



Arm[®] Accuracy Super Resolution™ for Unreal Engine

Version 2.1

Tutorial

Non-Confidential

Issue 03

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Arm® Accuracy Super Resolution™ for Unreal Engine Tutorial

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This document (109993_0201_03_en) was issued on 2025-05-01. There might be a later issue at <https://developer.arm.com/documentation/109993>

The product version is 2.1.

See also: [Proprietary notice](#) | [Product and document information](#) | [Useful resources](#)

Start reading

If you prefer, you can skip to [the start of the content](#).

Intended audience

This document is for software developers who want to use Arm ASR in Unreal Engine.

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We believe that this document contains no offensive language. To report offensive language in this document, email terms@arm.com.

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1. Introduction

This tutorial shows you how to get started with Arm® Accuracy Super Resolution™ (Arm ASR) using an example project in Unreal Engine.

Arm ASR is a mobile-optimized temporal upscaling technique derived from [AMD's FidelityFX™ Super Resolution 2 v2.2.2](#).

The main features of Arm ASR are:

- It has multiple optimizations on top of the original FidelityFX Super Resolution 2 to make the technique suited for the more resource-constrained environment of mobile gaming.
- Uses temporal accumulation to reconstruct high-resolution images while maintaining fine geometric and texture details compared to native rendering.
- Enables practical performance for costly render operations, for example, hardware ray tracing.

This tutorial is aimed at Unreal Engine developers who want to apply upscaling techniques to their projects. You will learn how to install Arm ASR and some of the common tasks that you might encounter when setting up Arm ASR for the first time.

1.1 Contact

You can reach out to us using the following email address arm-asr-support@arm.com.

1.2 Before you begin

We recommend using Unreal Engine versions 5.3-5.5 throughout this tutorial. If you have any questions, contact us at [Accuracy Super Resolution for Unreal](#).

1.3 Installing the Arm ASR plugin

This topic shows you how to install the Arm ASR plugin in Unreal Engine.

Before you begin

You must have Git installed.

Procedure

1. Open the Unreal Engine project that you intend to use with Arm ASR. The Third Person pack is available as an example.

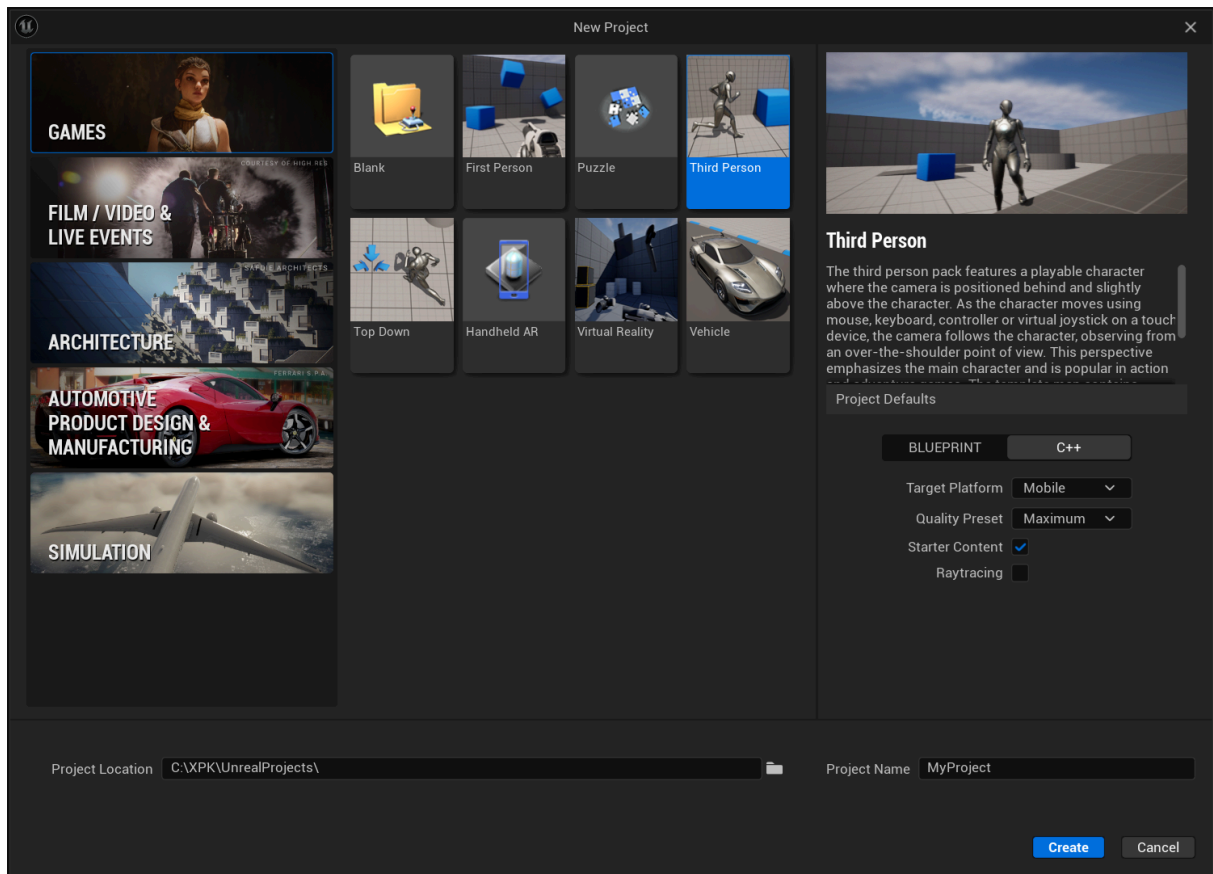
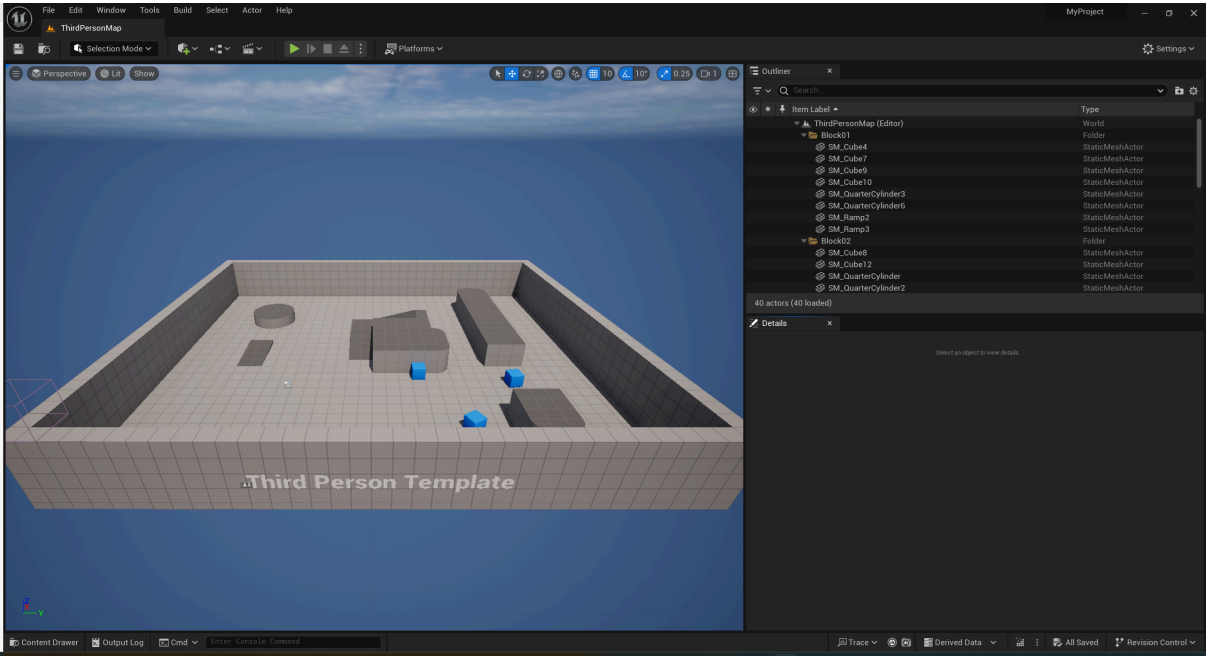
Figure 1-1: Third person pack

