Huge Playground: Post Apocalyptic
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1 Introduction

First, thank you for purchasing HugePlayground: Post Apocalyptic.
HugePlayground: Post Apocalyptic documentation contains everything you need to get started.

The asset is designed to create large map that's why the asset uses the scene additives system.

Additives scenes:
-To calculate lightmaps on a large scene, the demo scene is separated into several scenes. These scenes are recombined together in the hierarchy tab. Scenes are load additively.
Using additives scene system causes some constraints.
Read chapter 3 ,4 ,5 and 6 carefully to understand how to use additive scenes and adapt them to your project.

If you don't want to work with additive scenes and want to combine the demo scenes into a single scene read this tutorial : Link

Performance:
The demo scene includes a lot of prefabs. This is why it is necessary to optimize.
A script is included in the asset that makes some of the objects hide and unhide depending on the distance from the character.

For more informations about optimize scripts: Link

Something else to know

Procedural:
A script allowing to create procedural elements is included in the asset.
Script allows to create roads, electricity pole, fences and crash barrier.

For more informations about procedurals: Link

Prefabs :
To discover all prefabs contained in this asset open scenes:

Assets > HPA > Scenes > Showroom > Showroom_Prefabs_Buildings
Assets > HPA > Scenes > Showroom > Showroom_Prefabs_Objects

For more informations about prefabs : Link

How to start:

-Read chapter 2 to setup correcty the asset : **This settings are needed to use this asset.** Link

Caution: Don't forget to install **URP** package.

If the prefabs are pink when you open the demo scene, this means that URP Package is not installed or configured correctly.

If you have the following error message: the type or namespace name universal does not exist...
This means that URP Package is not installed.

If you do not have URP installed, other error messages may appear in the console. Install URP to make console errors disappear.

-Read chapter 3 to learn how to test the demo scene and integrate your project. Link

-Read chapter 4 to learn how export a build with additives scenes. Link

-Read chapter 5 to learn basics about working with additives scenes. Link

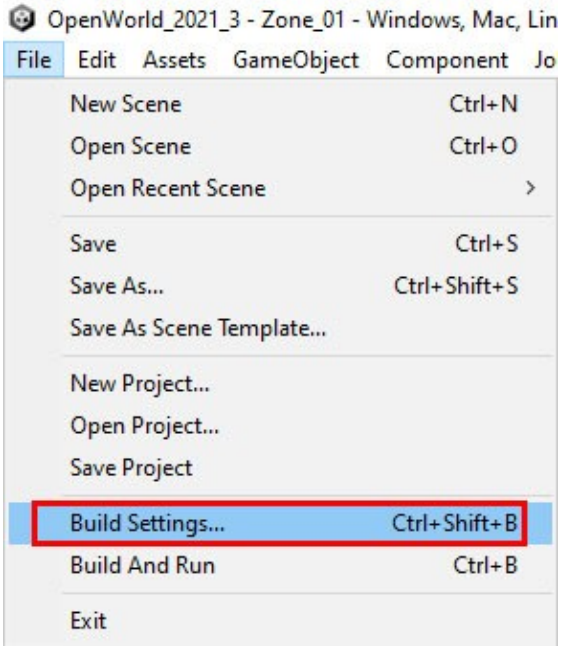
-Read chapter 6 to calculate lightmaps with additives scenes. Link

-If you have a problem read chapter 17 Troubleshooting Link

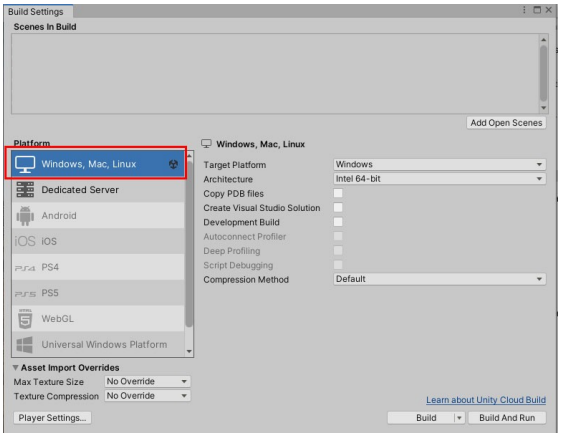
If you have any questions, please contact us at **tropicalstudio3d@gmail.com**

2 Settings

1 Go to File > Build_Settings.



Verify that PC, Mac & Linux Standalone mode is selected.



2 Installing unity Project on SSD disk

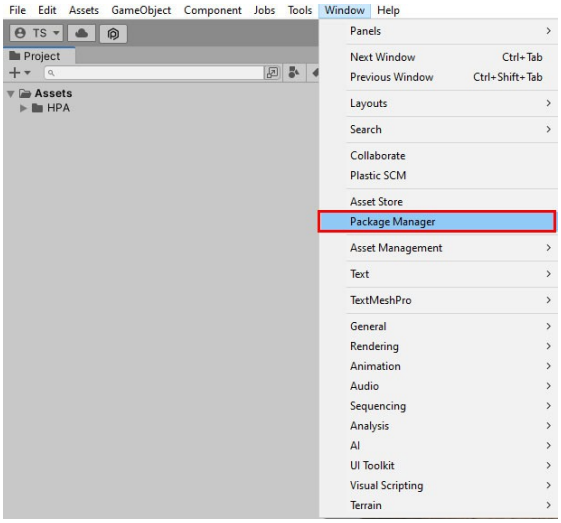
The asset is designed for use with additive scenes.

Using additive scenes increase the opening and closing time when you press play/stop in editor. This is why it is advisable to install the project on your SSD disk to reduce this time if you can. Installing unity Project on SSD drastically speedup the opening and closing time when you press play/stop in editor.

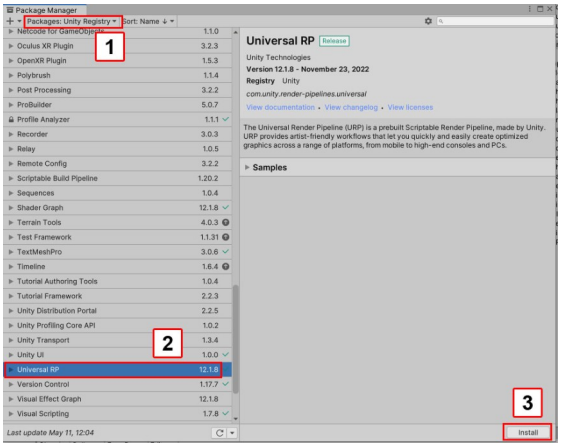
For more information about additives scenes Link

3 If you haven't already had it, installed URP (universal render pipeline)

Go to Window > Package Manager

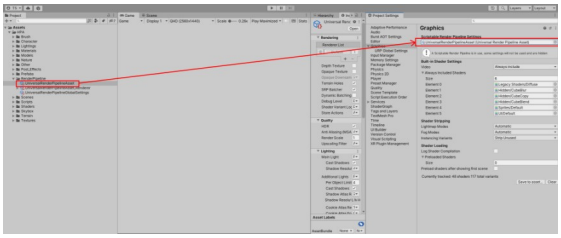


4 -Choose Unity Registry (spot 1)
-Choose Universal RP (spot 2)
-Press Install button (spot 3)



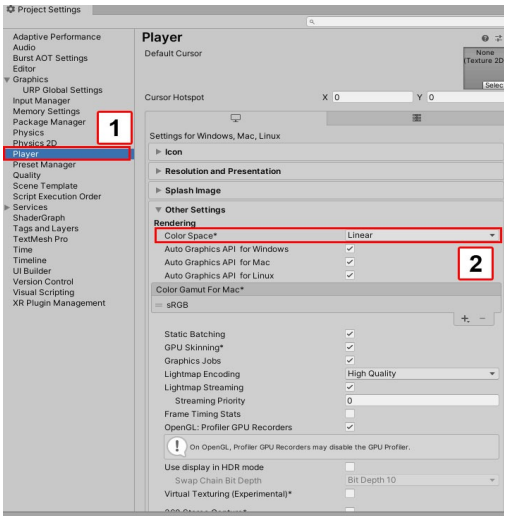
5 In project settings tab:
Select Graphics
From project tab drag and drop UniversalRenderPipelineAsset to scriptable Render Pipeline Settings slot

Assets > HPA > RenderPipeline > UniversalRenderPipelineAsset



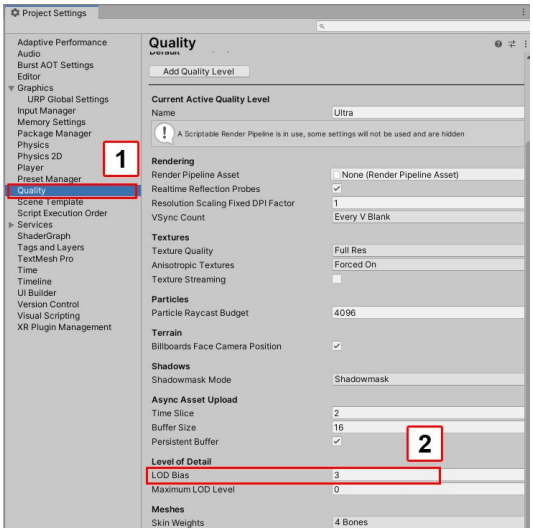
6 In Project settings tab:

-Select Player
-Set Color Space to Linear



7 In Project settings tab:

-Select Quality
-Set Lod Bias to 3

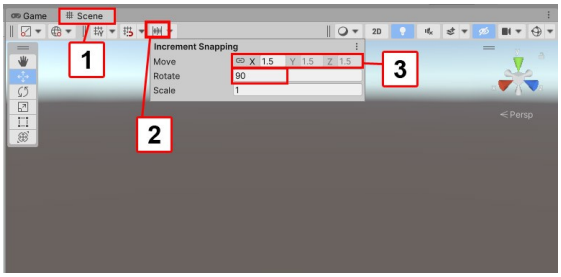


8 In scene tab: (spot 1)

-Press grid button (spot 2)

Set Move X to 1.5 (spot 3)
Set Move Y to 1.5
Set Move Z to 1.5

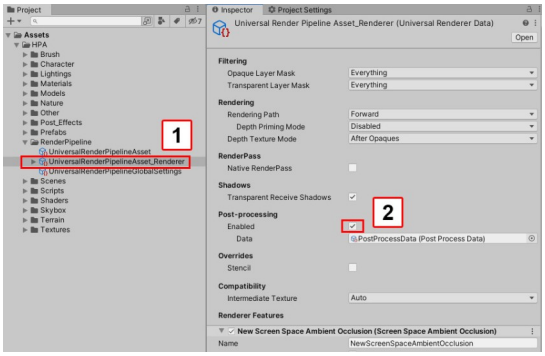
Set Rotate to 90



9 In Project settings tab:

-Select UniversalRenderPipelineAsset_Renderer (spot 1)
Assets > HPA > RenderPipeline > UniversalRenderPipelineAsset_Renderer

In Inspector tab:
-Check Enabled Checkbox (spot 2)

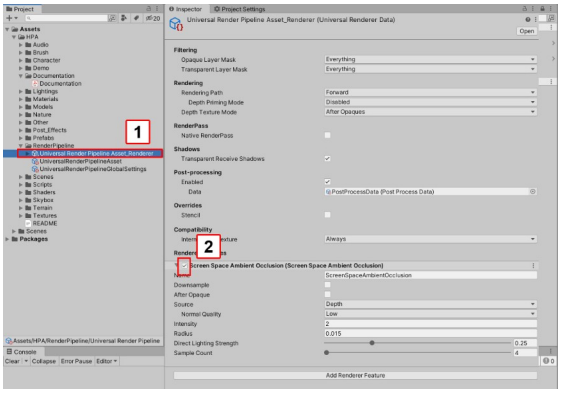


10 SSAO (Screen Space Ambiant Occlusion):

SSAO uses a lot of resources so you can disable it if you wish.

<u>To deactivate it:</u>
In project tab select: Universal Render Pipeline Asset_Renderer (spot 1)

In Inspector tab uncheck Screen Space Ambiant Occlusion checkbox (spot 2)



3 Prepare your project

Important:
To be able to calculate lightmaps on a large scene, the demo scene is separated into several scenes. These scenes are recombined together in the hierarchy tab.
Scenes are load additively.

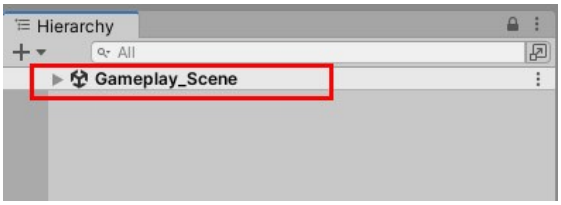
To set up the demo scenes we will place all the necessary scenes in the hierarchy tab

Configure demo scenes

In Project tab double click on Gameplay_Scene to open it (spot 1)

Assets > HPA > Demo > Gameplay_Scene

Info: Gameplay_Scene contains all the gameplay elements



To Go further

If you want to configure the demo with additional features (minimap,new locations feedback, shortcut info, FPS counter and sun movement):

-instead of Gameplay_Scene use Gameplay_Scene_Full
Assets > HPA > Other >Scene_Full > Gameplay_Scene_Full

Caution: These features are only there as an example. These features are not explained in this documentation.

If you want to deactivate these features:
-disable DEMO_Grp

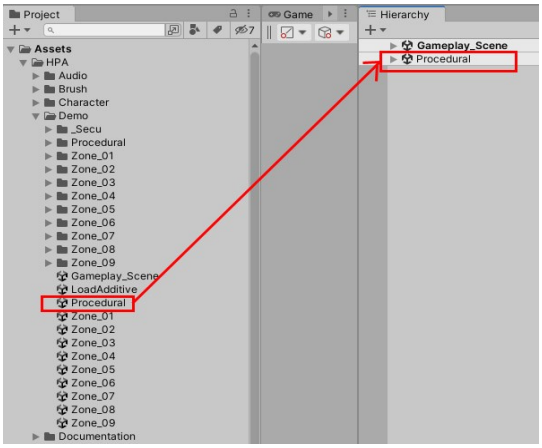
If you want to delete these features:
-delete DEMO_Grp

Important:
If you use Gameplay_Scene_Full
you must set Gameplay_Scene_Full as active scene
For more information about set active scenes Link

If you don't set Gameplay_Scene_Full as active you may have the following error message:
NullReferenceException: Object reference not set to an instance of an object.

In hierarchy tab:
From project tab drag and drop Procedural scene to the hierachy tab.

Assets > HPA > Demo > Procedural



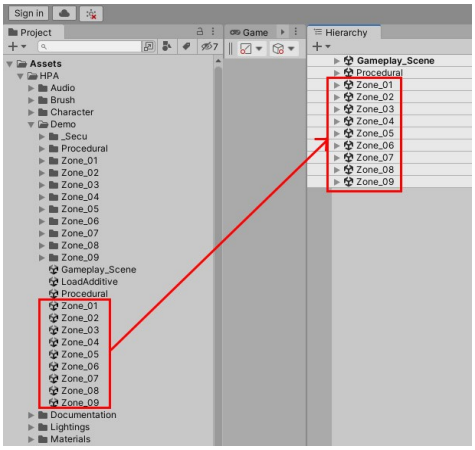
Info: Procedural contains all the procedural objets.
These procedural objects are roads, electricity pole, fences and crash barrier.
This procedural objects have been created with a script.
The script is included in the asset.

For more information about the procedural script Link

In hierarchy tab it is possible to drag and drop several scenes at the same time.

From project tab drag and drop
Zone 01 to Zone 09 to the hierarchy tab

Assets > HPA > Demo > Zone_01

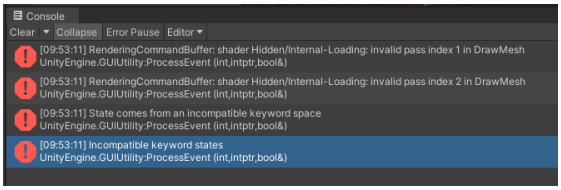


Info: Zone 01 to Zone 09 contains terrains, objects and buildings of each aera

Press Play to start the demo.

The first time you start the demo, error messages may appear.

Do not take this warning into account.



Using additive scenes increase the opening and closing duration when you press play/stop in editor.

Don't be surprised if the first time, the scene takes 1 minute 30 to open.

Afterwards the scene takes around 20 seconds to open / close.

A tip is presented at the end of this chapter to speed up the opening and closing time.
For more information about the tip Link

Shortcuts:

E,S,D,F to move
Hold **Shift (Maj)** to Run
Press **Space bar** to Jump
Press **C** to crouch
Press **ESC (Echap)**

Press ESC (Echap)
Press Play again to stop the demo.

Integrate your own gameplay elements

If you have gameplay elements from your project, copy them into the scene Gameplay_Scene

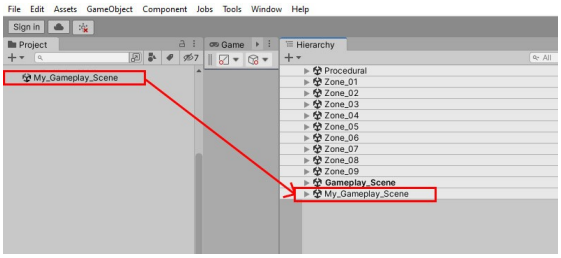
For some reason if you don't want to copy your gameplay elements into *Gameplay_Scene* follow this step:

-From project tab drag and drop your gameplay scene to the hierarchy tab

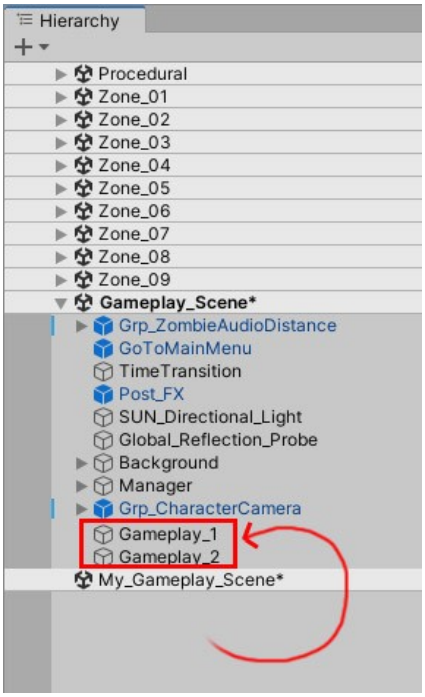
To export a build:
-Add your gameplay scene in the build window
To learn how to setup build window Link
-Setup LoadAdditive scene to add your gameplay scene to the list.
To learn how to use and setup LoadAdditive scene Link

Follow this steps to copy your own gameplay elements into Gameplay_Scene:

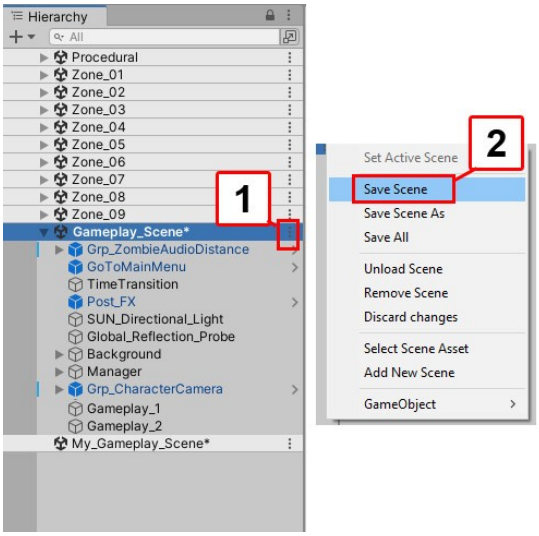
1 From project tab drag and drop your gameplay scene
to the hierarchy tab



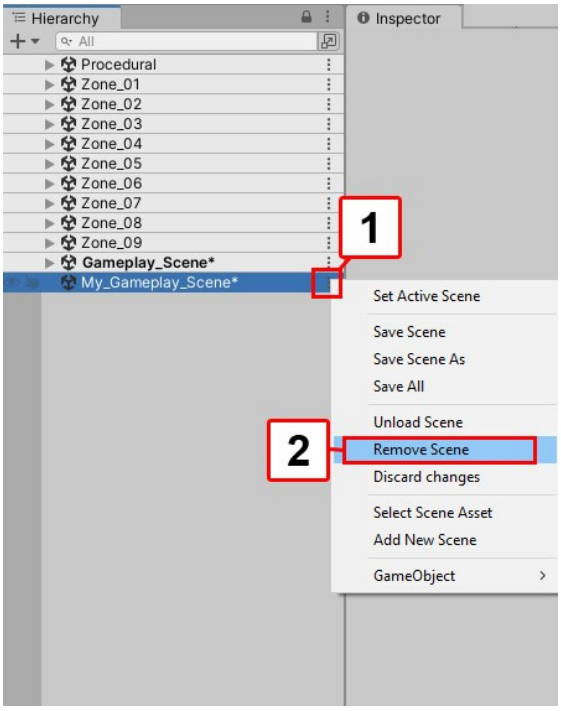
2 In hierarchy tab:
From your gameplay scene drag and drop elements in Gameplay_Scene



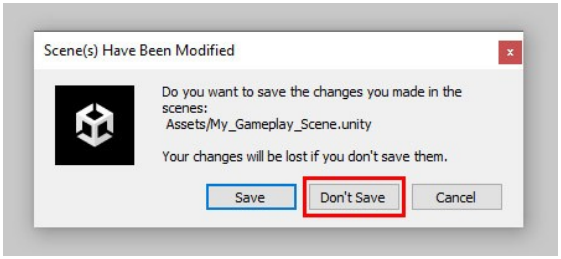
3 In hierarchy tab select Gameplay_Scene:
-Mouse right click (spot1)
-Choose Save Scene (spot2)



4-In hierarchy tab select your gameplay scene
-Mouse right click (spot1)
-Choose Remove Scene (spot2)



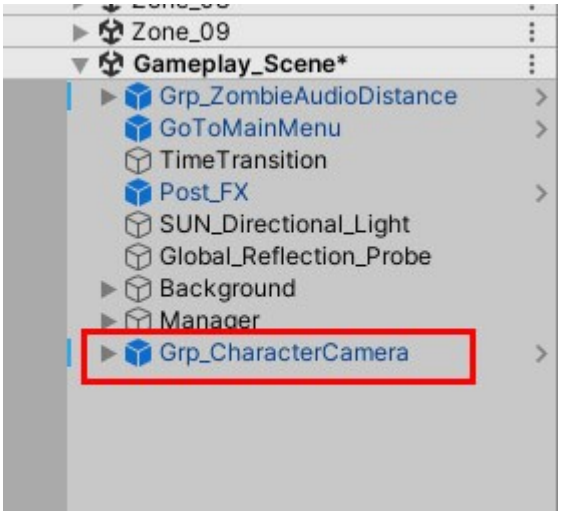
5 A new window appears
-Press Don't Save button



Use your own character controller

If you want to use your own character controller follow this steps:

1 In hierarchy tab:
-In Gameplay_Scene delete Grp_CharacterCamera



2 Add your character controller into Gameplay_Scene

3 To use the optimization system you must attach the optimization script included in the asset to your character

Important:
The optimization system hide or unhide prefabs depending on the distance from the player position.
A script **must be** attached to the character.
This script is included in the asset.

