

Autodesk Cloud 기반 개발 플랫폼 FORGE 시작하기

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Autodesk FORGE : Where to **START** ?

Autodesk FORGE

Where to **START** ?

The screenshot shows the Autodesk Forge developer website. The browser's address bar displays the URL `https://forge.autodesk.com/developer/getting-started`. The navigation bar includes links for Success Stories, Solutions, Getting Started (highlighted with a yellow box), Documentation, Community, Support, and Pricing. A large blue banner with the text "GETTING STARTED" is visible, with a yellow arrow pointing to it. Below the banner, the main content area features a large image of a person working on a laptop. Overlaid on this image is the text "Get started today" and "From starter walkthroughs to core concepts, find the information you need to start building apps with Forge APIs". A yellow arrow points to an orange "Start Here" button. To the right, the "Featured Walkthroughs" section lists two options: "ONLINE VIEWER" (Display 3D files directly on your browser) and "PHOTO TO 3D" (Build an application to convert photos to 3D). Each walkthrough has a "Follow walkthrough" link. At the bottom, a blue footer contains the text "Additional Tutorials" and "Need to know more? Check out these step-by-step tutorials."

Getting Started | Autodesk | +

Autodesk, Inc. [US] | `https://forge.autodesk.com/developer/getting-started`

AUTODESK FORGE FOR EMPLOYEES

Success Stories Solutions **Getting Started** Documentation Community Support Pricing

GETTING STARTED

Get started today

From starter walkthroughs to core concepts, find the information you need to start building apps with Forge APIs

Start Here >

Featured Walkthroughs

Check our walkthroughs for a guided tour of how Forge APIs are used in a solution.

ONLINE VIEWER
Display 3D files directly on your browser
Follow walkthrough

PHOTO TO 3D
Build an application to convert photos to 3D
Follow walkthrough

Additional Tutorials

Need to know more? Check out these step-by-step tutorials.

Autodesk FORGE

Where to START ?

The image shows a screenshot of the Autodesk Forge 'Get Started' page for employees. The browser address bar shows the URL <https://forge.autodesk.com/developer/start-now/signup>. The page has a navigation bar with links: Success Stories, Solutions, Getting Started, Documentation, Community, Support, and Pricing. A blue banner reads 'GET STARTED WITH FORGE IN 3 STEPS'. Below this, three steps are listed: 1. Get a Forge account, 2. Access Forge services, and 3. Learn about Forge services. A large yellow arrow points to step 1. Below step 1, there is a section titled '1. Get a Forge account' with instructions on how to create or sign in to an Autodesk account. To the right of this text is a graphic of a computer monitor displaying a login form with fields for email and password, and a 'Sign in' button. A yellow arrow points from the 'Sign in' button on the monitor to a yellow-bordered box on the right. This box contains the 'Online Viewer' section, which states 'Display 3D files directly on your browser' and includes a 'Follow walkthrough' button. The background of the 'Online Viewer' box shows a 3D architectural model of a building structure.

GET STARTED WITH FORGE IN 3 STEPS

- 1 Get a Forge account
- 2 Access Forge services
- 3 Learn about Forge services

1. Get a Forge account

You must have an Autodesk Account to get a Forge account.

If you don't have Autodesk Account, go to forge.autodesk.com and click **Create Account**.

If you already have an Autodesk Account, [sign in](#) with your Autodesk Account. A Forge account is automatically created when you sign in to forge.autodesk.com.

As soon as a Forge account is created you get full access to all Forge services for a limited time period.

In case your account is restricted to a limited set of Forge services, you may need to upgrade to a time limited full access account or purchase cloud credits, to access all Forge services.

Online Viewer

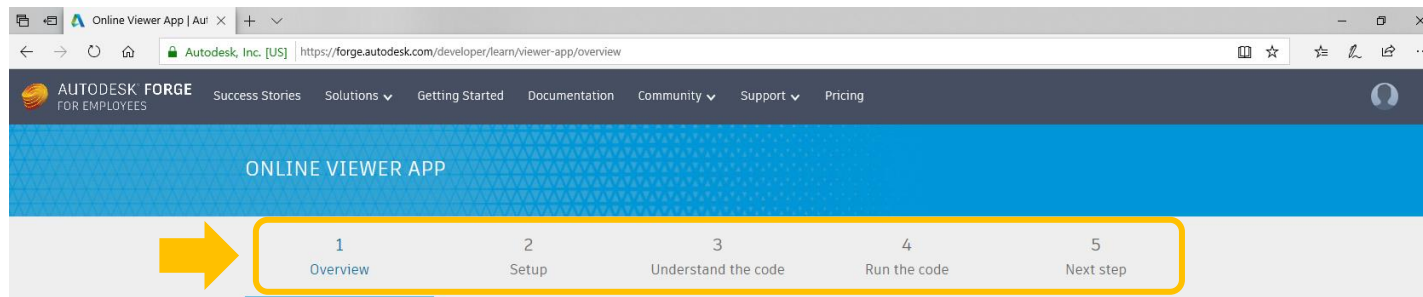
Display 3D files directly on your browser

[Follow walkthrough](#)

`nodejs, javascript`

Autodesk FORGE

Where to **START** ?



1. Overview

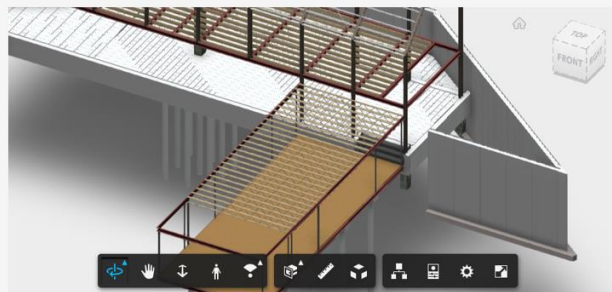
In this walkthrough, we will analyze a simple web page that allows site visitors to upload CAD files (or 3D Design files) to the Forge Data Management storage service. We will then translate those files using the Model Derivative service. Finally we will view those files using the Forge JavaScript Viewer embedded in the web page.

This may be your first full 3D Viewer web app!

The code samples in this walkthrough are solely for the purpose of demonstrating the specific Forge API service features, and should not be used in a production environment as-is.

In this section:

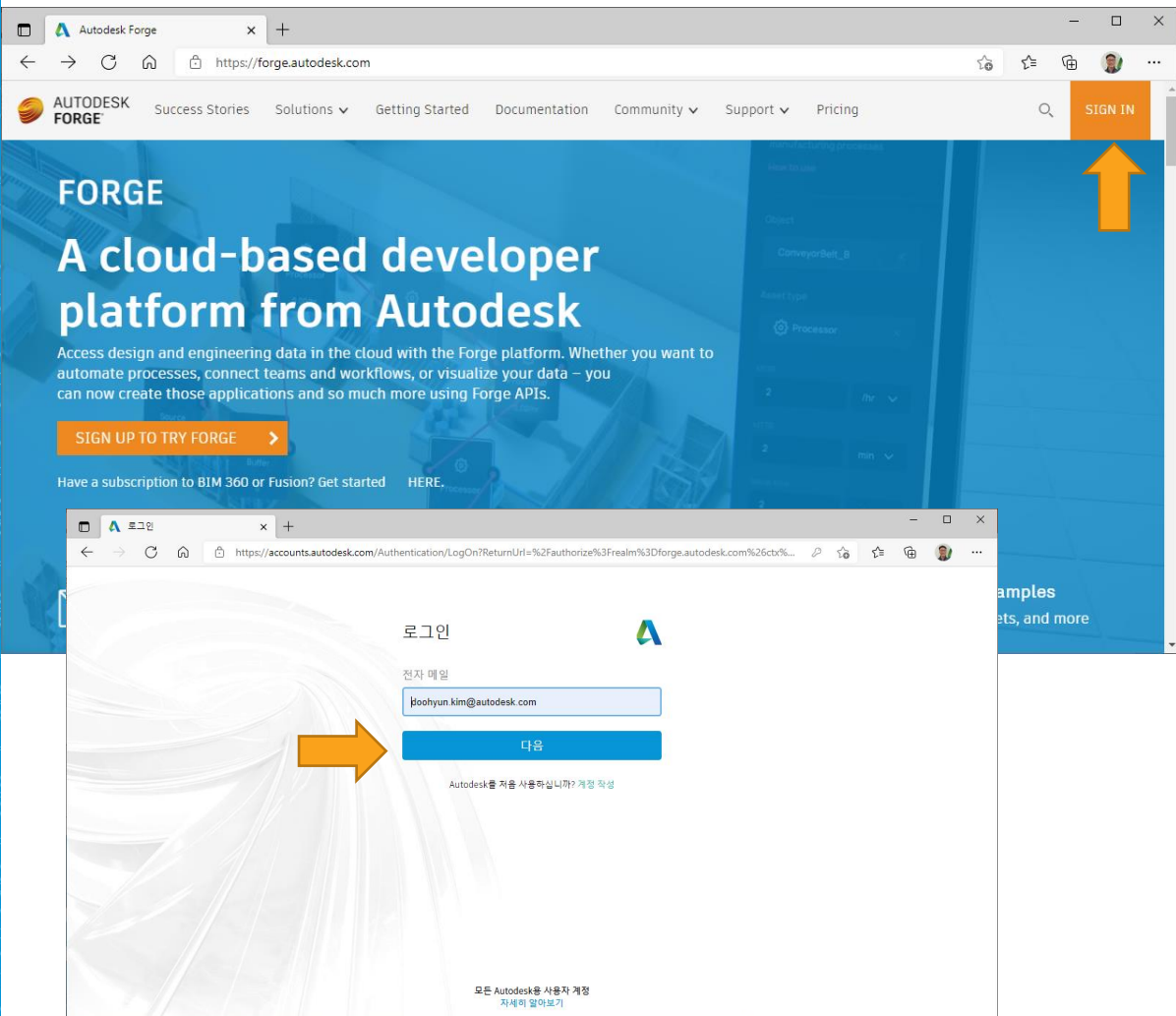
- Who is this for?
- What are the APIs used?
- What will I get from this tutorial?
- What is required?



Where to **START** ? :
Getting Started

Forge Sign in

- <https://forge.autodesk.com>
- SIGN IN 버튼 선택
- 로그인 페이지에서 로그인
- Autodesk Account와 동일
- Autodesk Account 없으면 생성
- 생성과 동시에 Forge Trial License로 사용 가능 (90일)



App 등록

- 계정 메뉴에서 My Apps 선택
- CREATE FORGE APP 선택
- APP 이름 입력 (Ex: AU FORGE)
- Application Type : Traditional Web App 선택
- Create 버튼 선택

The screenshot shows the Autodesk Forge interface for managing applications. The top navigation bar includes links for Success Stories, Solutions, Getting Started, Documentation, Community, Support, and Pricing. The user profile menu is open, showing options like My Apps, My Tasks, Internal Forge, and Usage Analytics. The 'My Apps' section is active, displaying a 'CREATE FORGE APP' button. The 'Create Application' dialog is open, with the 'Name*' field containing 'AU FORGE'. Under 'Application Type*', the 'Traditional Web App' option is selected, which is described as 'Server-side web apps that can securely store secrets. Supports 2-legged and 3-legged authentication.' Other options include 'Desktop, Mobile, Single-Page App' and 'Server-to-Server App'. The 'Create' button is highlighted at the bottom right.

