

AR with Unity - Step #3 - Adding content to your project

Please notice that this is part of a series of tutorials progressing from basic concepts to more functional and complex projects.

Aims

This tutorial aims to help you set up a AR Unity project using the Vuforia plug-in. In this step, we are going to review all the components needed to build a AR app.

Prerequisites

1. **Previous steps.**

To continue with this project you should make sure to first check our previous AR tutorials:

[AR with Unity - Step #1 - Development environment setup](#)

[AR with Unity - Step #2 - Enabling the Vuforia plug-in](#)

Creating your Vuforia account

To add your content, first you will need to create a Vuforia account, this will allow you to get a free Vuforia license key and also to create an image target database. First, visit the

<https://developer.vuforia.com/> website and click on the register button, it will display an online form to register as a Vuforia developer.

The screenshot shows the 'Register for a Vuforia Developer Account' page. The header includes the Vuforia logo and navigation links: Home, Pricing, Downloads, Library, Develop, Support, Log In, and Register (highlighted with a red box). The main heading is 'Register for a Vuforia Developer Account' with a subtext: 'With an account you can download development tools, get license keys, and participate in the Vuforia community.' The registration form contains the following fields: First Name *, Last Name *, Company *, Select Country of Residence *, Email Address *, Username *, Password *, Confirm Password *, and a Captcha Code field. Below the form are two checkboxes for terms and conditions, and a 'Create account' button.

Generate a license key

After creating your account, you should be able to access the license creation section by clicking the "Get Development Key" button.

The screenshot shows the 'License Manager' page. The header includes the Vuforia logo and navigation links: Home, Pricing, Downloads, Library, Develop, Support, Hello gatobarbado, and Log Out. The 'License Manager' tab is selected. The main heading is 'License Manager' with two buttons: 'Get Development Key' (highlighted with a red box) and 'Buy Deployment Key'. Below the heading is a search bar and a table with columns: Name, SSON, Type, Status, and Date Modified. The table shows 1-2 of 2 items. At the bottom, there is a pagination bar showing '25 per page' and 'Showing 1-2 of 2'.

We suggest putting a meaningful name to your license, please notice that you can use a single free

license for multiple projects, however, you could also have different licenses for different reasons that are not going to be explored in this tutorial.

The screenshot shows the 'Add a free Development License Key' page in the Vuforia Developer Portal. The page has a green header with the Vuforia logo and navigation links: Home, Pricing, Downloads, Library, Develop, and Support. A user is logged in as 'Hello gatobarbado'. Below the header, there are tabs for 'License Manager' and 'Target Manager'. The main content area has a link 'Back To License Manager' and a heading 'Add a free Development License Key'. There is a text input field for 'License Name *' with a note 'You can change this later'. Below this, the 'License Key' details are listed: Develop, Price: No Charge, Reco Usage: 1,000 per month, Cloud Targets: 1,000, VuMark Templates: 1 Active, and VuMarks: 100. A checkbox is present with the text 'By checking this box, I acknowledge that this license key is subject to the terms and conditions of the Vuforia Developer Agreement.' At the bottom, there are 'Cancel' and 'Confirm' buttons.

developer.vuforia.com/vui/develop/licenses/free/new

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Home Pricing Downloads Library **Develop** Support

Hello gatobarbado | Log Out

License Manager Target Manager

[Back To License Manager](#)

Add a free Development License Key

License Name *

You can change this later

License Key

Develop
Price: No Charge
Reco Usage: 1,000 per month
Cloud Targets: 1,000
VuMark Templates: 1 Active
VuMarks: 100

☐ By checking this box, I acknowledge that this license key is subject to the terms and conditions of the [Vuforia Developer Agreement](#).

Cancel Confirm

Once you hit the "Confirm" button you should be able to see it displayed in the License Manager, please click over it to access the license key and check the included features.

The screenshot shows the 'License Manager' page in the Vuforia Developer Portal. The page has a green header with the Vuforia logo and navigation links: Home, Pricing, Downloads, Library, Develop, and Support. A user is logged in as 'Hello gatobarbado'. Below the header, there are tabs for 'License Manager' and 'Target Manager'. The main content area has a heading 'License Manager' and two buttons: 'Get Development Key' and 'Buy Deployment Key'. Below this, there is a search bar and a table of licenses. The table has columns: Name, SSON, Type, Status, and Date Modified. There is one license entry: 'AR-image-project' with SSON 'N/A', Type 'Develop', Status 'Active', and Date Modified 'Sep 11, 2019'. At the bottom, there is a pagination bar showing '25 per page' and 'Showing 1-1 of 1'.

developer.vuforia.com/vui/develop/licenses

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License Manager Target Manager

License Manager

[Get Development Key](#) [Buy Deployment Key](#)

Create a license key for your application.