Figure 1-2: Third person pack opening screen



2. To download the plugin, run the following command:

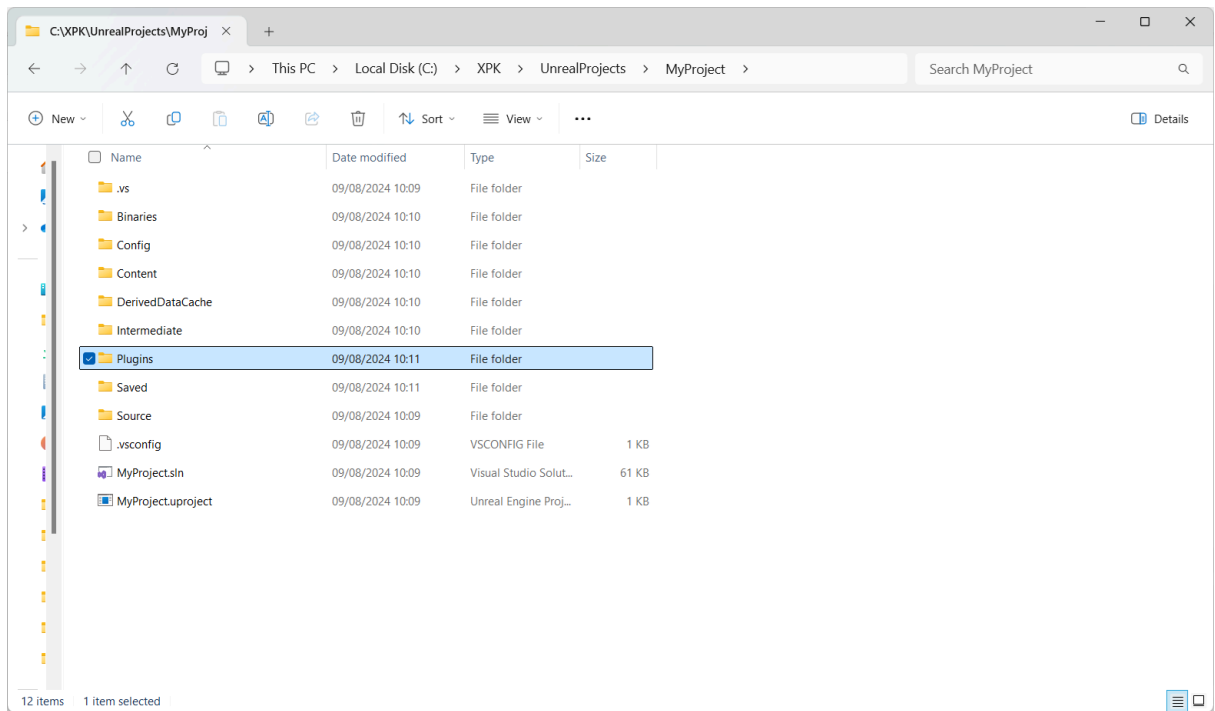
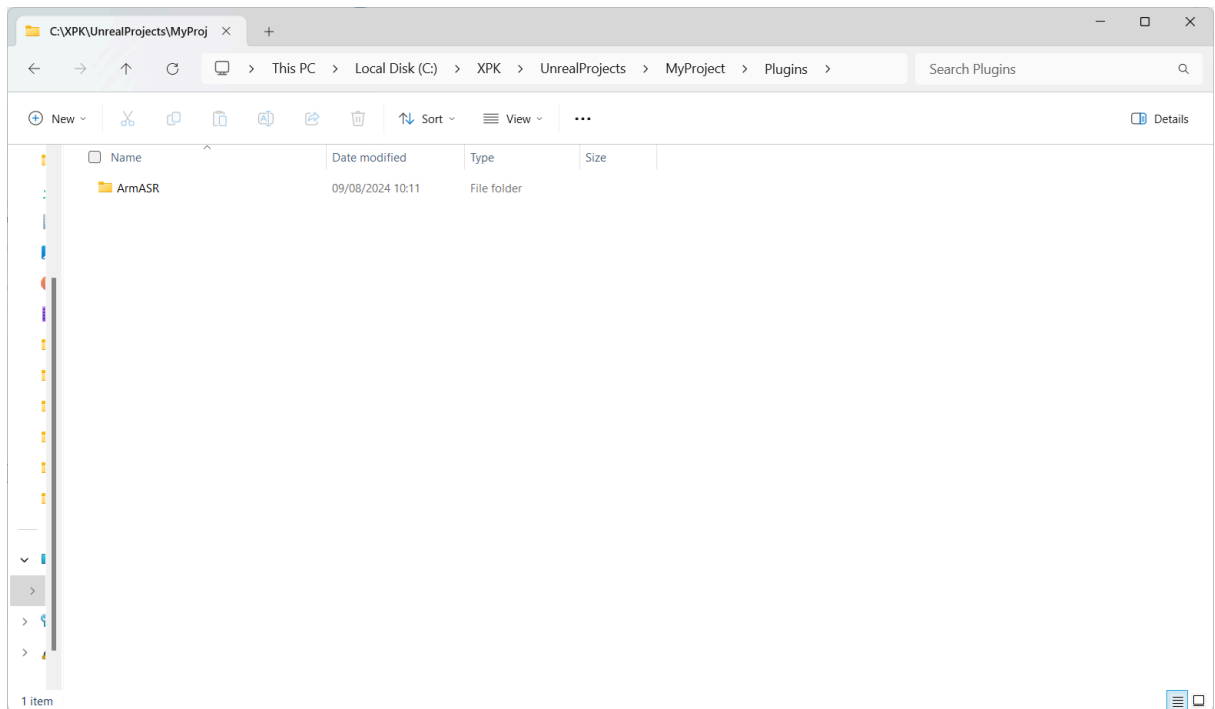
```
git clone https://github.com/arm/accuracy-super-resolution-for-unreal
```

3. Depending on your Unreal Engine version, navigate to the corresponding directory in the cloned repository.

Table 1-1: Unreal Engine versions

Unreal Engine version	Directory
5.3	UE-530
5.4	UE-540
5.5	UE-550

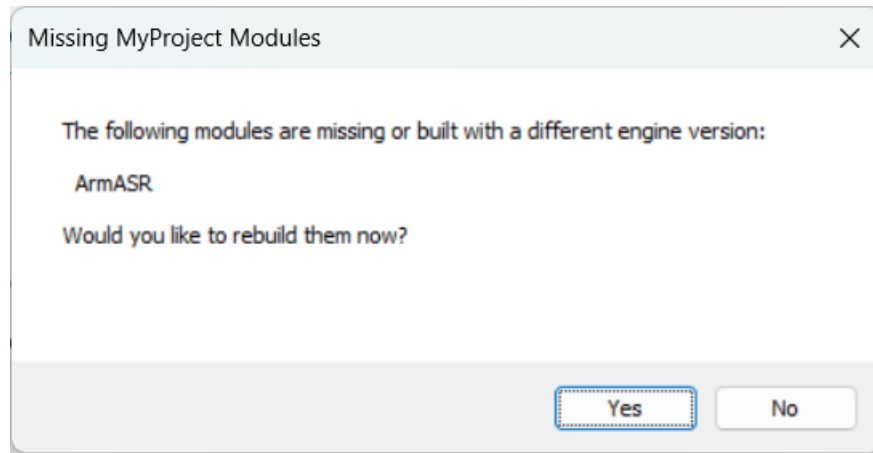
4. Copy the **Arm ASR** plugin into the `plugins` folder in the game directory.

Figure 1-3: Plugin folder**Figure 1-4: Copied Arm ASR plugin**

5. Navigate back to your **Unreal Engine** project.

- When the pop-up window opens asking to build **Arm ASR**, select **Yes**.

Figure 1-5: Arm ASR pop up window



1.4 Enable and configure Arm ASR plugin

This topic shows you how to enable and configure the Arm ASR plugin.

Procedure

- Go to **Edit > Plugins**, and search for **Arm ASR**. Make sure **Arm ASR** is checked.

