

# *Autodesk Web Services View & Data API*

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# 我的名片

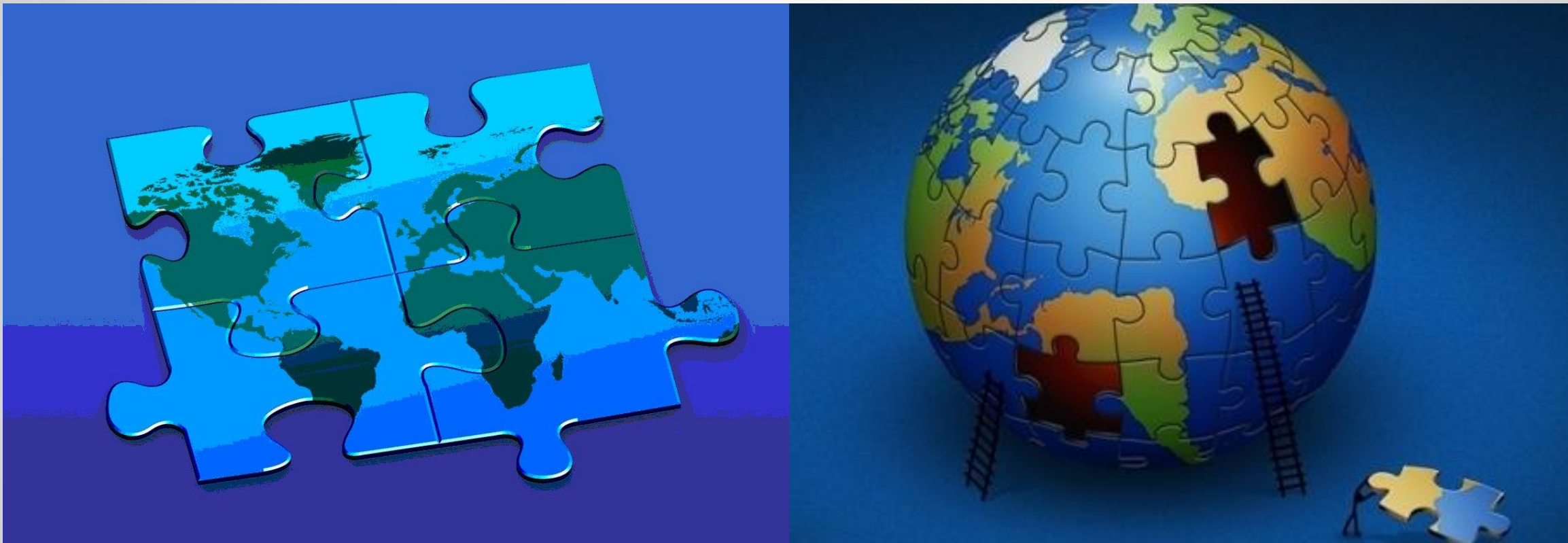
- 杜长宇
- 18600503761
- LinkedIn
  - 搜索Daniel Du Autodesk



# The Challenge – Big Data

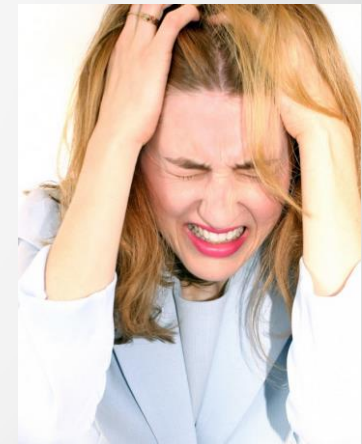


# 2D and/or 3D



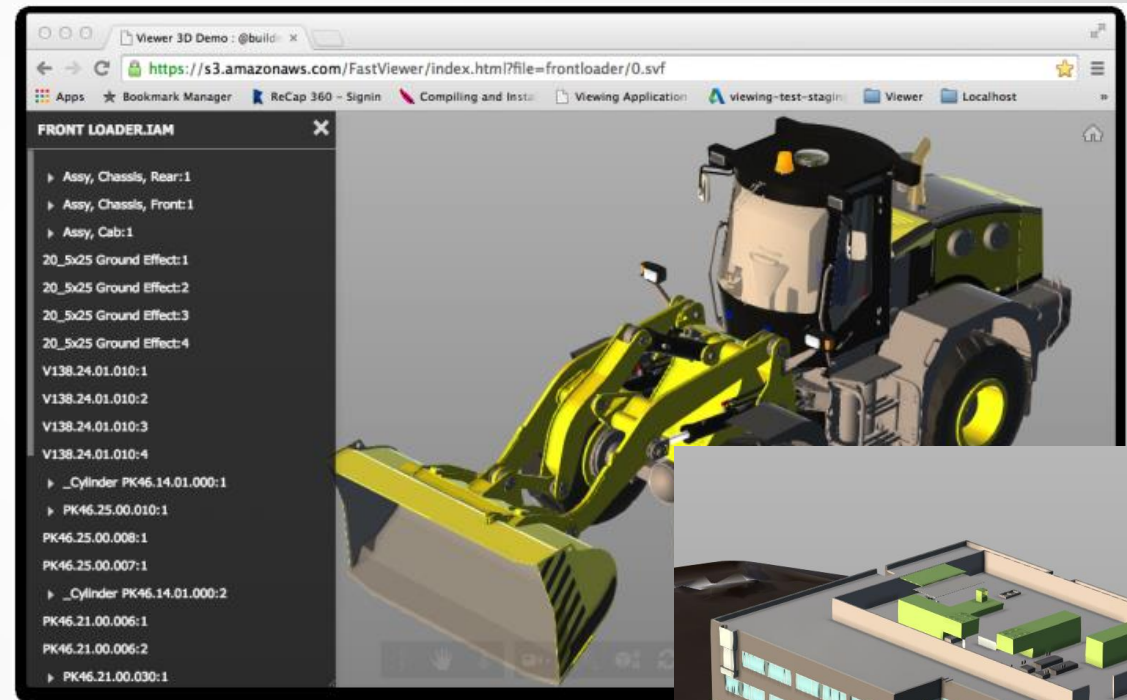
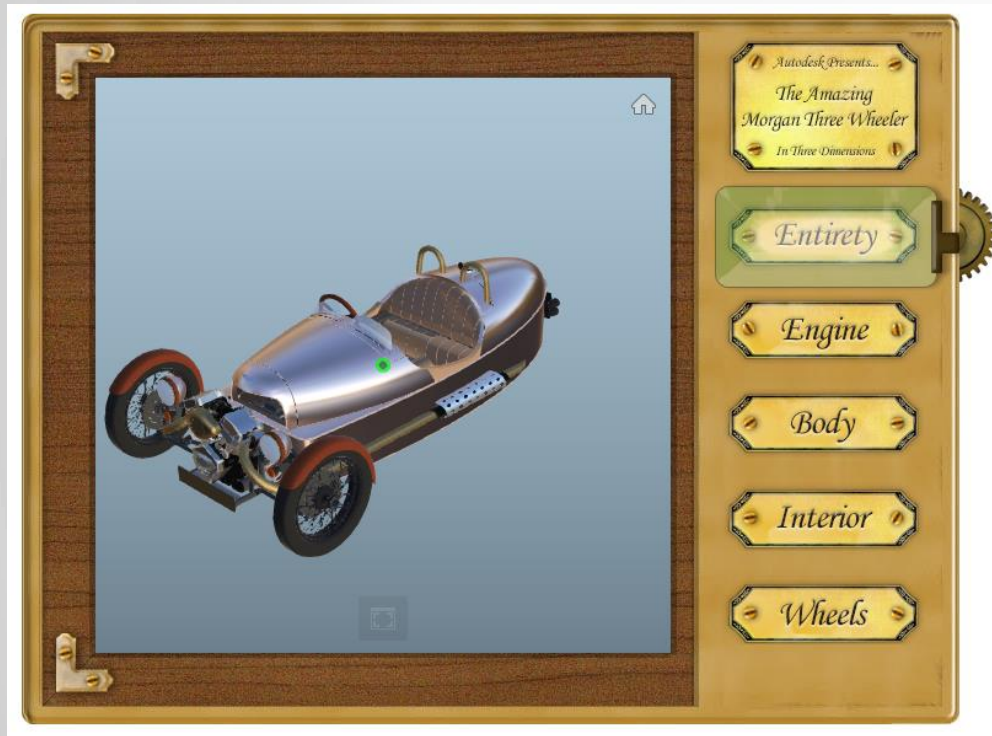
# Different formats