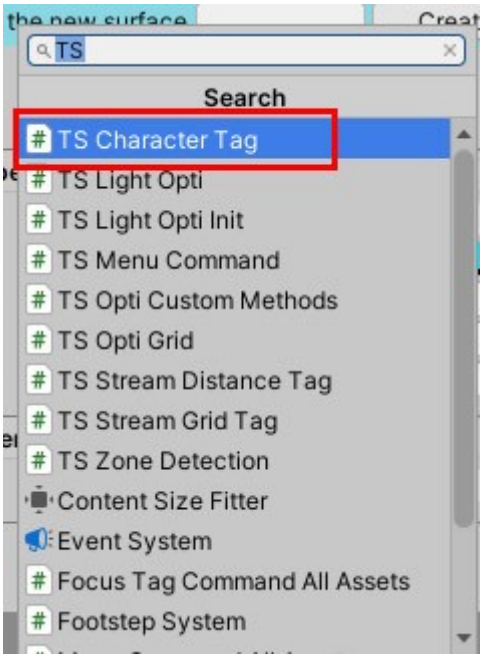
For more information about optimization script Link

In hierarchy tab select your character controller

4 In Inspector tab press Add Component button

5 In text field type TS

6 Choose TS Character Tag in the list



Optimize script is now attached to your character controller

Other important things to know about additive scenes

Calculating lightmaps with additive scenes requires calculating the lightmaps of each scene independently.
To facilitate this process, a script is included in this asset

For more information about lightmaps script Link

Using lightprobes with additive scenes requires adding a script that recombines them at start.

This script is included in this asset.
The name of the script is Init_LightProbes.
The script is in Gameplay_Scene and SK_Gameplay_Scene

For more information about lightprobes recombine script Link

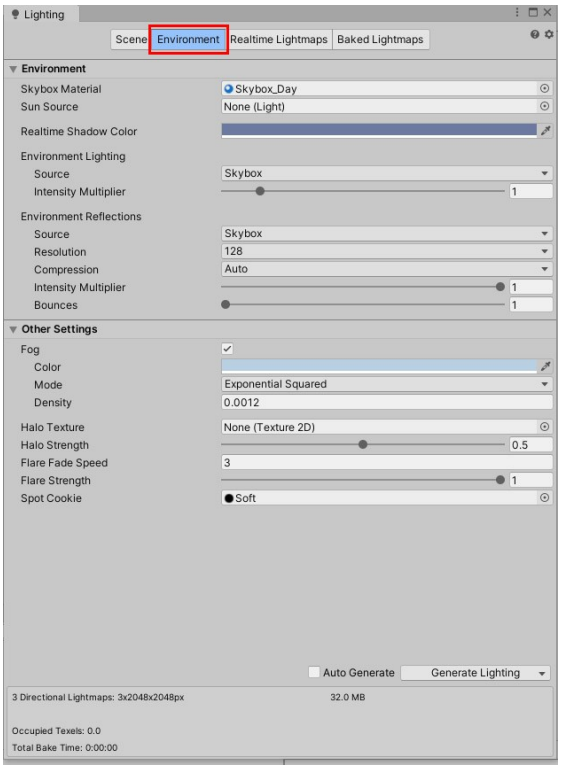
Create a build with additive scenes

When using additive scenes, it is necessary to load all the scenes at start

Chapter 4 is entirely devoted to this subject.
For more information about build Link

Environment parameters with additives scenes

When using additive scenes, use same environment parameters for all scenes.



Create your own map

If you want to create your own map from scratch, a starter kit is available to easily get started.

For more information about create your own map Link

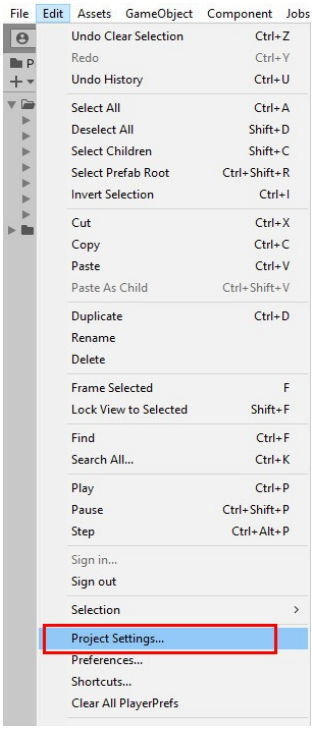
Speed up the opening and closing time when play/stop

This tip speeds up the opening/closing when you press the play button **but**:

-not all scenes elements are reloaded which **may cause visual bugs or other issues**.
-on the other hand it can be hepful if you want to quickly test an element of gameplay

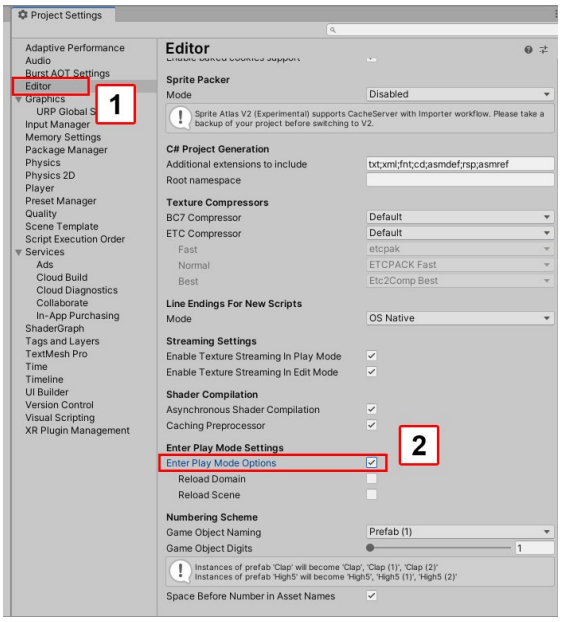
To speed up the opening and closing time when play/stop is pressed do this:

Go to Edit > Project Settings



In project settings Tab:

-Select Editor (spot 1)
-Check Enter Play Mode Options Checkbox (spot 2)

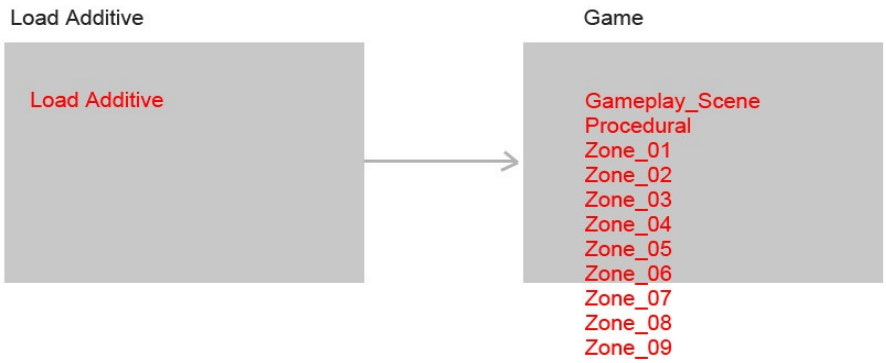


4 Create a build with additives scenes

Overview

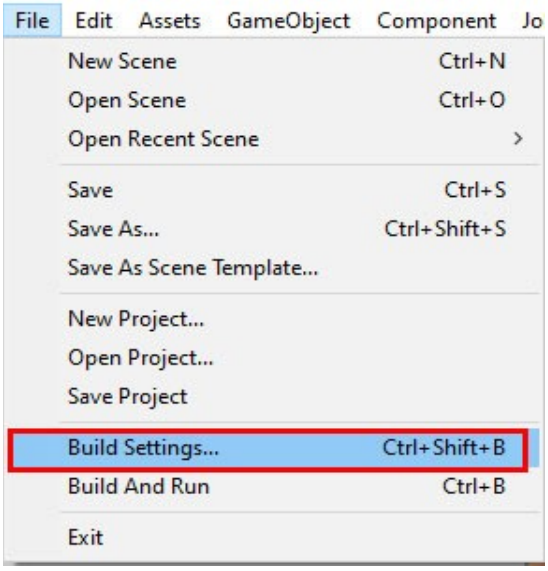
When working with additive scenes it is necessary to create a scene that will load all the scenes of the game at start.
As shown in the image below the scene LoadAdditives will load the scenes Gameplay_Scene, Procedural, Zone_01 to Zone_09

LoadAdditives scene is included in the asset.



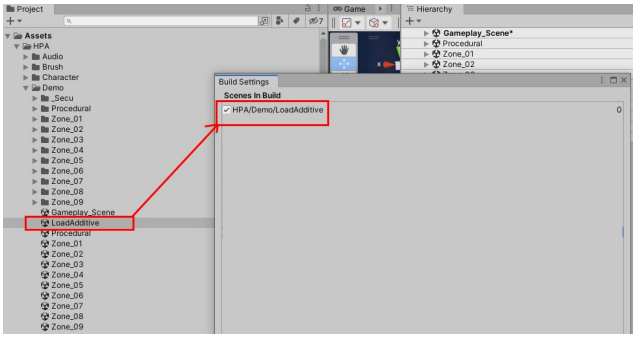
How to setup the build

Go to File > Build Settings

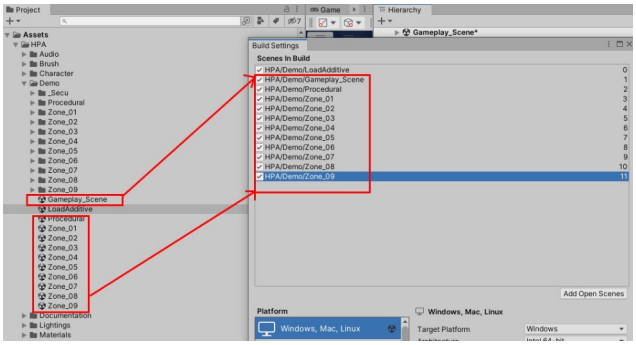


From Project tab drag and drop scene LoadAdditive to the Build settings tab.

Assets > HPA > Demo > LoadAdditive



Very Important:
LoadAdditive must be positioned first into the list.



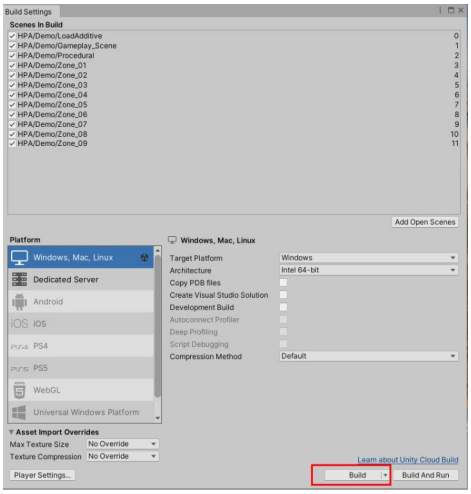
In the same way drag and drop the followings scenes:

-Gameplay_Scene
Assets > HPA > Demo > Gameplay_Scene

-Procedural
Assets > HPA > Demo > Procedural

-Zone_01
-Zone_02
-Zone_03
-Zone_04
-Zone_05
-Zone_06
-Zone_07
-Zone_08
-Zone_09
Assets > HPA > Demo > Zone_01

To Create the build:
Press button Build



Info:
The first time the build compute time is much longer.

Adapt LoadAdditive scene to your project

LoadAdditive loads all the scenes needed when unity open the build.

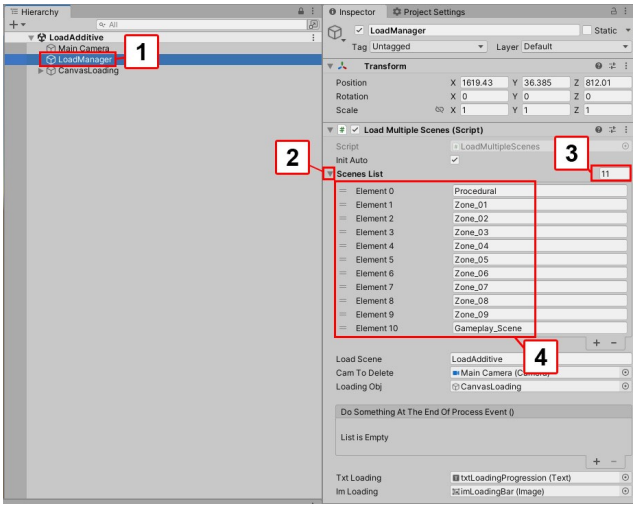
If you need to add new scene or remove a scene follow this step

1 In Project tab double click on LoadAdditive to open it (spot 1)

Assets > HPA > Demo > LoadAdditive

2 In hierarchy tab select LoadManager (spot 1)

3 Open scenes list by pressing triangle button (spot 2)



4 Modify the Scenes List number (spot 3)
Increase the number increase the number of slots.
Lower the number reduce the number of slots.

4 Finally, write **without error** the name of the scenes into the field Element (spot 4)

Very Important:
Put the scene that includes gameplay elements at the end last in the list. In this case Gameplay_Scene

Gameplay elements must always be loaded last in the list.

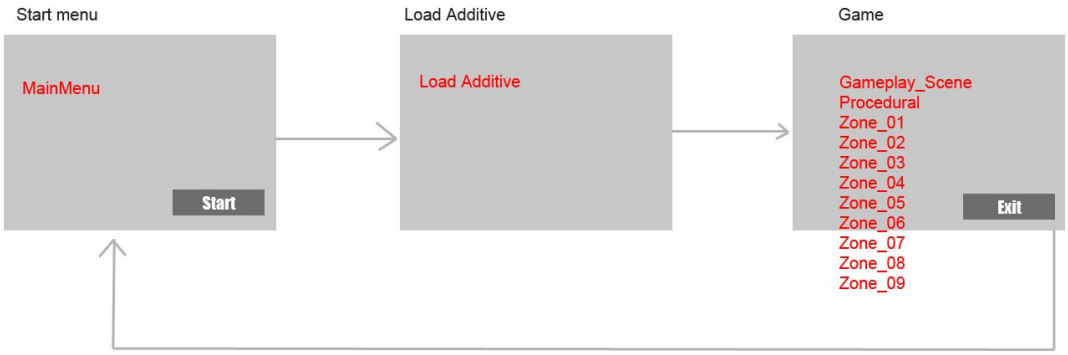
Important
Don't forget to remove LoadAdditive from the hierarchy tab.
If you do not remove LoadAdditive then press play, the game will not start.

Launch the game from your start menu

As shown in the image below, we will add a start menu.

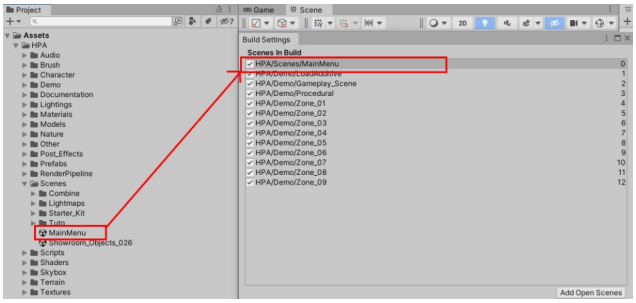
When the start button is pressed:
- MainMenu is destroyed
-LoadAdditive scene is loaded
-LoadAdditive scene loads all the scenes necessary for the game.
-Once all the scenes have been loaded, LoadAdditive scene is destroyed.

For example, MainMenu scene is included in the asset.



-Open Build window
-Add MainMenu to the build list

Assets > HPA > Scenes > MainMenu



Very Important:
MainMenu must be placed first in the list

To go further:
If you want to learn more about loading the game from a start menu Link

5 Work with additives scenes basics

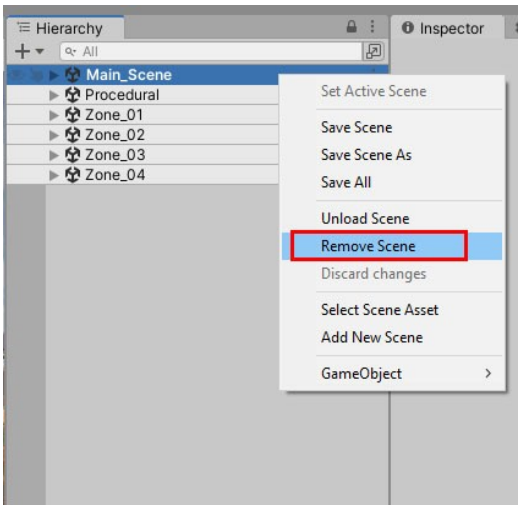
This chapter is intended for people who have never worked with additive scenes.

He explains how:
-save a scene
-transfer elements from one scene to another scene
-make a scene active

Remove a scene in hierarchy tab

If you want to remove a scene in the hierarchy:

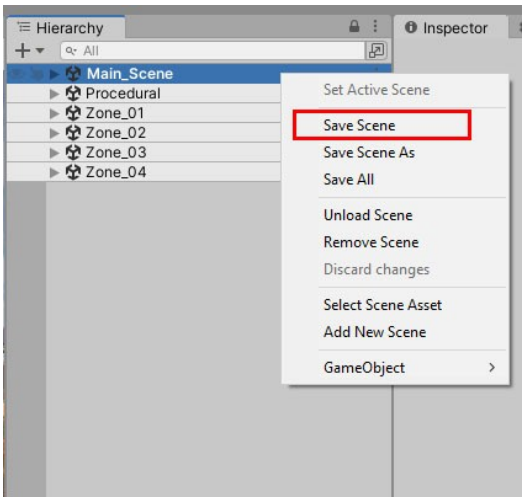
-In hierarchy tab select the scene
-Mouse right click
-Choose Remove Scene



Save a scene in hierarchy tab

If you want to save only one scene in the hierarchy:

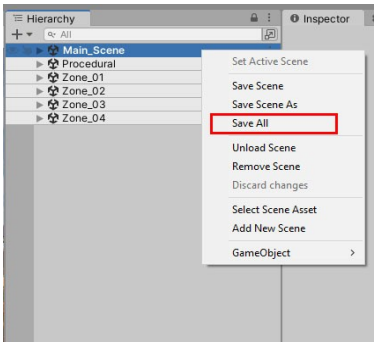
-In hierarchy tab select the scene
-Mouse right click
-Choose Save Scene



Save all scenes in hierarchy

If you want to save all scenes at the same time in the hierarchy:

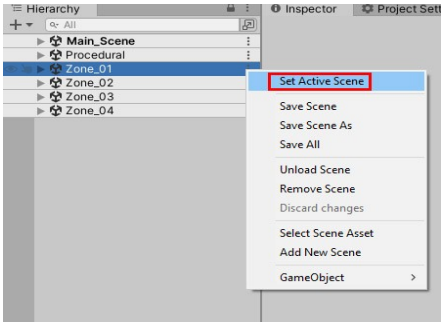
-In hierarchy tab select the scene
-Mouse right click
-Choose Save All
or
-use keyboard shortcut : CTRL + S



Make active a scene

Important:
New prefabs or elements are always imported into the active scene.

When you add a new prefab in the hierarchy tab, the prefab is placed in the active scene.



<u>To make a scene active:</u>

-In hierarchy tab select the scene
-Mouse right click
-Choose Set Active Scene

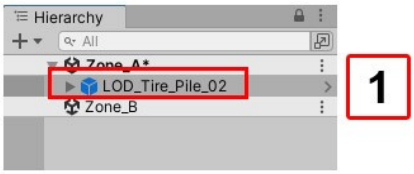
Info:
<u>when a scene is set active:</u>
In the hierarchy tab the name of the scene is in **bold**

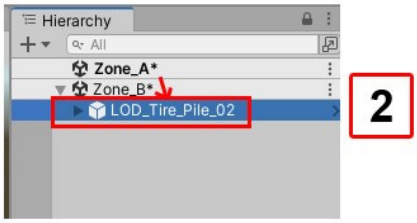
Transfer elements from one scene to another

-In the first scene, select one or more elements (spot 1)

-Drag and drop into the second scene (spot 2)

-Save both scenes





Important:
If you transfer prefabs from one scene to another scene, it will be necessary to recalculate the lightmaps of the 2 scenes

6 Calculate lightmaps with additives scenes

Overview

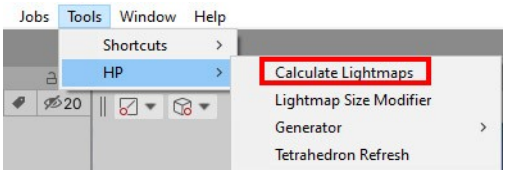
When using additive scenes, you have to calculate the lightmaps for each scene separately.
For this **it is necessary** to follow a special process.
To simplify this process a script is included in the asset. It allows to easily calculate lightmaps with additives scenes.

If you don't want to use the script to calculate lightmaps read chapter : Link

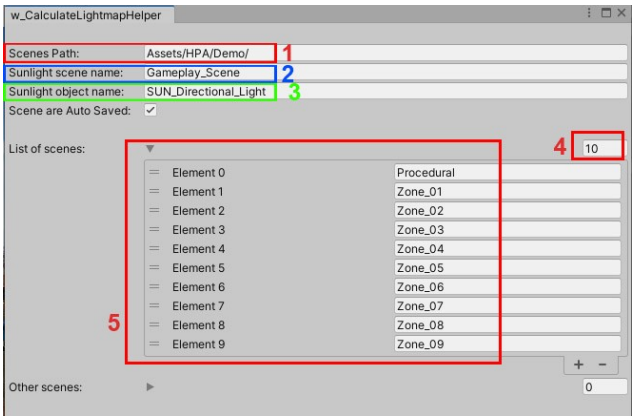
Important:
In rare cases, if there is a crash during lightmaps calculation, some scenes may be corrupted. It is therefore prudent to make a copy of the scenes before calculating the lightmaps.

Setup the script

Go to Tools > HP > Calculate Lightmaps



Info: In the image on the right, we used the demo scene as an example



-First, put the scenes you want to calculate in the same folder.

-Write **without error** the path of the folder
(spot 1)

Important:
Don't forget to add slash (/) at the end of the path
Example: Assets/HPA/Demo/

-Write **without error** the name of the scene in which directional light(Sun) is located
(spot 2)

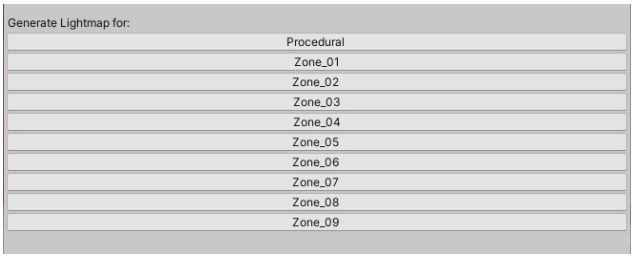
-Write **without error** the name of the directional light(Sun) (spot 3)

-If you want to add a scene or remove a scene you can modify the scenes number
(spot 4)
Increase the number increase the number of slots.
Lower the number reduce the number of slots.

-Finally, write **without error** the name of the scenes into the field List of scenes (spot 5)

-Click on the button corresponding to the scene you would like to calculate

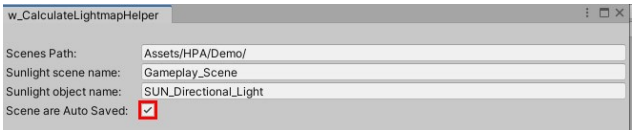
Each button allows to calculate one of the scenes.