Search

Name	SSON	Type	Status	Date Modified
AR-image-project	N/A	Develop	Active	Sep 11, 2019

25 per page Showing 1-1 of 1

Now click over the license key code to copy it to your clipboard.

developer.vuforia.com/vui/develop/licenses/54d87b59a95c417d94e2e07f1057b1fe/info

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License Manager Target Manager

License Manager > AR-image-project

AR-image-project

[Edit Name](#) [Delete License Key](#)

License Key Usage

Please copy the license key below into your app

```
AR3E1Qz/////AAABmapWoCimEGuv3ljDhwjqRA12hFL1qczreA92K8DcKytjhq/1tNEaTP1RBY+VwftRKlq0Xwp45NZzf167wlgC1B474  
z6C8fhVXLZh414ifX5zu3oTMJ78p8Q/8c9RqFLNy4vt10ES2IkJOOpUvleacawcxV6POaCV7c6430N0N9EAAeIRhJWh/dn7XkPlxNk7g  
tTwRGgmN+eJXNvShb+wgVx1CLWxtvugew88dpsGziJ+fv+FA251LzB+KKGrrL+j1XDH9UjVWkJNFC1DDBkrSWD/mSZES61IXD/y3oew5Tp  
811LEghIuB4t1DPUZkHikDUBbyLyYfBaxFr0HRYF7U6LehQ1n8Q8myEgY1c2z
```

Copied to clipboard

Plan Type: Develop
Status: Active
Created: Mar 28, 2019 19:47
License UUID: 54d87b59a95c417d94e2e07f1057b1fe

Permissions:

- Advanced Camera
- External Camera
- Model Targets
- Watermark

Back in Unity, please select the Vuforia camera and press the "Open Vuforia Engine Configuration" button in the Inspector and paste your License Key inside of the License key field.

AR project2 - SampleScene - PC, Mac & Linux Standalone - Unity 2019.2.0f1 Personal® <DX11>

File Edit Assets GameObject Component Window Help

Center Global

TE Hierarchy

- Create
- SampleScene*
- Main Camera
- Directional Light
- ARCamera**
- ImageTarget

Scene Shaded 2D 3D Gizmos

Inspector Services

Tag MainCamera Layer Default

Transform

Position X 0 Y 0 Z 0

Rotation X 0 Y 0 Z 0

Scale X 1 Y 1 Z 1

Camera

Clear Flags

Background

Culling Mask

Projection

FOV Axis

Field of View

Physical Camera

Clipping Planes

View Rect

Depth

Rendering Path

Target Texture

Occlusion Culling

HDR

MSAA

Allow Dynamic Resolution

Target Display

Audio Listener

Vuforia Behaviour (Script)

Upgrade to Vuforia Engine 8.3.9 via Package Manager

World Center Mode Device

Open Vuforia Engine configuration

Default Initialization Error Handler (Script)