- So many formats, so many software, 只是为了查看模型，大材小用
- DWG – AutoCAD
- RVT – Revit
- DWF
- NWD
- IPT
- ...



# Autodesk Large Model Viewer

Add interactive 3D viewing to your web application



- Autodesk View & Data API
- Getting Started
- Resources
  
- *Additional resources in appendix*

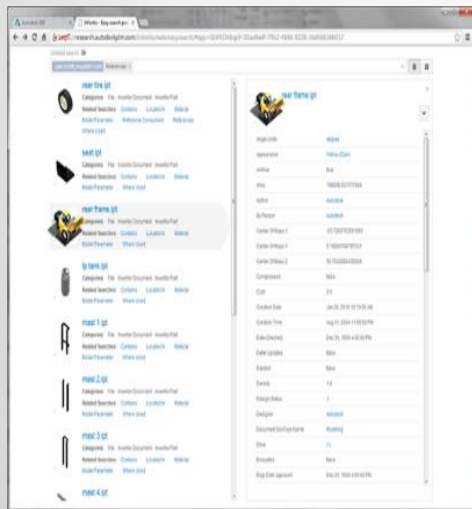


# Autodesk View & Data API



# Single Pipeline for Integrated Viewing, Search and Data

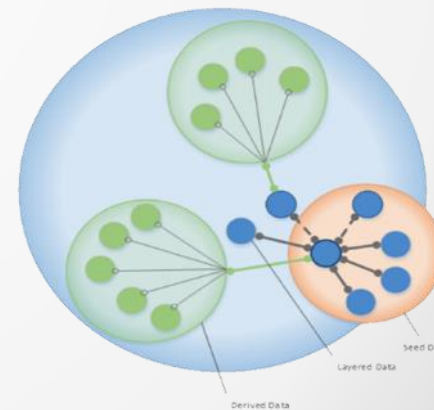
Find it



See it

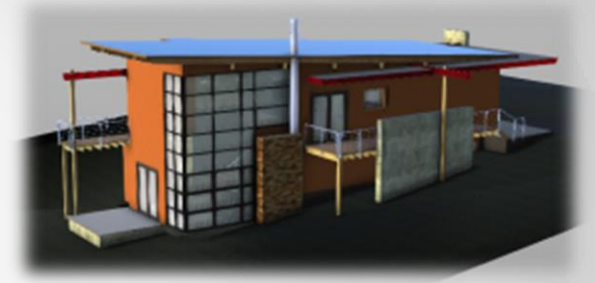


Extend it



*Empower your application with Autodesk Web Services*

# View and Data API



- **REST Server and Management API**
  - Authenticate using OAuth 2.0
  - Upload and translate files
  - Manage access rights
- **JavaScript Web Client API**
  - Viewing technology based on Three.js
  - Embed and control viewer in HTML5 applications
  - Implement user interaction, access documents, manipulate objects, camera, ...

