agreement with Forge then it probably doesn't).

Non-EBA Customers

For everyone else, gaining unfettered access to Forge means buying an annual Forge subscription directly from Autodesk. You can buy your subscription from the Autodesk eStore or by requesting a quote and submitting a purchase order. You'll find links to both these routes at forge.autodesk.com/pricing.

Note: A Forge subscription can only be purchased directly from Autodesk. You can't buy it from your reseller.

The current price for an annual Forge subscription is 100USD. Your Forge subscription comes with 100 Cloud Credits (CCs), which are consumed as you make calls to Forge APIs. You can buy additional CCs as you need them either via a purchase order or from your Forge subscription management portal (manage.autodesk.com). These are standard Autodesk CCs, so you can buy them direct from Autodesk or you can buy them from your reseller. (But ask your reseller to add the CCs to the same contract as your Forge subscription.

BIM 360 Docs/Fusion 360/Fusion Team customers

Some Forge APIs are available free to use (no Forge subscription required) if you have a subscription to an Autodesk Cloud application (BIM 360 Docs, Fusion 360, or Fusion Team). If you only use these APIs, then you do not need to buy a Forge subscription.

To activate this free access, click this button near the bottom of the forge.autodesk.com/pricing page:

Limited Free Access for Fusion 360, FusionTeam and BIM 360* subscribers

Autodesk Cloud Products are built on the Forge data platform. As a result, active subscribers to these cloud products gain free access to Data Management API, Webhooks API, and BIM 360 API.

GET STARTED >

*available only with 100+ active seats to your BIM 360 subscription

Only a subset of Forge APIs qualify for this free usage. To use any other APIs – even if those APIs don't incur a consumption charge – you must purchase a Forge subscription or add Forge to your EBA contract.

Here's an explanatory table for the main Forge APIs:

	Requires a Forge Account	Free with BIM 360*/ Fusion 360/ FusionTeam
oAuth (Authentication) API	✓	✓
Data Management API	✓	✓†
Webhooks API	✓	✓
All BIM 360 APIs‡	✓	✓
Model Derivative API	✓	
Design Automation API	✓	
Viewer API	✓	
Reality Capture API	✓	

* Requires a subscription of 100 seats or more or by request to bim360appsactivations@autodesk.com.
† Access to Project Service and Data Service APIs only. Does not include Object Storage Service. See here for definitions.
‡ Only applicable to BIM 360 integrations. All APIs documented under BIM 360 API at forge.autodesk.com.

Forge uses a Consumption Model

For simplicity, we'll explain the business model in terms of Cloud Credits (CCs). If you're using Forge from an EBA Contract, then you can translate to EBA Tokens at a rate of 1 CC = 1 Token.

Forge pricing is based on a consumption model. This means that a small number Forge API calls (specifically three endpoints at the time of writing) will cost you CCs when you call them. The CCs consumed are deducted from your total CC balance. The majority of the Forge APIs have no cost to the Forge user.

Consumption models are very common in the Web API world. For example, this is how Amazon charges web developers for using Amazon Web Services. The main difference between Forge and AWS consumption is that AWS bills customers for their usage in arrears at the end of the month, whereas Forge requires you to pre-purchase CCs to cover your consumption.

You can think of the Forge consumption model as being similar to driving your car. You go to the petrol station and fill your petrol tank, then you can drive your car around (consuming the petrol) until you need to go back to the petrol station to refill your tank. If you're an Uber driver, then you'll consume petrol very quickly, and may have to visit the petrol station every day. If you only use your car for a weekly trip to the grocery store, then you can go for several months before you need a refill.

Similarly, for Forge, you buy CCs in advance. If your application makes lots of calls to API endpoints that consume CCs, then you will have to either buy a larger pack of CCs in advance (we offer volume discounts for purchases over 5000 CCs) or you will have to buy CCs more frequently.

You can monitor your Forge CC consumption by visiting your Usage Analytics dashboard on forge.autodesk.com. (Sign In to the website, and then select usage Analytics from the dropdown menu that appears under your user profile icon on the top right of the screen).