Figure 1-6: Verify the plugin

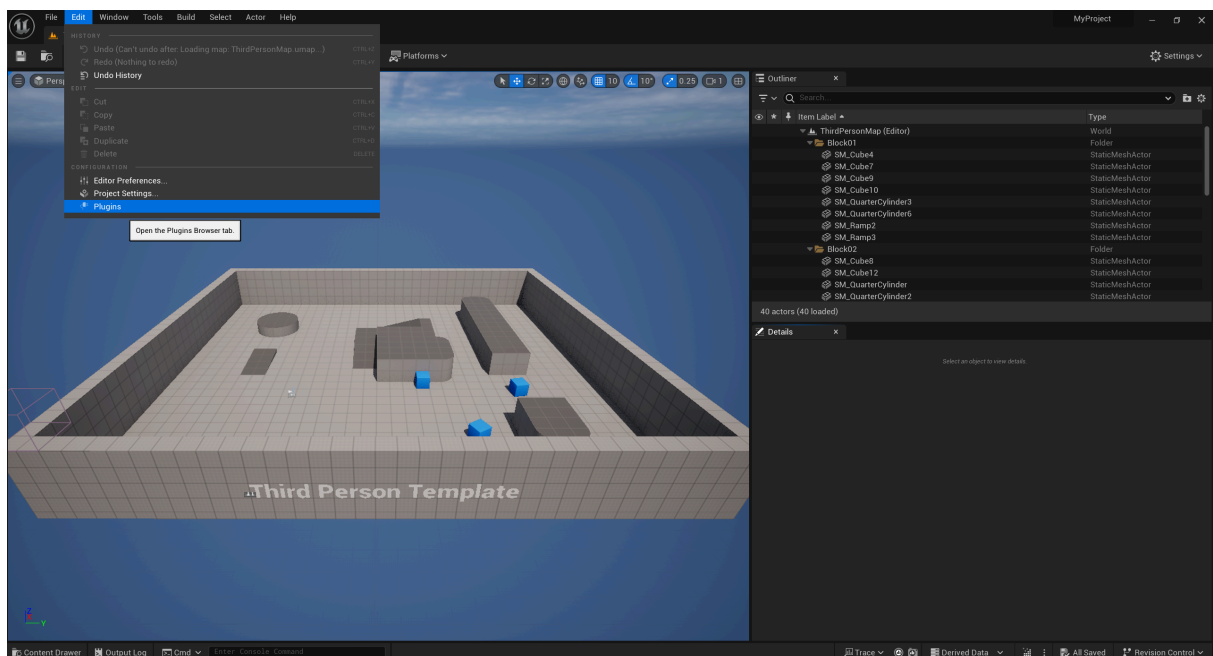