Client ID / Secret

- App 정보 확인
- App 상세 페이지에서 Client ID 확인 / 기록
- Client Secret은 눈 모양 아이콘 선택 후 확인 / 기록
- 추후 계정과 연결된 등록된 Forge App의 Token 생성에 사용

The screenshot shows the 'View App' page for an application named 'AU FORGE' on the Autodesk Forge platform. The page is titled 'App information' and includes a 'Back to My Apps' link. The 'Client ID' is displayed as 'eMXPC7m1hoPSVvwe91yzDF8I8D0S1Evj'. The 'Client Secret' is shown as a series of dots, with an eye icon and a 'REGENERATE' button next to it. An orange arrow points to the eye icon. The 'App Name' is 'AU FORGE', the 'Grant Type' is 'Authorization Code or Client Credentials', and the 'Description' is 'Enter a description'. The 'Callback URL(s)' is 'http://localhost:8080/'. Below the app information, there is a section titled 'APIs' with the text 'APIs this app will be able to access.' and a grid of 16 API icons, including 'App Framework API', 'Autodesk Construction Cloud API', 'BIM 360 API', 'BIM 360 Client API', 'Compute API', 'Design Automation API', 'Desktop Connections API', 'Developer Portal API', 'Generative Design API', 'Identity API', 'Machine Learning API', 'Misc API', 'Monitoring API', 'Plant API', 'Recap API', and 'UDP API'.

App의 Forge API 수정

- 계정 메뉴에서 My Apps 선택
- 수정할 App 선택
- App 정보 페이지 하단부 Edit 버튼 선택
- 수정하고자 항목 수정
- Save 선택

The screenshot displays the 'Edit App' interface in the Autodesk Forge developer portal. The page is titled 'Edit App' and shows the following details:

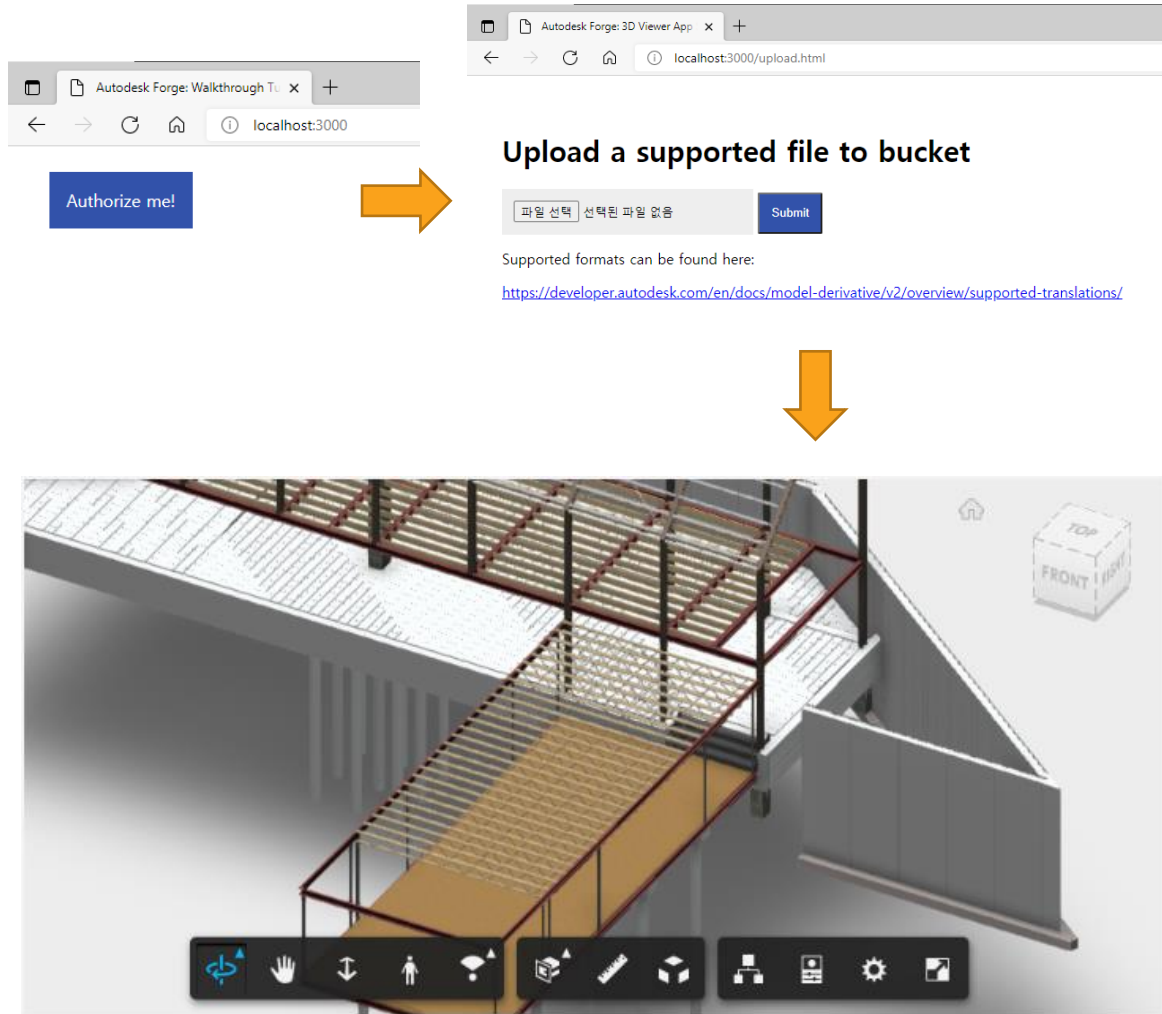
- App information (Created 18 Aug 2021)**
- About this app**
- App Name:** AU FORGE
- Client ID:** eMXPC7mJhoPSVvwe8tYzDF8i8D0SIEy
- Client Secret:** [REDACTED] with a 'REGENERATE' button.
- App description:** Enter a description
- Callback URL(s) (what is this?):** http://localhost:8080/
- + ADD URL** button
- Your Website URL:** http://
- APIs:** A grid of available APIs with checkboxes for selection. The selected APIs are: App Framework API, Autodesk Construction Cloud API, BIM 360 API, BIM 360 Client API, Compute API, Design Automation API, Desktop Connections API, and Developer Portal API.

On the right side of the page, there are three buttons: 'ADD', 'DELETE', and 'EDIT'. A large orange arrow points to the 'EDIT' button.

Where to **START** ? :
On-Line Viewer Example

예제 소개

- FORGE로 개발된 특정 웹 페이지 방문
- 사용자가 샘플 Revit 파일을 Upload
- 웹 페이지에서 Viewer 3D 형상 보기



예제에 사용된 FORGE API

- Authentication : Forge API 사용
허가를 위한 Token 생성
- Data Management : OSS
(Object Storage Service) 를 이
용한 사용자 파일의 Upload
- Model Derivative : Upload된 사
용자 파일을 Viewer에서 보기 위
한 Viewable 파일 변환 (SVF2)
- Viewer : 웹 페이지에서 3D 형상
을 보기



Authentication

Generate tokens based on the OAuth 2.0 standard to authenticate requests made to Forge APIs and SDKs.

➔ [View Documentation](#)



Model Derivative API

Derive outputs viewable by the Forge Viewer from more than 60 CAD file formats, and extract metadata about the models as well as the individual objects within the model.

➔ [Introduction](#)
➔ [View Documentation](#)



Data Management API

Access data across BIM 360 team, Fusion Team, BIM 360 Docs, and the Object Storage Service to build apps to display and extend your data in ways that add value to your users.

➔ [Introduction](#)
➔ [View Documentation](#)



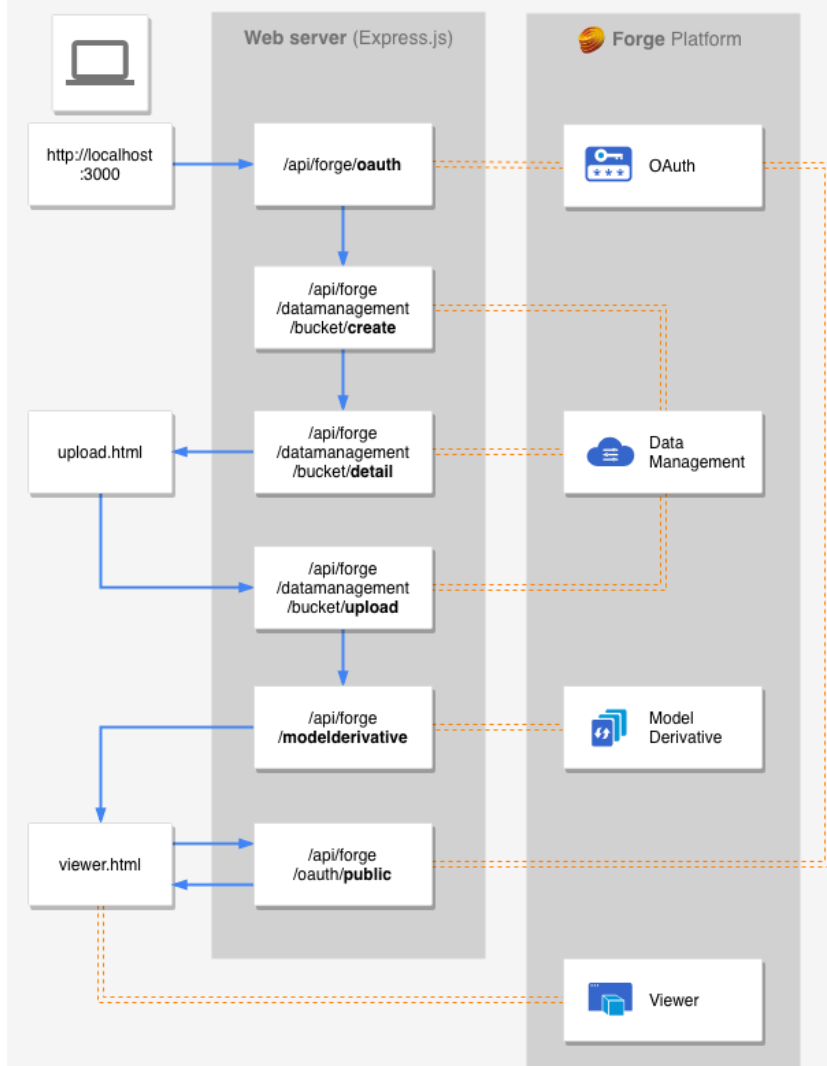
Viewer

Render 3D and 2D model data within a browser. The models can come from a wide range of applications such as AutoCAD, Fusion 360, Revit, and many more.