Example: I want to calculate the lightmaps of the scene Zone_01

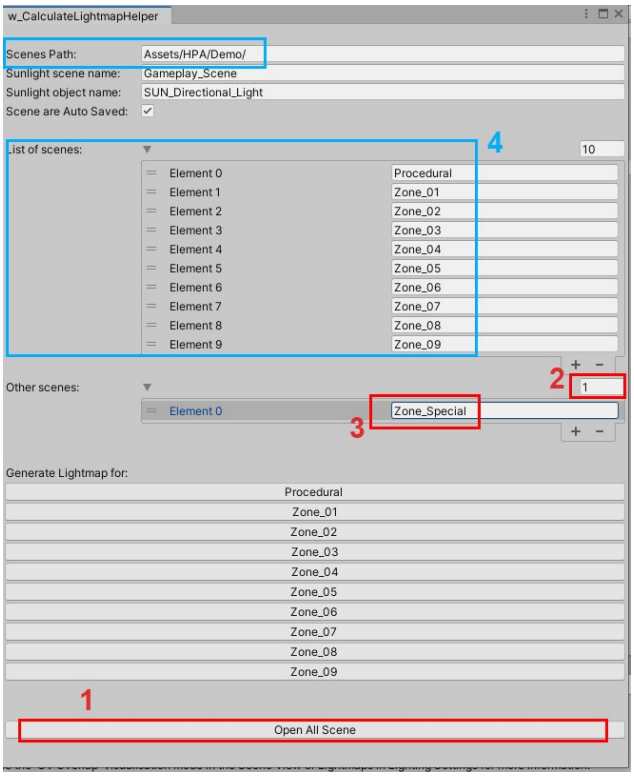
What does the script do:
-All scenes in hierarchy tab are saved
-All scenes are closed
-Zone_01 scene opens
-The sun (directional light) is added to Zone_01 scene
-Lightmaps are computed
-The sun (directional light) is delete in Zone_01 scene
-Zone_01 is saved

When starting the script:
if you do not want all the scenes in hierachy to be saved uncheck Scenes are Auto Saved checkbox



To easily reopen all scenes with a single click:
-press Open All Scenes button (spot 1)

-All scenes included in List of scenes opens
-The scene that contains Directional Light(sun) also opens

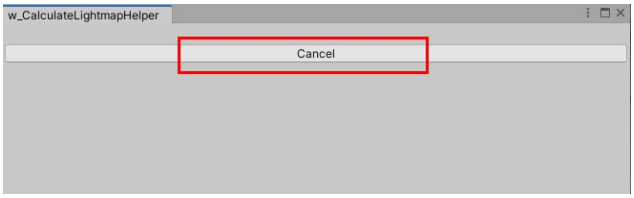


If you want one or more additional scenes to open as well:
-modify the scenes number (spot 2)
Increase the number increase the number of slots.
Lower the number reduce the number of slots.

-Write **without error** the name of the scenes into the field Other scenes (spot 3)

Important:
These scenes must be in the same folder (and therefore have the same path) as the scenes included in List of scenes (spot 4)

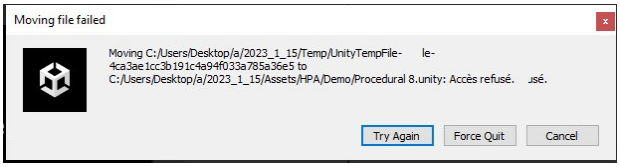
During the lightmap computed process:
-press Cancel button to cancel the lightmap calculation



To go further:
If you want to learn more about lightmaps as well as lightmap resolution settings: Link

Troubleshooting

Warning: **Moving file failed**



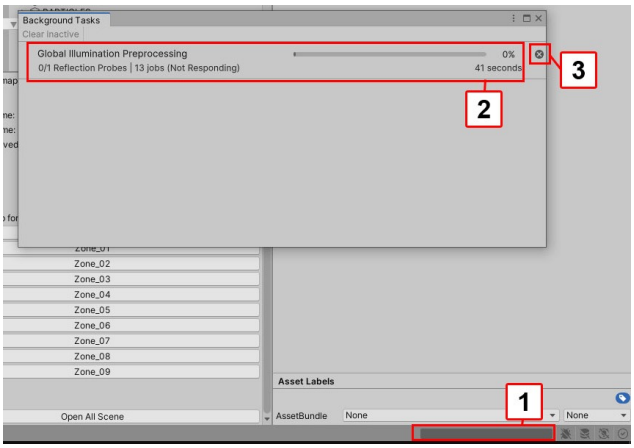
If this warning appears try these solutions:
-close Visual Studio (if it is open)
-before calculate lightmaps: save scenes manualy (Ctrl+S)

Issue: Grey bar stuck after the lightmap calculation is complete. (spot1)

-Click on grey bar (spot1)

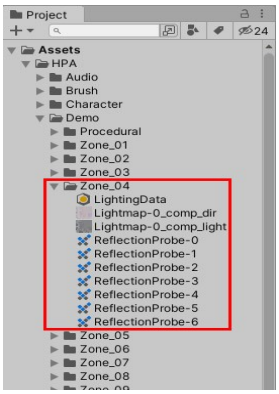
A new window open : **Not Responding** (spot2)

-Press exit button (spot3)



If you want to do another lightmaps calculation:
it is best to turn off Unity and then turn Unity back on.

If the problem persists:
-Try deleting the lightmaps folder before recalculating
-Try to restart your computer



7 Terrain, nature and trees

Overview

This chapter explain how to create your own map.

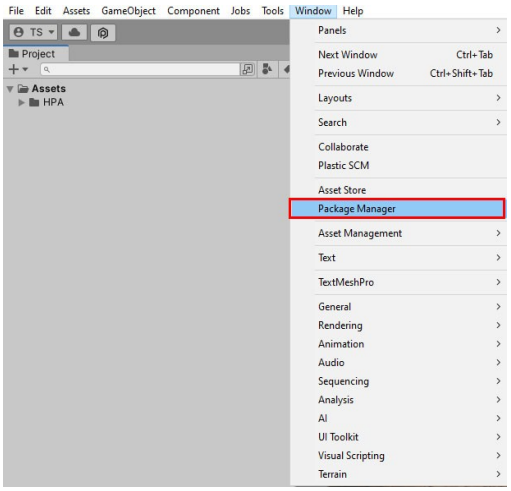
This chapter covers in detail how:
-to create terrains
-setup terrains
-paint textures on terrains
-paint grass, bushes and stones

Terrain Tools

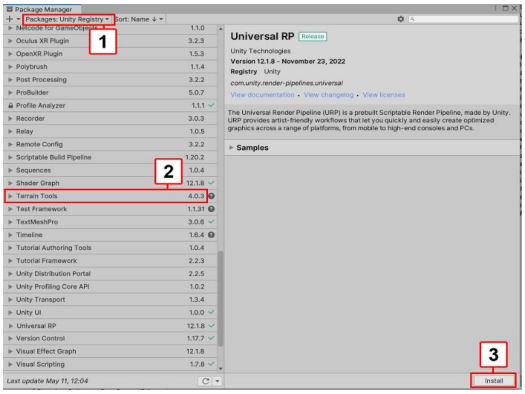
First of all, if you haven't installed the Unity Terrain Tools package, we advise you to do so.
This Unity package is free.
It makes it easier and faster to work on terrain.
The explanations in this chapter will be made using this package.

Here is the process to install the package:

Go to Window > Package Manager



5 -Choose Unity Registry (spot 1)
-Choose Terrains_Tools (spot 2)
-Press Install button (spot 3)

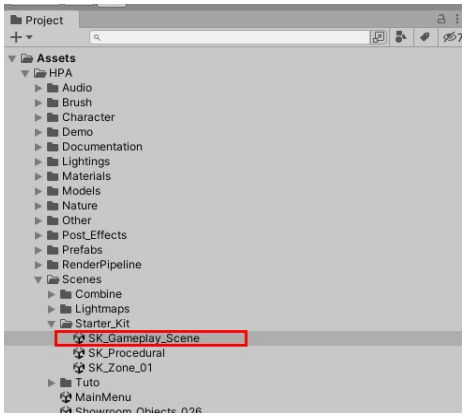


Use Starter kit scene

All the elements to start a new map are included in the starter kit. Starter kit use additives scenes setup.

Important:
This chapter does not explain the basics of using additive scenes.
If you want to learn how to work with additives scenes read Link

First, we will put in the hierarchy tab the 3 scenes of the starter kit:

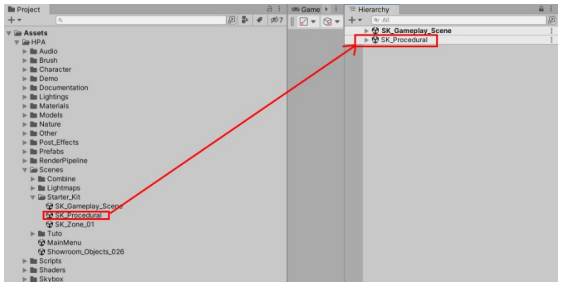


1 In Project tab double click on SK_Gameplay_Scene to open it (spot 1)

Assets > HPA > Scenes > Starter_Kit > SK_Gameplay_Scene

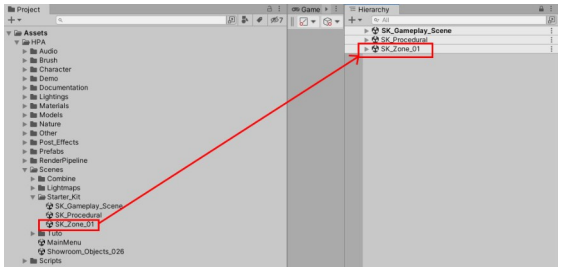
SK_Gameplay_Scene is open (spot 2)

2 In project settings tab:
Select scene SK_Procedural
From project tab drag and drop SK_Procedural into the hierarchy tab



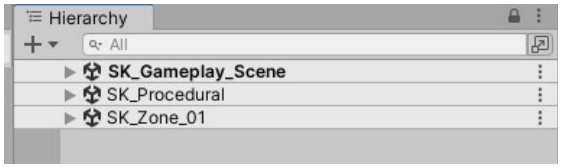
Assets > HPA > Scenes > Starter_Kit > SK_Procedural

3 In project settings tab:
Select scene SK_Zone_01
From project tab drag and drop SK_Zone_01 into the hierarchy tab



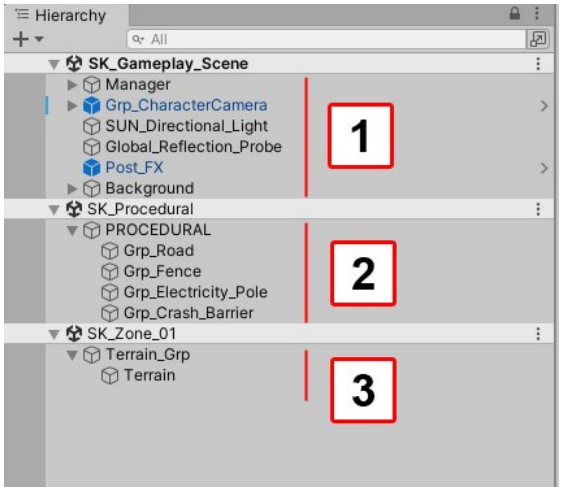
Assets > HPA > Scenes > Starter_Kit > SK_Zone_01

Now there are 3 scenes in hierarchy tab:
SK_Gameplay_Scene , SK_Procedural and SK_Zone_01 scenes



SK_Gameplay_Scene included : (spot 1)
-scripts
-character controller
-sun light
-clouds (skydome)
-background mountains

Important:
SK_Gameplay_Scene scene doesn't requires lightmaps calculation



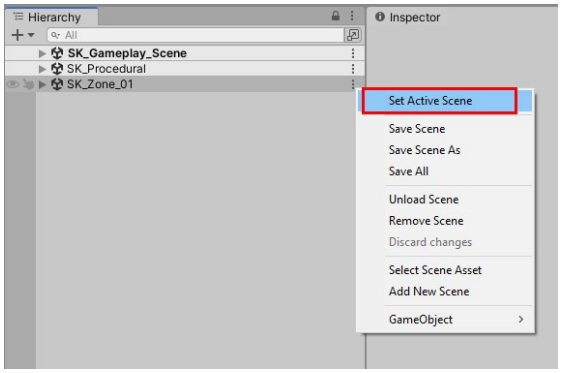
SK_Procedural : (spot 2)
This scene is used to add road, procedurally create fences and electricity pole.
This elements are create with a script included in the asset
To learn how to generate road, procedurally create fence and electricity pole with the script included in the asset read : Link

Important:
Procedural scene requires lightmaps calculation.

SK_Zone_01 : (spot 3)
This scene is used to add terrain, building prefabs and objects prefabs

Important:
SK_Zone_01 scene requires lightmaps calculation.

-In hierarchy tab select SK_Zone_01
-Mouse right click
-Choose Set Active scene

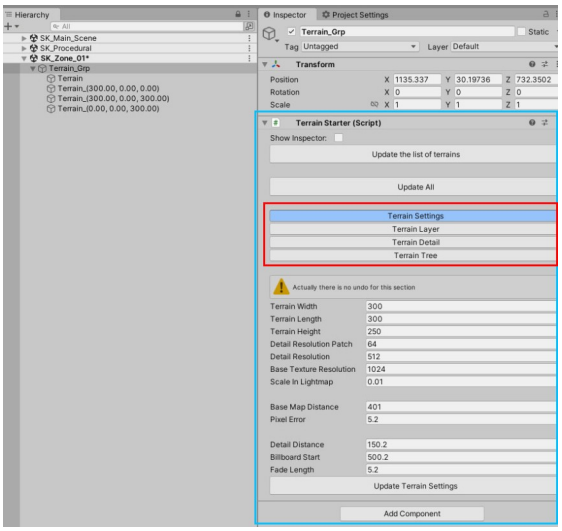


Important:
If SK_Zone_01 is set active, new terrain is created in SK_Zone_01

Info:
When a scene is set active scene its name in the hierarchy tab is in **bold**

Add terrain neighborhood

In hierarchy tab:
-select Terrain_Grp
SK_Zone_01 > Terrain_Grp

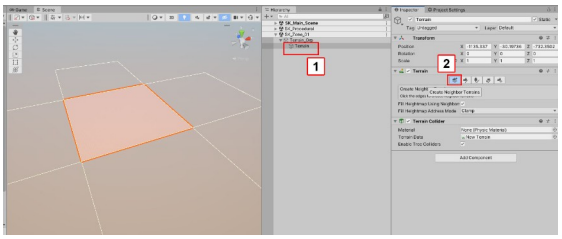


On Terrain_Grp there is a script named Terrain_Starter.cs
This script allows to configure terrains in a few clicks.

This script allows to setup:
-terrains parameters
-terrains textures layers
-terrains mesh details (grass, plants and stones)
-terrains trees

In Hierarchy tab:
In SK_Zone_01 scene select Terrain (spot 1)

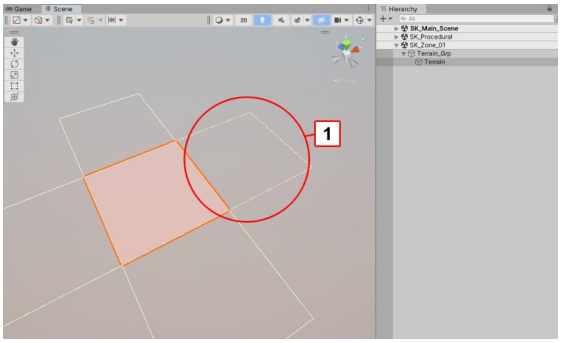
SK_Zone_01 > Terrain_Grp > Terrain



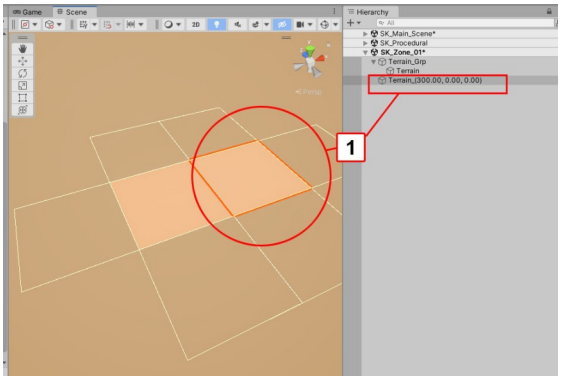
In Inspector tab:
Press Create Neighbor Terrains button (spot 2)

Important:
-Don't forget to set SK_Zone_01 Set Active Scene
If you want to learn how to set active a scene read Link

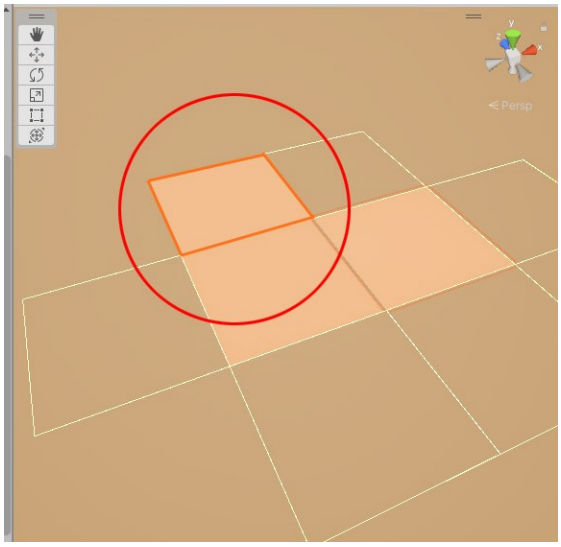
In Scene tab:
Click on the square to create a new terrain (spot 1)



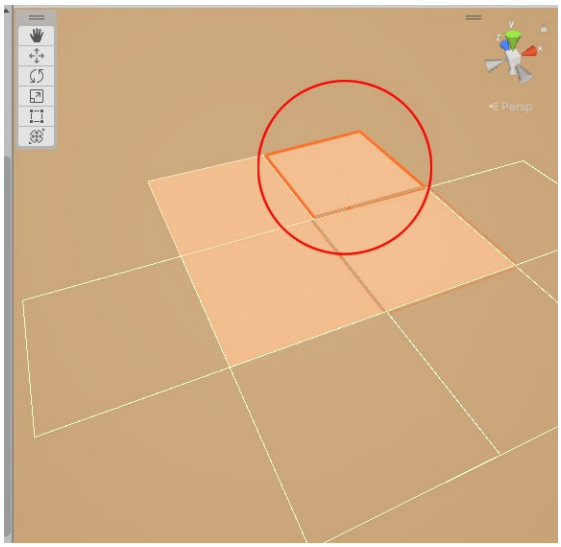
A new Terrain is added (spot 1).



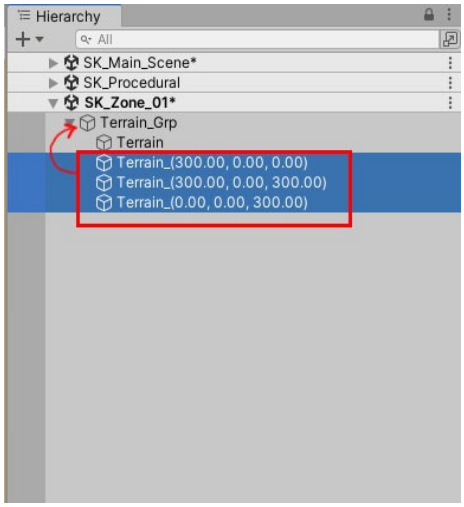
Create a new neighborhood terrain.



Create a new neighborhood terrain .



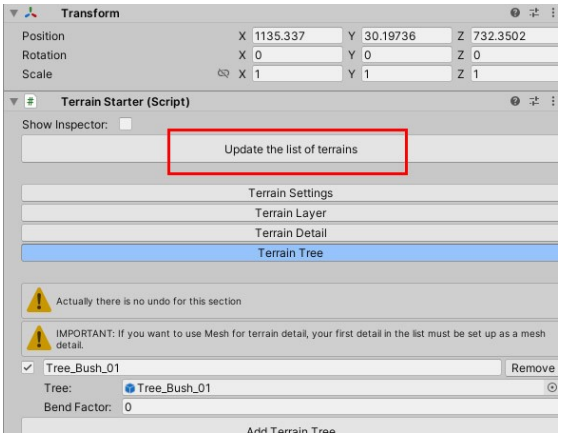
In hierarchy tab:
-add the 3 news terrains into Terrain_Grp



Update list of terrains

In hierarchy tab:
-Select Terrain_Grp

In Inspector tab:
-Press Update the list of terrains



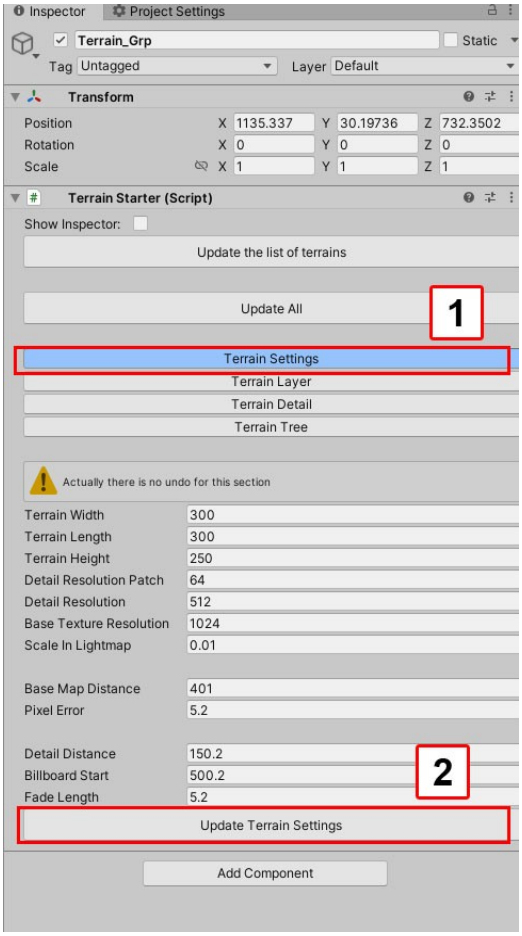
Very important:
Each time you add or remove terrain into Terrain_Grp you must press button Update the list of terrains

Setup terrain

In hierarchy tab:
-select Terrain_Grp

In Inspector tab:
-PressTerrain Settings button (spot 1).
-Press Update Terrain Settings button (spot 2).

Parameters of the terrains are modified

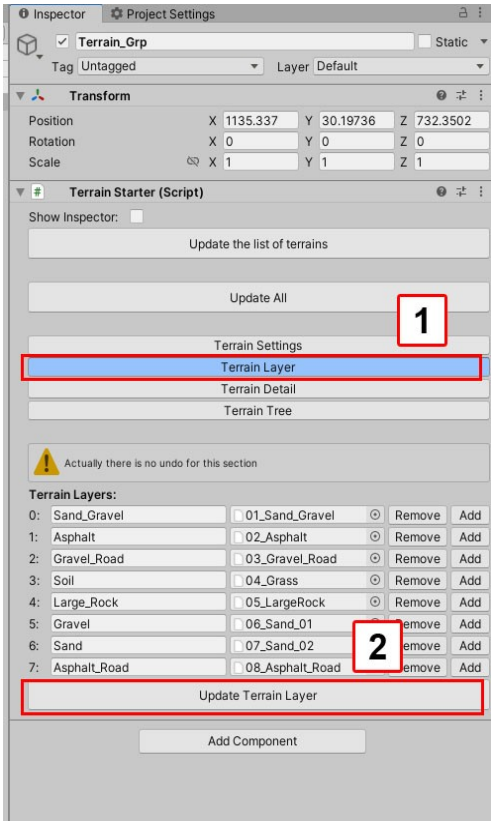


Important:
All the terrains that are in group Terrain_Grp will be modified by the script

In hierarchy tab:
-select Terrain_Grp

In Inspector tab:
-Press Terrain Layer button (spot 1).
-Press Update Terrain Layer button (spot 2).

Layers Textures are added to all the terrains included into Terrain_Grp

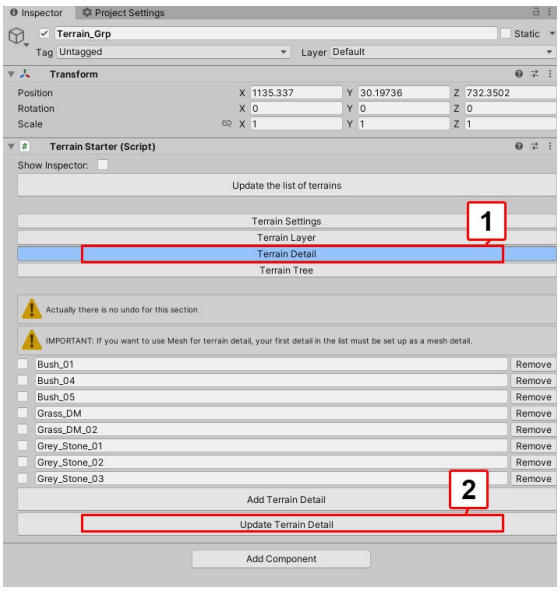


In hierarchy tab:
-select Terrain_Grp

In Inspector tab:
-Press Terrain Detail button (spot 1).