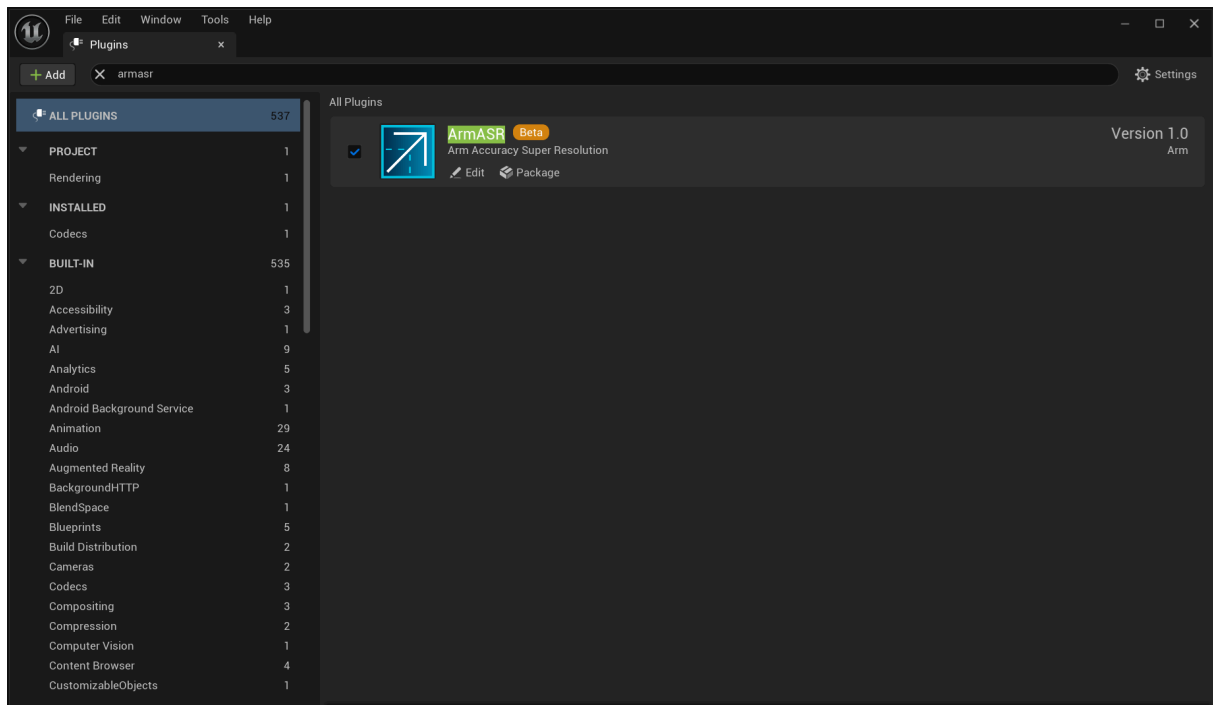
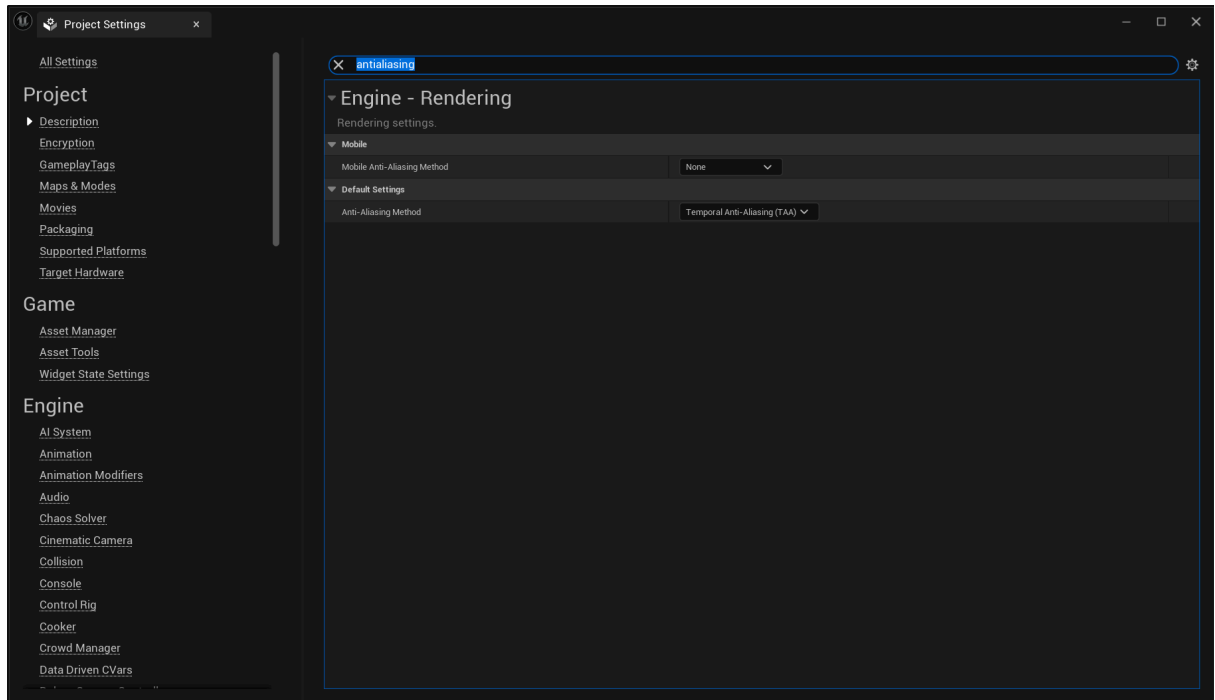