Script

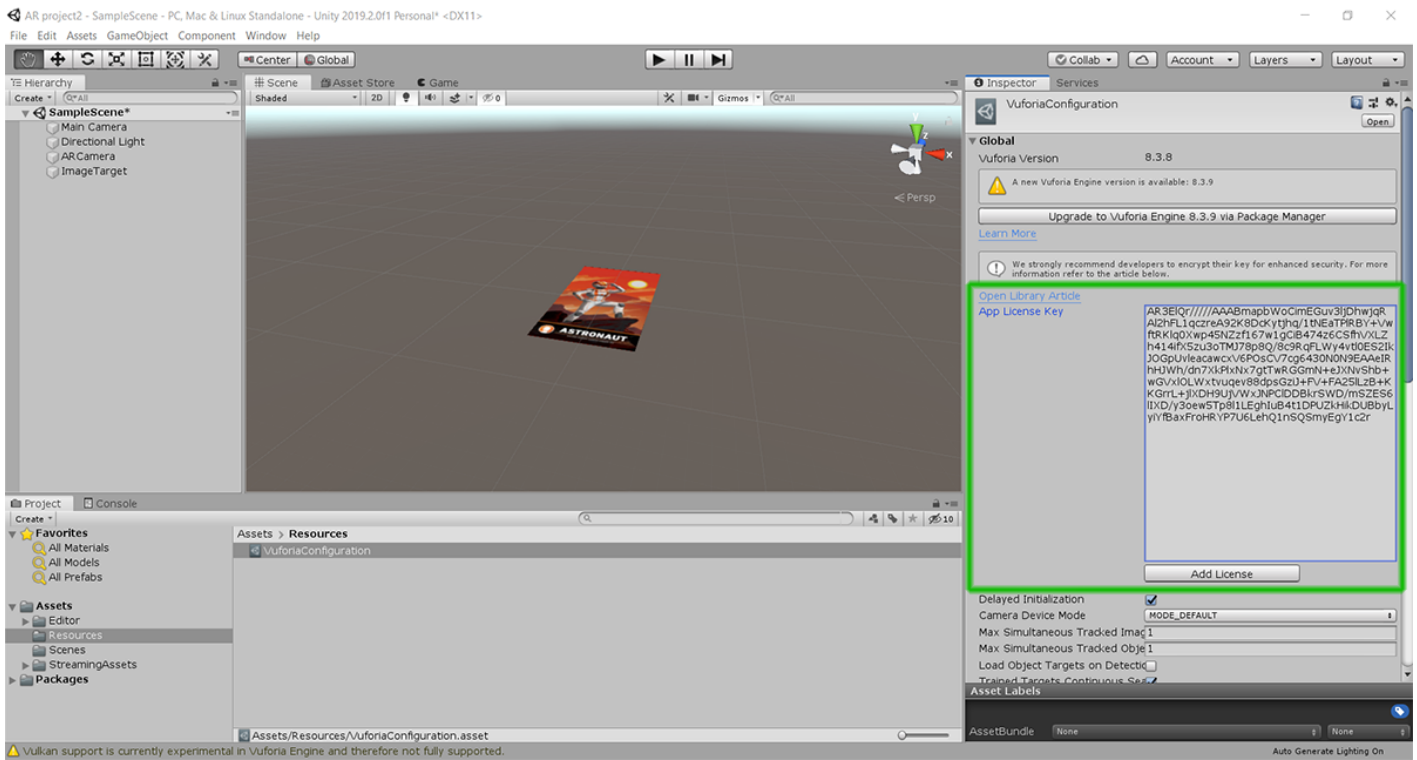
Add Component

Assets > Resources

- VuforiaConfiguration

Vulkan support is currently experimental in Vuforia Engine and therefore not fully supported.

Auto Generate Lighting On



Creating an image target database

Before starting, it is worth taking a moment to understand Vuforia databases, a Vuforia database contains both the image and tracking points data used to create a target. To create an image target, you will need to upload an image (JPG or PNG images in RGB or grayscale and less than 2MB in size) to the Vuforia website and it will rate it (from 0 to 5 stars) based on the amount of "trackable features", more features means higher rating.

A feature is a sharp, spiked, chiselled detail in the image, such as the ones present in textured objects. The image analyzer represents features as small yellow crosses. Increase the number of these details in your image, and verify that the details create a non-repeating pattern.

To give you an example, we have previously uploaded two different images to the Vuforia target manager and these are the results.

IMAGE TARGET RATING EXAMPLE 1

UPLOADED IMAGE

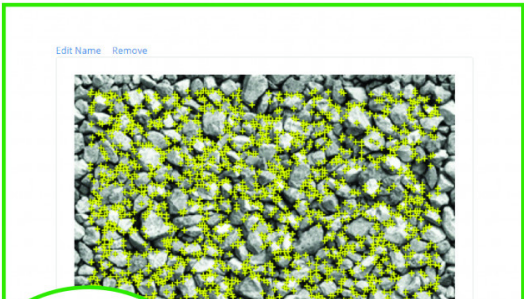
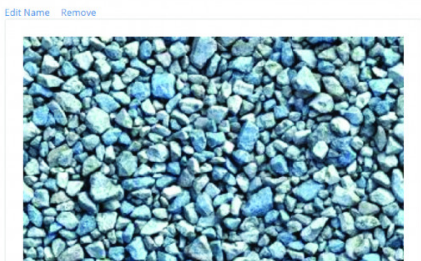
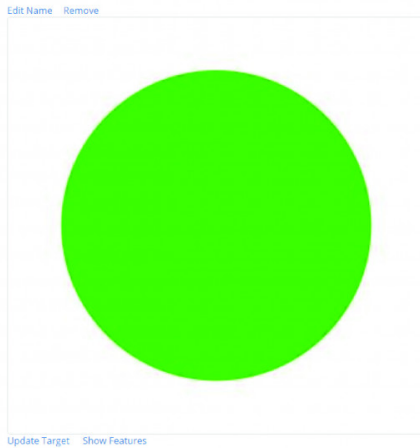