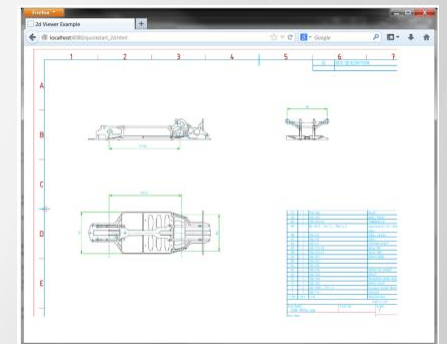
# WEBGL and Three.js



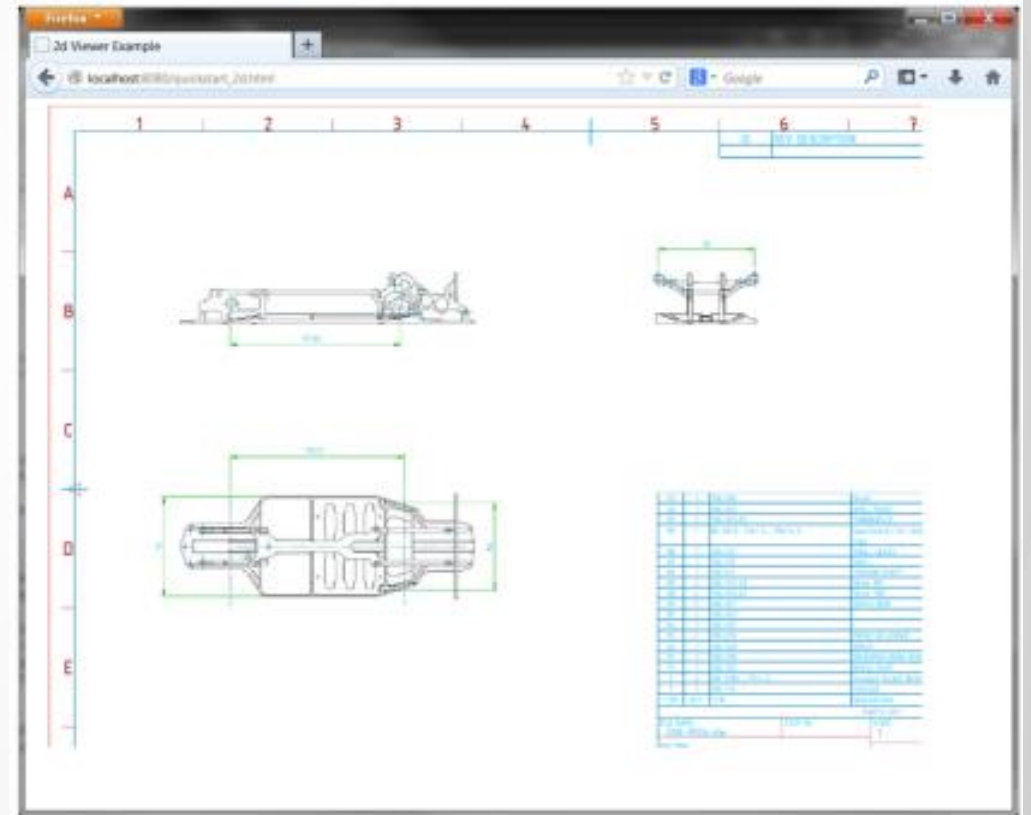
# 3D First



- 3D Functionality
  - Select, view properties, zoom, pan, orbit, isolate, focus, highlight
  - Access to underlying 3D model, e.g. meshes and materials
- 2D Functionality
  - Raster image – zoom and pan only
  - Vector graphics soon – select, view properties, zoom, pan, isolate, focus, highlight

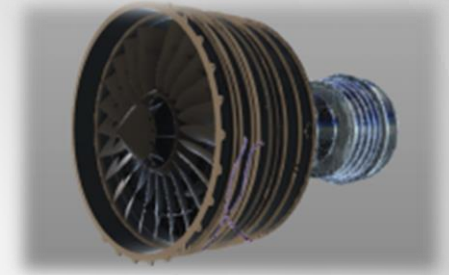


# 3D First



# Supported Formats

- dwg, dwt, dwf, dwfx, rvt, iam, ipt, nwc, nwd, f3d, fbx, 3ds, dae, obj, zip, stl, ifc, ige, iges, igs, 3dm, asm, catpart, catproduct, cgr, dlv3, exp, g, jt, model, neu, prt, sab, sat, session, skp, sldasm, sldprt, smb, smt, ste, step, stla, stlb, stp, wire, x\_b, x\_t, xas, xpr, cam360, sim, sim360
- More coming ...



# Demos

- Basic viewer
- Simple embedding
- Full workflow demo
- Integration with custom data sources
- Client-side APIs