Figure 1-7: Plugin screen

2. To enable Arm ASR upscaling, open **Project Settings** and change the **Anti-Aliasing Method** in Project Settings to **Temporal Anti-Aliasing (TAA)**.

**Note**

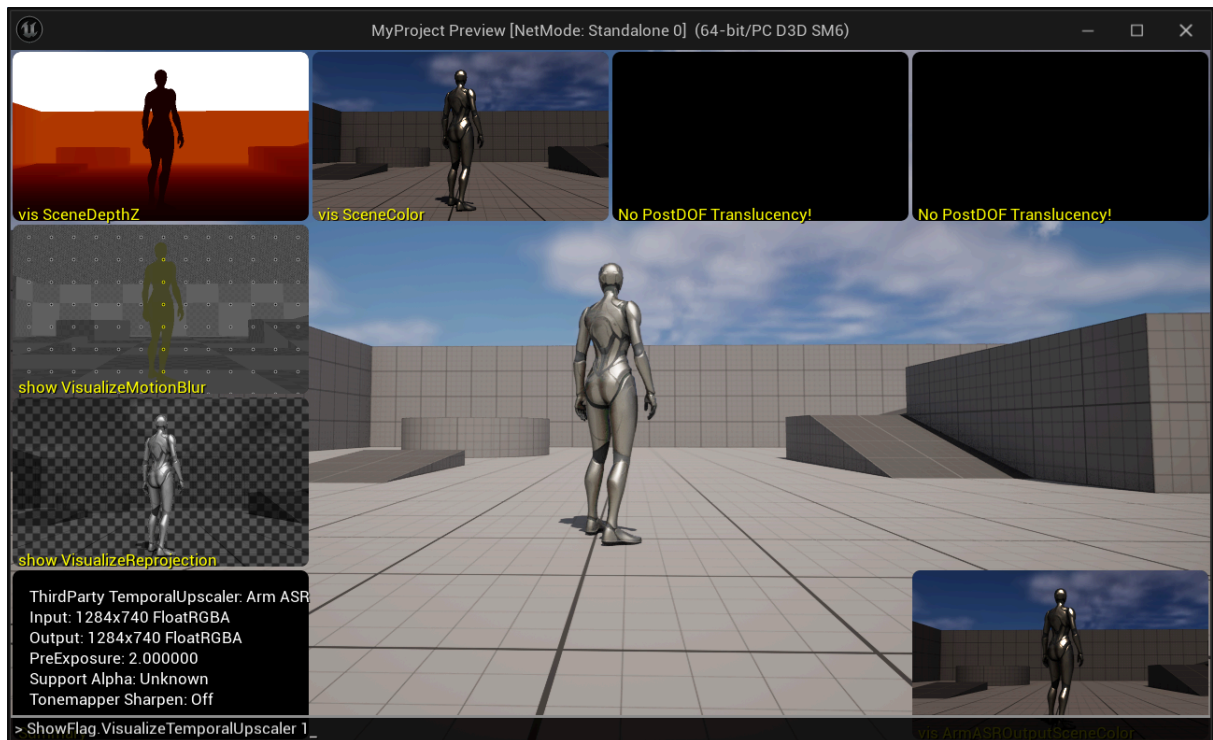
The **Mobile Anti-Aliasing Method** is used for the mobile renderer, however this specific tutorial describes the desktop renderer. You can learn about other available renderers in the `README.md` of the [accuracy-super-resolution-for-unreal](#) repository.