IMAGE TARGET RATING EXAMPLE 2

UPLOADED IMAGE



Type: Single Image

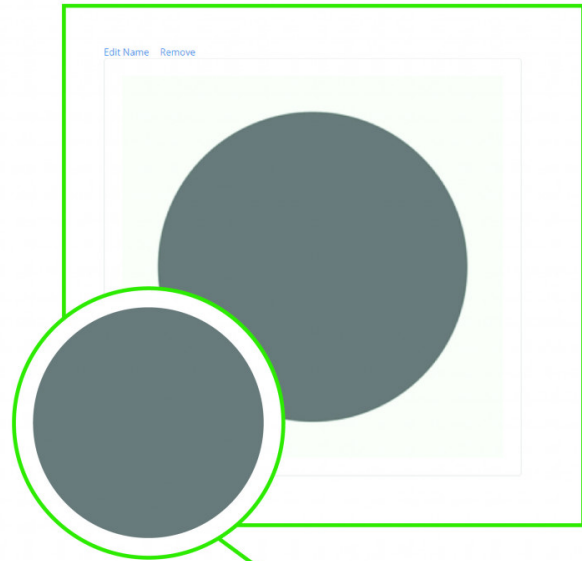
Status: Active

Target ID: 8c758d0ba7ab46d1a0b753d8147f006e

Augmentable: ☒

Added: Sep 19, 2019 17:58

Modified: Sep 19, 2019 17:58



NO FEATURES

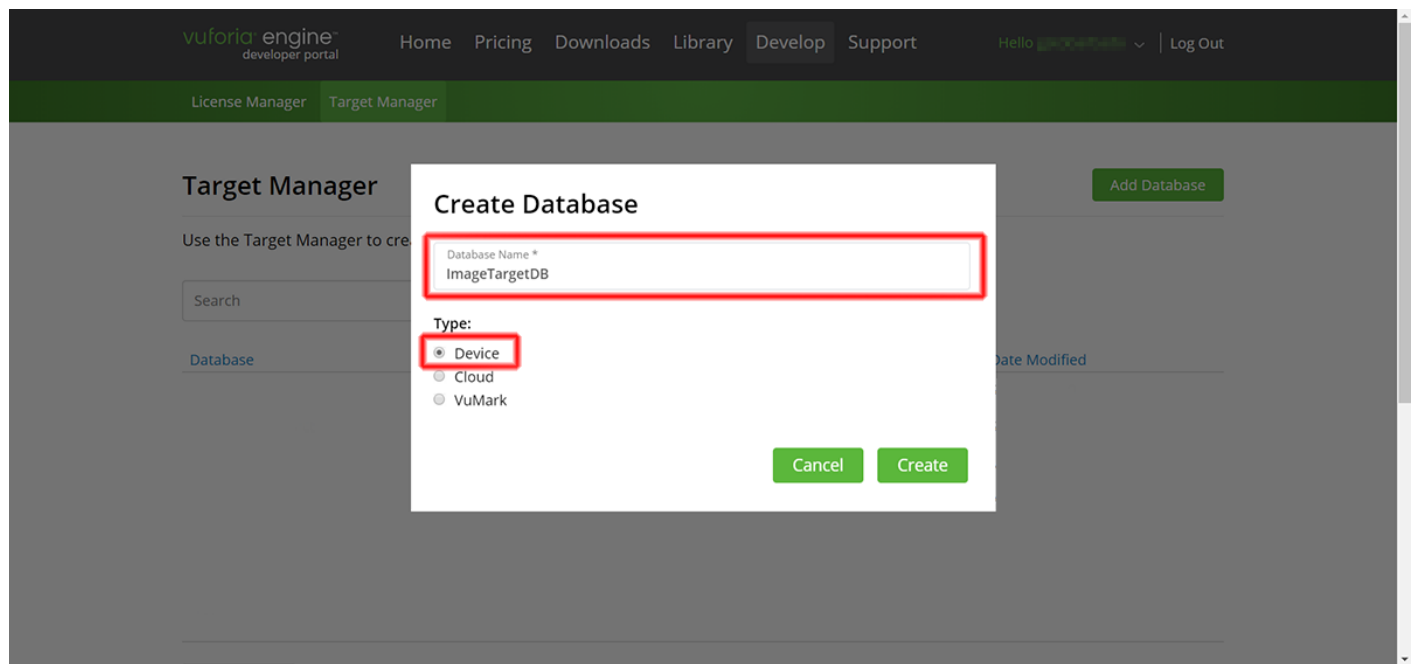
VUFORIA RATING

Now let's switch back to the Vuforia developer webpage to create our database. Click on the "Target Manager" tab and then click on the "Add database" button.