-Press Update Terrain Detail button (spot 2).

Mesh Details (grass, plants and stones) are added to all the terrains included into Terrain_Grp



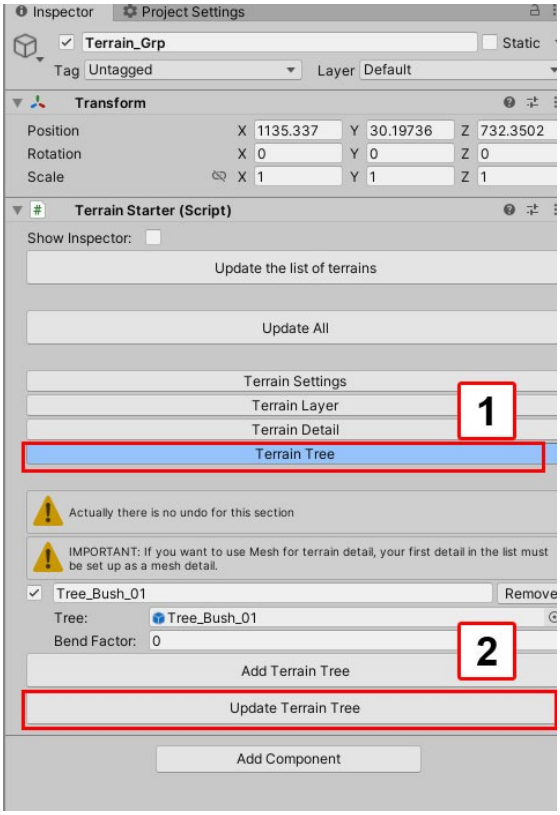
In hierarchy tab:
-select Terrain_Grp

In Inspector tab:
-Press Terrain Tree button (spot 1).

-Press Update Terrain Tree button (spot 2).

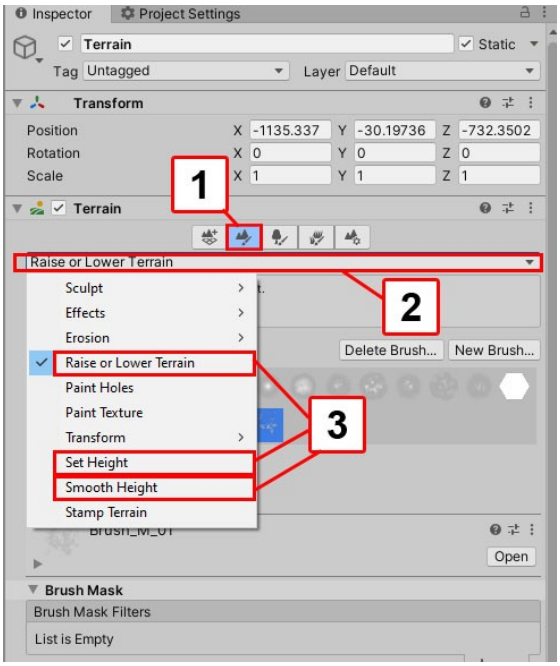
Tree (Bushes) are added to all the terrains included into Terrain_Grp

Terrain setup is Done



Terrain sculpting

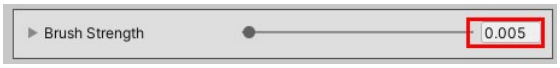
To sculpt the terrain:
-In hierachy tab select a terrain
-In Inspector tab select the second icon (spot 1).
-Click on the menu selection bar
-Choose Raise or Lower Terrain, Set Height or SmoothHeight



Learning how to use terrain sculpt tool is beyond the scope of this documentation but here some tips to help you have good result.

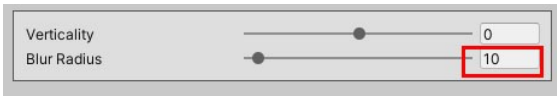
Raise or Lower Terrain:

For small details use low Brush Strength value (for example 0.005)



SmoothHeight

To smooth harder increase the Blur Radius value (for example 10 or 20)
Work with large brush size



Paint terrain texture

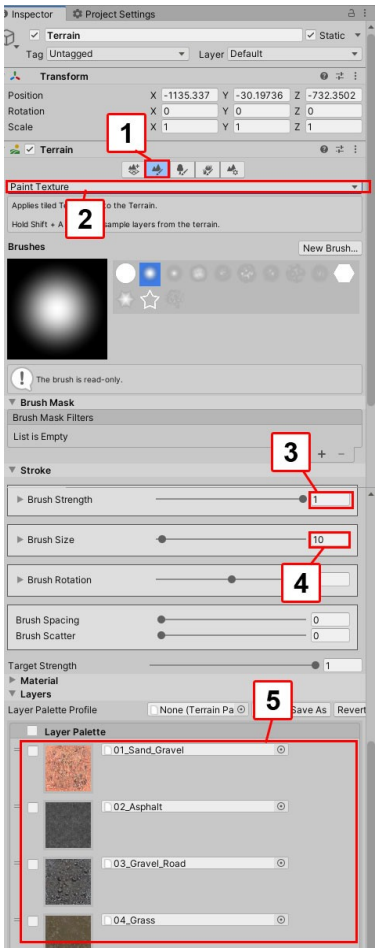
To paint a terrain:
-In hierachy tab select a terrain

-In Inspector tab select the second icon (spot 1).
-Click on the menu selection bar
Choose Paint Texture (spot 2).

-Set Brush Strenght to 1 (spot 3).

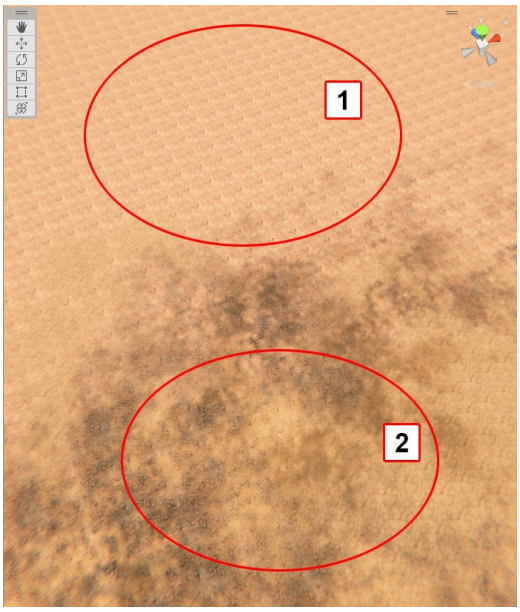
-Set Brush Size to 10 (spot 4).

-Select a texture to paint (spot 5)



Custom brush

A custom brush is included in the asset.
This custom brush is designed to reduce texture tile effect.



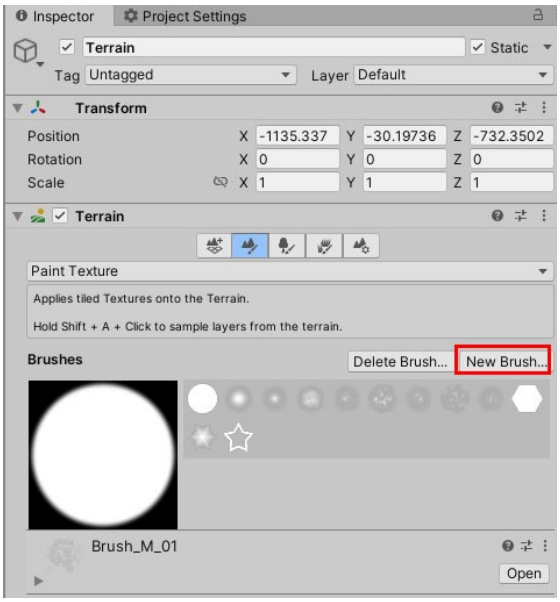
In the picture on the right:

Texture tile is visible (spot 1).
Texture tile is less visible (spot 2).

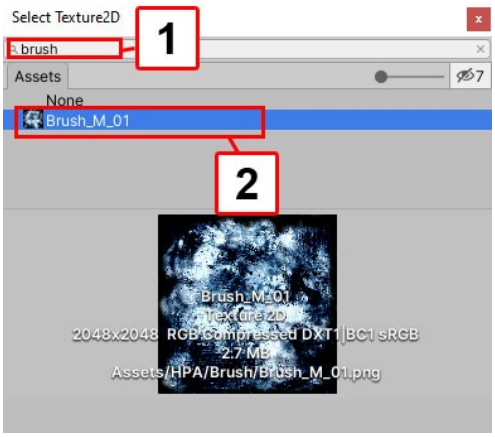
To install the brush:

If Brush_M_01 is not automatically installed:

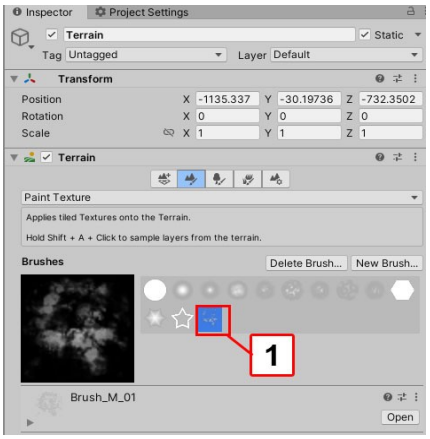
-Select a terrain
-In Inspector tab press New Brush button



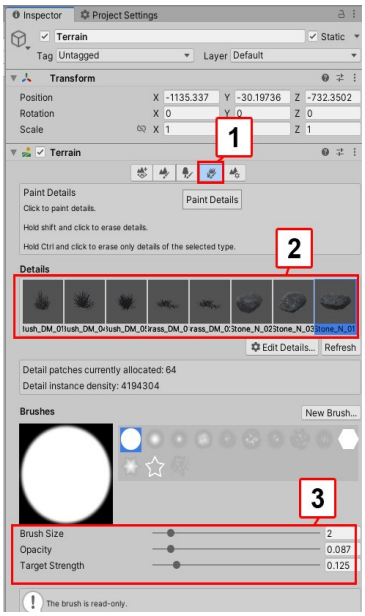
-In Text Field type “brush” (spot 1).
-Double click on Brush_M_01



A new brush is added in brushes Panel (spot 1).



Paint grass, plants and stones

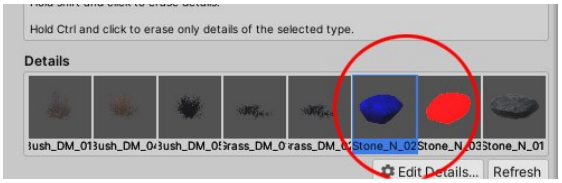


<u>To paint grass, plants and stones on terrains:</u>

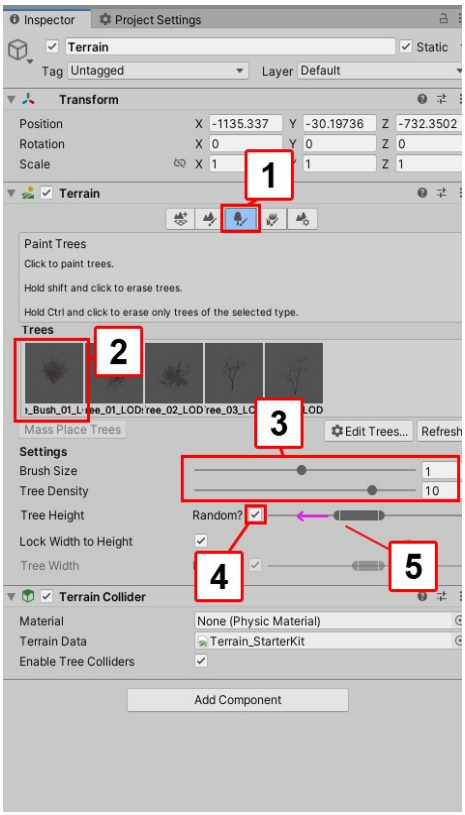
-In hierarchy tab select a terrain
-Press Paint Details button (spot 1)
-Select a MeshDetail (spot 2)
-Adjust the settings as needed (spot 3)
-Start painting mesh details on terrain

Important:
Each MeshDetail cast shadows.
If you put too many mesh details on the map, it could cause performance drops.
Stones meshDetails doesn't cast shadows.

Info:
It may happen that there is a bug displaying the icons, but this has no impact when painting the meshdetails in the scene.



Paint trees



<u>To paint trees on terrains:</u>

-In hierarchy tab select a terrain
-Press Paint Trees button (spot 1)
-Select Tree (spot 2)
-Set Brush size to 1
-Set Brush size to 10 (spot 3)
-Press Random checkbox to uncheck checkbox(spot 4)
-Press Random checkbox again
If random is on, each tree will be a slightly different size
-Pull the left end of the slider a little to the left (spot 5)

Important:
If you put too many trees on the map, it could cause performance drops

8 Prefabs

Prefabs Showroom

To discover all prefabs contained in this asset open scenes:

Assets > HPA > Scenes > Showroom > Showroom_Prefabs_Objects
Assets > HPA > Scenes > Showroom > Showroom_Prefabs_Buildings

Prefabs folder

The buildings prefabs and objects prefabs are in the folder Prefabs

Assets > HPA > Prefabs

Prefabs Tips

Unpack prefab

Prefabs unpack:
In hierarchy tab before Unity 2022.1 **it is not** possible to move elements into a prefab without having to unpack them first

But without breaking a prefab it is possible to:
- hide / unhide object included in the prefab
- move, rotate, scale an element included in the prefab

Info:
To keep a good optimization it is preferable not to unpack the prefabs (with the exception of building prefabs as explained later in this chapter)

In hierarchy tab in version 2022.1 + of Unity it is possible to move elements into a prefab without having to unpack them first

LODs

In the asset the prefabs that use LODs have the prefix **"LOD_"** at the beginning of their name.

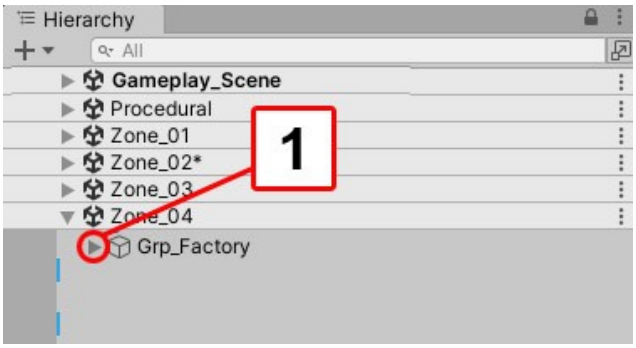
Info:
LOD means “Level of Details”.
Prefabs with different levels of detail included in a LOD appear or disappear depending on the distance from the camera.

Flickering effects on some objects.

If objects flickering it's probably because two similar objects exactly at the same position. To solve the issue move one of the two objects a little bit.

Open / close all element in group in one click:

In hierarchy tab if you want to open all the elements included into a group in one click:

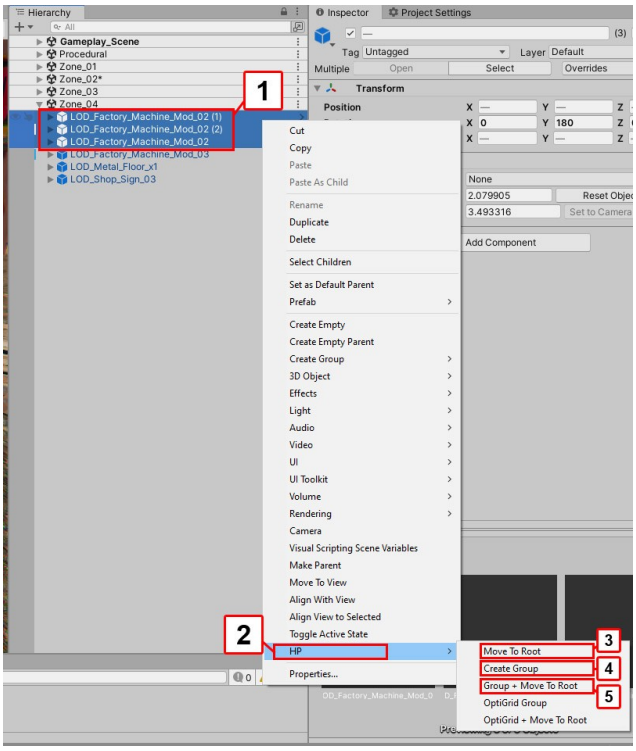


<u>In hierarchy tab :</u>
Hold Shift(Maj) + Left Ctrl + Alt click on the triangle icon near the group (spot 1)

Do the same thing to close all the elements included into a group in one click.

Create group (script)

A script is included in the asset to easily create group:



<u>To create a group:</u>
-In hierarchy tab select more than one elements
(spot 1)
-Mouse Right click
-In the menu choose HP(spot 2) then Create Group (spot 4)

If you want to create group and move to root of the scene choose create Group + Move to Root (spot 5)

If you want to move select elements to root without making a group choose Move to Root (spot 3)

Important:
The other choice in list:
Optigrid Group and Optigrid + Move to root are using for optimization.

For learn more information about optimization read chapter Link

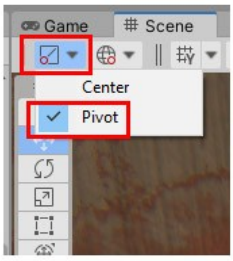
Snap Prefabs

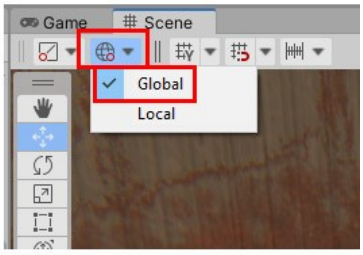
To place certain prefabs very precisely it is interesting to use the snap system

In the asset the prefabs that use the snap have the prefix **"SNAP_"** at the beginning of their name.

Important:
To use Snap don't forget to setup Snap settings
For more information about setup snap settings read:
Link

Important:
When you move an object with **"SNAP_"** prefix be sure to select:
- **Pivot** mode
- **Global** mode





Here the list of “SNAP” prefabs:

-Fences
Assets > HPA > Prefabs > Fence
-Walls
Assets > HPA > Prefabs > Walls
-Bastion
Assets > HPA > Prefabs > Bastion
-Metal stairs and walls
Assets > HPA > Prefabs > Stairs > Stairs_Metal > Metal_Floor

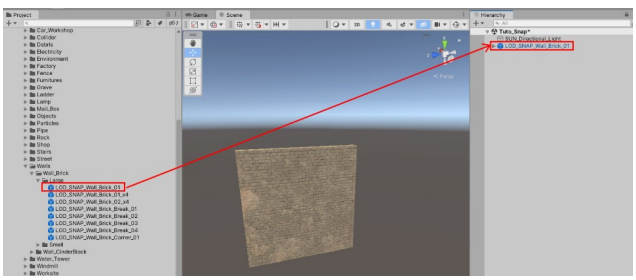
Snap Tutorial

1 In Project tab double click on Tuto_Snap to open it (spot 1)

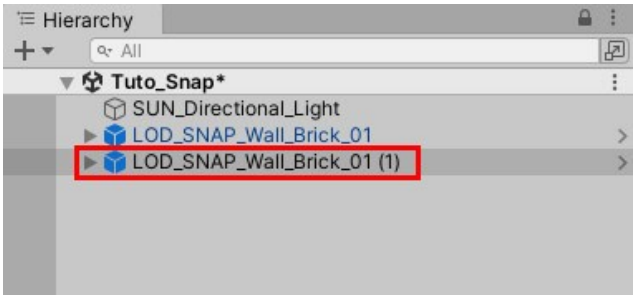
Assets > HPA > Scenes > Tuto > Tuto_Snap

2 From project tab drag and drop LOD_SNAP_Wall_Brick_01 in the hierarchy tab

Assets > HPA > Prefabs > Walls >Wall_Brick > Large > LOD_SNAP_Wall_Brick_01

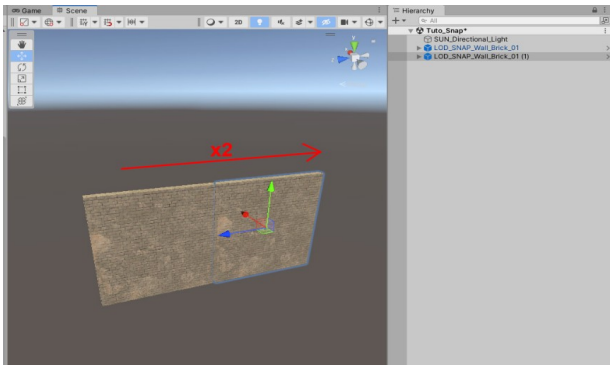


3 In hierarchy tab:
-Select LOD_SNAP_Wall_Brick_01
-Ctrl + D to duplicate



5 In scene view:

-Press W to activate Move tool
-While holding down the CTRL key pressed move LOD_SNAP_Wall_Brick_01 on Z axis twice.



Important:
When an object is moved while holding down the Ctrl key the snapping mode is used

The position of LOD_SNAP_Wall_Brick_01 (1) *must be*
X: 0
Y: 0
Z: -3

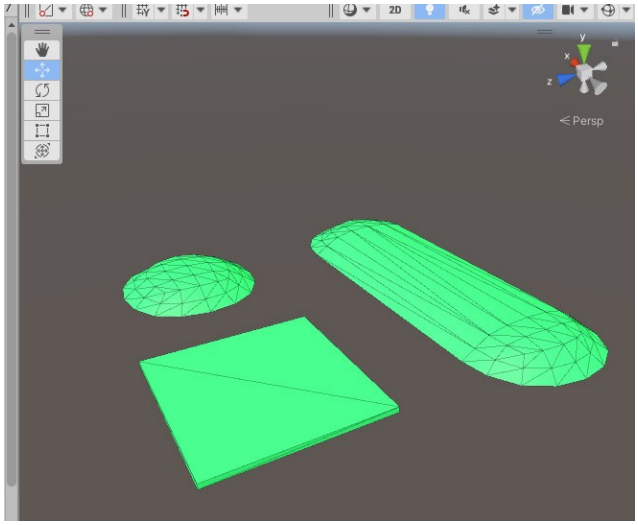
Procedural objects

Roads, utility poles and some fences are not prefabs
This elements are created with a script incuded in the asset.

To learn how to generate road, fence and electricity pole
Link

Colliders

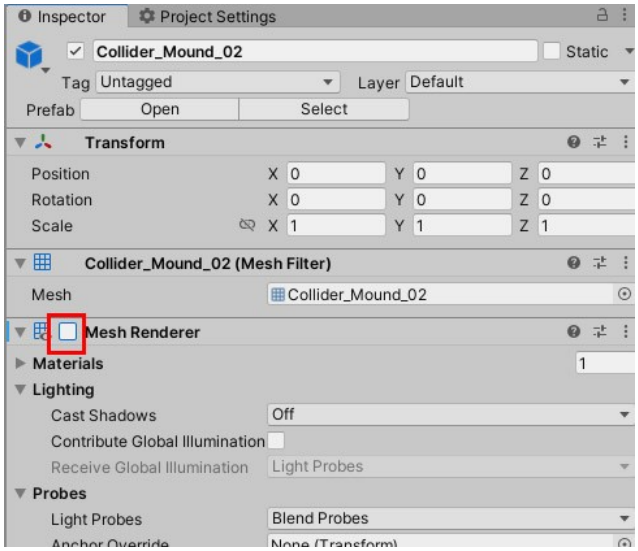
In some cases, it may be better to remove the colliders of certain objects and replace them with another collider.
For example of the case of a pile of objects fallen on the ground.