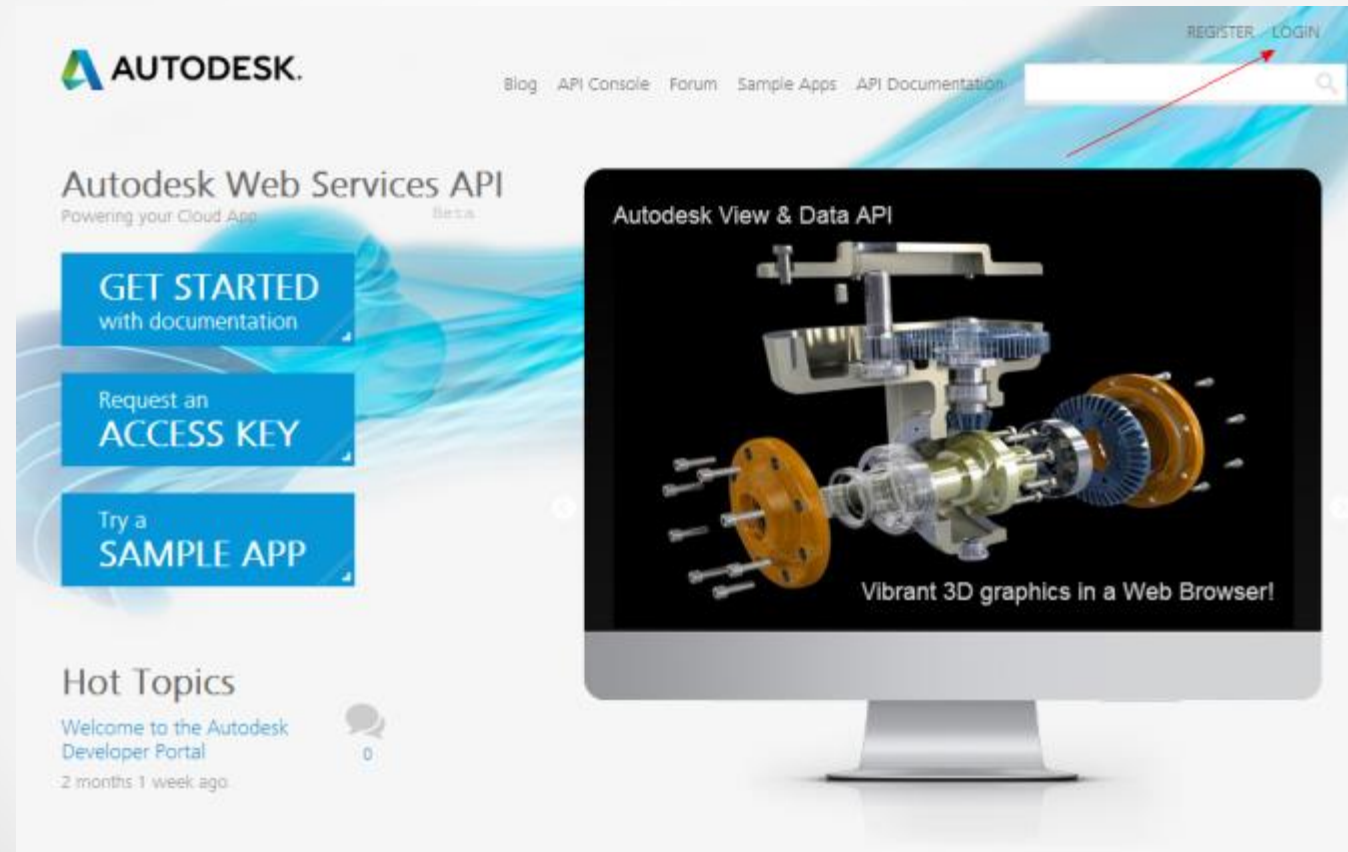




# Getting Started Server side

# Getting Started

- <http://developer.autodesk.com>

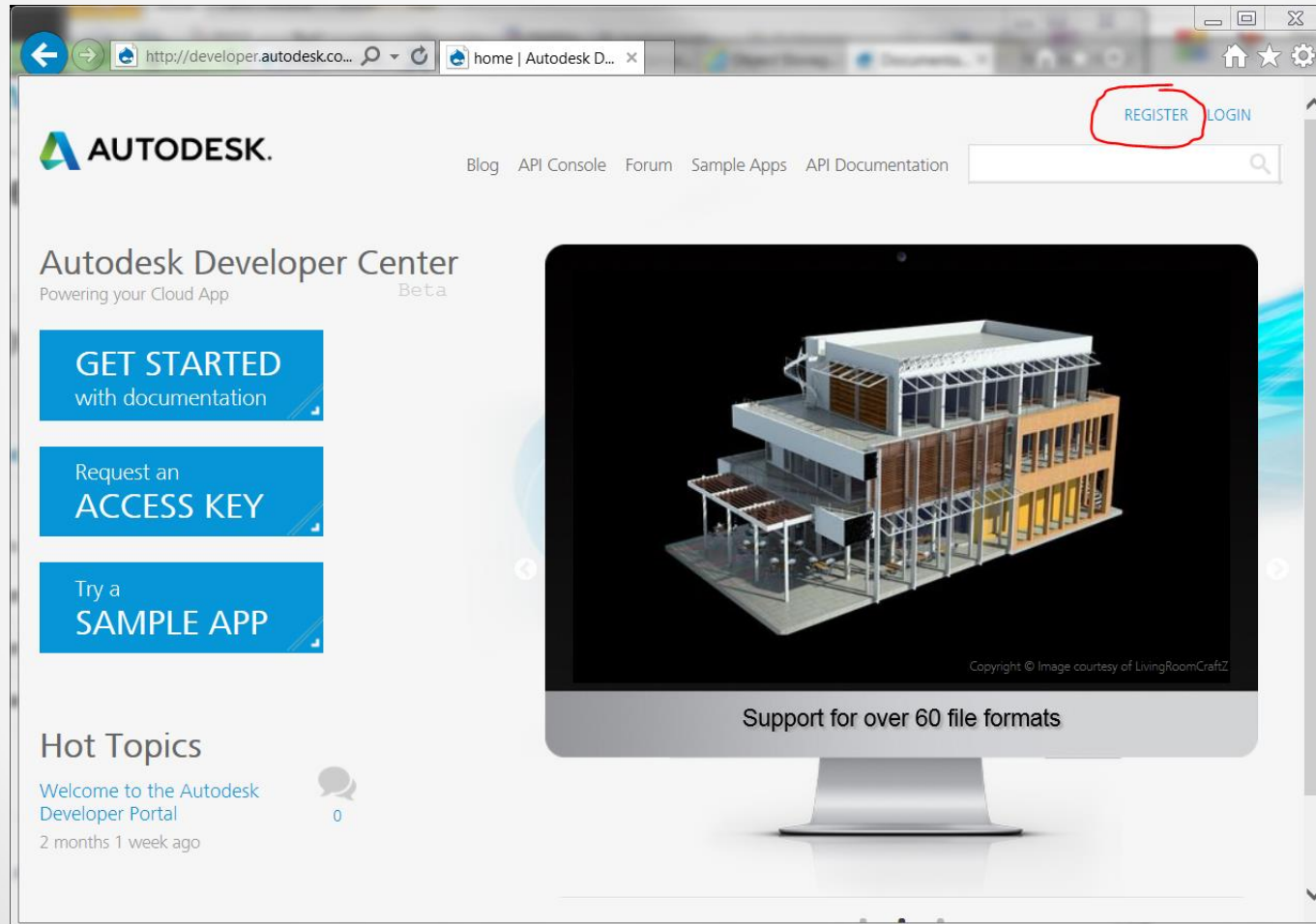


# Getting Started – Server/Management Workflow

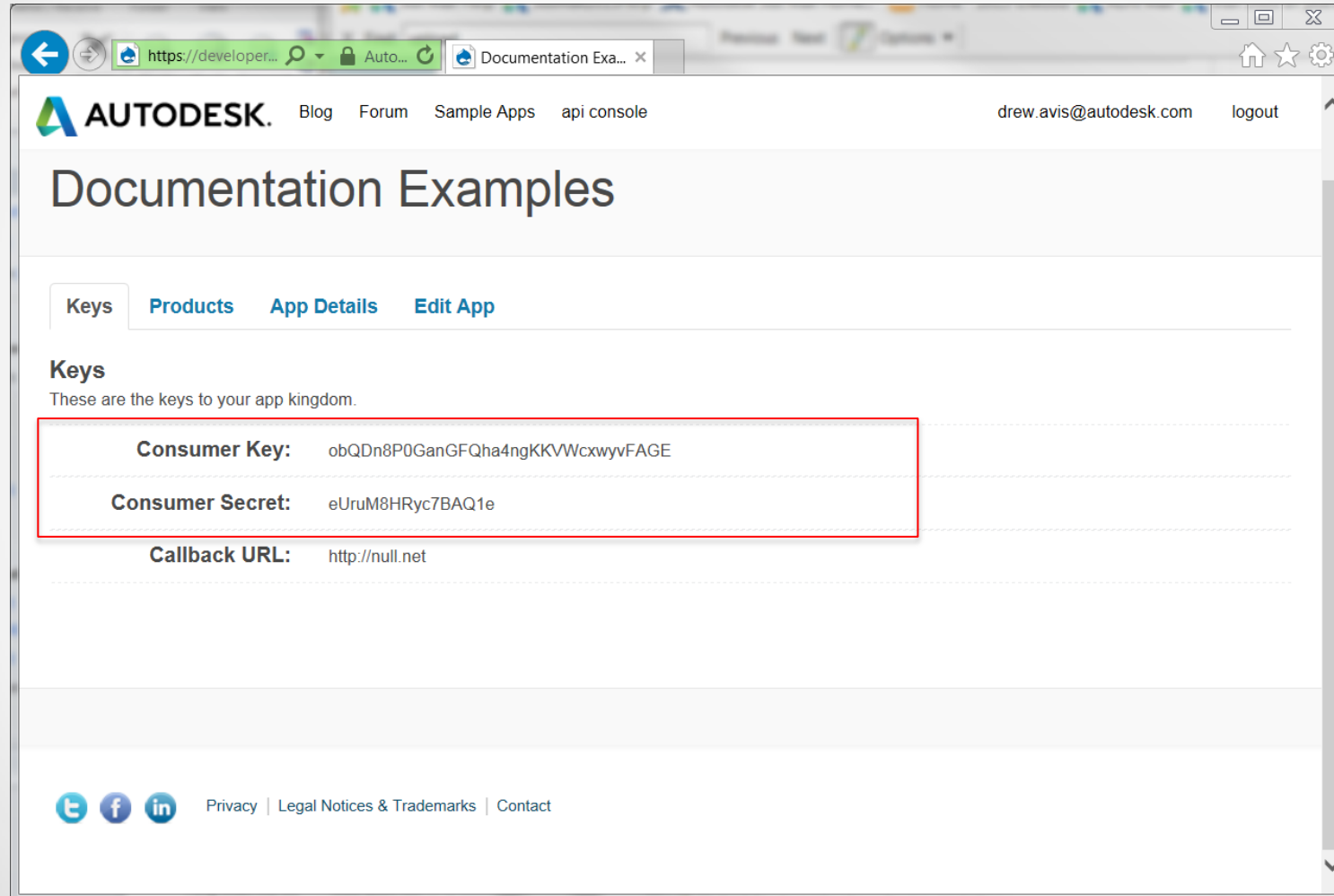


# Step 1: Register and Create an Application

<http://developer.autodesk.com>



# List of Registered Applications



The screenshot shows a web browser window displaying the Autodesk Developer Portal. The page title is "Documentation Examples". The navigation bar includes the Autodesk logo, "Blog", "Forum", "Sample Apps", and "api console". The user is logged in as "drew.avis@autodesk.com". The main content area has tabs for "Keys", "Products", "App Details", and "Edit App". Under the "Keys" tab, there is a section titled "Keys" with the text "These are the keys to your app kingdom." Below this, a red box highlights the following information:

|                         |                                  |
|-------------------------|----------------------------------|
| <b>Consumer Key:</b>    | obQDn8P0GanGFQha4ngKKVWcxwyvFAGE |
| <b>Consumer Secret:</b> | eUruM8HRyc7BAQ1e                 |
| <b>Callback URL:</b>    | http://null.net                  |

At the bottom of the page, there are social media icons for Twitter, Facebook, and LinkedIn, along with links for "Privacy", "Legal Notices & Trademarks", and "Contact".

# Step 2: Obtain an Access Token

- **Header**

Content-Type: application/x-www-form-urlencoded

- **Body**

client\_id=xxxxxxxxxxxxx  
&client\_secret=xxxxxxxxxxxxx  
&grant\_type=client\_credentials

- **POST**

<https://developer.api.autodesk.com/authentication/v1/authenticate>

## Step 3: Create a Bucket

- **Header**

Content-Type: application/json

Authorization: Bearer xxxxxxxxxxxxxx

- **Body**

'{"bucketKey": "mybucket", "policy": "transient"}'

- **POST**

<https://developer.api.autodesk.com/oss/v1/buckets>

# Bucket Policy

- **Transient**: persists for 24 hours
- **Temporary**: persists for 30 days
- **Persistent**: persists until deleted



# Step 4: Upload a Model File

- **Header**

Authorization: Bearer xxxxxxxxxxxxxxxxxxxx

Content-Length: 308331

Content-Type: application/octet-stream

- **Body**

- File content

- **PUT**

<https://developer.api.autodesk.com/oss/v1/buckets/{bucketkey}/objects/{objectkey}>

# Response to Upload Request

- Determine the URN from the upload response

```
{  
  "bucket-key" : "mybucket",  
  "objects" : [ {  
    "location" : "https://developer-  
stg.api.autodesk.com/oss/v1/buckets/mybucket/objects/skyscpr1.3ds",  
    "size" : 308331,  
    "key" : "skyscpr1.3ds",  
    "id" : "urn:adsk.objects:os.object:mybucket/skyscpr1.3ds",  
    "sha-1" : "e84021849a9f5d1842bf792bbcbcb6445c280e15b",  
    "content-type" : "application/octet-stream"  