➔ [Introduction](#)
➔ [View Documentation](#)

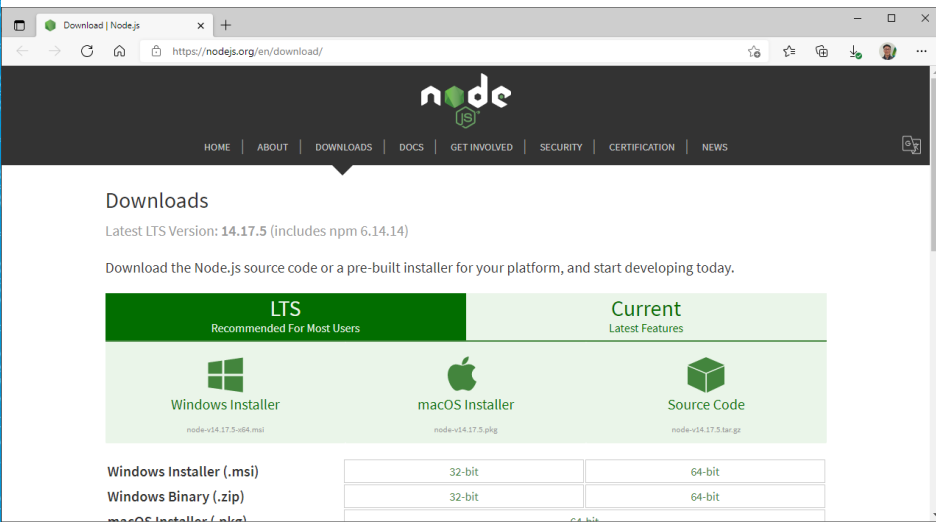
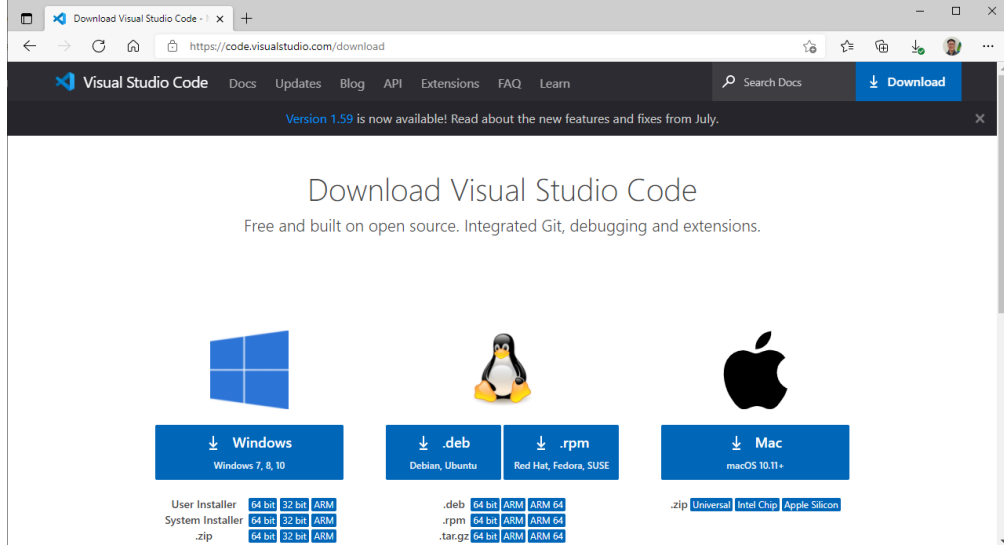
FORGE 예제 흐름

- 웹서버 (Express Server) 구동
- 사용자 Welcome page 접속
- 사용자 Authorize Me 버튼 선택 (Authentication)
- Data Management OSS Bucket 생성 및 상세 확인
- Upload 페이지 에서 사용자 파일 Upload
- Model Derivative : SVF 변환
- Viewer에 3D 모델 표시



개발 준비 및 필요 항목

- Forge 계정 및 App 등록
- Text Editor (Visual Studio Code) 설치 : <https://code.visualstudio.com/download>
- Node.JS 설치 : <https://nodejs.org/en/download/>
- 사전 지식
 - HTML / CSS
 - JavaScript
 - Node.JS 명령어
 - Axios
 - body-parser
 - Express
 - multer

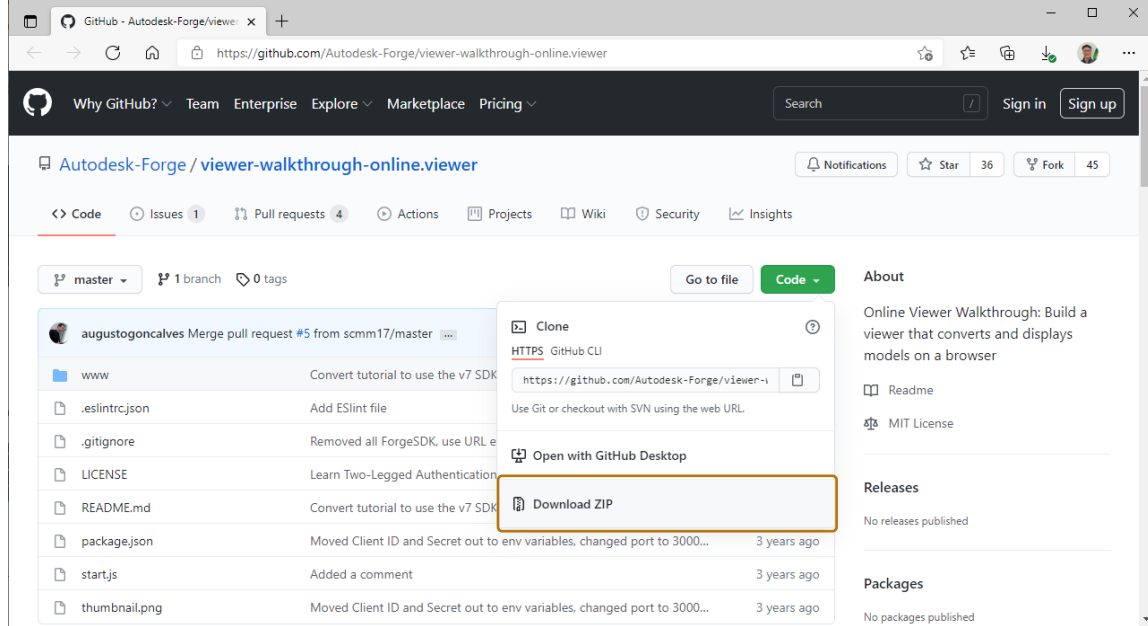


Sample Code

- Github에서 다운로드
(<https://github.com/Autodesk-Forge/viewer-walkthrough-online.viewer>)

- 주요 파일

- Package.json
- Start.js
- Index.html
- Upload.html
- Viewer.html

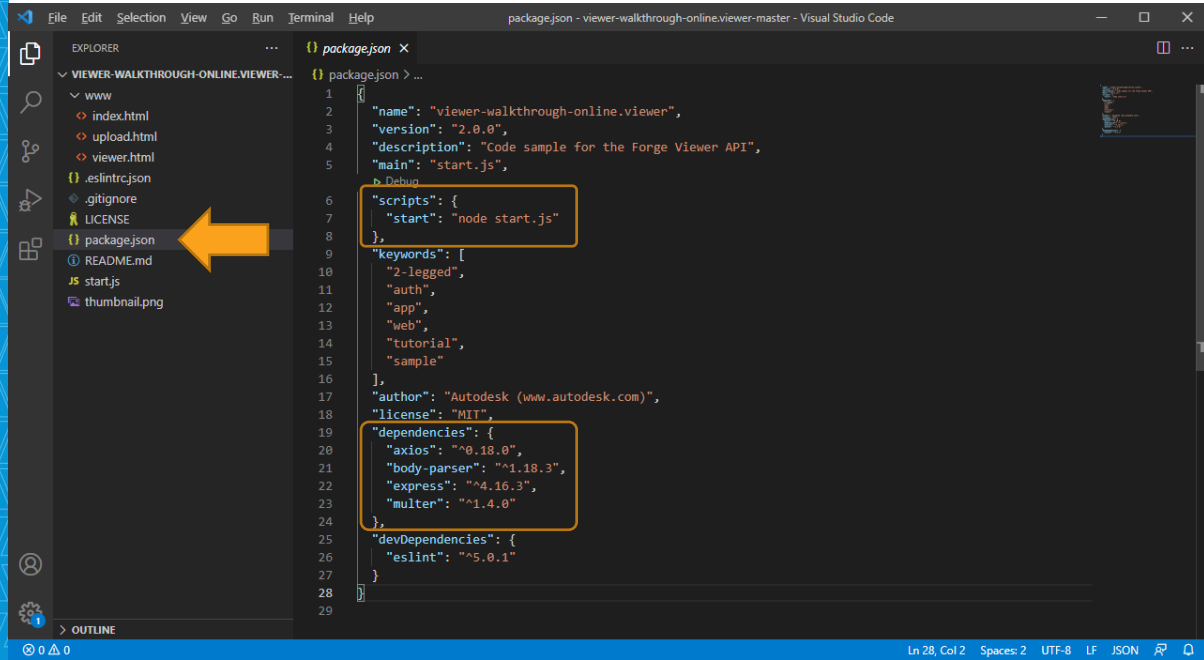
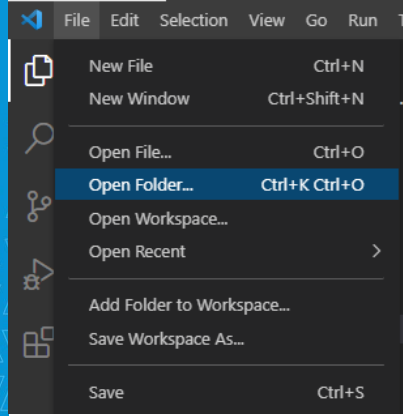


- walkthrough

- |- README.md
- |- LICENSE
- |- .eslintrc.json
- |- thumbnail.png
- |- package.json (important)
- |- start.js (important)
- |- www
 - |- index.html (important)
 - |- upload.html (important)
 - |- viewer.html (important)

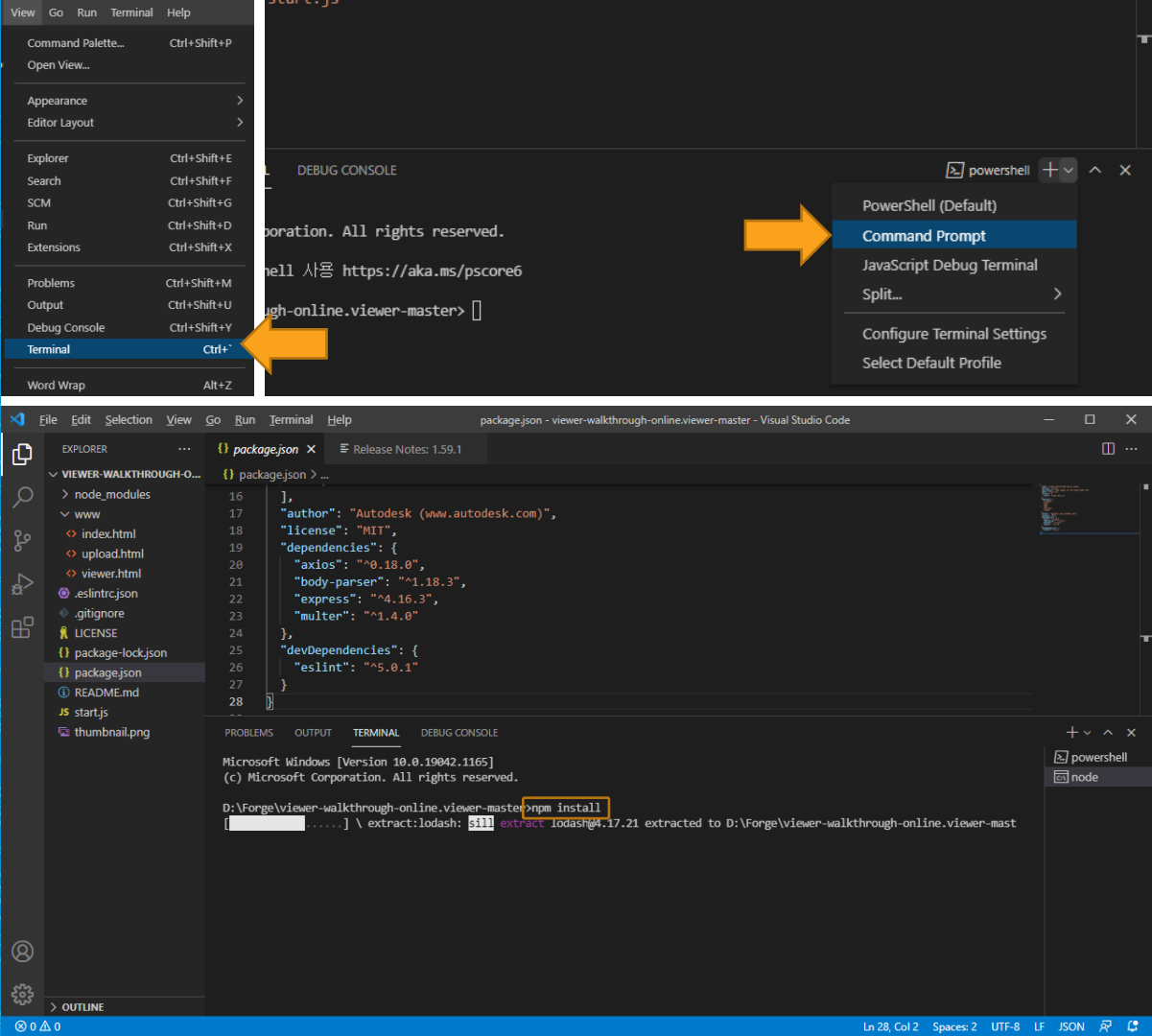
Sample Code 열기

- VS Code File > Open Folder 실행
후 Sample Code 폴더 선택
- 좌측 Explorer 영역에서
Package.json 선택
 - Scripts
 - dependencies