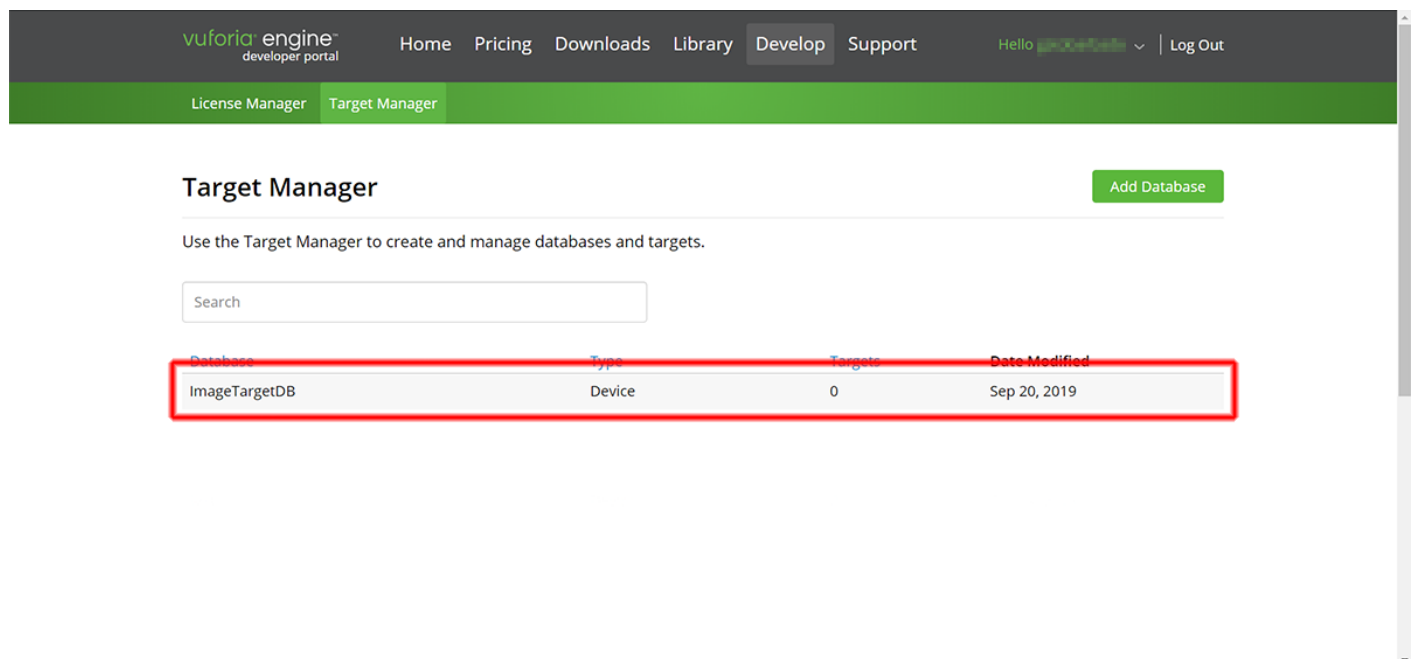
A screenshot of the Vuforia developer portal. The top navigation bar includes links for Home, Pricing, Downloads, Library, Develop, and Support. The 'Target Manager' tab is highlighted in the sub-navigation bar. Below the navigation bar, the 'Add Database' button is highlighted with a red box. The main content area shows a search bar and a table with columns for Database, Type, Targets, and Date Modified. The table is currently empty.

We suggest also putting a meaningful name to your target database. Do make sure that Type is set

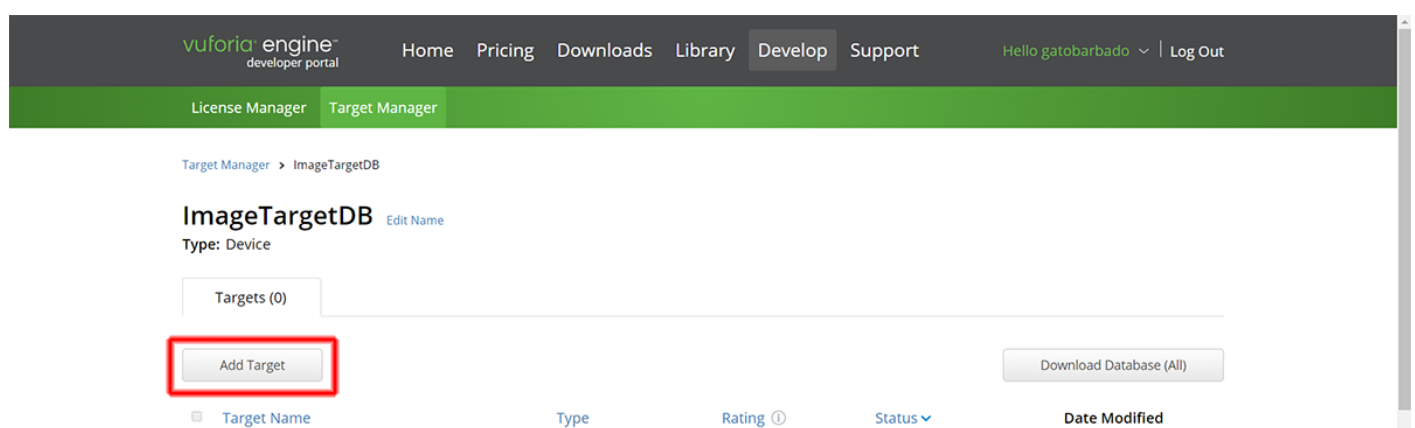
to Device, this means that all the data will be stored in the device where the AR app is running rather than downloaded from the cloud.