  } ]  
}
```

- The URN is the Base64 encoded id

# Step 5: Register the Model for Viewing

- **Header**

Content-Type: application/json

Authorization: Bearer xxxxxxxxxxxxxx

- **Body**

{\"urn\": \" {base64 encoded id in previous step} \" }

- **POST**

<https://developer.api.autodesk.com/viewingservice/v1/register>

# Check Progress

- **Header**

Authorization: Bearer xxxxxxxxxxxxxx

- **GET**

<https://developer.api.autodesk.com/viewingservice/v1/{URN}>

- You can start viewing the object as soon as some parts have a 'complete' status

# Retrieve Thumbnail Image

- ***Header***

Authorization: Bearer xxxxxxxxxxxxxx

- ***GET***

<https://developer.api.autodesk.com/viewingservice/v1/thumbnails/{URN}>



# Getting Started

## Client side

# Compatibility Requirements

- The A360 Viewer requires a WebGL canvas compatible browser, such as:
  - Chrome 18.0+
  - Opera 15.0+
  - Firefox 4.0+



# Load URN in JavaScript Viewer

- Create a html5 page or web application
- Add references to CSS style sheet and JavaScript library

```
<link rel="stylesheet"  
      href="https://developer.api.autodesk.com/viewingservice/v1/viewers/style.css"  
      type="text/css">
```

```
<script  
  src="https://developer.api.autodesk.com/viewingservice/v1/viewers/viewer3D.min.js"  
></script>
```

# Load URN in JavaScript Viewer

- Add a html container

```
<body onload="initialize()">
```

```
  <div id="viewer"></div>
```

```
</body>
```

- Should be a div for now (vs. a canvas)

# Load URN in JavaScript Viewer

- Initialize Viewer

```
function initialize () {  
    var options ={"accessToken": "XXXXX", "document" : "urn:XXXXXXXXXXXX" } ;  
    var viewerElement =document.getElementById ("viewer") ;  
    var viewer =new Autodesk.Viewing.Viewer3D (viewerElement, {} ) ;  
    Autodesk.Viewing.Initializer (options, function () {  
        viewer.initialize () ;  
        loadDocument (  
            viewer,  
            options.document) ;  
        }) ;  
    }  
}
```

# Load URN in JavaScript Viewer

- Load model into viewer

```
function loadDocument (viewer, documentId) {  
  // Find the first 3d geometry and load that.  
  Autodesk.Viewing.Document.load (documentId,  
    function (doc) {  
      var geometryItems =[] ;  
      geometryItems =Autodesk.Viewing.Document.getSubItemsWithProperties (  
        doc.getRootItem (), { "type" : "geometry", "role" : "3d" }, true  
      );  
      if ( geometryItems.length > 0 )  
        viewer.load (doc.getViewablePath (geometryItems [0]));  
    },  
    function (errorMsg) {  
      alert ("Load Error: " + errorMsg) ;  
    }  
  );  
}
```

# Extend Client side API

# Client Side API

- Model hierarchy
- Metadata and properties
- Events
- Camera / Zoom / Navigation
- Access to geometry, textures, ...
- ...