VS Code Terminal 열기 및 Library 설치

- VS Code View > Terminal 실행
- 하단 터미널 영역 우측 “+” 메뉴에서 Command Prompt 선택
- Command Prompt에서 “npm install” 명령 실행
 - 인터넷을 통해 필요한 Javascript Library 다운로드



Authentication 환경 변수 설정 및 Web Server 기동

- Command Prompt에서 “set FORGE_CLIENT_ID=” 환경 변수 설정
- Command Prompt에서 “set FORGE_CLIENT_SECRET=” 환경 변수 설정
- Command Prompt에서 “npm start” 명령 실행
- Web Server 기동

The image shows a web browser displaying the Autodesk Forge Developer Portal for an application named 'AU FORGE'. The page includes fields for 'Client ID' (eMXPc7m1hoPSVvwe91yzDF818D0SIEvj) and 'Client Secret' (masked with dots), with a 'REGENERATE' button. Below these are fields for 'App Name', 'Grant Type', 'Description', and 'Callback URL(s)'. A section for 'APIs' lists various services like App Framework API, Compute API, Generative Design API, and Monitoring API.

Overlaid on the bottom right is a terminal window showing the following commands and output:

```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

D:\Forge\viewer-walkthrough-online.viewer-master>npm install
npm WARN viewer-walkthrough-online.viewer@2.0.0 No repository field.

added 193 packages from 119 contributors and audited 193 packages in 10.593s

4 packages are looking for funding
run 'npm fund' for details

found 1 high severity vulnerability
run 'npm audit fix' to fix them, or 'npm audit' for details

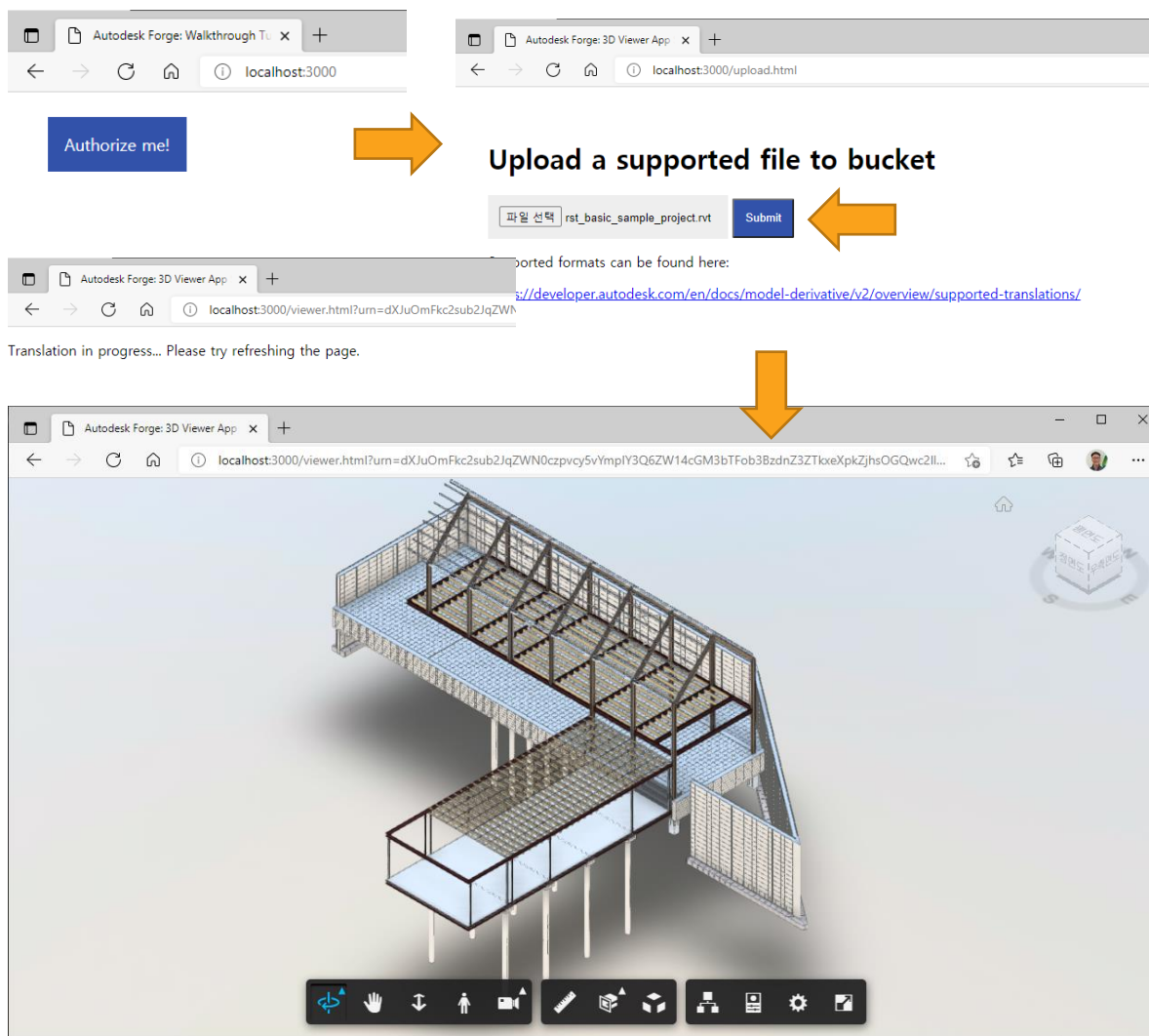
D:\Forge\viewer-walkthrough-online.viewer-master>set FORGE_CLIENT_ID=eMXPc7m1hoPSVvwe91yzDF818D0SIEvj
D:\Forge\viewer-walkthrough-online.viewer-master>set FORGE_CLIENT_SECRET=nfnKMHvt7Bjgynz6
D:\Forge\viewer-walkthrough-online.viewer-master>npm start

> viewer-walkthrough-online.viewer@2.0.0 start D:\Forge\viewer-walkthrough-online.viewer-master
> node start.js

Server listening on port 3000
```

Web Server 접속 및 Revit 파일 적용

- Web Browser에서 “localhost:3000” 입력
- “Authorize me!” 버튼 선택
- “파일 선택” 버튼 선택해서 다운로드 한 Revit 파일 선택
 - 다운로드 (https://developer.static.autodesk.com/forgeunified/releases/samples/rst_basic_sample_project.rvt)
- “Translation in progress... Please try refreshing the page.” 메시지 발생시 잠시 뒤 Web Browser에서 “새로 고침” 실행



Where to **START ?** :
Online Viewer Example Code

Code 분석

- 필요 Package Import
- express : 웹 서버
- Axios : Promise 기반 Browser와 node.js를 위한 HTTP Client
- bodyParser : JSON 형식 Parser
- 웹 서버가 JSON 파일 읽을 수 있도록 설정
- /WWW 폴더를 html 파일 저장소로 지정
- 웹 서버 포트 3000 설정

@start.js Line 23 to 25:

```
23 var express = require('express'); // For web server
24 var Axios = require('axios'); // A Promised base http client
25 var bodyParser = require('body-parser'); // Receive JSON format
```

@start.js Line 27 to 30:

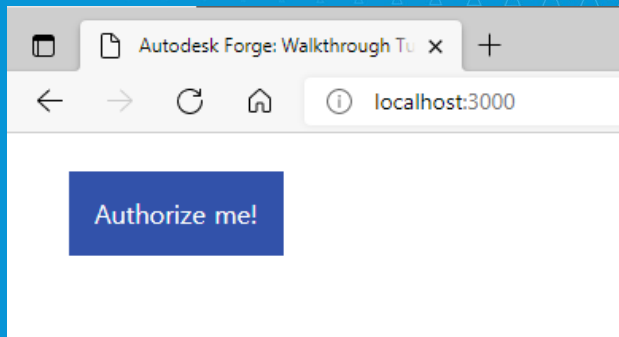
```
27 // Set up Express web server
28 var app = express();
29 app.use(bodyParser.json());
30 app.use(express.static(__dirname + '/www'));
```

@start.js Line 32 to 36

```
32 // This is for web server to start listening to port 3000
33 app.set('port', 3000);
34 var server = app.listen(app.get('port'), function () {
35     console.log('Server listening on port ' + server.address().port);
36 });
```

Code 분석

- URL 입력시 `www/index.html` 로드



- Authorize me! 선택시
`http://localhost:3000/api/forge/oauth` 로 전용
- Express Routing

@index.html full source code:

```
1 <!DOCTYPE html>
2 <html lang="en">
3
4 <head>
5   <meta charset="UTF-8">
6   <title>Autodesk Forge: Walkthrough Tutorial</title>
7
8   <meta http-equiv="cache-control" content="max-age=0" />
9   <meta http-equiv="cache-control" content="no-cache" />
10  <meta http-equiv="expires" content="0" />
11  <meta http-equiv="expires" content="Tue, 01 Jan 1980 1:00:00 GMT" />
12  <meta http-equiv="pragma" content="no-cache" />
13
14  <style>
15    /** Just simple CSS styling to make this page a little nicer **/
16    main {
17      padding: 2em;
18    }
19    main a {
20      background-color: #3252aa;
21      color: #fff;
22      text-decoration: none;
23      padding: 1em;
24    }
25  </style>
26 </head>
27
28 <body>
29   <main id="main">
30     <a href="/api/forge/oauth">Authorize me!</a>
31   </main>
32 </body>
33
34 </html>
```

Code 분석

- Client ID와 Secret 정보를 환경 변수에 가져옴
- API 권한 범위 설정
 - Data:read : Bucket에서 읽기
 - Data:write : Bucket에 쓰기
 - Data:create : Bucket에 생성
 - Bucket:create : Bucket을 생성
 - Bucket :read : Bucket을 읽기
- Index.html Authorize me! 선택시 Routing 설정

@start.js

```
43 var FORGE_CLIENT_ID = process.env.FORGE_CLIENT_ID;  
44 var FORGE_CLIENT_SECRET = process.env.FORGE_CLIENT_SECRET;
```

@start.js:

```
45 var access_token = '';  
46 var scopes = 'data:read data:write data:create bucket:create bucket:read';  
47 const querystring = require('querystring');
```

@start.js:

```
49 // // Route /api/forge/oauth  
50 app.get('/api/forge/oauth', function (req, res) {
```