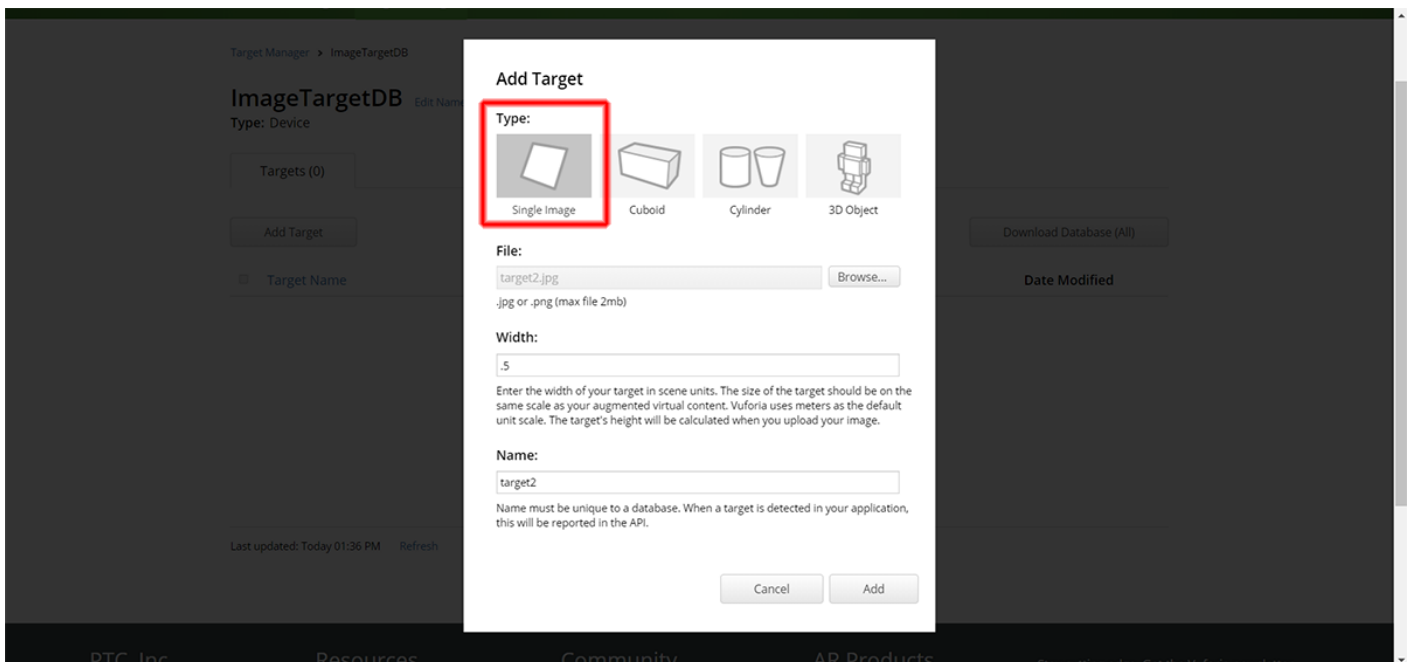
Once created, your database should be available in the Target manager. To upload your image target please click on top of your database.



Once in your database page, do click on top of the "Add target" button.



This will display a web form that will guide you through the process, please make sure that Type is set to Single Image, also, be aware that your image size should match the exact size of your printed image to avoid scale mismatch. Unity uses meters as the default unit scale so if your image width is 50cm you should type 0.5



Target Manager > ImageTargetDB

ImageTargetDB Edit Name

Type: Device

Targets (0)

Add Target

Target Name

Last updated: Today 01:36 PM Refresh

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Add Target

Type:

Single Image Cuboid Cylinder 3D Object

File:

target2.jpg Browse...

.jpg or .png (max file 2mb)

Width:

.5

Enter the width of your target in scene units. The size of the target should be on the same scale as your augmented virtual content. Vuforia uses meters as the default unit scale. The target's height will be calculated when you upload your image.

Name:

target2

Name must be unique to a database. When a target is detected in your application, this will be reported in the API.