<http://developer.api.autodesk.com/documentation/v1/viewers/index.html>

# Client Side API – Get properties

Example

```
viewer.getProperties(dbId, propsCallback);
```

```
function propsCallback(result) {  
  if (result.properties) {  
    for (var i = 0; i < result.properties.length; i++) {  
      var prop = result.properties[i];  
      if (prop.displayName == name) {  
        alert(prop.displayValue);  
      }  
    }  
  }  
}
```

# Client Side API - Events

## ■ Add Event Listener

```
viewer.addEventListener('selection', onViewerItemSelected);  
function onViewerItemSelected(event) {  
    var dbldArray = event.dbldArray;  
    for (var i = 0; i < dbldArray.length; i++) {  
        var dbld = dbldArray[i];  
        alert(dbld);  
    }  
}
```

Example

## ■ Remove Event Listener

- `viewer.removeEventListener(type, listener)`



# Viewer Events

- Viewer
  - Autodesk.Viewing.**ESCAPE\_EVENT**
  - Autodesk.Viewing.**PROGRESS\_UPDATE\_EVENT**
  - Autodesk.Viewing.**FULLSCREEN\_MODE\_EVENT**
  - Autodesk.Viewing.**NAVIGATION\_MODE\_CHANGED\_EVENT**

# Viewer3D events

- Autodesk.Viewing.**GEOMETRY\_LOADED**\_EVENT
- Autodesk.Viewing.**OBJECT\_TREE\_CREATED**\_EVENT
- Autodesk.Viewing.**SELECTION\_CHANGED**\_EVENT
- Autodesk.Viewing.**ISOLATE**\_EVENT
- Autodesk.Viewing.**HIDE**\_EVENT
- Autodesk.Viewing.**SHOW**\_EVENT
- Autodesk.Viewing.**HIGHLIGHT**\_EVENT
- Autodesk.Viewing.**CAMERA\_CHANGE**\_EVENT
- Autodesk.Viewing.**RENDER\_OPTION\_CHANGED**\_EVENT

# Client Side API - Camera

- **Viewer3D**

- **getCamera()** → {THREE.camera}

- Gets the camera so it can be modified by the client.

- **applyCamera(boolean)**

- Applies the camera to the current viewer's camera.

- **setViewFromArray**

setViewFromFile

getFOV/setFOV

getFocalLength/setFocalLength

# Client Side API - More

- `detectWebGL`
- `resize`
- `search`
- `isolate`
- `setBackground-color`
- `select/deselect/clearSelection`
- `hide/show/showAll/hideAll`
- `explode`
- ...

# Client Side API - UI

- ModelStructurePanel
- ToolBar
- DockingPanel
- ObjectContextMenu

博客:

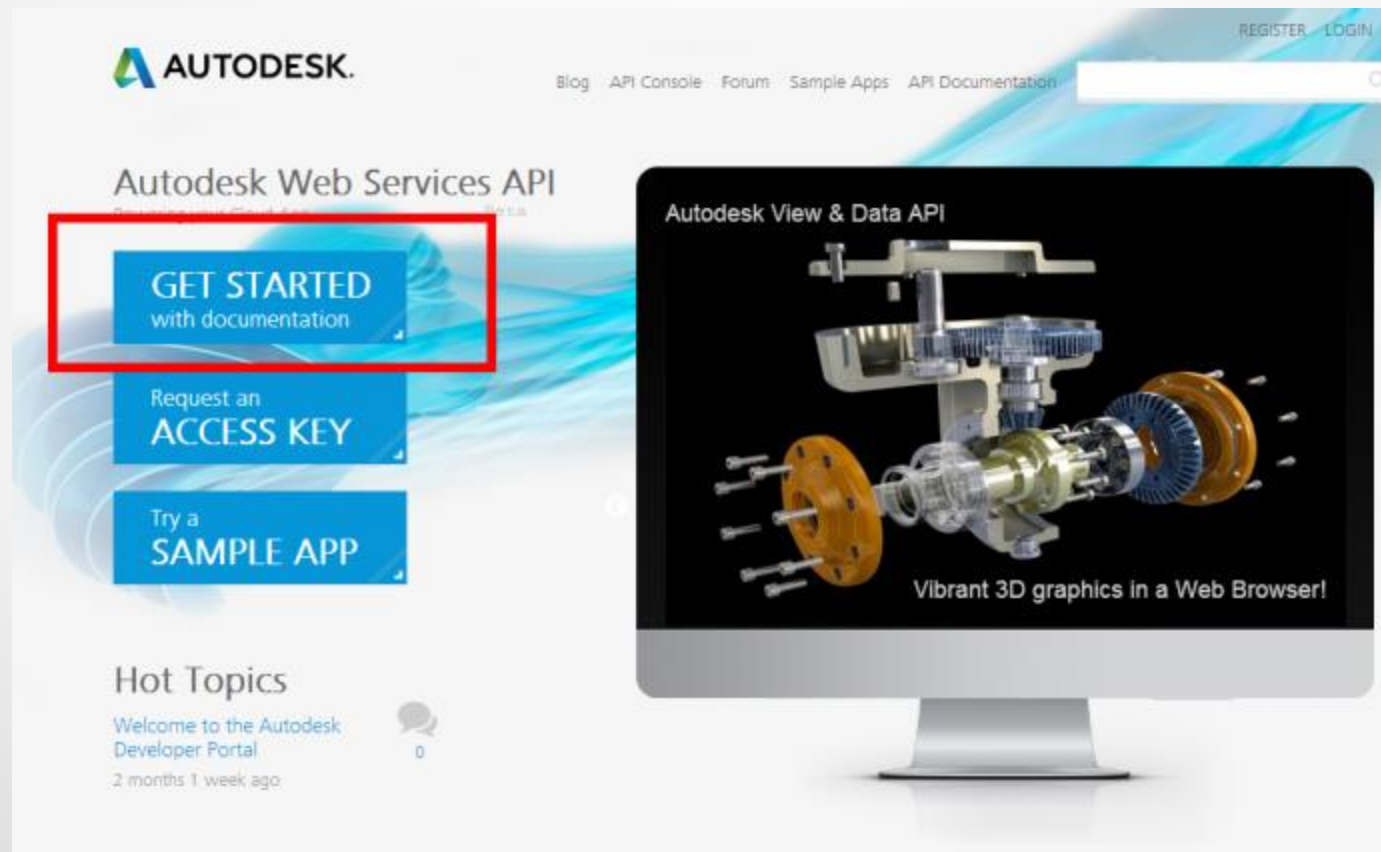
[为Autodesk Viewer添加自定义工具条](#)  
[为Autodesk Viewer添加自定义工具条的更好方法](#)