Code 분석

- Axios를 이용한 Post Request
 - Method
 - url
 - Headers
 - data
- 성공하면 .then
 - Access_token 저장
 - <http://localhost:3000/api/forgedatamanagement/bucket/create> 로전용
- 실패하면 .catch
 - 오류처리

```
50 app.get('/api/forge/oauth', function (req, res) {
51   Axios({
52     method: 'POST',
53     url: 'https://developer.api.autodesk.com/authentication/v1/authenticate',
54     headers: {
55       'content-type': 'application/x-www-form-urlencoded',
56     },
57     data: querystring.stringify({
58       client_id: FORGE_CLIENT_ID,
59       client_secret: FORGE_CLIENT_SECRET,
60       grant_type: 'client_credentials',
61       scope: scopes
62     })
63   })
64   .then(function (response) {
65     // Success
66     access_token = response.data.access_token;
67     console.log(response);
68     res.redirect('/api/forge/datamanagement/bucket/create');
69   })
70   .catch(function (error) {
71     // Failed
72     console.log(error);
73     res.send('Failed to authenticate');
74   });
75 });
```

Code 분석

- Bucket 생성을 위한 변수 선언
 - Transient : 24시간
 - Temporary : 30일
 - Persistent : 지속 유지

```
106 const bucketKey = FORGE_CLIENT_ID.toLowerCase() + '_tutorial_bucket'; // Prefix with y
107 const policyKey = 'transient'; // Expires in 24hr
```

Code 분석

- Axios를 이용한 Post Request
 - Method
 - url
 - Headers
 - data
- 성공하면 .then
 - <http://localhost:3000/api/forgedatamanagement/bucket/detail> 로 전용
- 실패하면 .catch
 - 이미 있으면 전용
 - 실패하면 오류처리

@start.js Line 109 to 139

```
109 // Route /api/forge/datamanagement/bucket/create
110 app.get('/api/forge/datamanagement/bucket/create', function (req, res) {
111   // Create an application shared bucket using access token from previous route
112   // We will use this bucket for storing all files in this tutorial
113   Axios({
114     method: 'POST',
115     url: 'https://developer.api.autodesk.com/oss/v2/buckets',
116     headers: {
117       'content-type': 'application/json',
118       Authorization: 'Bearer ' + access_token
119     },
120     data: JSON.stringify({
121       'bucketKey': bucketKey,
122       'policyKey': policyKey
123     })
124   })
125   .then(function (response) {
126     // Success
127     console.log(response);
128     res.redirect('/api/forge/datamanagement/bucket/detail');
129   })
130   .catch(function (error) {
131     if (error.response && error.response.status == 409) {
132       console.log('Bucket already exists, skip creation.');
```

'/api/forge/datamanagement/bucket/detail');

```
133       res.redirect('/api/forge/datamanagement/bucket/detail');
134     }
135     // Failed
136     console.log(error);
137     res.send('Failed to create a new bucket');
138   });
139 });
```

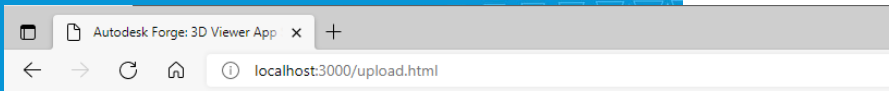

Code 분석

- Bucket이 제대로 생성되었는지 확인
 - Bucket Detail을 가져올 수 있는지 확인
- 성공하면 .then
 - <http://localhost:3000/upload.html> 로전용
- 실패하면 .catch
 - 실패하면 오류처리

```
141 // Route /api/forge/datamanagement/bucket/detail
142 app.get('/api/forge/datamanagement/bucket/detail', function (req, res) {
143   Axios({
144     method: 'GET',
145     url: 'https://developer.api.autodesk.com/oss/v2/buckets/' + encodeURIComponent(bucketName),
146     headers: {
147       Authorization: 'Bearer ' + access_token
148     }
149   })
150   .then(function (response) {
151     // Success
152     console.log(response);
153     res.redirect('/upload.html');
154   })
155   .catch(function (error) {
156     // Failed
157     console.log(error);
158     res.send('Failed to verify the new bucket');
159   });
160 });
```

Code 분석

- File Upload Form 생성
 - Submit 버튼 선택시
<http://localhost:3000/api/forge/datamanagement/bucket/upload> 로 전용



Upload a supported file to bucket

파일 선택

Supported formats can be found here:

<https://developer.autodesk.com/en/docs/model-derivative/v2/overview/supported-translations/>

@www/upload.html full source code:

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <title>Autodesk Forge: 3D Viewer App Sample</title>

  <meta http-equiv="cache-control" content="max-age=0" />
  <meta http-equiv="cache-control" content="no-cache" />
  <meta http-equiv="expires" content="0" />
  <meta http-equiv="expires" content="Tue, 01 Jan 1980 1:00:00 GMT" />
  <meta http-equiv="pragma" content="no-cache" />

  <style>
    /** Just simple CSS styling to make this page a little nicer **/
    main {
      padding: 2em;
    }
    main button {
      background-color: #3252aa;
      color: #fff;
      text-decoration: none;
      padding: 1em;
      border-radius: 2px;
      transition: background-color 0.2s ease;
    }
    main button:hover {
      background-color: #ff5800;
    }
    main input {
      background-color: #eee;
      padding: 1em;
    }
  </style>
</head>

<body>
  <main id="main">
    <h1>Upload a supported file to bucket</h1>
    <form action="/api/forge/datamanagement/bucket/upload" enctype="multipart/form-data">
      <input type="file" name="fileToUpload" />
      <button type="submit">Submit</button>
    </form>
    <p></p>
    <p>Supported formats can be found here:</p>
    <p><a target="_blank" href="https://developer.autodesk.com/en/docs/model-derivative/v2/overview/supported-translations/">https://developer.autodesk.com/en/docs/model-derivative/v2/overview/supported-translations/</a></p>
  </main>
</body>

</html>
```

Code 분석

- 파일 Upload를 위해 Multer 사용
 - fileToUpload 경로 파일 서버 /tmp 폴더에 저장
 - /tmp 폴더로부터 파일 읽기
- bucketKey 와 objectName 정보로 <https://developer.api.autodesk.com/oss/v2/buckets/:bucketKey/objects/:objectName> PUT 요청
 - Header에 access token, file name, file size 정보
 - Data에 file content
- 성공하면 .then
 - URN을 Base64 형식 변환
 - <http://localhost:3000/api/forge/modelderivative> 로전용

실패하면 오류처리

@start.js Line 162 to 199:

```
162 // For converting the source into a Base64-Encoded string
163 var Buffer = require('buffer').Buffer;
164 String.prototype.toBase64 = function () {
165     // Buffer is part of Node.js to enable interaction with octet streams in TCP stream
166     // file system operations, and other contexts.
167     return new Buffer(this).toString('base64');
168 };
169
170 var multer = require('multer'); // To handle file upload
171 var upload = multer({ dest: 'tmp/' }); // Save file into local /tmp folder
172
173 // Route /api/forge/datamanagement/bucket/upload
174 app.post('/api/forge/datamanagement/bucket/upload', upload.single('fileToUpload'), function (req, res) {
175     var fs = require('fs'); // Node.js File system for reading files
176     fs.readFile(req.file.path, function (err, filecontent) {
177         Axios({
178             method: 'PUT',
179             url: 'https://developer.api.autodesk.com/oss/v2/buckets/' + encodeURIComponent(bucketKey) + '/objects/' + encodeURIComponent(objectName),
180             headers: {
181                 Authorization: 'Bearer ' + access_token,
182                 'Content-Disposition': req.file.originalname,
183                 'Content-Length': filecontent.length
184             },
185             data: filecontent
186         })
187         .then(function (response) {
188             // Success
189             console.log(response);
190             var urn = response.data.objectId.toBase64();
191             res.redirect('/api/forge/modelderivative/' + urn);
192         })
193         .catch(function (error) {
194             // Failed
195             console.log(error);
196             res.send('Failed to create a new object in the bucket');
197         });
198     });
199 });
```

Code 분석

- Upload 된 파일 변환 필요
- :urn Parameter 가 req.params.urn 에 저장
 - Urn 설정
 - Format_type 설정
 - Format_view 설정

@start.js Line 202:

```
202 app.get('/api/forge/modelderivative/:urn', function (req, res) {
```

@start.js Line 203:

```
203 var urn = req.params.urn;
```

@start.js Line 204 to 205:

```
204 var format_type = 'svf';
205 var format_views = ['2d', '3d'];
```

Code 분석

- Access_token, urn, format_type, format_view 정보를 <https://developer.api.autodesk.com/modelderivative/v2/designdata/job>에 Post
- 성공하면 .then
 - <http://localhost:3000/viewer.html?urn> 로전용
- 실패하면 .catch
 - 실패하면 오류처리

```
206 Axios({
207   method: 'POST',
208   url: 'https://developer.api.autodesk.com/modelderivative/v2/designdata/job',
209   headers: {
210     'content-type': 'application/json',
211     Authorization: 'Bearer ' + access_token
212   },
213   data: JSON.stringify({
214     'input': {
215       'urn': urn
216     },
217     'output': {
218       'formats': [
219         {
220           'type': format_type,
221           'views': format_views
222         }
223       ]
224     }
225   })
226 })
227 .then(function (response) {
228   // Success
229   console.log(response);
230   res.redirect('/viewer.html?urn=' + urn);
231 })
232 .catch(function (error) {
233   // Failed
234   console.log(error);
235   res.send('Error at Model Derivative job.');
```

Code 분석

- Viewer.html
 - External libraries
 - HTML code
 - Frontend Javascript
- External Libraries
 - Autodesk Viewer 도구를 나타내기 위한 CSS
 - SVF 형식 보기를 위한 Autodesk.Viewing API 접근
 - Ajax, DOM을 위한 JQuery 활용

@viewer.html Line 15 to 16

```
15 <link rel="stylesheet" href="https://developer.api.autodesk.com/modelderivative/v2/viewers/6.*/viewer3D/default.css">
16 <script src="https://developer.api.autodesk.com/modelderivative/v2/viewers/6.*/viewer3D/default.js"></script>
```

@viewer.html Line 13:

```
13 <script src="https://code.jquery.com/jquery-3.3.1.min.js"></script>
```


Code 분석

- HTML Code

- Frontend JavaScript

- Autodesk.Viewing API 구동을 위한 Options

- <http://localhost:3000/api/forge/oauth/public> 으로 전용

@viewer.html Line 28:

```
28 <div id="MyViewerDiv"></div>
```

@viewer.html Line 31 to 36:

```
31 var viewerApp;  
32 var options = {  
33   env: 'AutodeskProduction',  
34   api: 'derivativeV2', // TODO: for models uploaded to EMEA change this option to '  
35   getAccessToken: getForgeToken  
36 };
```

@viewer.html Line 85 to 92:

```
60 function getForgeToken(callback) {  
61   jQuery.ajax({  
62     url: '/api/forge/oauth/public',  
63     success: function (res) {  
64       callback(res.access_token, res.expires_in);  
65     }  
66   });  
67 }
```

Code 분석

- <http://localhost:3000/api/forge/oauth> Routing 과 유사
 - Scope만 viewables:read
- 성공하면 .then
 - Access_token과 expires_in 반환
 - 보안상 Token 을 Backend JS로 처리
- 실패하면 .catch
 - 실패하면 오류처리

@start.js Line 77 to 103:

```
77 // Route /api/forge/oauth/public
78 app.get('/api/forge/oauth/public', function (req, res) {
79   // Limit public token to Viewer read only
80   Axios({
81     method: 'POST',
82     url: 'https://developer.api.autodesk.com/authentication/v1/authenticate',
83     headers: {
84       'content-type': 'application/x-www-form-urlencoded',
85     },
86     data: querystring.stringify({
87       client_id: FORGE_CLIENT_ID,
88       client_secret: FORGE_CLIENT_SECRET,
89       grant_type: 'client_credentials',
90       scope: 'viewables:read'
91     })
92   })
93   .then(function (response) {
94     // Success
95     console.log(response);
96     res.json({ access_token: response.data.access_token, expires_in: response.
97   })
98   .catch(function (error) {
99     // Failed
100    console.log(error);
101    res.status(500).json(error);
102  });
103 });
```

Code 분석

- Frontend JavaScript
 - Web Browser 주소로부터 urn 가져오기

@viewer.html Line 37:

```
37 var documentId = 'urn:' + getUrlParameter('urn');
```

@viewer.html Line 66 to 71:

```
66 function getUrlParameter(name) {  
67     name = name.replace(/[[\]/, '\\[\\]')  
68     var regex = new RegExp('[\\?&]' + name + '=(^&#)*');  
69     var results = regex.exec(location.search);  
70     return results === null ? '' : decodeURIComponent(results[1].replace(/\+/g, ' '));  
71 }
```



- Autodesk.Viewing 초기화
 - MyViewerDiv 이용
 - GuiViewer3D Type
 - documentId를 이용한 Load

@viewer.html Line 39 to 41:

```
39 Autodesk.Viewing.Initializer(options, function onInitialized(){  
40     viewerApp = new Autodesk.Viewing.ViewingApplication('MyViewerDiv');  
41     viewerApp.registerViewer(viewerApp.k3D, Autodesk.Viewing.Private.GuiViewer3D);  
42     viewerApp.loadDocument(documentId, onDocumentLoadSuccess, onDocumentLoadFailure);  
43 });
```

Code 분석

- Frontend JavaScript

- Document Load 성공시

- Autodesk.Viewing application의 bubble 속성을 이용한 접근
- Viewable이 없으면 오류 처리
- Viewable의 첫 Item 선택

- Document Load 실패시

- MyViewerDiv 위치에 메시지 처리

@viewer.html Line 50 to 62:

```
50 function onDocumentLoadSuccess(doc) {
51   // We could still make use of Document.getSubItemsWithProperties()
52   // However, when using a ViewingApplication, we have access to the **bubble** attribute
53   // which references the root node of a graph that wraps each object from the Manifest
54   var viewables = viewerApp.bubble.search({'type':'geometry'});
55   if (viewables.length === 0) {
56     console.error('Document contains no viewables.');
```

```
57     return;
58   }
59
60   // Choose any of the available viewables
61   viewerApp.selectItem(viewables[0].data, onItemLoadSuccess, onItemLoadFail);
62 }
```

@viewer.html Line 87 to 90:

```
87 function onDocumentLoadFailure(viewerErrorCode) {
88   console.error('onDocumentLoadFailure() - errorCode:' + viewerErrorCode);
89   jQuery('#MyViewerDiv').html('<p>Translation in progress... Please try refreshing the page</p>');
90 }
```

Code 분석

- Frontend JavaScript
 - Item Load 성공시
 - Console Log 처리

- Item Load 실패시
 - MyViewDiv 위치에 메시지 처리

@viewer.html Line 97 to 104:

```
97  function onItemLoadSuccess(viewer, item) {
98      console.log('onItemLoadSuccess(!)');
99      console.log(viewer);
100     console.log(item);
101
102     // Congratulations! The viewer is now ready to be used.
103     console.log('Viewers are equal: ' + (viewer === viewerApp.getCurrentViewer()));
104 }
```

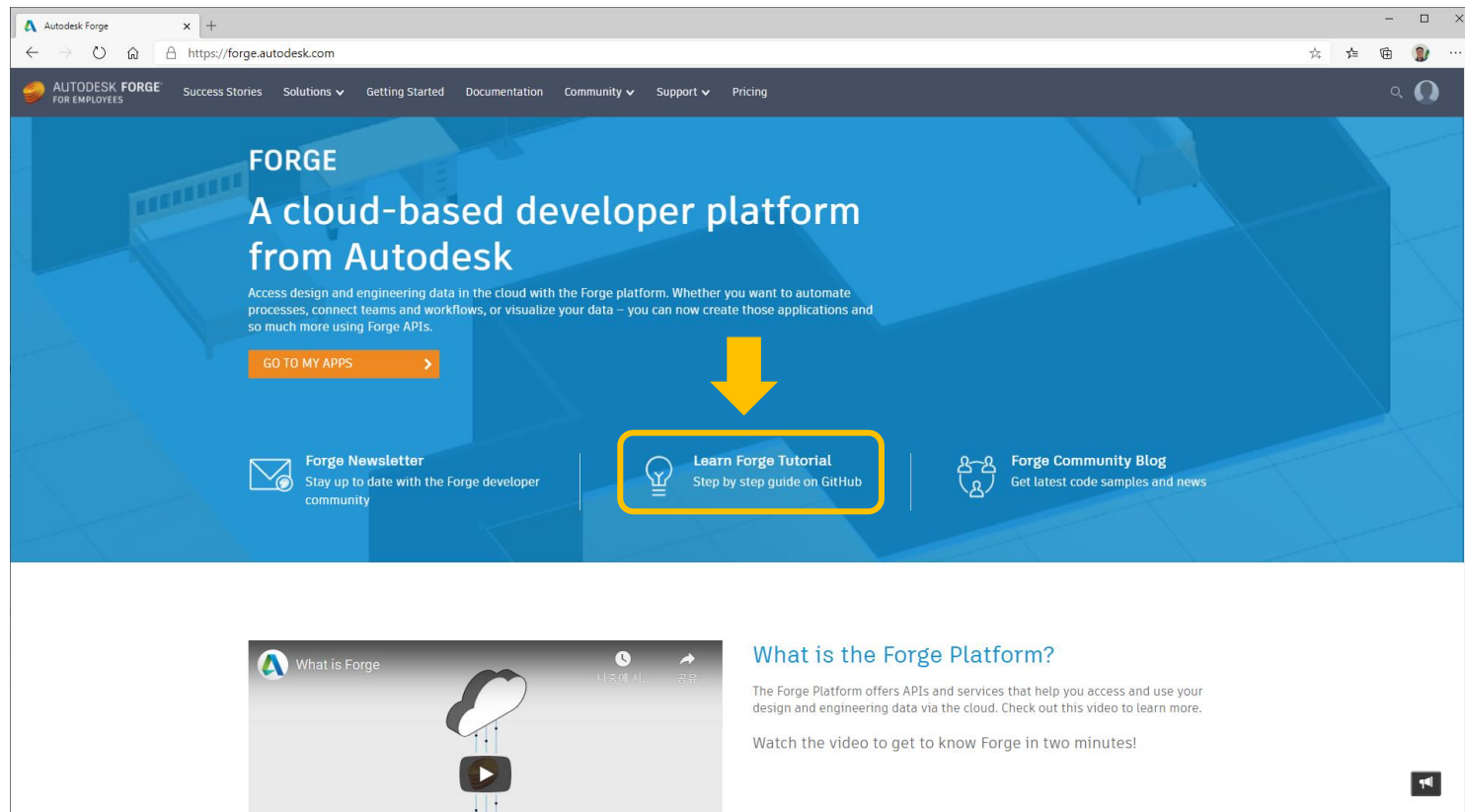
@viewer.html Line 110 to 113:

```
110 function onItemLoadFail(viewerErrorCode) {
111     console.error('onLoadModelError() - errorCode: ' + viewerErrorCode);
112     jQuery('#MyViewerDiv').html('<p>There is an error fetching the translated SVF file
113 }
```

Autodesk FORGE :
Where to **LEARN** ?

Autodesk FORGE

Where to **LEARN** ?



The screenshot shows the Autodesk Forge website homepage. The browser address bar displays 'https://forge.autodesk.com'. The navigation bar includes links for Success Stories, Solutions, Getting Started, Documentation, Community, Support, and Pricing. The main header features the 'FORGE' logo and the tagline 'A cloud-based developer platform from Autodesk'. Below this, a paragraph describes the platform's capabilities: 'Access design and engineering data in the cloud with the Forge platform. Whether you want to automate processes, connect teams and workflows, or visualize your data – you can now create those applications and so much more using Forge APIs.' An orange button labeled 'GO TO MY APPS' is positioned below the text. A large yellow arrow points from this button area down to a yellow-bordered box containing the 'Learn Forge Tutorial' link, which is described as a 'Step by step guide on GitHub'. Other links visible include 'Forge Newsletter' and 'Forge Community Blog'. At the bottom, there is a video player titled 'What is Forge' and a section titled 'What is the Forge Platform?' with a brief description and a link to watch a video.

Autodesk Forge
https://forge.autodesk.com

AUTODESK FORGE
FOR EMPLOYEES

Success Stories Solutions Getting Started Documentation Community Support Pricing

FORGE
A cloud-based developer platform from Autodesk

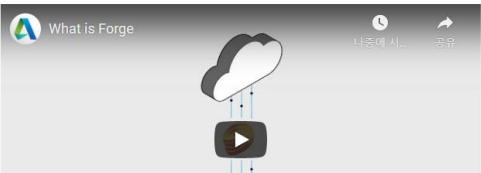
Access design and engineering data in the cloud with the Forge platform. Whether you want to automate processes, connect teams and workflows, or visualize your data – you can now create those applications and so much more using Forge APIs.

GO TO MY APPS

 **Learn Forge Tutorial**
Step by step guide on GitHub

 **Forge Newsletter**
Stay up to date with the Forge developer community

 **Forge Community Blog**
Get latest code samples and news

 **What is Forge**

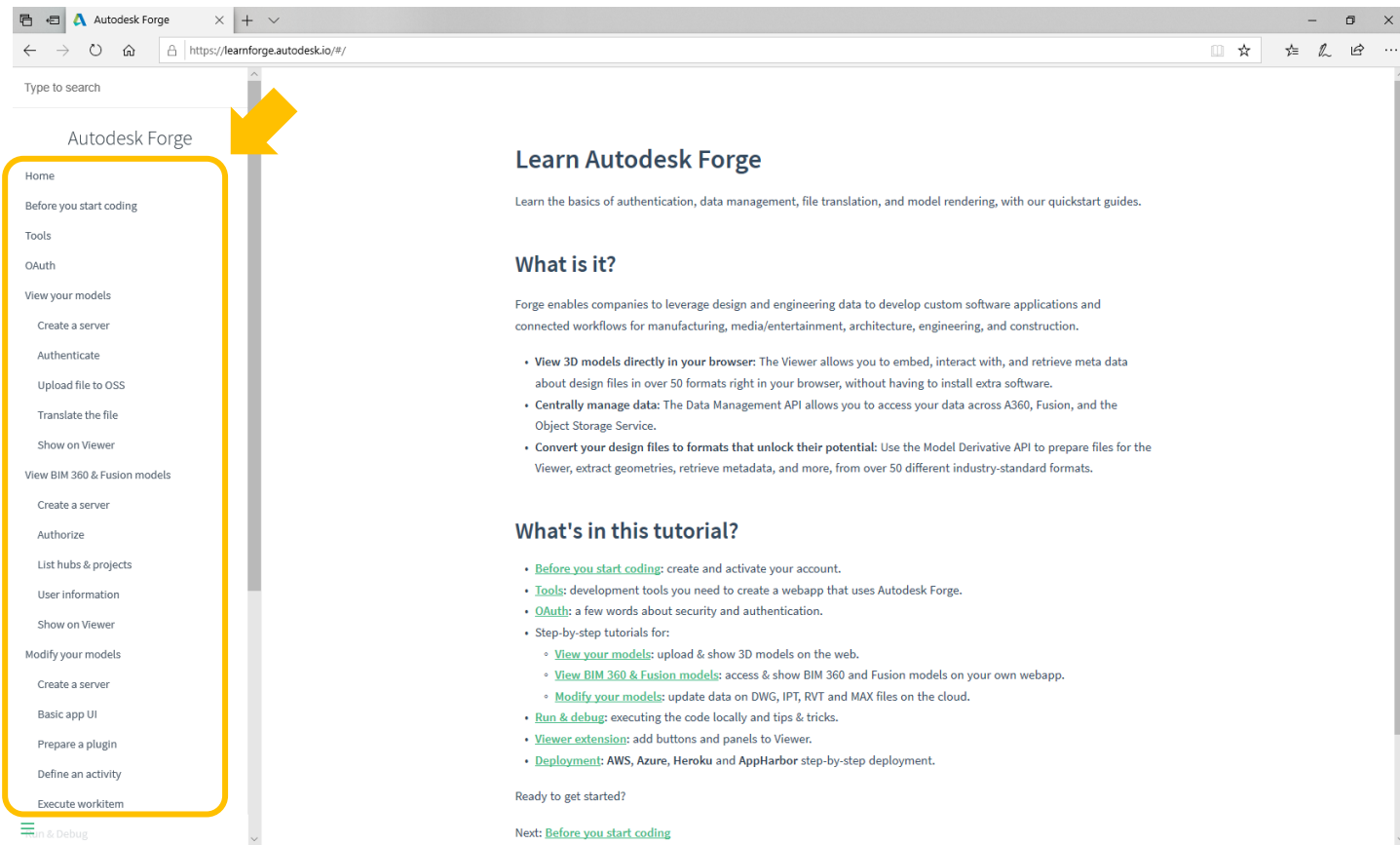
What is the Forge Platform?

The Forge Platform offers APIs and services that help you access and use your design and engineering data via the cloud. Check out this video to learn more.

Watch the video to get to know Forge in two minutes!

Autodesk FORGE

Where to LEARN ?



The screenshot shows the Autodesk Forge Learn website. A yellow box highlights the left sidebar, and a yellow arrow points to the 'Autodesk Forge' link at the top of the sidebar. The main content area is titled 'Learn Autodesk Forge' and includes sections for 'What is it?' and 'What's in this tutorial?'. The sidebar contains the following links:

- Autodesk Forge
- Home
- Before you start coding
- Tools
- OAuth
- View your models
 - Create a server
- Authenticate
 - Upload file to OSS
 - Translate the file
 - Show on Viewer
- View BIM 360 & Fusion models
 - Create a server
 - Authorize
 - List hubs & projects
 - User information
 - Show on Viewer
- Modify your models
 - Create a server
 - Basic app UI
 - Prepare a plugin
 - Define an activity
 - Execute workitem

The main content area is titled 'Learn Autodesk Forge' and includes the following sections:

Learn Autodesk Forge

Learn the basics of authentication, data management, file translation, and model rendering, with our quickstart guides.

What is it?

Forge enables companies to leverage design and engineering data to develop custom software applications and connected workflows for manufacturing, media/entertainment, architecture, engineering, and construction.

- **View 3D models directly in your browser:** The Viewer allows you to embed, interact with, and retrieve meta data about design files in over 50 formats right in your browser, without having to install extra software.
- **Centrally manage data:** The Data Management API allows you to access your data across A360, Fusion, and the Object Storage Service.
- **Convert your design files to formats that unlock their potential:** Use the Model Derivative API to prepare files for the Viewer, extract geometries, retrieve metadata, and more, from over 50 different industry-standard formats.

What's in this tutorial?

- **Before you start coding:** create and activate your account.
- **Tools:** development tools you need to create a webapp that uses Autodesk Forge.
- **OAuth:** a few words about security and authentication.
- Step-by-step tutorials for:
 - **View your models:** upload & show 3D models on the web.
 - **View BIM 360 & Fusion models:** access & show BIM 360 and Fusion models on your own webapp.
 - **Modify your models:** update data on DWG, IPT, RVT and MAX files on the cloud.
- **Run & debug:** executing the code locally and tips & tricks.
- **Viewer extension:** add buttons and panels to Viewer.
- **Deployment:** AWS, Azure, Heroku and AppHarbor step-by-step deployment.

Ready to get started?

Next: [Before you start coding](#)

Autodesk FORGE :
Where to **Getting DEEPER ?**

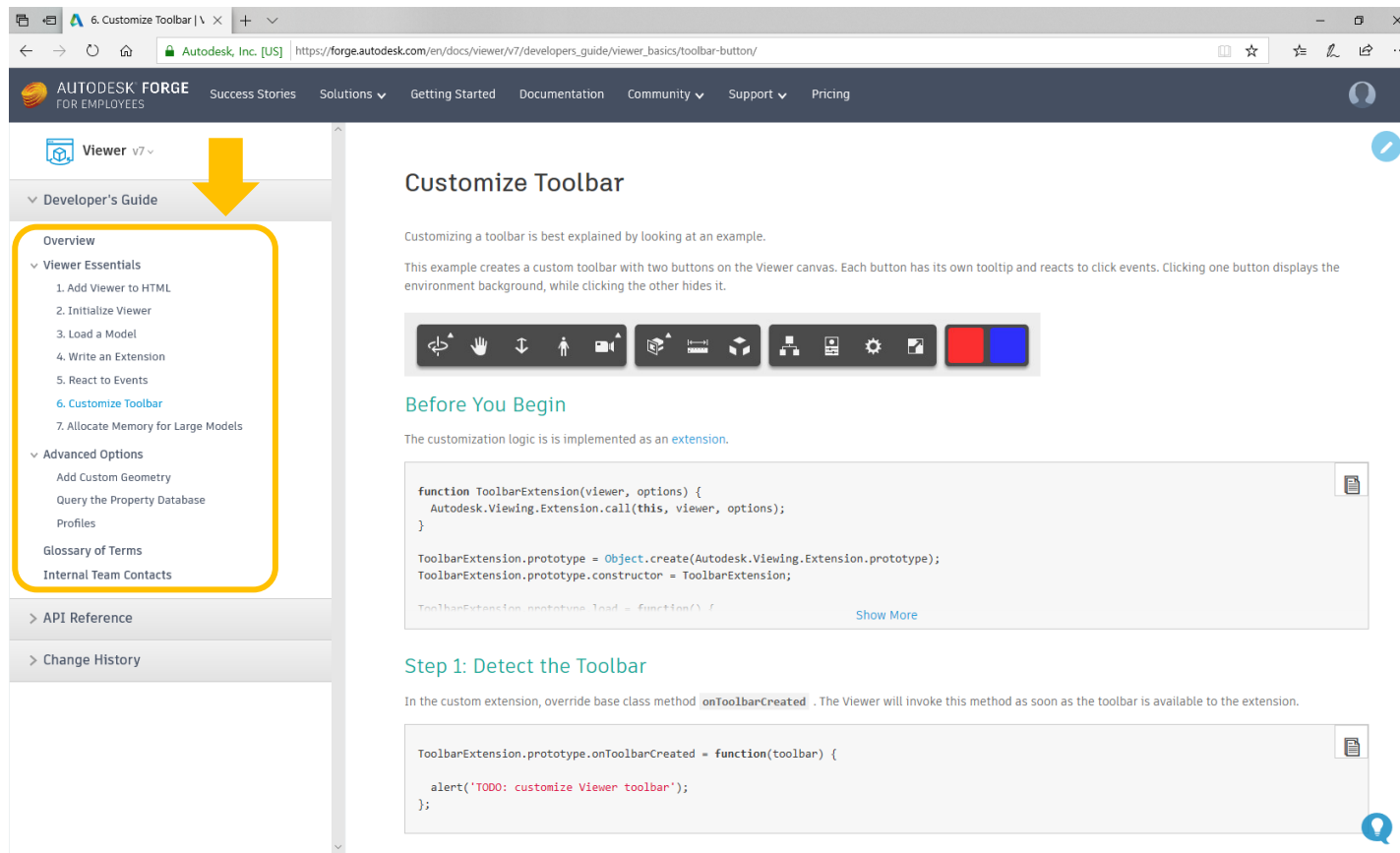
Autodesk FORGE

Where to Getting DEEPER ?

The screenshot shows the Autodesk Forge website interface. The top navigation bar includes links for Success Stories, Solutions (highlighted with a yellow box), Getting Started, Documentation, Community, Support, and Pricing. The 'Solutions' dropdown menu is open, displaying a list of services: Ideas, API & Services, BIM 360, Data Management, Design Automation, Model Derivative, Reality Capture, Token Flex, Viewer (highlighted with a yellow box and a yellow arrow), and Webhooks. The 'Viewer' description reads: 'View and navigate through complex 2D and 3D models'. The background of the website features a large blue banner with the text 'FORGE A cloud from' and 'platform'. Below the banner, there are sections for 'Forge Tutorial' and 'Forge Community Blog'. At the bottom of the page, there is a section titled 'What is the Forge Platform?' with a video player and a description: 'The Forge Platform offers APIs and services that help you access and use your design and engineering data via the cloud. Check out this video to learn more. Watch the video to get to know Forge in two minutes!'.

Autodesk FORGE

Where to Getting DEEPER ?



6. Customize Toolbar | \ × + ▾

Autodesk, Inc. [US] | https://forge.autodesk.com/en/docs/viewer/v7/developers_guide/viewer_basics/toolbar-button/

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

Viewer v7 ▾

Developer's Guide

Overview

Viewer Essentials

1. Add Viewer to HTML
2. Initialize Viewer
3. Load a Model
4. Write an Extension
5. React to Events
6. Customize Toolbar
7. Allocate Memory for Large Models

Advanced Options

- Add Custom Geometry
- Query the Property Database
- Profiles

Glossary of Terms

Internal Team Contacts

> API Reference

> Change History

Customize Toolbar

Customizing a toolbar is best explained by looking at an example.

This example creates a custom toolbar with two buttons on the Viewer canvas. Each button has its own tooltip and reacts to click events. Clicking one button displays the environment background, while clicking the other hides it.



Before You Begin

The customization logic is implemented as an [extension](#).

```
function ToolbarExtension(viewer, options) {
  Autodesk.Viewing.Extension.call(this, viewer, options);
}

ToolbarExtension.prototype = Object.create(Autodesk.Viewing.Extension.prototype);
ToolbarExtension.prototype.constructor = ToolbarExtension;

ToolbarExtension.prototype.load = function() {
```

[Show More](#)

Step 1: Detect the Toolbar

In the custom extension, override base class method `onToolbarCreated`. The Viewer will invoke this method as soon as the toolbar is available to the extension.