Figure 1-8: Change anti-aliasing method

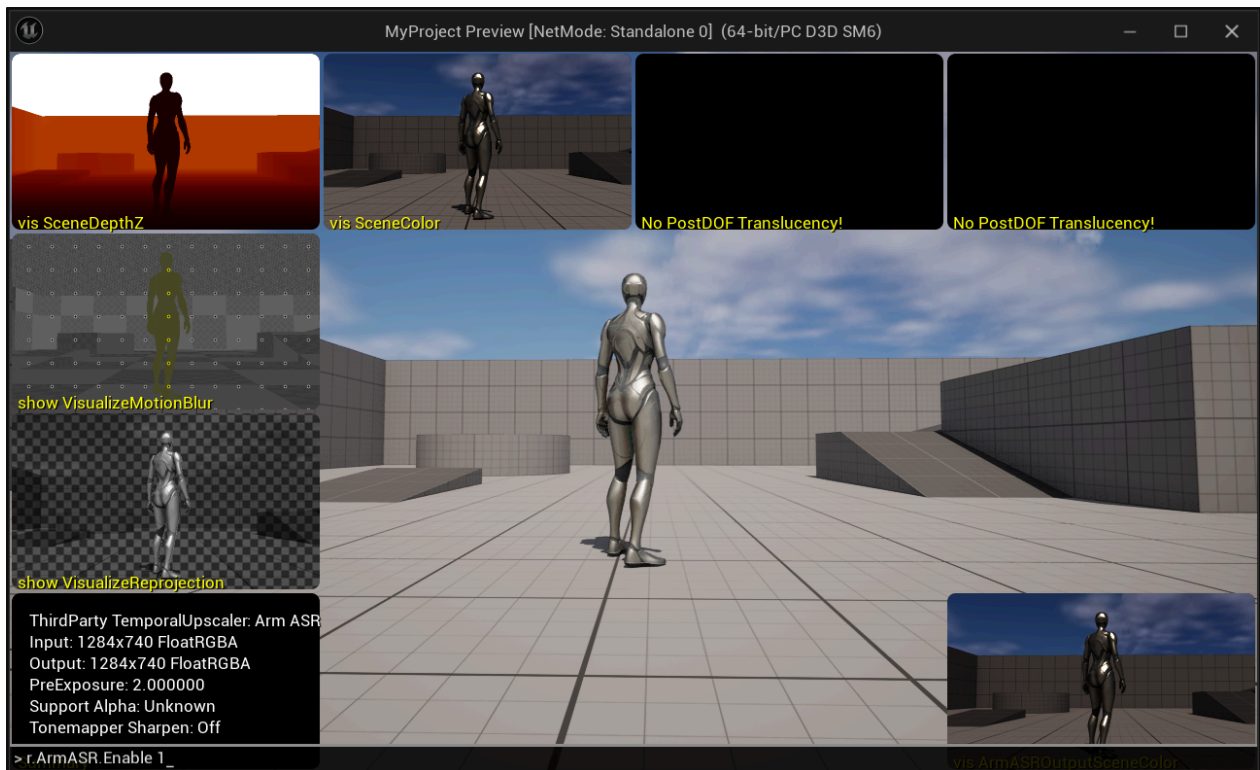
3. To check that Arm ASR is enabled and working, use the `showFlag.VisualizeTemporalUpscaler 1` console command. If Arm ASR is working, you will see Arm ASR listed as the **ThirdParty TemporalUpscaler** in the command window.

**Note**

When you use the `showFlag.VisualizeTemporalUpscaler 1` console command, the debug views are generated from Unreal Engines TAA. The debug views are not generated from Arm ASR.