# Resources

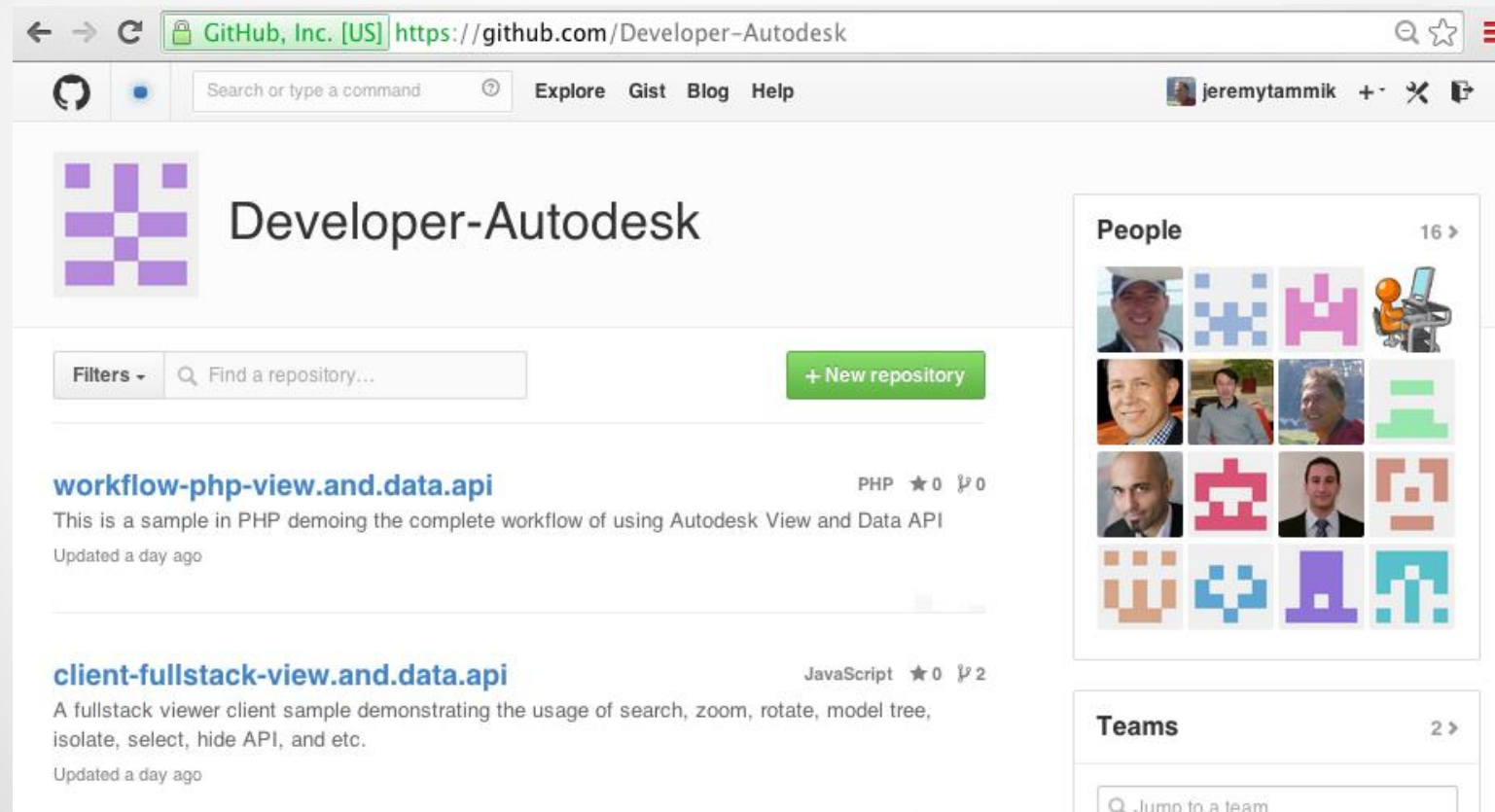
# Resource & Documents

- <http://developer.autodesk.com>



# Demo Code and Sample Applications on GitHub

- <http://autode.sk/viewerapisamples>
- <https://github.com/developer-autodesk>



The screenshot shows the GitHub profile page for 'Developer-Autodesk'. The browser address bar displays 'https://github.com/Developer-Autodesk'. The profile header includes the repository icon, the name 'Developer-Autodesk', and a search bar with the text 'Find a repository...'. A green '+ New repository' button is visible. Below the header, two repositories are listed:

- workflow-php-view.and.data.api** (PHP, 0 stars, 0 forks): This is a sample in PHP demoing the complete workflow of using Autodesk View and Data API. Updated a day ago.
- client-fullstack-view.and.data.api** (JavaScript, 0 stars, 2 forks): A fullstack viewer client sample demonstrating the usage of search, zoom, rotate, model tree, isolate, select, hide API, and etc. Updated a day ago.

On the right side, there are sections for 'People' (16 members) and 'Teams' (2 teams).