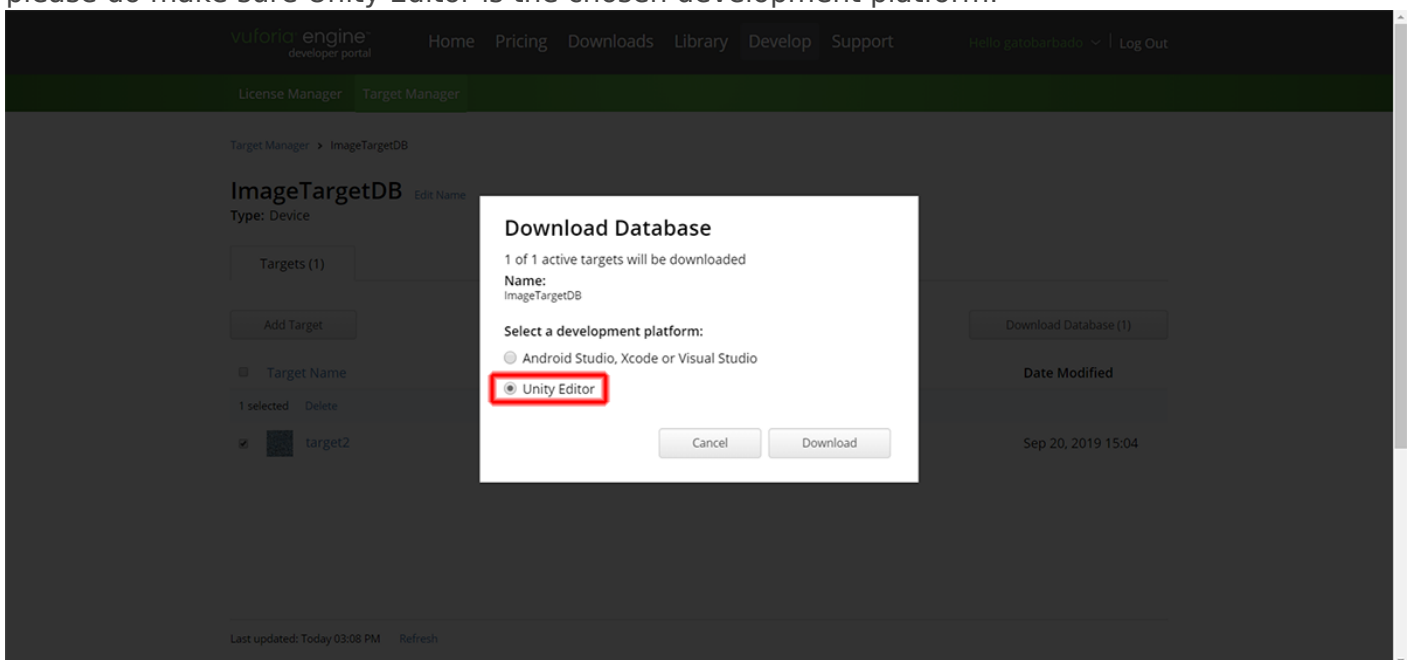
Cancel Add

Usually, it doesn't take long for your image to upload and get rated, be patient, if it does not refresh automatically, just click on top of the rating link, that should be enough to refresh the rating without refreshing the page.

<input type="checkbox"/> Target Name	Type	Rating ⓘ	Status ▾	Date Modified
<input type="checkbox"/> target2	Single Image	☆☆☆☆	Processing	Sep 20, 2019 15:04

<input type="checkbox"/> Target Name	Type	Rating ⓘ	Status ▾	Date Modified
<input checked="" type="checkbox"/> target2	Single Image	★★★★★	Active	Sep 20, 2019 15:04

Now, select your database and click the "Download database" button, before hitting "Download" please do make sure Unity Editor is the chosen development platform.



vuforia engine developer portal Home Pricing Downloads Library Develop Support Hello gabriellabado | Log Out

License Manager Target Manager

Target Manager > ImageTargetDB

ImageTargetDB Edit Name

Type: Device

Targets (1)

Add Target

Target Name

1 selected Delete

target2

Last updated: Today 03:08 PM Refresh

Download Database

1 of 1 active targets will be downloaded

Name: ImageTargetDB

Select a development platform:

☐ Android Studio, Xcode or Visual Studio

☒ Unity Editor

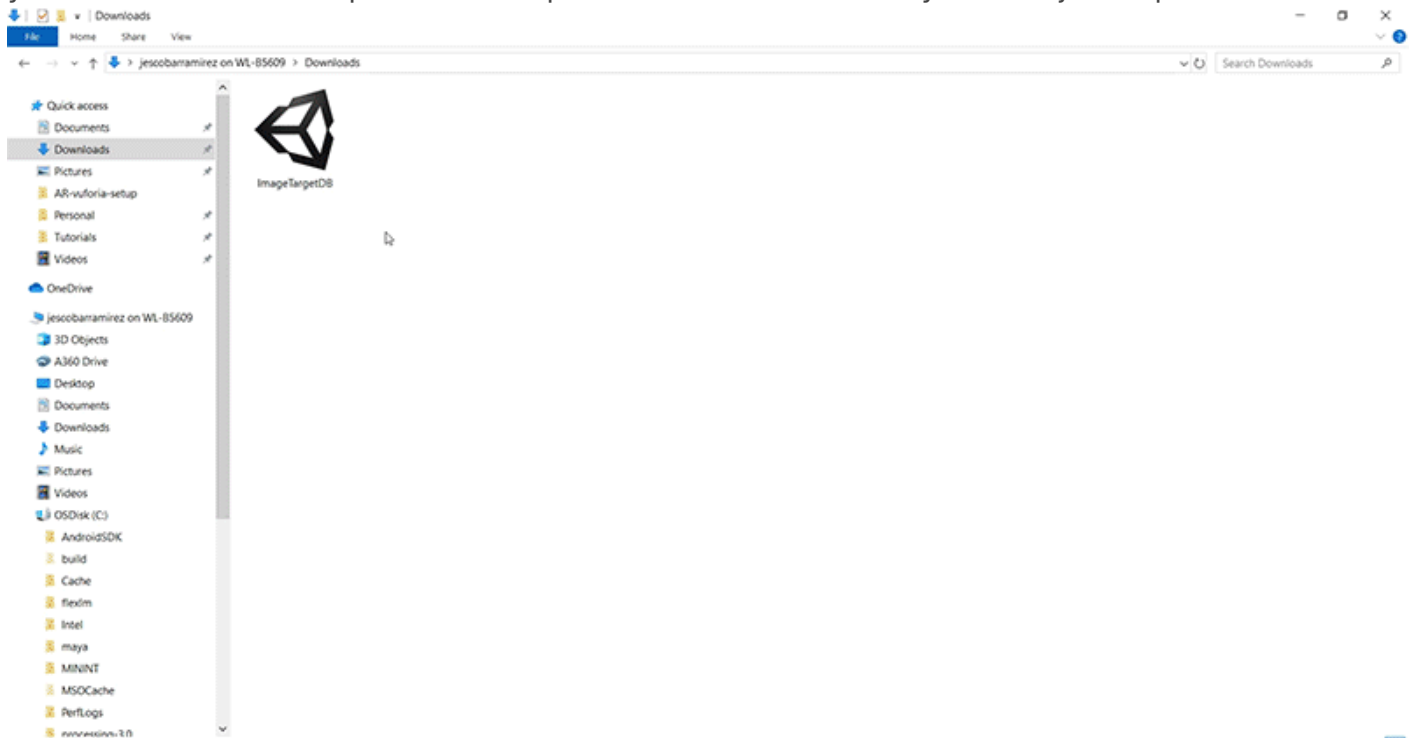
Cancel Download

Download Database (1)

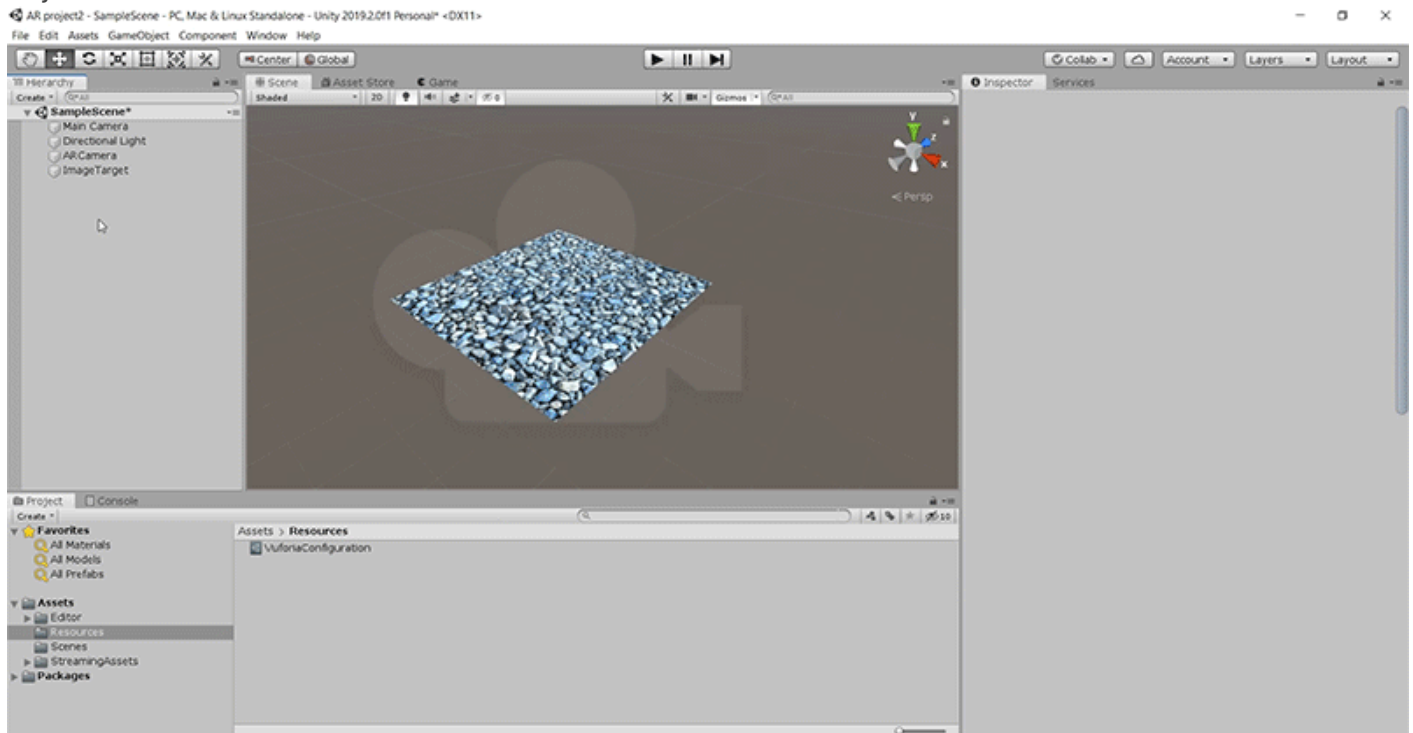
Date Modified

Sep 20, 2019 15:04

After downloading your database, check that your Unity project is open and then double click on the database file then Unity will then display a Window with all your database elements, you should click the "import". After this is done, please select the image object and then look in the inspector, you should be able to replace the sample database with the one you have just imported.



Now let's add a 3D model to the project, for this tutorial we are going to add one cube but you are welcome to use your 3D asset instead. We will need to scale it down as the default size is a bit big, For the object to be displayed, you will need to make sure you make it a child of the image target object.



Next step - Building your app and testing it

In the next step, we will build the app file and will test it on and android phone.

Go to step #4 - Building and testing your app (Android)

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