Figure 1-9: Visualize console command

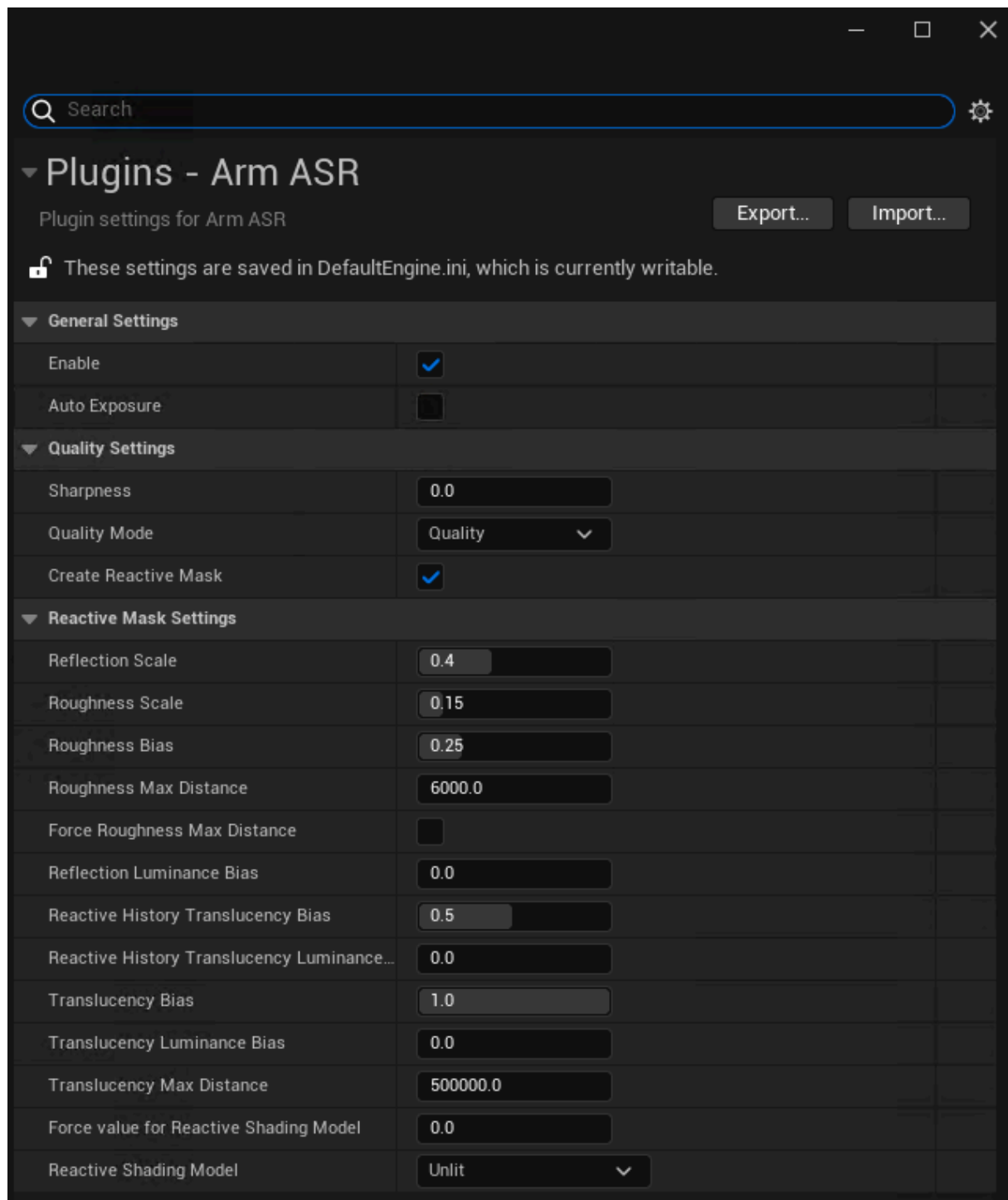
4. If Arm ASR is not shown here, use the `r.ArmASR.Enable 1` console command to enable upscaling.

Figure 1-10: Arm ASR.Enable 1 command

Further configuration

You can configure Arm ASR further. For an overview of the available variables, see the table in [Settings](#).

- You can choose to configure the settings using the UI or the console.
 - To configure the settings using the UI, go to **Edit > Project Settings > Plugins > Arm ASR**.

Figure 1-11: Configure settings using UI

- To configure the settings using the console, type `r.ArmASR.` into the console window and you will see the configuration options.

For example, you can change the upscaling ratio by modifying the **ScreenPercentage**. You can set the upscaling ratio of Arm ASR through the `r.ScreenPercentage`. For example, a value of 50.0 means that the plugin upscales frames by a factor of 2.

Results

You are now ready to use Arm ASR in your Unreal Engine projects. You can use [Arm Performance Studio](#) tools to measure performance of your game as it runs on a mobile device, allowing you to monitor the effect of Arm ASR.

1.5 Settings

You can configure Arm ASR further using the plugin-specific console variables in the following table. For steps on how to configure Arm ASR, see [Further configuration](#).

Table 1-2: Arm ASR Setting options

Console Variable	Default Value	Value Range	Details
<code>r.ArmASR.Enable</code>	1	0, 1	Enable / disable Arm ASR.
<code>r.ArmASR.AutoExposure</code>	0	0, 1	Set to 1 to use Arm ASR's own auto-exposure, otherwise the engine's auto-exposure value is used.
<code>r.ArmASR.Sharpness</code>	0	0-1	If greater than 0 this enables Robust Contrast Adaptive Sharpening Filter to sharpen the output image.
<code>r.ArmASR.ShaderQuality</code>	1	1, 2, 3	Select shader quality preset: 1 - Quality, 2 - Balanced, 3 - Performance.
<code>r.ArmASR.CreateReactiveMask</code>	1	0-1	Create the reactive mask.
<code>r.ArmASR.ReactiveMaskReflectionScale</code>	0.4	0-1	Range from 0.0 to 1.0, scales the Unreal engine reflection contribution to the reactive mask, which can be used to control the amount of aliasing on reflective surfaces.
<code>r.ArmASR.ReactiveMaskRoughnessScale</code>	0.15	0-1	Range from 0.0 to 1.0, scales the GBuffer roughness to provide a fallback value for the reactive mask when screenspace & planar reflections are disabled or don't affect a pixel.
<code>r.ArmASR.ReactiveMaskRoughnessBias</code>	0.25	0-1	Range from 0.0 to 1.0, biases the reactive mask value when screenspace/planar reflections are weak with the GBuffer roughness to account for reflection environment captures.
<code>r.ArmASR.ReactiveMaskRoughnessMaxDistance</code>	6000	-	Maximum distance in world units for using material roughness to contribute to the reactive mask, the maximum of this value and <code>View.FurthestReflectionCaptureDistance</code> will be used.
<code>r.ArmASR.ReactiveMaskRoughnessForceMaxDistance</code>	0	-	Enable to force the maximum distance in world units for using material roughness to contribute to the reactive mask rather than using <code>View.FurthestReflectionCaptureDistance</code> .
<code>r.ArmASR.ReactiveMaskReflectionLumaBias</code>	0	0-1	Range from 0.0 to 1.0, biases the reactive mask by the luminance of the reflection. Use to balance aliasing against ghosting on brightly lit reflective surfaces.