The special colliders can be found in the following folder:

Assets > HPA > Prefabs > Collider

To make the collider active but invisible:
-Uncheck MeshRenderer checkbox

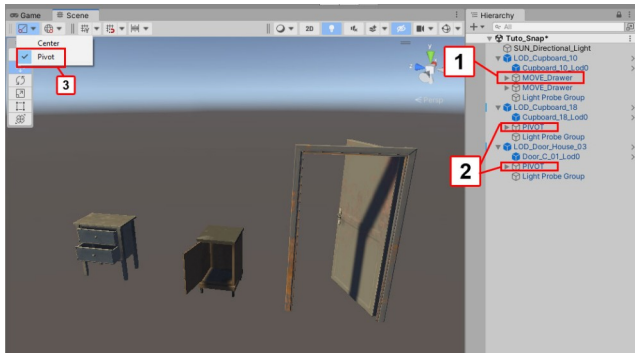


Prefabs in details

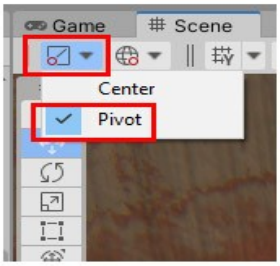
Doors and Furnitures Drawers

In the hierarchy tab:
-to open or close the drawer of furniture use the MOVE group (spot 1)
-to open or close a cabinet door use the PIVOT group (spot 2)

-to open or close a door use the PIVOT group (spot 2)

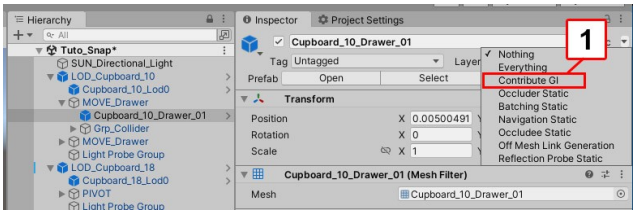


Important:
Before rotate PIVOT group don't forget to choose Pivot Mode



Important:
Drawers and doors **are not** included in lighmaps.
Contribute GI is not check (spot 1)

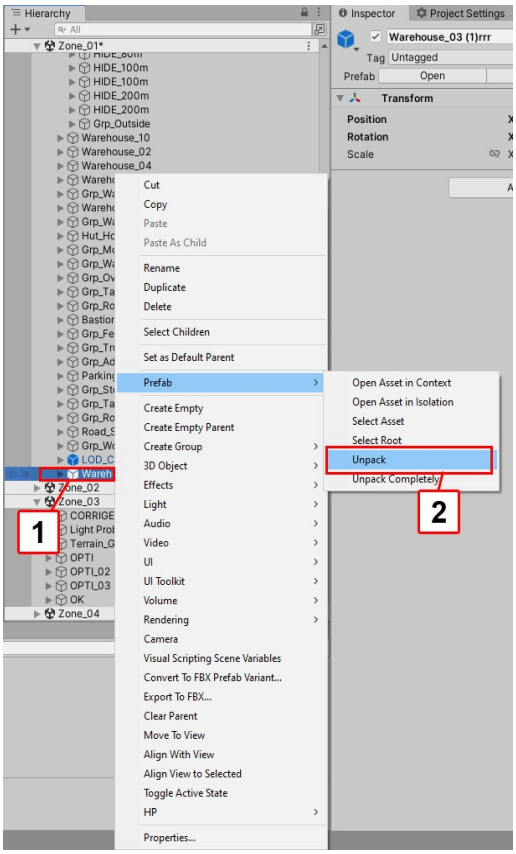
Drawers and doors use lightprobs.
For more informations about lightprobs read Link



Buildings

If you are using unity 2021 version it's best to unpack building prefabs so you can easily move or delete objects into the building
To unpack a prefab:

-In hierarchy tab select a building prefab (spot 1)
-Mouse Right Click
-Prefab > Unpack (spot 2)



<u>Are included into the buildings:</u>

-Buildings floor, walls and roofs prefabs

-One or more reflections probs
For more informations about reflection Probs read Link

-LightProbs
For more informations about Lights Probs read Link

-EyeAdaptation (Local Post Fx):
EyeAdaptation simulates the adaptation of the pupil when entering or leaving a building. It's a local Post FX.
For more informations about local Post FX read Link

Important:
In building prefabs Eye Adaptation system is disabled.
To use Eye adaptation:
In building prefabs unhide Grp_EyeAdaptation

-Lights
For more informations about lights read Link

-Group named HIDE.
Through a script this objects included into the group are hide or unhide depending on the distance of the camera.
This optimization script is included in the asset
For more informations about optimization script read Link

Important:
There are two versions of building prefabs:
-The first version: with optimisation scripts
If you want to use the optimization script, use these prefabs.
HPA > Prefabs > Buildings > With_Optimisation

-The second version: without optimisation scripts
If you don't want to use the optimization script, use these prefabs
HPA > Prefabs > Buildings > Without_Optimisation

Particles

The particles prefabs are in folder Particles

Assets > HPA > Prefabs > Particles

Through a script particles are hide or unhide depending on the player distance .
For more informations about optimization script read Link

Environment

Prefabs Included in folder Environment are designed to recreate far away elements like clouds, and mountain.

Assets > HPA > Prefabs > Environment

These elements are ready to use in the starter kit
For more informations about the starter kit read Link

Pipe

The pipe prefabs are in folder Pipe

Assets > HPA > Prefabs > Pipe

In prefabs folder pipes are only available in one color. This is to avoid too many prefabs.
If you want another color of pipes:
-In project bar open folder _Drag_n_Drop

Assets > HPA > Materials > _Drag_n_Drop > Pipe

-From project tab drag and drop material to the pipe in scene tab.

9 Roads, electricity Pole and procedural fence

Overview

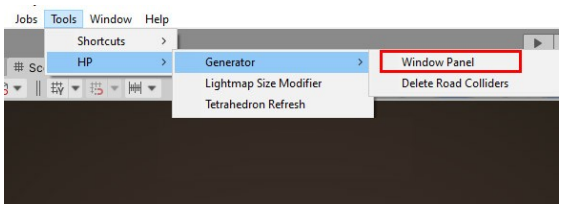
A script allowing to create procedural elements is included in the asset

Script allows to create:
-Roads on terrain
-Electricity pole with procedural wires
-Procedural fences
-Crash Barrier

Infos:
Objects created with the script are not prefabs. Added this objects increase the size of scenes more than prefabs.
It is better not to copy/paste these objects.

Setup

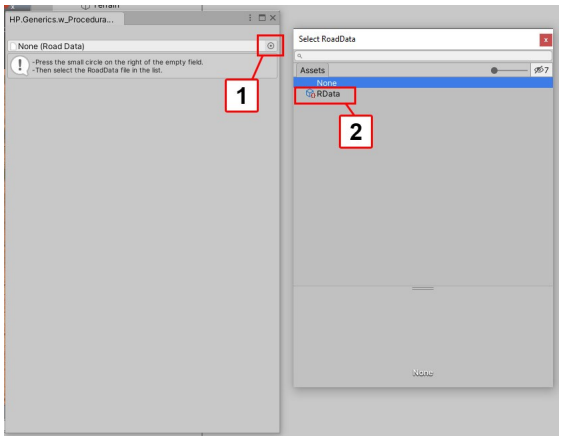
Go to Tools > HP > Generator > Window Panel



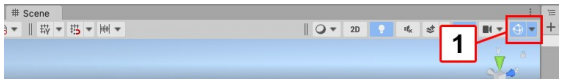
-Click on circle icon (spot 1)

-Choose Rdata (spot 2)

Info:
This setup should only be done the first time the panel is opened



In scene view:
-click on gizmos icon to activate gizmos



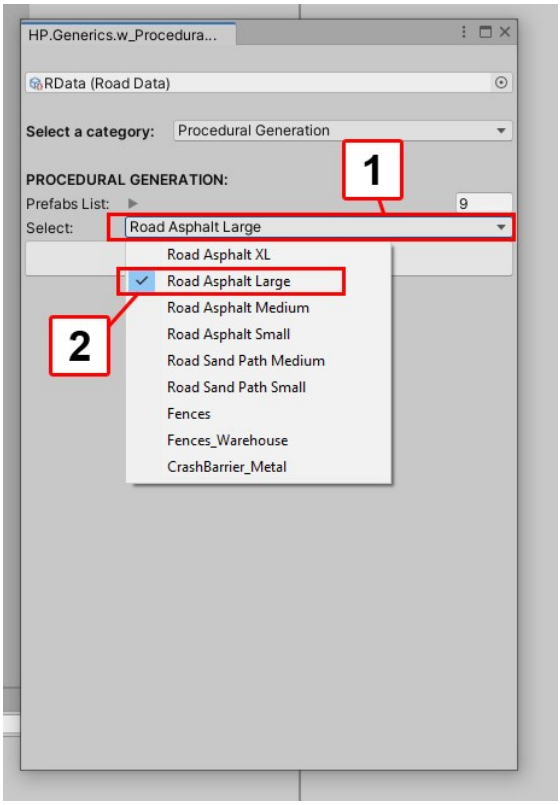
Create roads

In Project tab double click on Tuto_Procedural scene to open it.

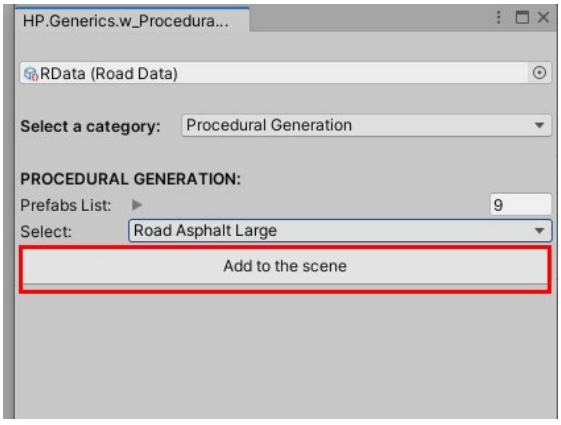
Assets > HPA > Scenes > Tuto > Tuto_Procedural

Into the procedural panel:

-Click on select bar (spot 1)
-Choose Road Asphalt Large (spot 2)

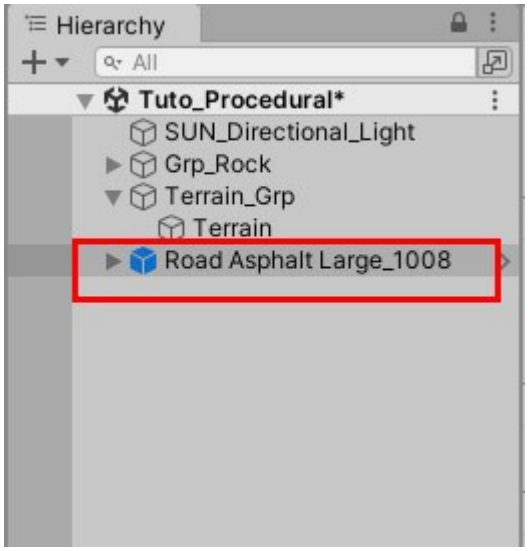


-Press Add to the scene

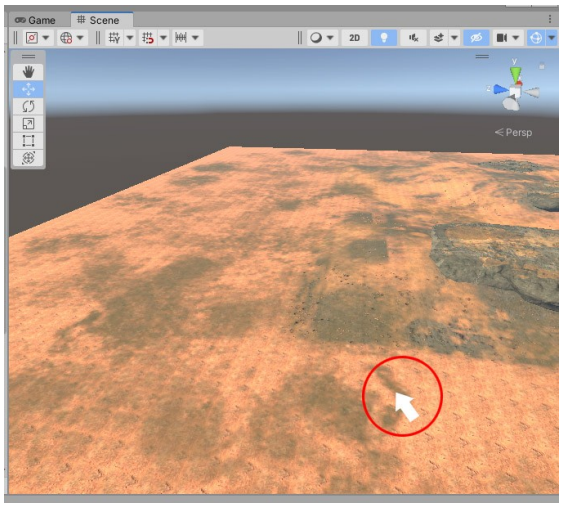


In hierarchy tab:
A new road is created.

-Select the new road

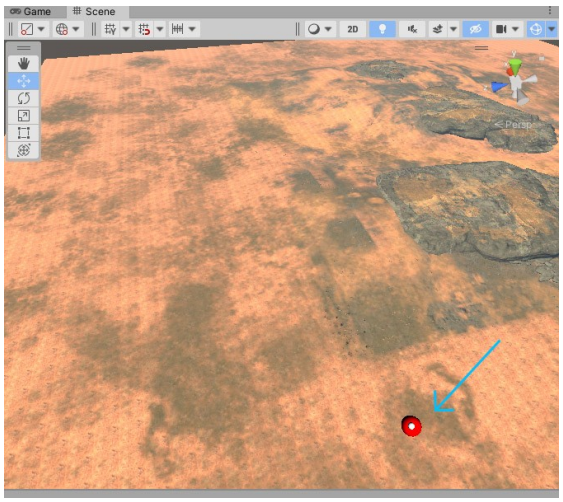


-Position the mouse over the terrain where you want to start the road



Into scene view:
Mouse right click to activate scene view
Do this only the first time you create a point n
-Press keyboard shortcut N

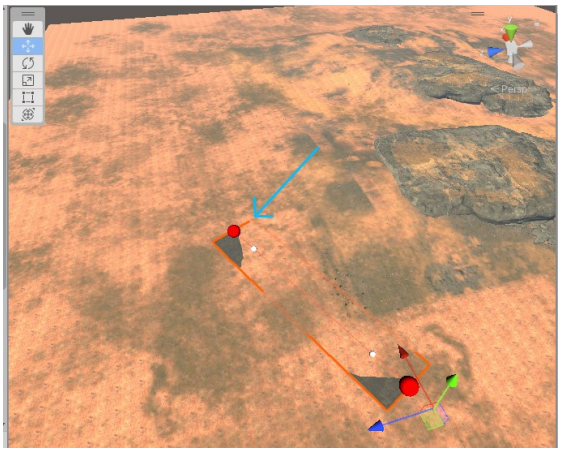
The first point is created



Important:
If the first point doesn't appear:

-Verify that gizmos are activate in scene tab
-In scene view select the terrain
-In hierarchy tab select again the new Road
-Press keyboard shortcut N

-Position the mouse over the terrain where you want to create the second point.

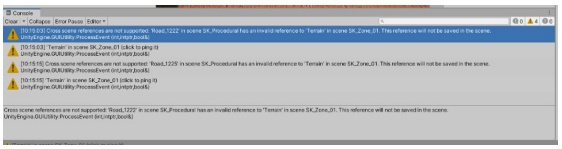


Don't forget:
To create a point, the road **must be selected** in the hierarchy tab.

-Press keyboard shortcut N
The second point is created

Info:
if you want to undo:
-Press keyboard shortcut Ctrl+Z

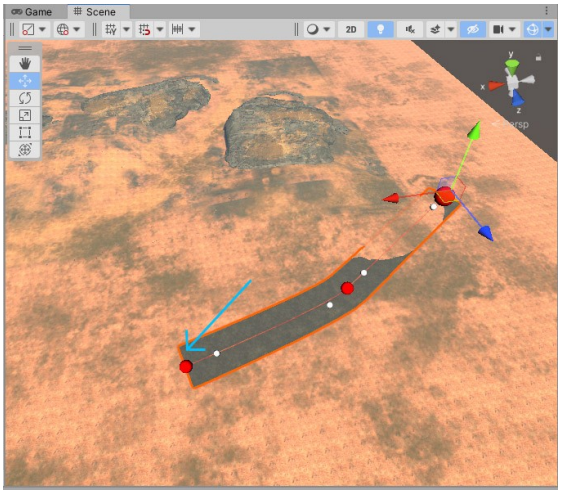
Info:
During roads creation you may have this following warning:
Cross scene references are not supported



Do not take this warning into account.

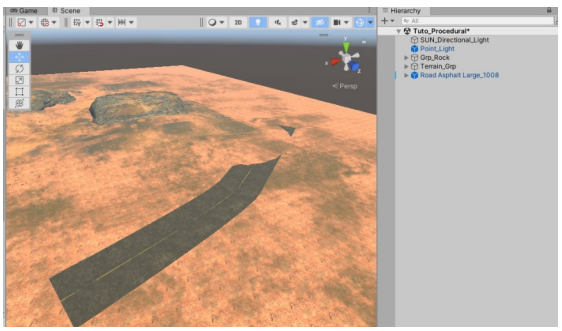
-Position the mouse over the terrain where you want to create the third point.

-Press keyboard shortcut N
The third point is created



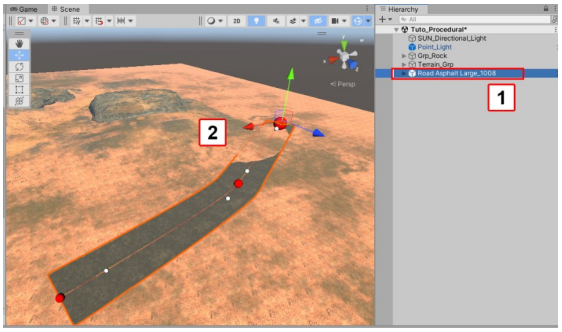
-In hierarchy tab unselect Road Asphalt Large

Road points are no longer selectable



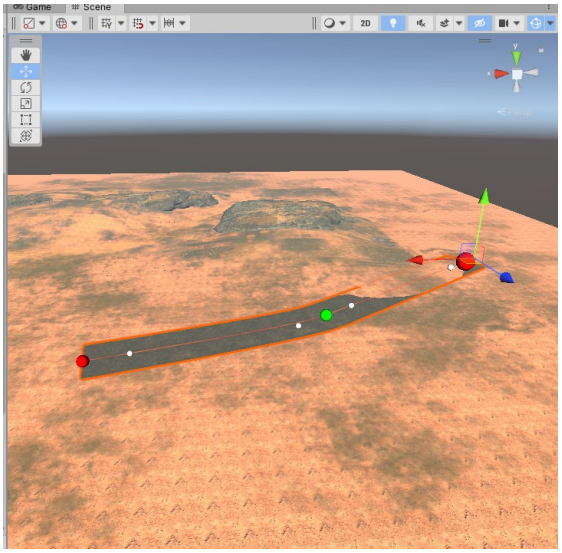
-In hierarchy tab select Road Asphalt Large (spot 1)

Road points are selectable (spot 2)



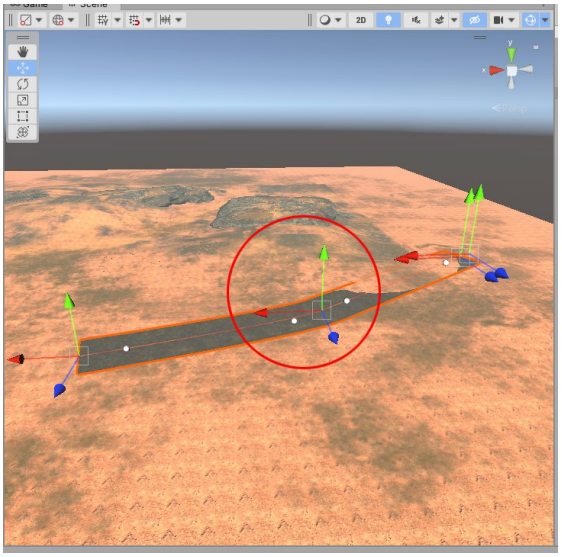
-Click on the second point to select it

Point turns green

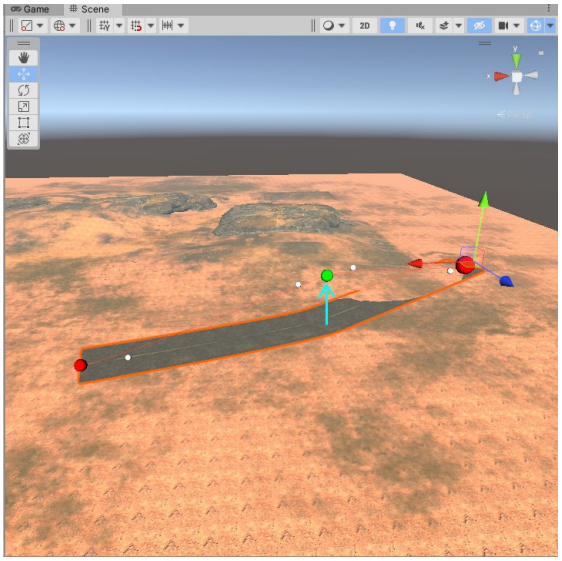


-Hold Shift (Maj)

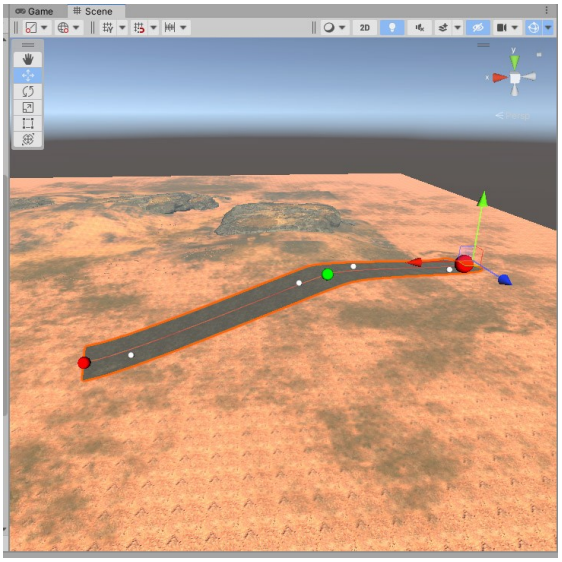
X Y Z translation handles appear



While holding down the Shift (Maj) move handle on Y axis.