You can view your CC balance on your subscription portal – manage.autodesk.com. (Click on Reporting->Cloud Services Usage on the left tab).

The advantage of a consumption model is that you pay for exactly what you use – and no more. The disadvantage is that it takes a while for you to understand what your consumption is likely to be. Obviously, if you're using Forge as part of a web application for which you're charging your users to access, then you need to understand your expected Forge usage so that you can ensure you're not selling your application for less than it costs you to run. But this is no different to other web APIs and services – for example, you also need to understand you expected AWS or Microsoft Azure costs if you're using those services.

What does each API cost?

Let's look at the Forge API line-up to see what (if anything) they cost.

Free APIs

Free APIs don't consume any CCs. However, some of them require that you purchase a Forge subscription (or add Forge to your EBA contract) in order to use them.

Authentication API

In order to call any Forge API, you first need to authenticate your application so that the Forge service knows you are a legitimate user. In the case of 3-legged authentication, this also allows a BIM 360 Docs, Fusion 360 or Fusion Team user to grant your application permission to access their data.

This API is free to use, whether you have a Forge subscription or are using the free Forge APIs with BIM 360 Docs, Fusion Team, or Fusion 360.

Data Management API

The Data Management API allows you to access the Forge 'file system'. This includes uploading files, downloading files, and listing files.

There are two sub-categories of Data Management API – APIs to access files in a Project Hub (files stored in BIM 360 Docs, Fusion 360 or Fusion Team), and APIs to allow you to store and access files in a storage location that is private to your application (the Object Storage Service) – see here for a more detailed explanation.

Access to the Object Storage Service requires an active Forge subscription (or Trial). The other Data Management APIs are free with a BIM 360 Docs, Fusion 360 or Fusion Team subscription.

WebHooks API

The WebHooks APIs allow your application to subscribe to event notifications. For example, your application can ask to be notified when a new file is uploaded to a folder in BIM 360 Docs.

The WebHooks API is free with a BIM 360 Docs, Fusion 360 or Fusion Team subscription. Uniquely amongst Forge APIs, the WebHooks is also used by Fusion Lifecycle

BIM 360 API

Forge includes a growing range of BIM 360 specific APIs, that are collectively (and obviously) called the BIM 360 APIs. All BIM 360 APIs are free to use with a BIM 360 Docs subscription. They aren't relevant to any other product.

Viewer API

The Viewer API allows you to embed a zero-client 2D/3D interactive model viewer in your web or mobile application. The Viewer API is free to use as long as you have an active Forge subscription (or Trial).

However, the Viewer requires that models be translated to a common file format (SVF) in order to display them.

If you're creating a 'standalone' application, then this requires that you call the Model Derivative API to translate the file. Calls to the Model Derivative API consume CCs (see below). The good news is that, once translated, a model can be viewed any number of times at no additional cost (as long as you maintain an active Forge subscription).

If you're creating a BIM 360 Docs integration, then – good news – BIM 360 Docs translates all files to the SVF format for you. So there is no cost at all for preparing files for Viewing in this scenario. This is an important nuance of the Forge Business Model – it significantly reduces the cost of many BIM 360 Docs integrations.

Fusion 360 and Fusion Team translate models 'on demand', so you may have to explicitly translate models stored in these products. This will incur Model Derivative API consumption costs.

Token Flex API

The Token Flex API allows you to programmatically query your Token consumption for your EBA account. This is only relevant if your company has an EBA contract.

Consuming APIs

There are three Forge APIs (actually three specific API endpoints) that incur a consumption charge when you call them.

Model Derivative API

The Model Derivative API allows you to 'translate' models from one format to another, and to access data that has been extracted from the model.

The Model Derivative API requires a Forge subscription (or Trial). There is one endpoint that incurs a consumption cost:

```
POST job
```

All other endpoints are free of charge, but require a Forge subscription (or Trial).

This is the endpoint that translates a model from one format to another (and is most commonly used to convert a model to SVF in order to render it in the Forge Viewer).