Console Variable	Default Value	Value Range	Details
r.ArmASR. ReactiveHistoryTranslucencyBias	0.5	0-1	Range from 0.0 to 1.0, scales how much translucency suppresses history via the reactive mask. Higher values will make translucent materials more reactive which can reduce smearing.
r.ArmASR. ReactiveHistoryTranslucencyLumaBias	0	0-1	Range from 0.0 to 1.0, biases how much the translucency suppresses history via the reactive mask by the luminance of the transparency. Higher values will make bright translucent materials more reactive which can reduce smearing.
r.ArmASR.ReactiveMaskTranslucencyBias	1	0-1	Range from 0.0 to 1.0, scales how much contribution translucency makes to the reactive mask. Higher values will make translucent materials more reactive which can reduce smearing.
r.ArmASR. ReactiveMaskTranslucencyLumaBias	0	0-1	Range from 0.0 to 1.0, biases the translucency contribution to the reactive mask by the luminance of the transparency. Higher values will make bright translucent materials more reactive which can reduce smearing.
r.ArmASR. ReactiveMaskTranslucencyMaxDistance	500000	-	Maximum distance in world units for using translucency to contribute to the reactive mask. This is a way to remove sky-boxes and other back-planes from the reactive mask, at the expense of nearer translucency not being reactive.
r.ArmASR. ReactiveMaskForceReactiveMaterialValue	0	0, 1	Force the reactive mask value for Reactive Shading Model materials, when > 0 this value can be used to override the value supplied in the Material Graph.
r.ArmASR. ReactiveMaskReactiveShadingModelID	MSM_NUM	-	Treat the specified shading model as reactive, taking the CustomData0.x value as the reactive value to write into the mask.

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Read the information in these sections to understand the release status of the product and documentation, and the conventions used in Arm documents.

Product status

All products and services provided by Arm require deliverables to be prepared and made available at different levels of completeness. The information in this document indicates the appropriate level of completeness for the associated deliverables.

Product completeness status

The information in this document is for a product under development (dev product).

Revision history

These sections can help you understand how the document has changed over time.

Document release information

The Document history table gives the issue number and the released date for each released issue of this document.

Document history

Issue	Date	Confidentiality	Change
0201-03	1 May 2025	Non-Confidential	First release for version 2.1
0200-02	18 March 2025	Non-Confidential	First release for version 2.0
0100-01	31 August 2024	Confidential	First release for version 1.0

Change history

The Change history tables describe the technical changes between released issues of this document in reverse order. Issue numbers match the revision history in [Document release information](#) on page 18.

Table 2: Differences between issue 0200-02 and 0201-03

Change	Location
First release for version 2.1	-
Adds new topic	Contact

Table 3: Differences between issue 0100-01 and 0200-02

Change	Location
First release for version 2.0	-
Adds new topic	Settings
Adds Unreal Engine version table	Installing the Arm ASR plugin
Updates note	Enable and configure Arm ASR plugin

Table 4: Issue 0100-01

Change	Location
First release for version 1.0	-

Conventions

The following subsections describe conventions used in Arm documents.

Glossary

The Arm Glossary is a list of terms used in Arm documentation, together with definitions for those terms. The Arm Glossary does not contain terms that are industry standard unless the Arm meaning differs from the generally accepted meaning.

See the Arm Glossary for more information: developer.arm.com/glossary.

Typographic conventions

Arm documentation uses typographical conventions to convey specific meaning.

Convention	Use
<i>italic</i>	Citations.
bold	Interface elements, such as menu names. Terms in descriptive lists, where appropriate.
monospace	Text that you can enter at the keyboard, such as commands, file and program names, and source code.
monospace <u>underline</u>	A permitted abbreviation for a command or option. You can enter the underlined text instead of the full command or option name.
<and>	Encloses replaceable terms for assembler syntax where they appear in code or code fragments. For example: <pre>MRC p15, 0, <Rd>, <CRn>, <CRm>, <Opcode_2></pre>
SMALL CAPITALS	Terms that have specific technical meanings as defined in the <i>Arm® Glossary</i> . For example, IMPLEMENTATION DEFINED , IMPLEMENTATION SPECIFIC , UNKNOWN , and UNPREDICTABLE .



We recommend the following. If you do not follow these recommendations your system might not work.



Your system requires the following. If you do not follow these requirements your system will not work.



You are at risk of causing permanent damage to your system or your equipment, or harming yourself.



This information is important and needs your attention.



A useful tip that might make it easier, better or faster to perform a task.



A reminder of something important that relates to the information you are reading.

Useful resources

This document contains information that is specific to this product. See the following resources for other useful information.

Arm documents are available on developer.arm.com/documentation.

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Arm product resources	Document ID	Confidentiality
Arm® Accuracy Super Resolution™ for Generic Library	110404	Non-Confidential