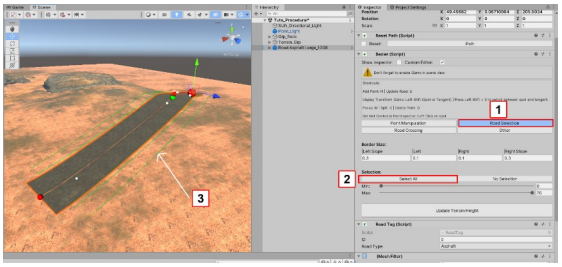
-Press U to update the Road



-In Inspector tab
Press Road Selection button (spot 1)

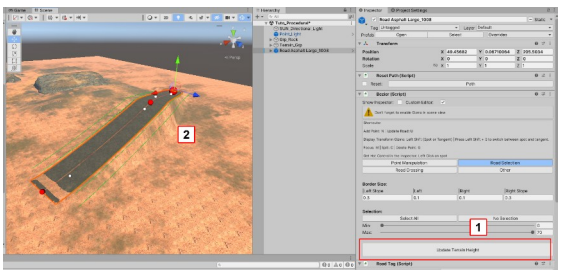
Press Select All button (spot 2)

Green lines appear on the sides of the road (spot 3)



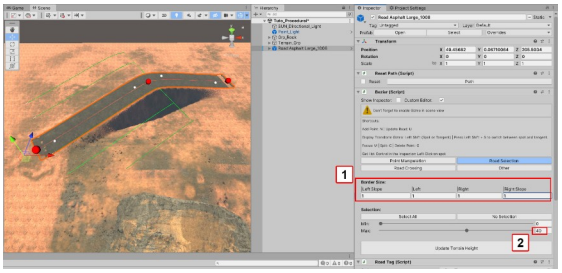
-In Inspector tab
Press Update Terrain Height button (spot 1)

The terrain has adapted to the shape of the road (spot 2)



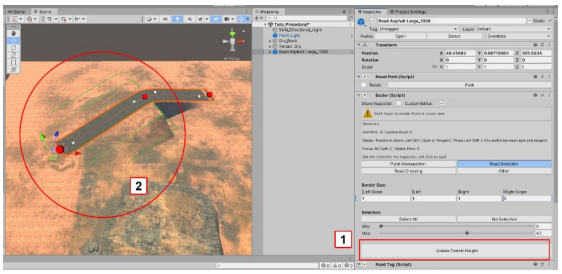
-In Inspector tab
In Border size section: (spot 1)
set Left slope to 1
set Left to 1
set Right to 1
set Right Slope to 1

In Selection section: (spot 2)
set Max to 40 so that only half of the road will be affected



-In Inspector tab
Press Update Terrain Height button (spot 1)

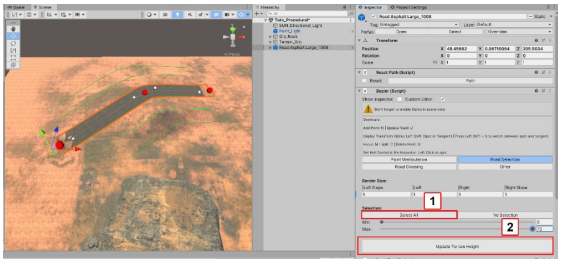
Transition between terrain and road is smoother but only at the beginning of the road (spot 2)



-In Selection section:
Press Select All button (spot 1)

-In Inspector tab
Press Update Terrain Height button (spot 2)

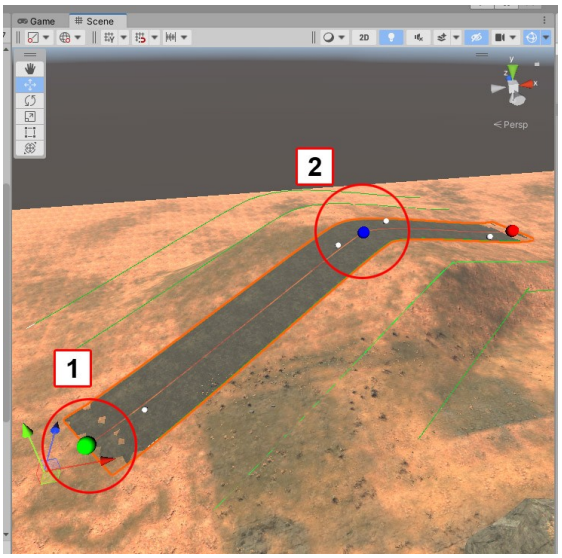
Transition between terrain and road is smoother all along the road



To select several points at the same time

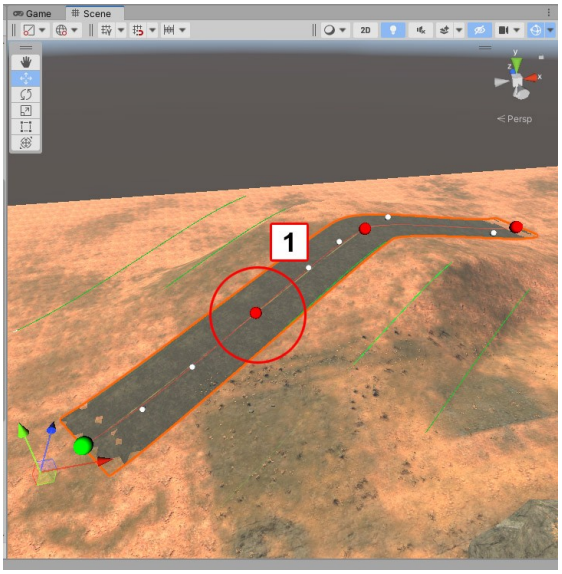
-Select a Point (spot 1)
Point turns green

-While holding down the Left Ctrl select a second point
Second point turns blue (spot 2)



-Press C to split

A new point is created between the 2 points (spot 1)



-Select the new point.
-Press G to delete the point

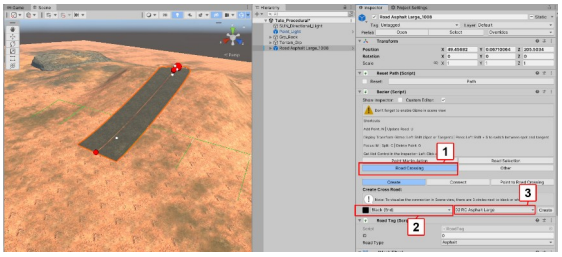
Important:
Don't forget to press U when you want to update the shape of the road

Create crossroad

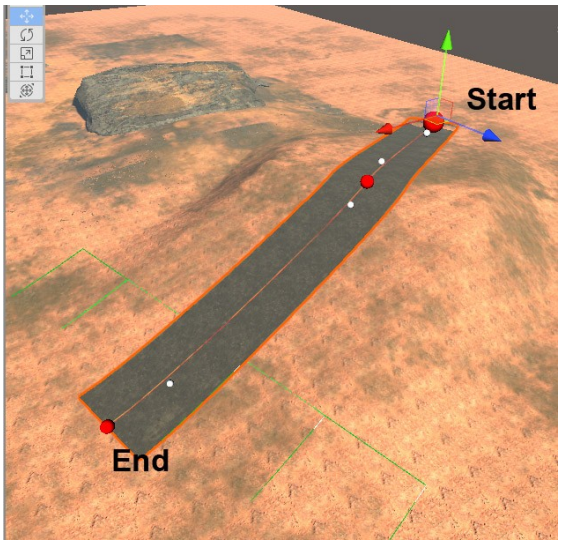
-In Inspector tab
Press Road Crossing button (spot 1)

-Choose End (spot 2)

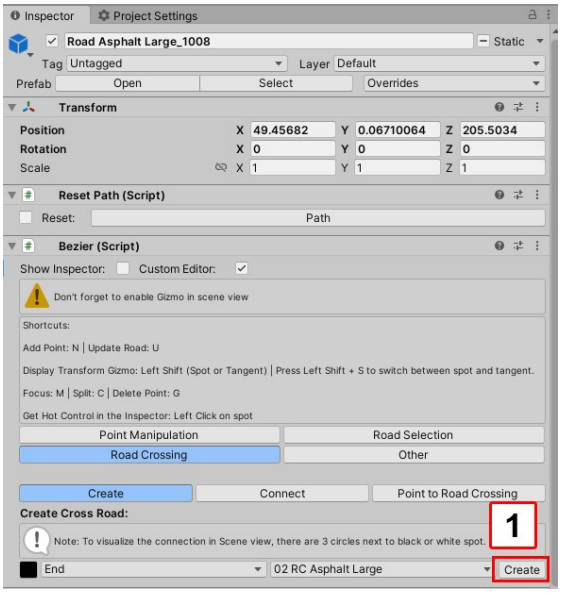
The type of road is automatically configured to match the road type (spot 3)



Info:
the dot that indicates the start of the road is bigger than the dot that indicates the end of the road

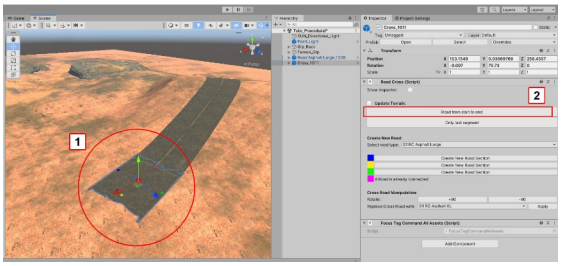


-In Inspector tab
Press Create button (spot 1)



A new crossroad is created (spot 1)

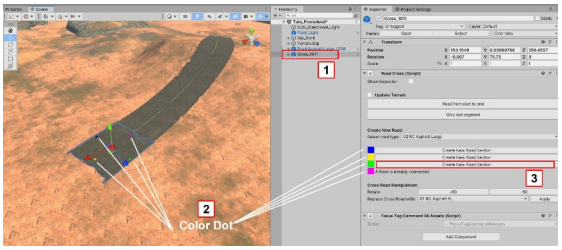
-Press Road From Start to End button to adapt the terrain to the new crossroad (spot 2)



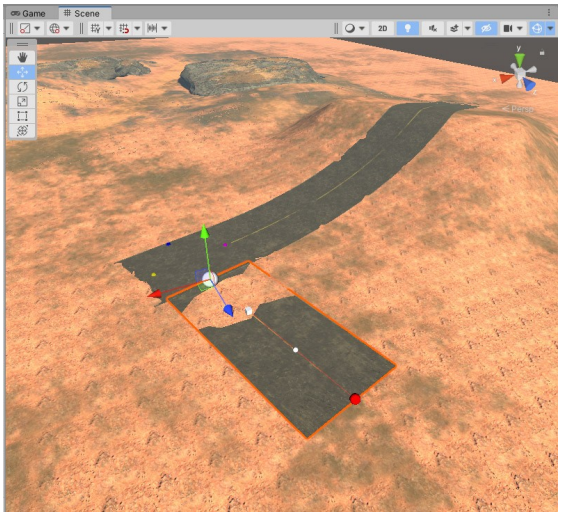
-In hierarchy tab select the crossroad (spot 1)

A different color indicates each side of the crossroads (spot 2)

-Press Create new road section in front of the green square (spot 3)

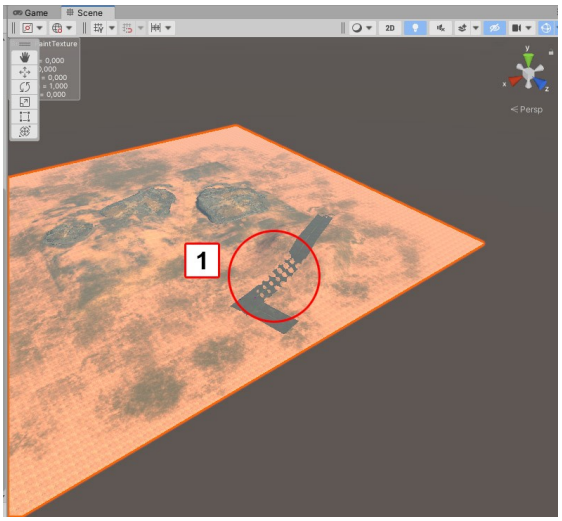


A new road is created from the crossroads



Road terrain texture

As the camera move away the definition of the terrain decreases. The terrain no longer fits perfectly with the road. To solve this problem we will paint texture on the ground under the road.



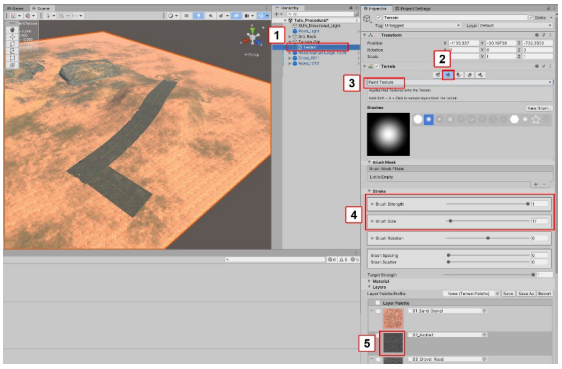
In hierarchy tab :
Select Terrain (spot 1)

In Inspector tab:
-Press button Paint Texture (spot 2)

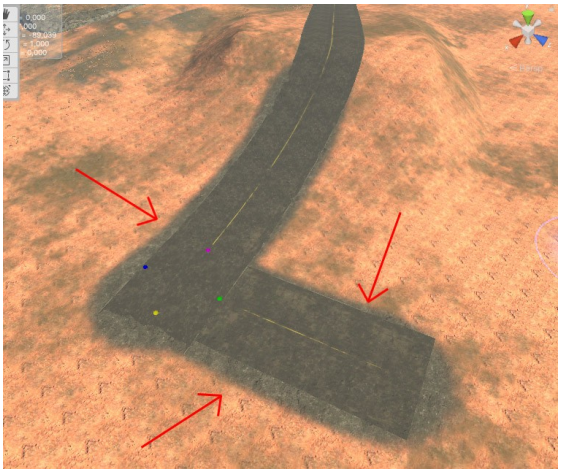
-Choose Paint Texture (spot 3)

-Set Brush Strenght to 1
-Set Brush Brush Size to 17 (spot 4)

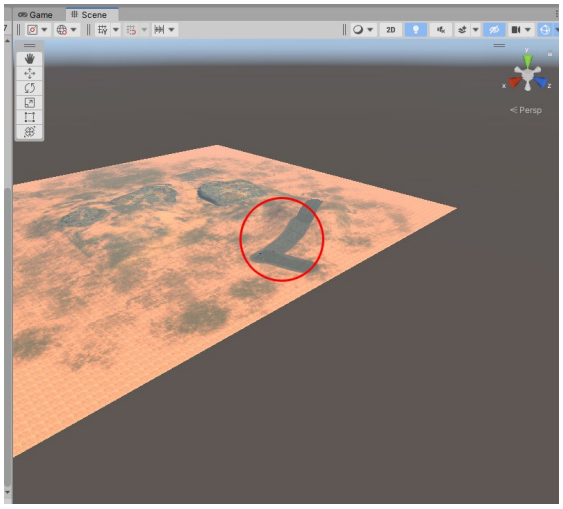
-Select 08_Asphalt_Road texture (spot 5)



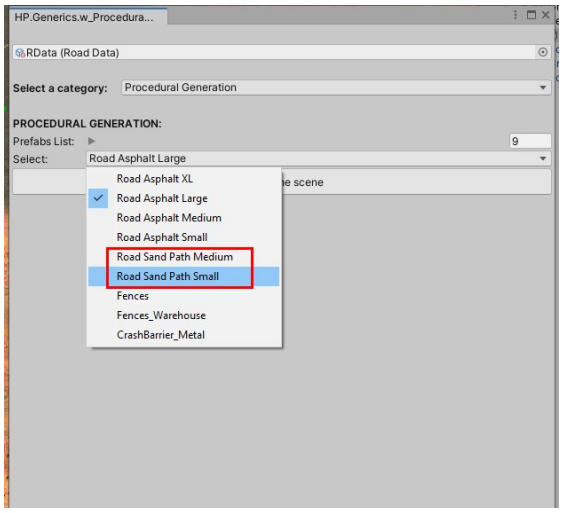
Paint the asphalt texture under the road



Now even when the camera moves away, the road remains visible.



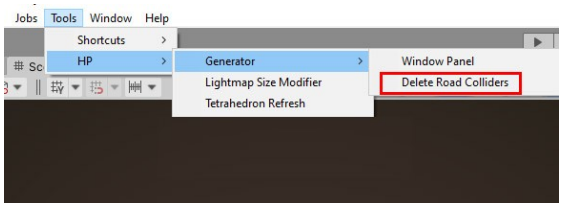
Info:
If you create a pathway with the preset road sand path:
-use the terrain texture 01_Sand_Gravel, 06_Sand_01 or/and 07_Sand_02 to paint the terrain



Road colliders

To adapt the terrain to the road, colliders are created.
Once the road is adapted to the terrain these colliders are no longer useful.
It is necessary to delete them.
If you do not remove them, it is possible to have invisible collisions at certain places of the terrain

Go to Tools > HP > Generator > Delete Road Colliders



All the roads colliders are remove.

Important:
If you modify the roads again, new colliders will be created.
Don't forget to delete them.

Modify the curve of a road

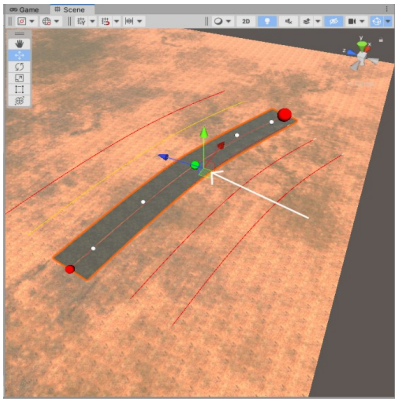
In Project tab double click on Tuto_Procedural_02 scene to open it.

Assets > HPA > Scenes > Tuto > Tuto_Procedural_02

Very Important:

Don't select the road into the hierarchy tab.
This can cause problems when trying to access the curve handles
Select the road into the scene tab.

-In the scene tab select Road Asphalt Large_1018

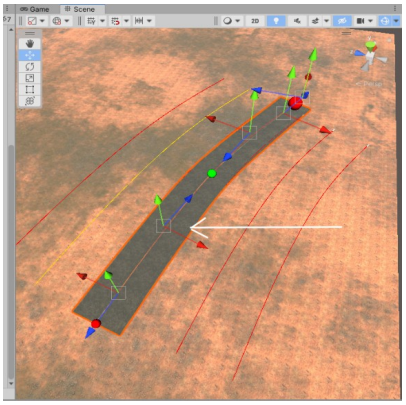


-Select the point of the road as indicated on the image on the right

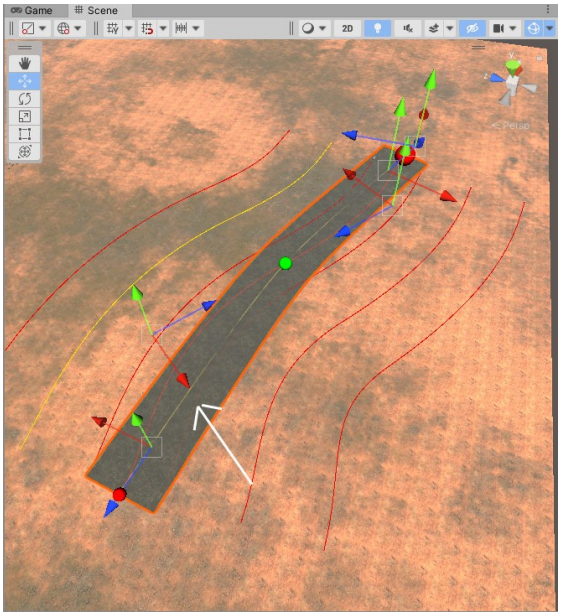
Point turns green

-While holding down the Shift (Maj) press S then release S

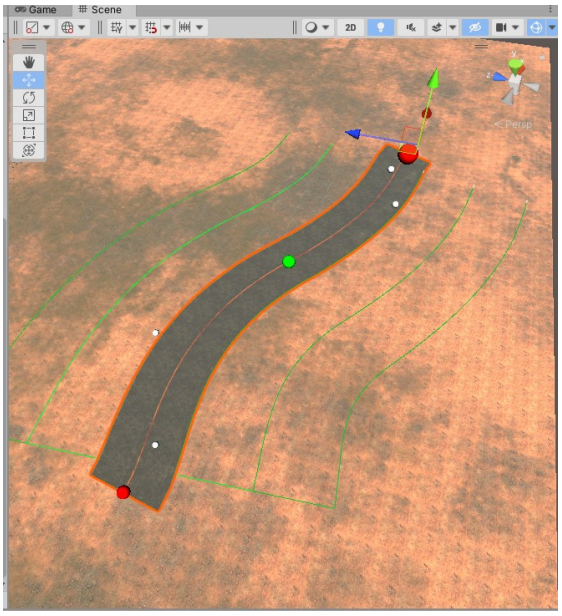
New handle appears



-While continuing to hold down the Shift (Maj), move red axis as indicated on the image on the right



-Press U to update the Road



You have learned the main techniques for creating roads.

To finish as a reminder
Here is the list of keyboard shortcuts:

Split curve: select 2 points then press C

Delete Point: select point then press G

Active Handle: While holding down the Shift (Maj) press S then release S
While continuing to hold down the Shift (Maj), move the axis you want.

To select several points
-Select a Point
-While holding down the Left Ctrl select a second point

Advanced Techniques

In this part we will see advanced techniques for editing routes.

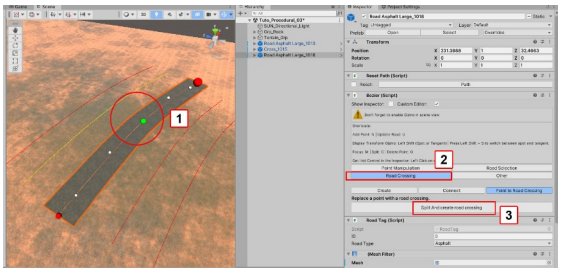
Create a crossroad from a point

In Project tab double click on Tuto_Procedural_03 scene to open it.

Assets > HPA > Scenes > Tuto > Tuto_Procedural_03

-In the scene tab:
select Road Asphalt Large_1018

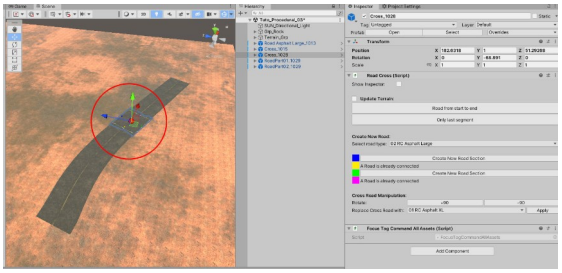
-Select the point in the middle of the road curve (spot 1)
Point turns green



-In Inspector tab:
Press Road Crossing button (spot 2)

-In Inspector tab:
Press Split And create road crossing button (spot 3)

A new crossroad is created

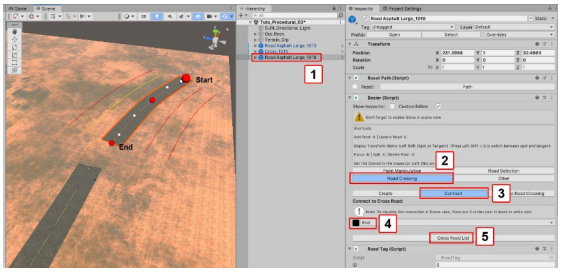


Connect a road with a crossroad

In Project tab double click on Tuto_Procedural_04 scene to open it.

Assets > HPA > Scenes > Tuto > Tuto_Procedural_04

-In hierarchy tab select Road Asphalt Large_1018 (spot 1)



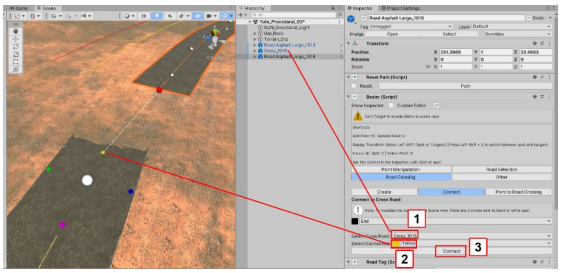
-In Inspector tab:
Press Road Crossing button (spot 2)

Press Connect button (spot 3)
Choose End button (spot 4)

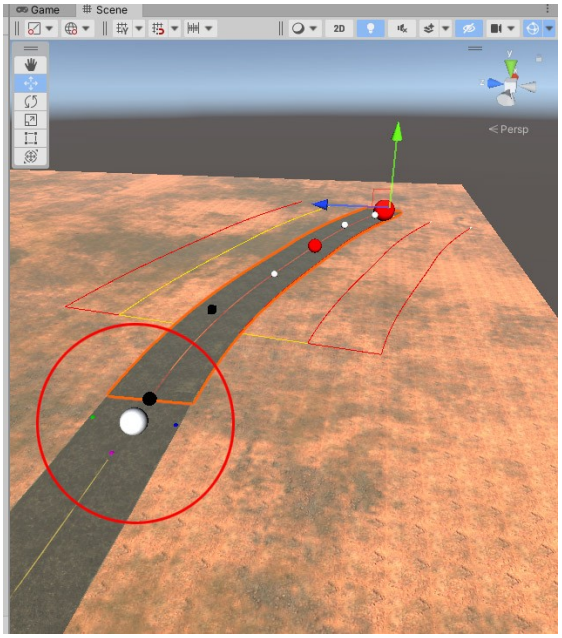
Press Cross Road List button (spot 5)

-In Inspector tab:
Choose Cross 1015 (spot 1)
Choose Yellow Dot (spot 2)

Press Connect button (spot 3)



Road is now connected with crossroad



Align points on curves

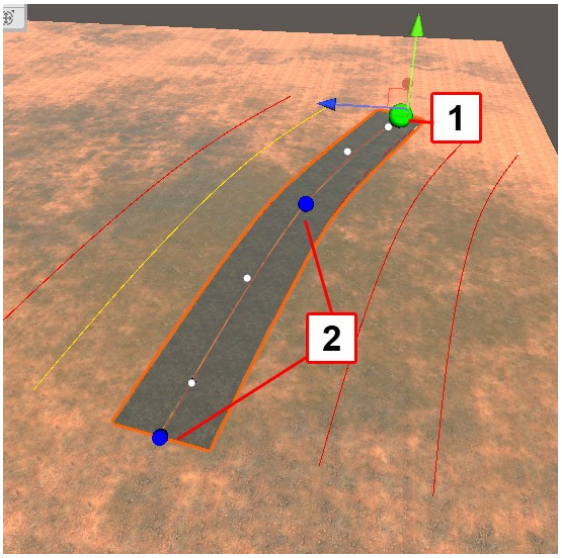
In Project tab double click on Tuto_Procedural_03 scene to open it.