The consumption cost for this endpoint is:

- 1.5 CCs to process a Revit or Navisworks model to any other format.
- 0.2 CCs to process any other file format.

The cost is per model, which means that a multi-file model (e.g. an Inventor assembly and all the part files) only counts as a single job. (So that Inventor model will only cost 0.2 CCs to process).

The cost is also independent of file size. A 1MB model costs the same to process as a 1GB model, so the best way to estimate the cost to you is to estimate how many models and of what type you intend to process.

Design Automation API

The Design Automation API allows you to run 'headless' versions of Autodesk desktop products in the cloud, into which you can load your add-ins (with the UI stripped out) in order to perform batch automation tasks. Currently supported products are Inventor, Revit, 3DS Max and AutoCAD.

There are two endpoint that incur a consumption cost:

```
POST workitems
POST workitems/batch
```

This API sets a job running. All other Design Automation APIs are free of charge, but require a Forge subscription (or Trial).

Because this API allows you to run your own add-in 'in the cloud', this API could result in a job that lasts 1 second or 1 hour. Therefore, the consumption for this API is charged on the amount of processor time on the server that your job takes – this is the time from when a job starts uploading files to when is has finished downloading your results.

The consumption costs are:

- 4 CCs per hour of processing time for AutoCAD.

- 6 CC per hour of processing time for Revit, Inventor and 3DS Max.

A good way to make an initial estimate of the cost of using this API is to time how long the same operation takes with the same add-in running on a desktop copy of Revit, Inventor, 3DS Max or AutoCAD.

Reality Capture API

The Reality Capture API is a photogrammetry API - it allows you to convert a set of photos of an object into a 3D mesh. The photogrammetry algorithm is optimized for processing photos taken from drones.

Again, there is one endpoint that incurs a consumption cost:

```
POST photoscene/photosceneid
```

All other APIs are free, but require a Forge subscription (or Trial).

The consumption cost for this API is 3.5 CCs per gigapixel processed, so you can easily calculate the cost of calling this API from knowing how many photos and at what resolution you plan to process.

How are charges accumulated?

You've probably already noticed that many of the Forge API consumption prices are fractional (for example 0.2 CCs to process an Inventor model in the Model Derivative API). But the Cloud Credit system only permits charging in integers. This means that the Forge system accumulates fractional charges until the charges exceed an integer, at which point the charges are passed to your account, which has that integer number of CCs debited.

For example:

- If you process 4 Inventor models using the Design Automation API, you've consumed 0.8 CCs, but haven't been charged anything. Your next call to the same API will charge an additional 0.2 CCs, taking your total to 1 CC which is charged to your account.
- The price for the Design Automation for Revit API is 6 CC per hour, or 1 CC per 10 minutes. Running a 5-minute job consumes 0.5 CCs, but you're charged nothing. Running an additional 25-minute job will take you to an accumulated 30 minutes of usage, for which you will be charged 3 CCs.

You can monitor your Forge CC consumption by visiting your Usage Analytics dashboard on forge.autodesk.com. (Sign In to the website, and then select usage Analytics from the dropdown menu that appears under your user profile icon on the top right of the screen).

You can view your CC balance on your subscription portal – manage.autodesk.com. (Click on Reporting->Cloud Services Usage on the left tab).

Resources

Thank you again for signing up our Forge DevCon class, and for reading this handout. We welcome questions from the audience either during or after the class. However, here are some resources for you to find out more on your own.

Information

Website/Developer Portal: https://forge.autodesk.com

Customer success stories: https://forge.autodesk.com/customers

Sales material : https://forge.autodesk.com/ots

Systems Integrators: https://forge.autodesk.com/systemsintegrators

Accelerators: https://forge.autodesk.com/accelerator

Email addresses

Sales questions: forge.sales@autodesk.com

Technical questions : forge.help@autodesk.com

Systems Integrators Program questions: forge.si.program@autodesk.com

See you in Vegas,

Ron and Stephen