# Test the API online in the API Console

- <https://developer.autodesk.com/api-console>

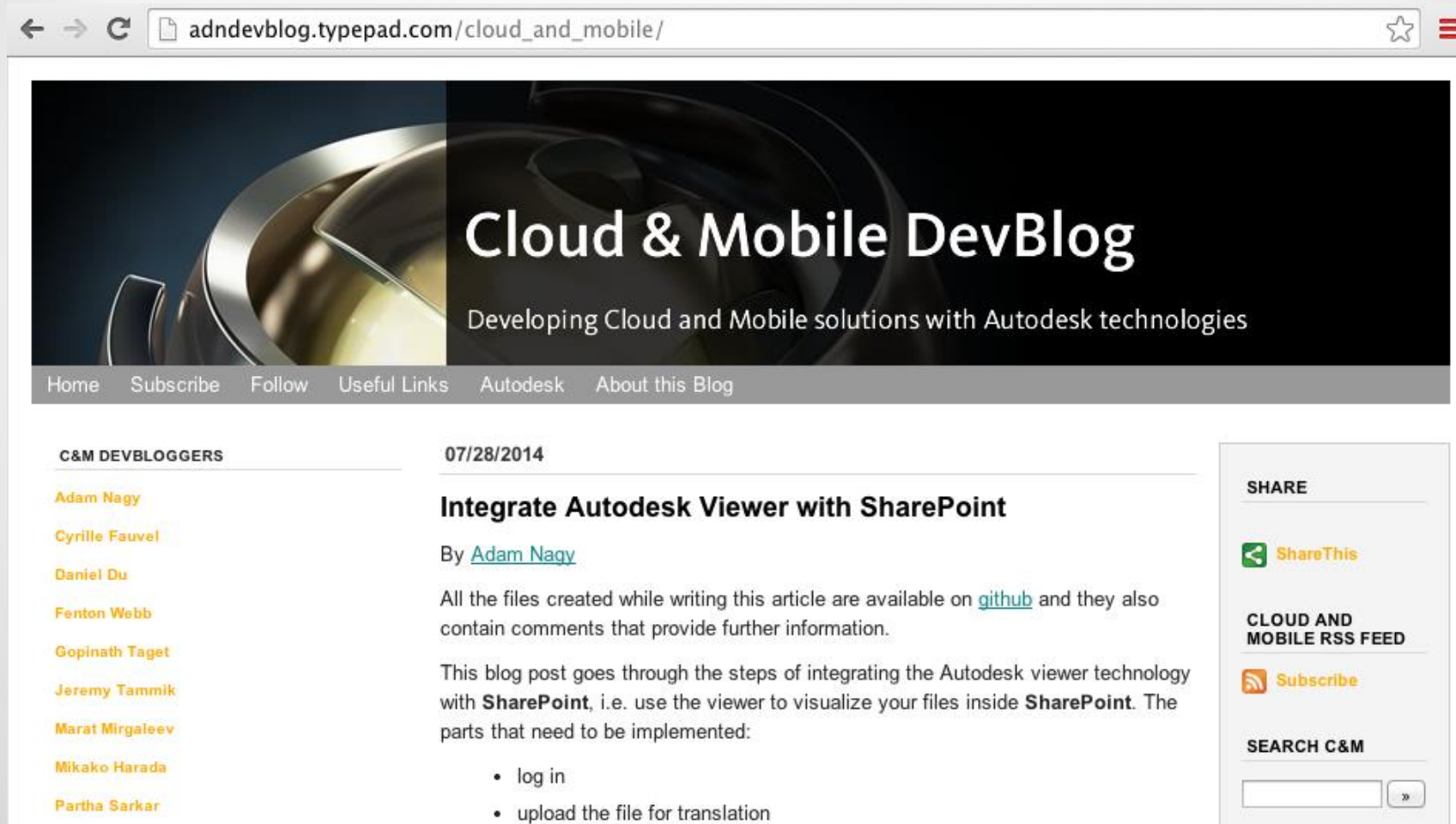
The screenshot displays the API Console interface, powered by Apigee. The Service is set to `https://developer.api.autodes` and Authentication is set to `No Auth`. The Request URL is `GET https://developer.api.autodesk.com/viewingservice/v1/dXJuOmFkc2sub2JqZWNoZmVpY3Q6Y3lyaWx`. The console shows a successful response with status `HTTP/1.1 200 OK`. The response headers include `x-ads-startup-time: wed Jul 16 05:13:26 UTC 2014`, `Access-Control-Allow-Origin: *`, `Content-Length: 1102`, `x-ads-error-id: x-ads-app-identifier: platform-viewing-1.6.4.832.6a7639c-production`, `x-ads-duration: 49 ms`, `Content-Type: application/json; charset=utf-8`, and `Access-Control-Allow-Credentials: true`. The response body is a JSON object:

```
{
  "guid": "dXJuOmFkc2sub2JqZWNoZmVpY3Q6Y3lyaWxZTCvQXUub2Jq",
  "type": "design",
  "hasThumbnail": "true",
  "progress": "complete",
  "startedAt": "Wed Jul 16 17:26:02 UTC 2014",
  "status": "success",
  "success": "100%"
}
```



# Blog

- [http://adndevblog.typepad.com/cloud\\_and\\_mobile/](http://adndevblog.typepad.com/cloud_and_mobile/)



The screenshot shows a web browser window with the address bar containing [adndevblog.typepad.com/cloud\\_and\\_mobile/](http://adndevblog.typepad.com/cloud_and_mobile/). The page features a header with a large image of a metallic sphere and the text "Cloud & Mobile DevBlog" and "Developing Cloud and Mobile solutions with Autodesk technologies". Below the header is a navigation menu with links: Home, Subscribe, Follow, Useful Links, Autodesk, and About this Blog.

The main content area displays a post titled "Integrate Autodesk Viewer with SharePoint" dated "07/28/2014" by "Adam Nagy". The post text states: "All the files created while writing this article are available on [github](#) and they also contain comments that provide further information. This blog post goes through the steps of integrating the Autodesk viewer technology with **SharePoint**, i.e. use the viewer to visualize your files inside **SharePoint**. The parts that need to be implemented:

- log in
- upload the file for translation

On the right side of the page, there is a "SHARE" section with a "ShareThis" button, a "CLOUD AND MOBILE RSS FEED" section with a "Subscribe" button, and a "SEARCH C&M" section with a search input field and a search button.

# Blog

- <http://junqilian.cnblogs.com/>

峻祁连. Moving to Cloud/Mobile  
Cloud, Mobile, MapGuide OpenSource/Enterprise, AutoCAD Map 3D, Civil 3D, and more...

Select Language  
Powered by Google Translate

社长字(Daniel Du)  
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置顶随笔

[置顶]AutoCAD.net/Map 3D/AIMS/MapGuide二次开发学习指南

摘要: AutoCAD作为Autodesk公司的旗舰产品, 已经在各个行业得到了广泛的应用, DWG格式更是成为事实上的工业产品, 了解Map3D开发, 请参考Map 3D API二次开发学习指南。 Autodesk Infrastructure Map Server(AIMS) : Map Server(AIMS)/MapGuide API二次开发学习指南 阅读全文

2014年8月18日



# Demos Embedded Everywhere

## Blog

[http://through-the-interface.typepad.com/through\\_the\\_interface/2014/05/a-sneak-peek-at-the-new-autodesk-360-viewer.html](http://through-the-interface.typepad.com/through_the_interface/2014/05/a-sneak-peek-at-the-new-autodesk-360-viewer.html)

**Facebook** <https://www.facebook.com/a360viewer>  
**TypePad** [http://adndevblog.typepad.com/cloud\\_and\\_mobile/stephens-test-page.html](http://adndevblog.typepad.com/cloud_and_mobile/stephens-test-page.html)  
**Sharepoint** <https://share.autodesk.com/IPG/CloudPlatforms/SitePages/Test%20Page.aspx>  
**Model** <https://s3.amazonaws.com/FastViewer/index.html?file=frontloader/0.svf>

## Architectural, Engineering, Construction, HVAC, Mechanical Equipment in Buildings

[https://s3.amazonaws.com/FastViewer/index.html?file=Revit\\_Kitchen/0.svf](https://s3.amazonaws.com/FastViewer/index.html?file=Revit_Kitchen/0.svf)  
<https://s3.amazonaws.com/FastViewer/index.html?file=Waltham/0.svf>

## Infraworks model

<https://s3.amazonaws.com/autodesk.viewingservice.viewers.prod/0.1.68/viewer3d.html?&file=https://s3.amazonaws.com/temporary-model-artifact-storage/11044/LMVGeneratorPlugin/proposals/master/model.svf>

**Database Integration** <http://54.191.41.170/sapdemo2>





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