Assets > HPA > Scenes > Tuto > Tuto_Procedural_03

-In hierarchy select Road Asphalt Large_1018

In scene tab:
-Select the first point of a curve (spot 1)

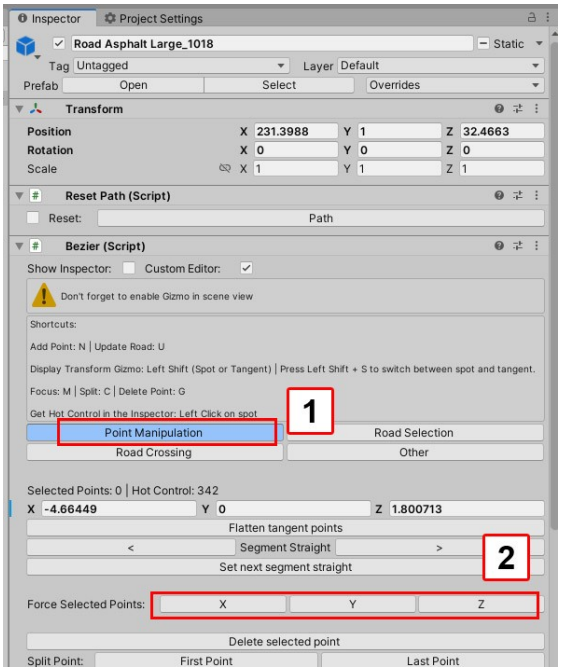
-While holding down the Left Ctrl select the other points (spot 2)



In Inspector tab
Press Point Manipulation button (spot 1)

-Press Z button to align points on Z axis (spot 2)

-Press U to update the Road



Create fences

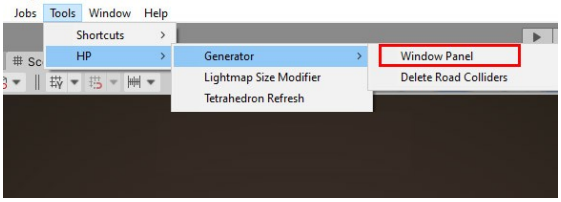
First if you have not setup the procedural script read this part Link

In Project tab double click on Tuto_Procedural_05 scene to open it.

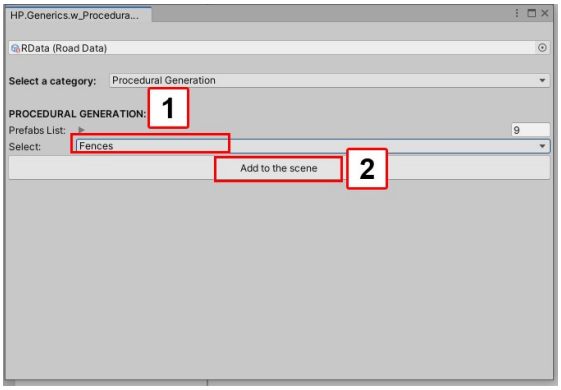
Assets > HPA > Scenes > Tuto > Tuto_Procedural_05

Important:
Don't forget to enable gizmos in scene mode if you don't.

Go to Tools > HP > Generator > Window Panel



-In select List Choose Fences (spot 1)



Note:
Fences_Warehouses works the same way as Fences

-Press Add to the scene button (spot 2)

The curve system for creating fences is the same curve system for creating roads.

For more informations about how to create roads Link

You can use the same keyboard shortcuts:

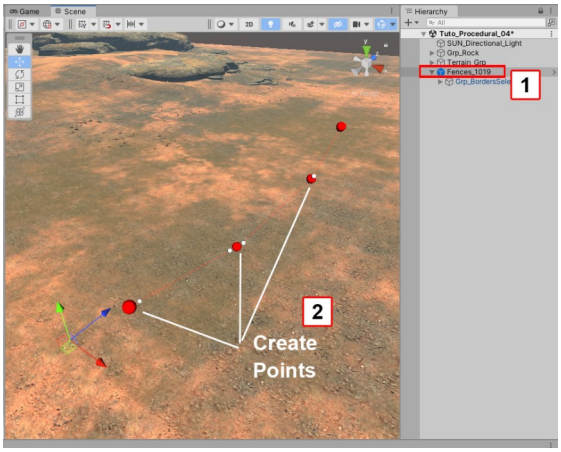
Split curve: select 2 points then press C

Delete Point: select point then press G

Active Handle: While holding down the Shift (Maj) press S then release S
While continuing to hold down the Shift (Maj), move the axis you want.

To select several points
-Select a Point
-While holding down the Left Ctrl select a second

In hierarchy tab :
Select Fence (spot 1)



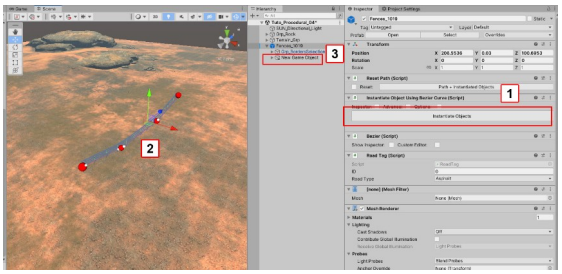
-Into scene view:
Mouse right click to activate scene view
Do this only the first time you create a point

In scene tab:
-Press keyboard shortcut N to create points (spot 2)

Important:
If the first point doesn't appear:

-Verify that gizmos are activate in scene tab
-In scene view select the terrain
-In hierarchy tab select again the new fence

-Press keyboard shortcut N

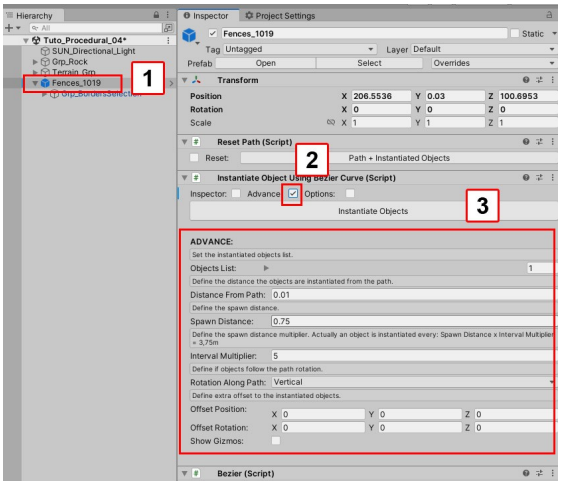


In Inspector tab :
Press Instantiate Objects button (spot 1)

Fences are created (spot 2)

In hierarchy tab a new game objets is added to fence group (spot 3)

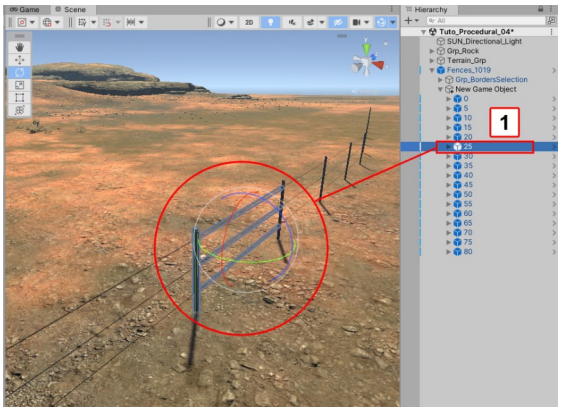
Important:
If you want to change the fences creation settings:



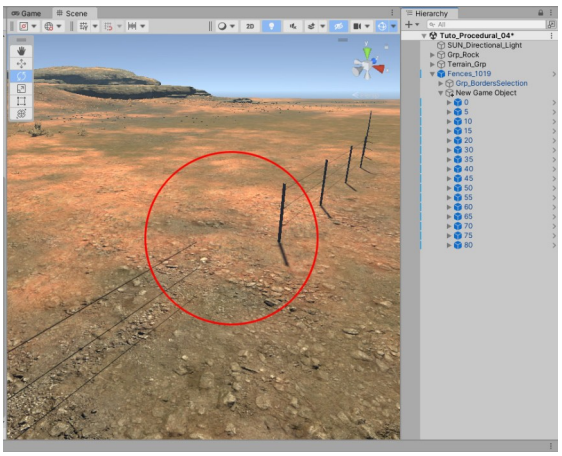
-In hierarchy tab :
Select Fence (spot 1)

-In Inspector tab
Check Advance Checkbox (spot 2)

-Set Parameters according to your needs (spot 3)



In hierarchy tab :
In Fence:
Select one of the new game object (spot 1)



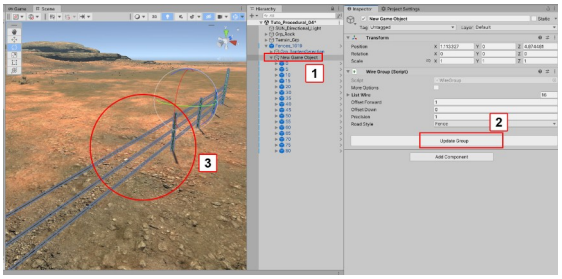
In hierarchy tab :
In Fence:
Delete the game object

The wires are no longer correctly connected to the posts of the fence

-In hierarchy tab :
Select New Game Object (spot 1)

-In Inspector tab :
Press Update Group button (spot 2)

The wires are again connected to the posts of the fence (spot 3)



Create crash barrier

First if you have not setup the procedural script read this part Link

In Project tab double click on Tuto_Procedural_05 scene to open it.

Assets > HPA > Scenes > Tuto > Tuto_Procedural_05

The curve system for creating crash barrier is the same curve system for creating roads and fences

For more informations about how to create roads Link

You can use the same keyboard shortcuts:

Split curve: select 2 points then press C

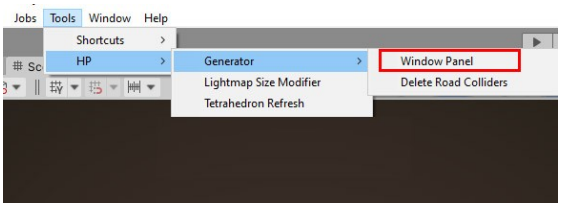
Delete Point: select point then press G

Active Handle: While holding down the Shift (Maj) press S then release S
While continuing to hold down the Shift (Maj), move the axis you want.

To select several points
-Select a Point
-While holding down the Left Ctrl select a second point

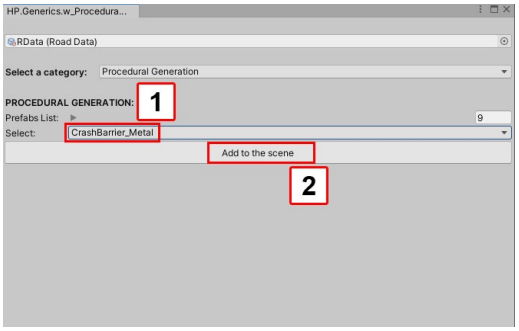
Important:
Don't forget to enable gizmos in scene mode if you don't.

Go to Tools > HP > Generator > Window Panel



-In select list choose CrashBarrier_Metal (spot 1)

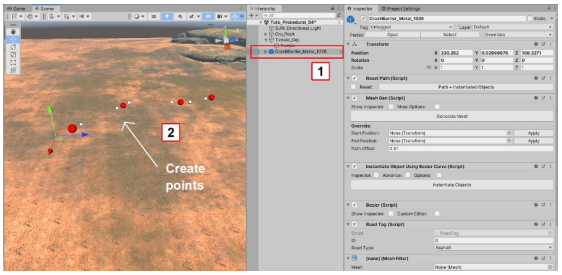
-Press Add to the scene button (spot 2)



In hierarchy tab :
Select CrashBarrier_Metal (spot 1)

-Into scene view:
Mouse right click to activate scene view
Do this only the first time you create a point

In scene tab:
-Press keyboard shortcut N to create points (spot 2)

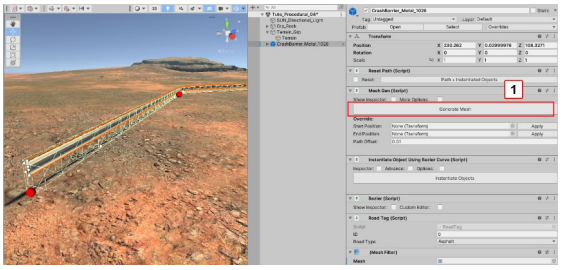


Important:
If the first point doesn't appear:

-Verify that gizmos are activate in scene tab
-In scene view select the terrain
-In hierarchy tab select again the new crash barrier
-Press keyboard shortcut N

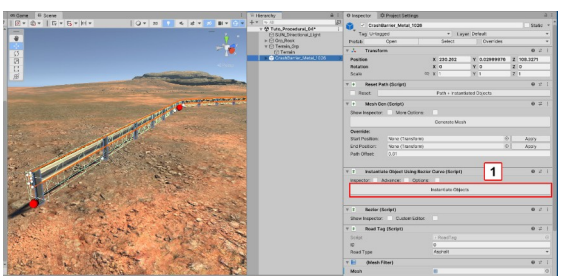
In Inspector tab :
Press Generate Mesh button (spot 1)

Barrier is created

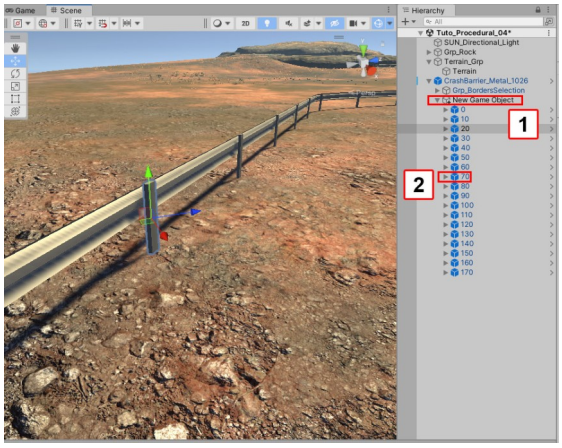


In Inspector tab :
Press Instantiate Objects button (spot 1)

Plots are created (spot 2)

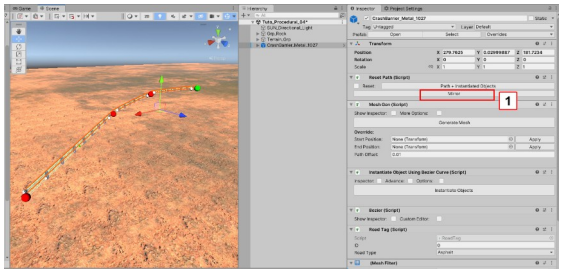


To delete a pole



In hierarchy tab:
Into New Game Object group (spot 1):
-select a pole (spot 2)
-delete it

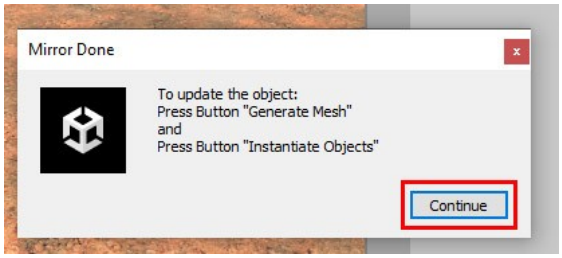
To reverse Crash barrier



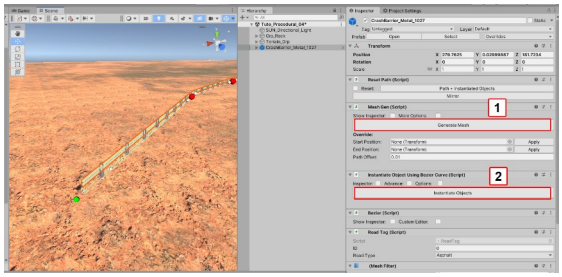
In hierarchy tab :
Select CrashBarrier_Metal

In Inspector tab press Mirror Button (spot 1)

A new window appears



Press Continue button



In Inspector tab :
Press Generate Mesh button to mirror the barrier (spot 1)

Press Instantiate Objects button to mirror the plots (spot 2)

Create High Voltage Pole

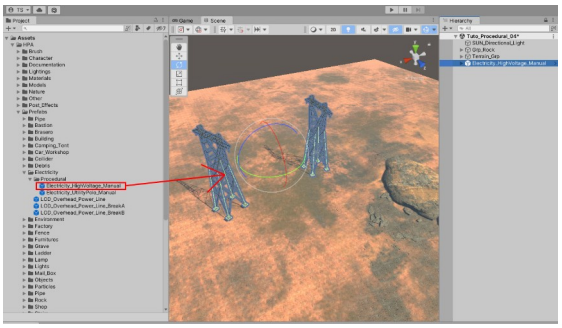
Procedural utility poles do not work the same as roads, fences, and crashbarrier

In Project tab double click on Tuto_Procedural_05 scene to open it.

Assets > HPA > Scenes > Tuto > Tuto_Procedural_05

-From Project tab drag and drop
Electricity_HighVoltage_Manual into the scene tab

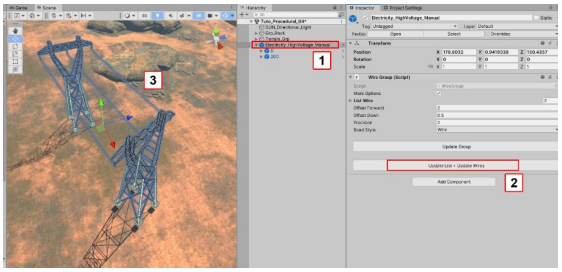
Assets > HPA > Prefabs > Electricity> Procedural > Electricity_HighVoltage_Manual



-In hierarchy tab
select Electricity_HighVoltage_Manual (spot 1)

In Inspector tab :
Press Update List +Update Wires (spot 2)

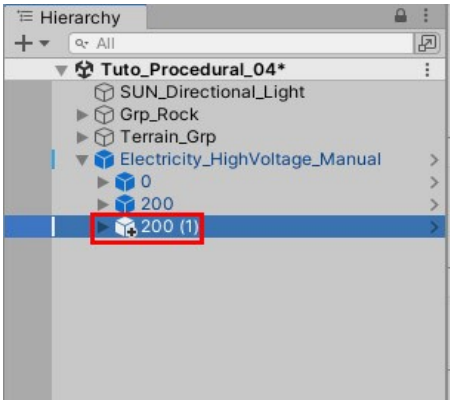
Wires are created (spot 3)



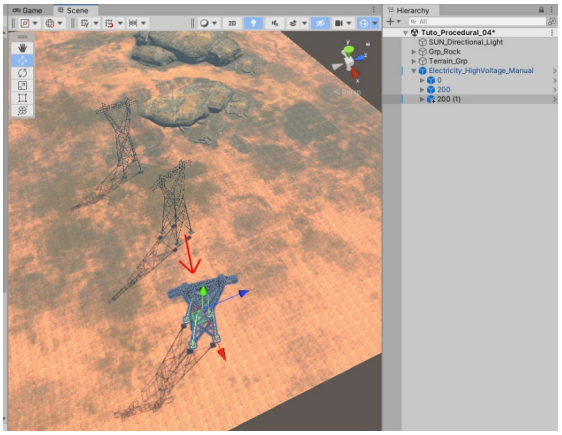
-In hierarchy tab
select 200

-Ctrl + D to duplicate 200

A new plot named 200(1) is created



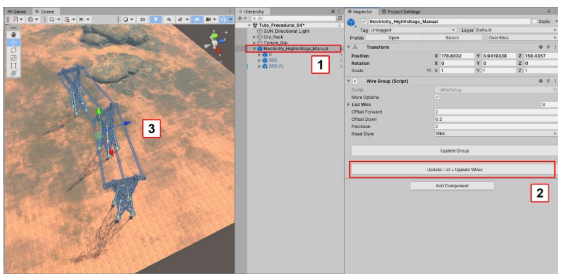
Select 200(1)
Move 200(1) as indicated on the image on the right



-In hierarchy tab
select Electricity_HighVoltage_Manual (spot 1)

Press Update List +Update Wires (spot 2)

Wires are updated (spot 3)



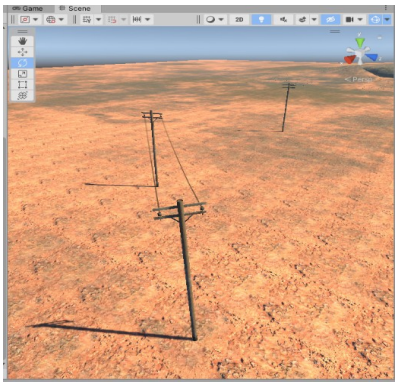
Create Electricity Utility Pole

If you want to create Electricity_UtilityPole

-From Project tab drag and drop Electricity_UtilityPole_Manual into the scene tab

Assets > HPA > Prefabs > Electricity> Procedural > Electricity_UtilityPole_Manual

Electricity UtilityPole and Electricity HighVoltage works the same way



10 Lightings

Overview

This chapter explains how to configure the lighting to have the same rendering as in the demo.
Of course you can create your own lighting setup or adapt these tips according to the needs of your project.

Sun, Aera lights and spots lights

3 types of light are used in the project.

-Sun:
Directional light set to mixed mode
Mixed mode means:
Lightmaps are baked and must be precomputed.
Shadows are in realtime. It is therefore possible to modify the direction of the sun in realtime

Sun is ready to use in the starter kit

-Aera lights:
These lights are used to increase the intensity of light into the buildings.
These lights are baked only.

Aera Lights are ready to use into buildings prefabs.
You can adapt the lights according to the needs of your project.

-Spot light or point light
These light simulate light sources such as a lamp, neon, fire etc.
These lights are realtime only.
It is possible to move them in realtime.

These lights are in the folder:
Assets > HPA > Prefabs > Lights

Important:
Realtime spot lights and point lights are resource intensive.

This is why a script is added which allows to activate or deactivate the shadow of the light according to the distance with the camera.
This script is included in the asset.

For more informations about light optimization read Link

Reflection Probs

-A reflection probe must encompass the entire scene
Global reflection prob is ready to use in the starter kit

-Each building has one or more reflection prob so that the reflections inside the building are correct
Reflection probs are ready to use in the prefabs buildings

Tips:
If a building lighting doesn't look right, reflections look weird, or the building doesn't look well integrated with the terrain:
-Check if the reflection prob encompasses the whole building
-Check that the center of the reflection prob is inside the building

Lightmaps

Overview:
The asset is designed for use with additive scenes . Use additively load scenes allows to not recalculate the lighmaps for the whole scene. It's faster and it avoids problems during lightmap computation on less powerful PC.