```
ToolbarExtension.prototype.onToolbarCreated = function(toolbar) {

  alert('T000: customize Viewer toolbar');
};
```

Autodesk FORGE :
Need **SAMPLES** ?

Autodesk FORGE

Need SAMPLES ?

The screenshot shows the Autodesk Forge website for employees. The browser address bar displays "Autodesk, Inc. [US] | https://forge.autodesk.com/". The website header includes the Autodesk Forge logo and navigation links: Success Stories, Solutions, Getting Started, Documentation, Community, Support, and Pricing. A user profile icon is visible in the top right.

The main content area has a blue background with a geometric pattern. On the left, under the heading "Stay current with Forge", there is a sign-up form for the Forge newsletter. The form includes a text input field labeled "Email" and a checkbox labeled "I agree to the use of my personal information as described in the Autodesk Privacy Statement." Below the form is an orange "SUBMIT" button with a right-pointing arrow.

On the right, under the heading "READY TO GET STARTED?", there are two links: "EXPLORE THE APIS AND SERVICES" and "START BUILDING". Below this, under the heading "QUESTIONS?", there is a link: "GET HELP".

The footer contains five columns of links:

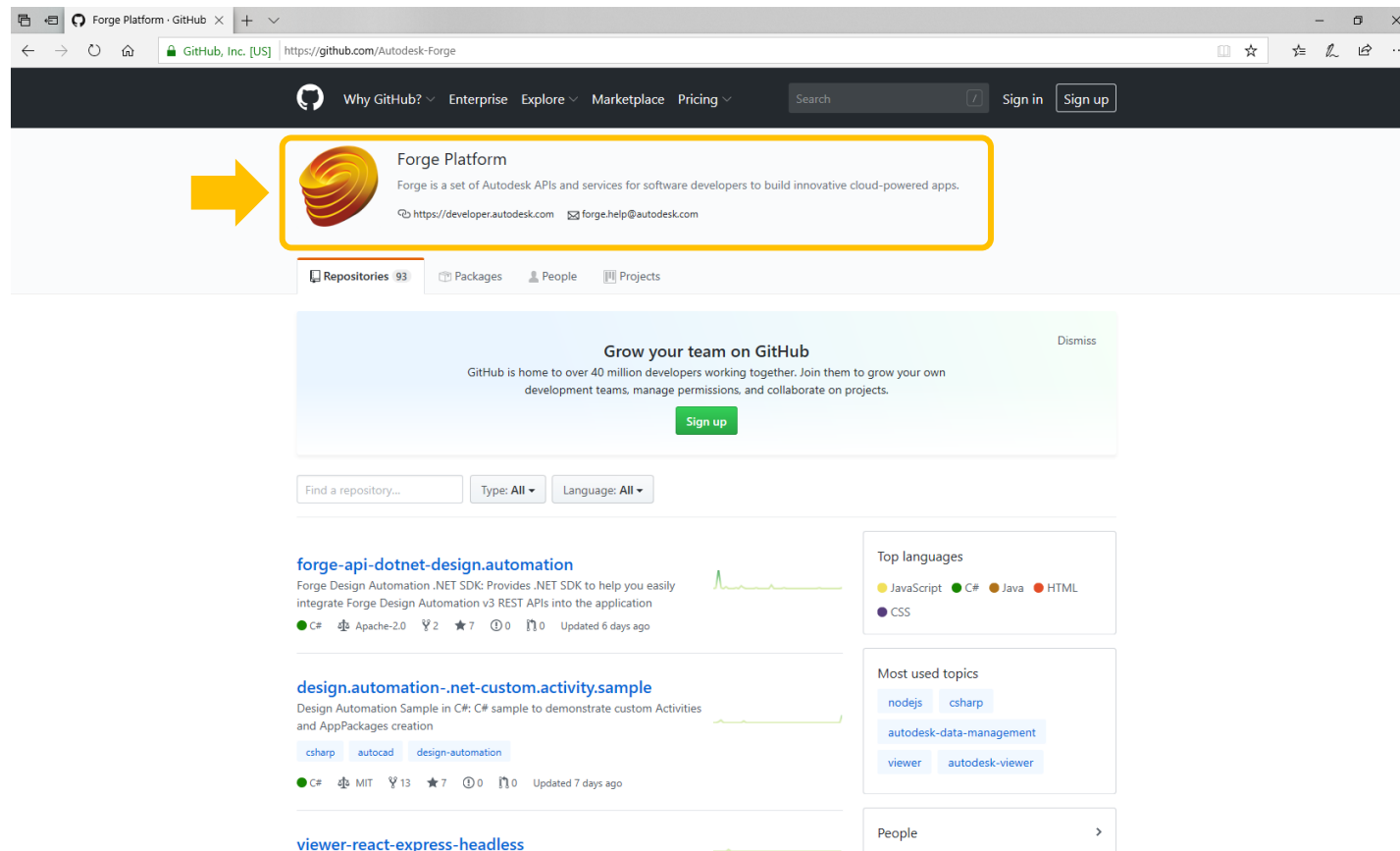
- FOLLOW FORGE**
 - Twitter
 - Facebook
- SOLUTIONS**
 - BIM 360
 - Data Management
 - Design Automation
 - Model Derivative
 - Reality Capture
 - Token Flex
 - Viewer
 - Webhooks
- DOCUMENTATION**
 - Authentication
 - BIM 360
 - Data Management
 - Design Automation
 - Model Derivative
 - Reality Capture
 - Token Flex
 - Viewer
 - Webhooks
- RESOURCES**
 - Get Help
 - API Status
 - Blog
 - FAQ
 - Code Samples**
 - Videos & Slides
 - Service Issue? Contact Us
- ABOUT**
 - About Forge
 - Pricing
 - Success Stories
 - Partners
 - Forge Fund
 - DevCon 2019
 - DevCon 2018
 - DevCon 2017
 - DevCon 2016

A yellow arrow points from the "DOCUMENTATION" column to the "Code Samples" link in the "RESOURCES" column.

The footer of the page contains the following text: "Privacy/Cookies | Privacy Settings | Terms of Service | Legal Notices & Trademarks | Report Noncompliance | © 2019 Autodesk Inc. All rights reserved." A blue question mark icon is visible in the bottom right corner.

Autodesk FORGE

Need SAMPLES ?



The screenshot shows the Autodesk Forge Platform GitHub page. A yellow arrow points to the Forge Platform logo, and a yellow box highlights the Forge Platform description. The page includes a navigation bar with links to Why GitHub?, Enterprise, Explore, Marketplace, and Pricing. A search bar and Sign in/Sign up buttons are also present. The main content area features a 'Grow your team on GitHub' banner, a repository search bar, and a list of repositories. The first repository is 'forge-api-dotnet-design.automation', and the second is 'design.automation-.net-custom.activity.sample'. The page also includes sections for 'Top languages' and 'Most used topics'.

Forge Platform

Forge is a set of Autodesk APIs and services for software developers to build innovative cloud-powered apps.

<https://developer.autodesk.com> forge.help@autodesk.com

Repositories 93 Packages People Projects

Grow your team on GitHub

GitHub is home to over 40 million developers working together. Join them to grow your own development teams, manage permissions, and collaborate on projects.

Sign up

Dismiss

Find a repository... Type: All Language: All

forge-api-dotnet-design.automation

Forge Design Automation .NET SDK: Provides .NET SDK to help you easily integrate Forge Design Automation v3 REST APIs into the application

C# Apache-2.0 2 7 0 0 Updated 6 days ago

design.automation-.net-custom.activity.sample

Design Automation Sample in C#: C# sample to demonstrate custom Activities and AppPackages creation

csharp autocad design-automation

C# MIT 13 7 0 0 Updated 7 days ago

viewer-react-express-headless

Top languages

- JavaScript
- C#
- Java
- HTML
- CSS

Most used topics

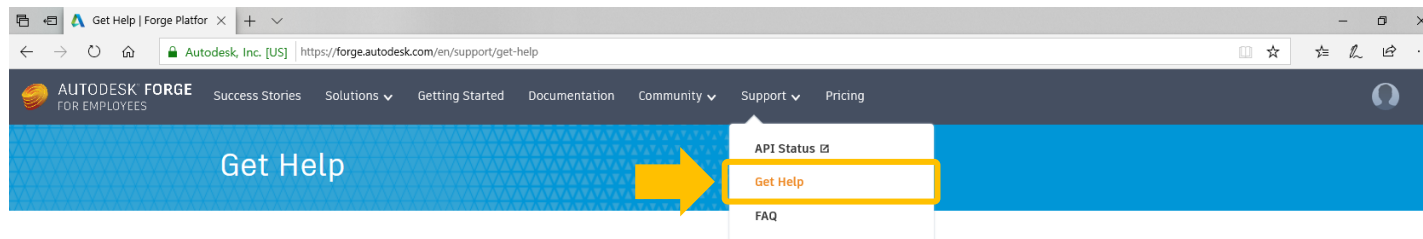
- nodejs
- csharp
- autodesk-data-management
- viewer
- autodesk-viewer

People

Autodesk FORGE :
Need **HELP** ?

Autodesk FORGE

Need **HELP** ?



Find answers from StackOverflow

The Forge support team monitors StackOverflow for, and will answer, all questions marked with Forge-related tags. In many cases, members of the Forge developer community will also give you advice.

[Ask a question now!](#)

TIPS | Here's how to get better answers.

Tags

at least one tag such as (html5 eclipse ios), max 5 tags

☐ Send me new responses to my posts via email ([settings](#))

[Post Your Question](#)

- 1 Always add the **autodesk-forge** tag to indicate that your question is about Forge.
- 2 If you are asking a question about specific API, add any of the following that are appropriate for your context:
Authentication (OAuth): **oauth**
Data Management API: **autodesk-data-management**
Design Automation API: **autodesk-designautomation**
Model Derivative API: **autodesk-model-derivative**
Viewer: **autodesk-viewer**
BIM 360 API: **autodesk-bim360**
Reality Capture API: **autodesk-realitycapture**

As the community grows and more questions are asked and answered on StackOverflow, you'll get better and better results when searching for what you need help with before having to post a thing:



Autodesk FORGE

Need **HELP** ?

The screenshot shows the Stack Overflow website with the search bar containing "[autodesk-forge]". The page title is "Questions tagged [autodesk-forge]". A yellow box highlights the tag name, and a yellow arrow points to it from the right. The page shows a list of questions related to Autodesk Forge, including:

- Click event information in context menu callback**
There is a possibility to create custom items for viewer's context menu and callback can be registered ('target' property). But click event doesn't pass inside this callback - I need it to get 'ctrlf'...
asked 2 days ago
Yury Apanask
85 • 3
- Design Automation (Linking Revit and Plaxis)**
Does anyone know if it is possible to connect in any way Plaxis with Revit through Forge? I think that it can be an interesting option. Best regards, thanks.
asked 2 days ago
Alex Camara Perez
1
- Can there be different numbers of objects in the collections of the views?**
Something I've been wondering, can you have a different number of objects for each view when querying the metadata properties? (https://forge.autodesk.com/en/docs/model-derivative/v2/reference/http/...)
asked 2 days ago
jorisjh
112 • 7
- Two different Autodesk Forge apps are running same code**
Please, it looks to me that I am asking a very basic question, however I could not find an explanation yet. I used NET and both exercises for view models and modify models work great individually. I ...
asked Jan 2 at 22:49
Mr Willy
1 • 1

On the right side of the page, there is a sidebar with a "Blog" section and a "Featured on Meta" section. The "Blog" section includes links to "This veteran started a code bootcamp for people who went to bootcamp" and "This Week #StackOverflowKnows Parties With Introverts, Perfect Cookie Ratio, ...". The "Featured on Meta" section includes a link to "Update: an agreement with Monica Cello".

Autodesk FORGE :
Need **IDEA** ?

Autodesk FORGE

Need **IDEA** ? (<https://forge-showroom.autodesk.io/>)

The screenshot shows the Autodesk Forge Showroom website. The header features the Forge logo and navigation links: Home, About Forge, Documentation, Forge Tools, and Forge Github. A search bar is located on the right. The main content area displays a grid of 3D models, each with a 'VIEWER' button and a 'Github Demo' link. The models include:

- Visual Reports MFG
- Design Automation (Revit.IO)
- Visual Reports AEC
- Clock
- Wifi signal attenuation in a building
- IoT hotspot (rcdb)
- 3D Markup with Multi-icons and Info-Card
- Internet of Things (IoT) for Pier o

The background is black with four abstract, metallic-looking geometric shapes in the corners. These shapes are composed of flat, reflective surfaces that catch the light, creating bright highlights and dark shadows. They appear to be fragments of larger, complex structures, possibly representing architectural or industrial design elements. The shapes are positioned in the top-left, top-right, bottom-left, and bottom-right corners, framing the central text.

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