When using additive scenes, you have to calculate the lightmaps for each scene separately.
The lightmaps are recombined automaticaly afterwards when all the scenes are put into the hierarchy tab.

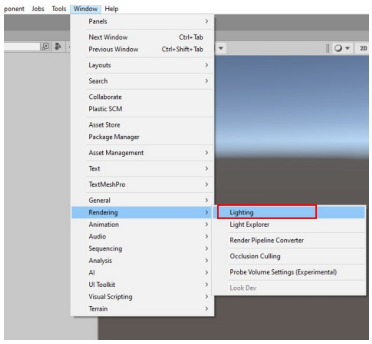
A script is included in the asset **to easily** calculate lightmaps with additives scenes.
If you want to learn how to use lightmaps script : Link

Calculating lightmaps without the script can be tedious, which is why it is better to use the script.

Lightings Presets:

Ready to use lighting presets are included in the asset.

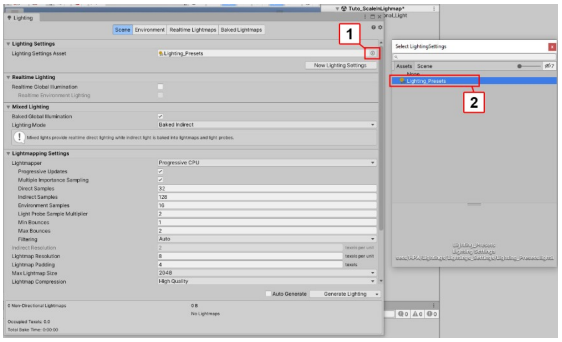
-Go to Window > Rendering > Lighting



-Click on circle icon (spot 1)

-Into the list choose Lighting_Presets (spot 2)

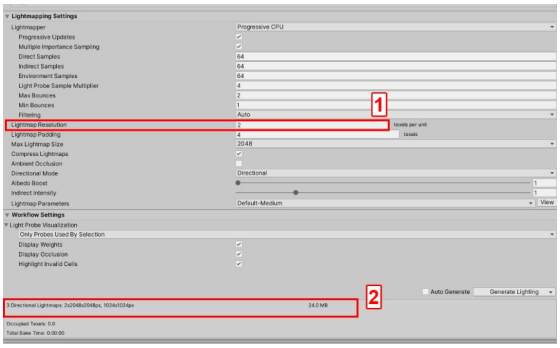
Assets > HPA > Lightings > Lightings_Settings> Lighting_Presets



Demo scene is very large then a low Lightmap Resolution is used (spot 1)

Increase the Lightmap resolution value increase the quality of the lightmaps but:
-Lightmaps computation is longer
-Lightmaps size are bigger

The size of the lightmaps are visible at the bottom of the lighting tab (spot 2)



In Lighting tab Lightmap Resolution parameter is set to 2.

A value of 2 is good for elements that are outside of buildings.
On the other hand, for buildings and objects inside buildings, this definition of lightmaps is not sufficient.

It is therefore necessary to increase the definition of lightmaps, but only for buildings.

To increase the quality of lightmaps of a particular object, you must increase its scaleInLighmap parameter.
Changing the scaleInLightmap value of each object would be very tedious.
This is why a script **is included in the asset**, to modify the scaleInLightmap parameter of a set of objects with one click.

To learn how to use the script: Link

Important:
In demo scene:
Folders named Scale_x4 contains objects with a scaleinLightmap value of 4

Lightmap calculation time

Info:
Do not rely on the time indicated at the beginning of the calculation of the Lightmaps. The calculation time is much shorter than the times indicated at the beginning of the calculation.

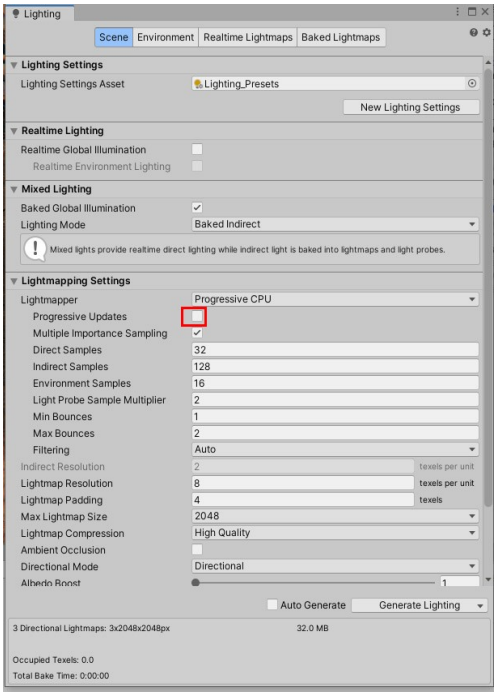
PC configuration for test:
Intel(R) Core(TM) i7-9700K CPU @ 3.60GHz
RAM 16,00 Go
Nvidia Geforce GTX 1060 6GB

Here is the calculation time of demo scenes:
The calculation time is about 2 to 5 minutes per zone (Zone_01 to Zone_09)
The calculation time is about 1 minute for Procedural scene
Gameplay_Scene consists of gameplay elements and scripts. It should **not** be calculated.

Tips to reduce rendering time

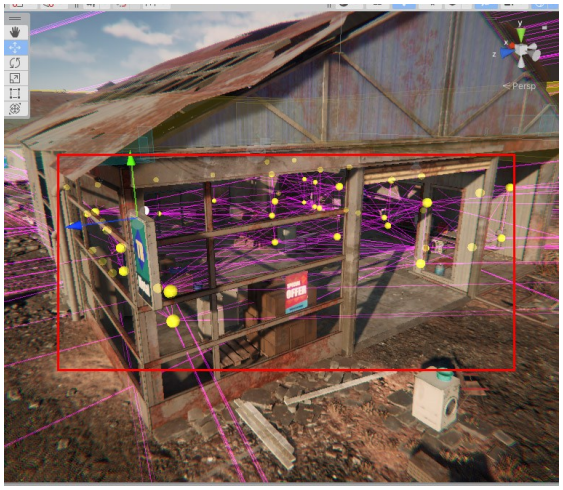
-In Lighting tab uncheck Progressive Update checkbox

Window > Rendering > Lighting

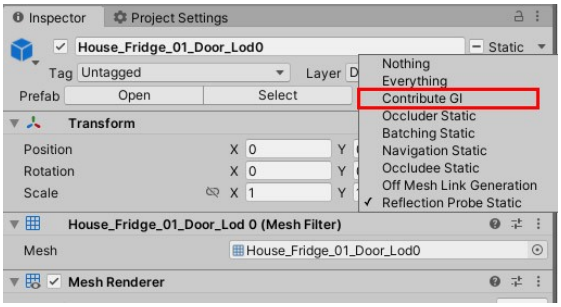


LightProbs

LightsProbs are using to light objects which are not static like character, doors, furnitures.



Contribute GI is uncheck for this objects

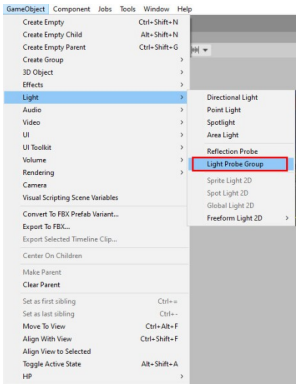


The lightsprobes are not very useful outside the buildings because the light is globally homogeneous (except for night scenes if there are light sources)
On the other hand, lightprobs are very useful in interiors because the variations in light intensity are stronger (whether or not you are next to windows)

Note:
In buildings prefabs, lightprobes are included but will need to be adjusted according to your needs

Very Important:
When working with additive scenes you need at least one lightprob per scene with the exception of the scene including the gameplay elements (Gameplay_Scene)

To create a lightprob:
GameObject > Light > Light Probe Group



Combine lightprobes when working with additives scenes

When using additive scenes, Lightprobs of the differents scenes are not automatically combine.
It is necessary to add a script to combine the lightsprobs of the different scenes

code:

```
  void OnTetrahedralization(){
            isTetraDone = true;
            }
```

This script is attach to prefab: Init_LightProbes

Assets > HPA > Scripts > Additives_Scenes > Lightprobes > Init_LightProbes

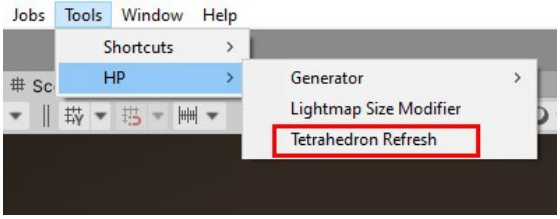
Add the prefabs into your Gameplay scene

In demo Init_LightProbes script is added to Gameplay_Scene and ready to use.
In Starter Kit this script is added to SK_Gameplay_Scene and ready to use

Update tetrahedral tessellation into the Editor

Into the editor, if the lightprobs do not refresh automatically in the scene tab:

-Go Tools > HP > Tetrahedron Refresh



Scale in lightmap script

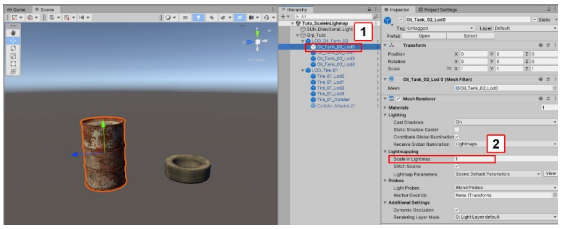
This script is designed to increase scaleInLightmap parameter of a group of objects in one click.
This script is useful to increase scaleInLightmap value of LOD_Prefabs.
Increasing scaleInLightmap improves the quality of lightmaps only for one object and not for the whole scene.

1 In Project tab double click on Tuto_ScaleInLighmap scene to open it

Assets > HPA > Scenes > Tuto > Tuto_ScaleInLightmap

2 In Hierarchy tab select Oil_Tank_02_Lod0 (spot 1)

ScaleInLightmap is set to 1 (spot 2)

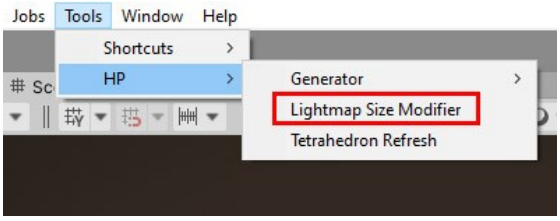


3 In Hierarchy tab select Oil_Tank_02_Lod1 (spot 1)

ScaleInLightmap is set to 0.5 (spot 2)

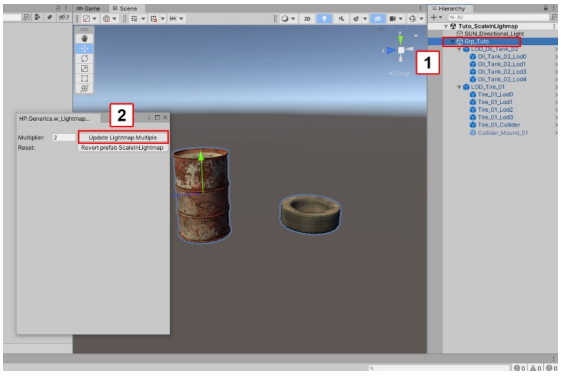
4 Go to Tools > HP > Lightmap Size Modifier

A new window appear



5 In Hierarchy tab select Grp_Tuto (spot 1)

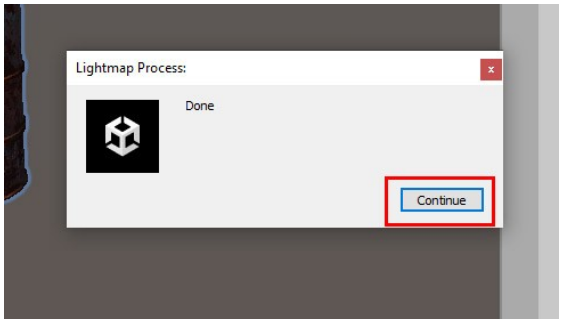
6 In window press Update Lightmap Multiple button (spot 2)



A new window appear

7 In window press Continue button

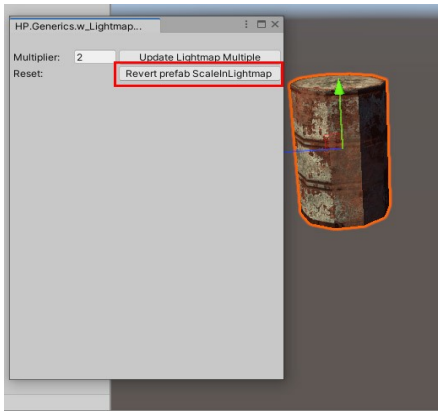
In group Grp_Tuto scaleInLightmap of all objects has been multiplied by 2



Important:
In the hierarchy tab select only one group.
If you select several groups at the same time, only the last one will be taken into account

8 To revert to default scaleInLighmaps value

-In Hierarchy tab select Grp_Tuto
-In Window press Revert prefabs ScaleInLightmaps button



In a Prefabs that has an LOD component:

ScaleInLightmap value:
lod0 = 1
lod1 = 0.5
lod2 = 0.25
lod3 = 0.125

If you choose to multiply by 4:
ScaleInLightmap value:
lod0: 1 x 4 = 4
lod1: 0.5 x 4 = 2
lod2: 0.25 x 4 = 1
lod3: 0.125 x 4 = 0.5

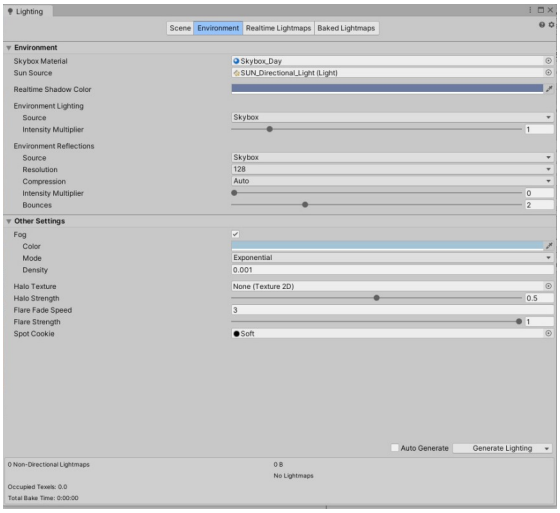
Important:
Increasing scaleInLightmap value increase the render time of the lightmaps and the size of the lightmaps

11 Post Fx

Lightings and environments parameters

Important:
When working with additive scene:
To avoid any problems, it is best to use the same environment presets.

When using the additive scene system, the active parameters are those of the scene which is "active scene"



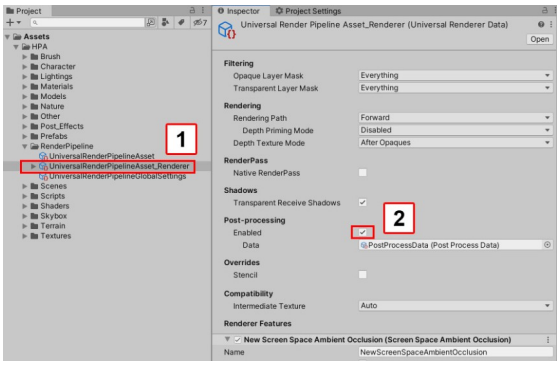
SetUp

PostFx **must** be enabled. If you haven't done it yet:
In Project settings tab:

-Select UniversalRenderPipelineAsset_Renderer (spot 1)

Assets > HPA > RenderPipeline

-Check Enabled Checkbox (spot 2)



Global PostFx

To add global Post Fx to the scene :
-From Project tab drag and drop Post_Effects prefab to hierarchy tab

Assets > HPA > Post_Effects > Global > Post_FX

Global post FX is ready to use in the starter kit and demo scene

Local PostFx

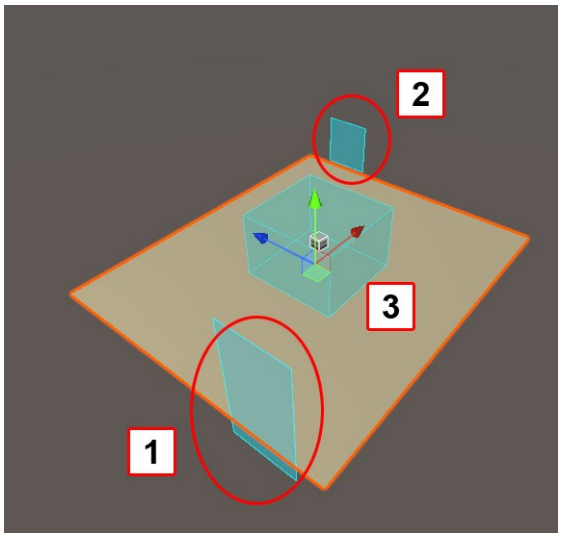
EyeAdaptation simulates the adaptation of the pupil when entering or leaving a building. It's a local PostFX.

In scene view:
-click on gizmos icon to activate gizmos

How It works:
In the picture on the right:

-Orange square that represents the floor of the house
-House door number 1 (spot 1)
-House door number 2 (spot 2)
-PostFx Gizmo box (spot 3)

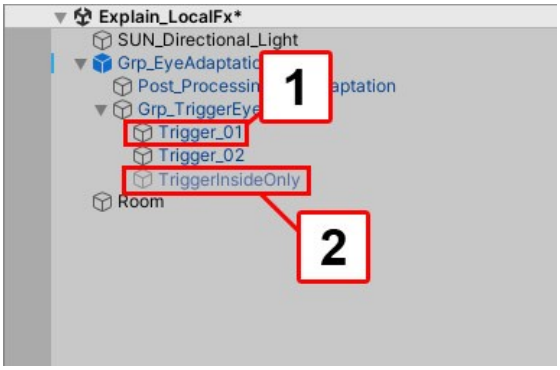
If the player enters through a door (door 1 or 2), the postFx is triggered.
When the player leaves the house through a door (door 1 or 2) postFx stops.



A trigger must be placed at each entrance/exit of the building.

In prefab Grp_EyeAdaptation doors trigger are Trigger_01 and Trigger_02 (spot 1)
Scale and move trigger according to your needs
If you need more entry duplicate Trigger_01 or Trigger_02

In your project if the player respawn into the building:
Put TriggerInsideOnly at player respawn point (spot 2)



Important:
Grp_EyeAdaptation is included in all buildings prefabs and ready to use.

But in building Eye Adaptation prefabs system is disabled.
To use Eye adaptation:
In building prefabs unhide Grp_EyeAdaptation

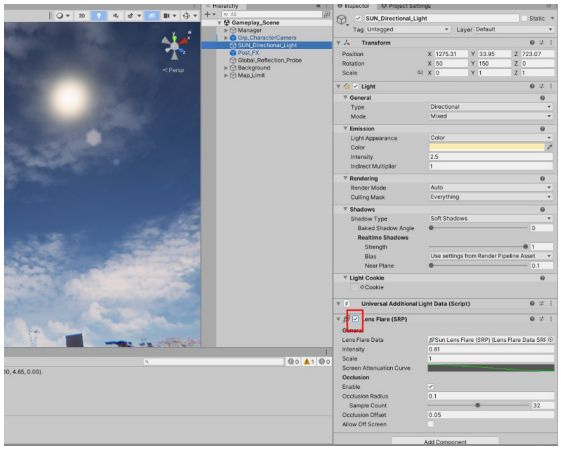
You will find Grp_EyeAdaptation prefab in the folder:
Assets > HPA > Post_Effects > Local > Grp_EyeAdaptation

Info:
If you don’t want to use Eye Adaptation system:
delete Grp_EyeAdaptation group

Lens Flare

There is a lens flare component on SUN Light.
If you don’t want to use :

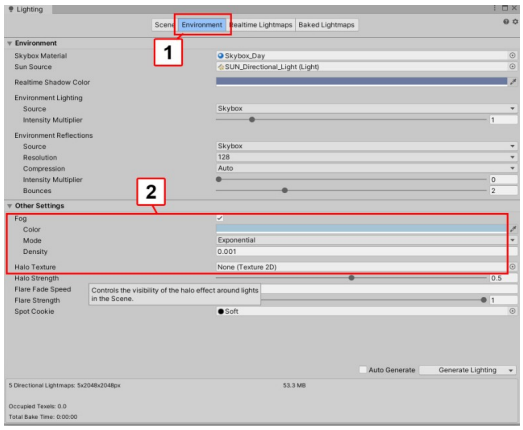
-Select Sun directional light:
-In Inspector tab uncheck Lens Flare (SRP) checkbox.



Fog

To setup fog:

-Go to Window > Rendering > Lighting
-Choose Environment tab (spot 1)
-Set Density to 0.0012 (spot 2)
-Set Mode to Exponential Squared
-Set Color to B9D0E2



12 Optimization

Overview

Large environment needs optimization.
This is why optimization scripts are included in the asset.

Optimization system

Overview:
A script is included in the asset that makes some of the objects hide or unhide depending on the distance from the player position.

For whatever reason if you don't want to use optimization script read: Link

The script is separated in 2 cases.
Depending on the position and size of objects, case 1 or case 2 will be chosen.
The two cases are used together.

Case 1 : grid system
Objects appear or disappear depending on the player position on the grid.
This system is ideal for small to medium sized objects that **are not** inside buildings.

For large objects use case 2 instead.

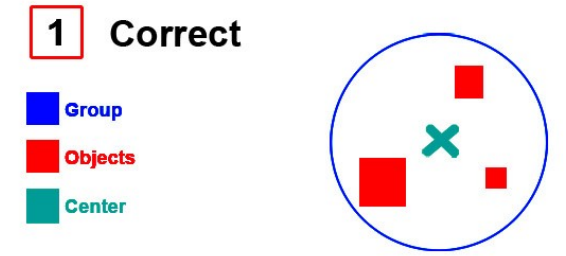
Case 2 : group distance system
A distance is assigned to a group (for example 500 meters)
Objects included in this group will be visible within 500 meters.
This case is ideal for objects that are in buildings and large objects outside buildings.
Each group can have a different distance setup.

Small objects must be visible at 50 or 100 meters .
Medium or large objects must be visible at 300 or 400 meters.

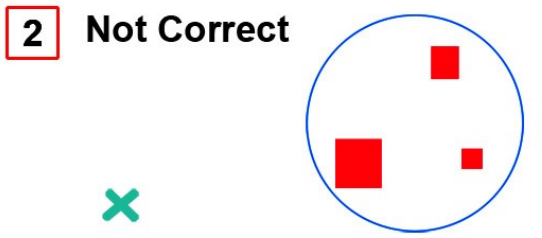
Very Important:

To determine the distance, the optimization system takes into account the center of the group

In image 1:
The center of the group is in the middle of the objects.
This position is correct



In image 2:
The center of the group is not in the middle of the objects.
This position is incorrect



If the center of the group is not correctly placed it is possible that certain objects:
-do not appear
-appear/disappear at the wrong time

Important:
To work, the system must know the position of the character controller of the player.

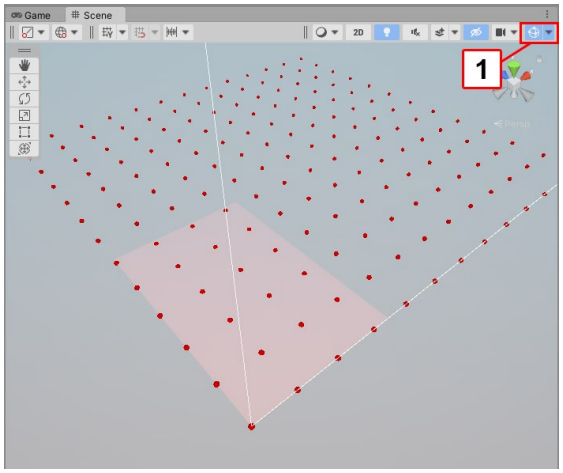
For more information about how to connect optimize script and character controller: Link
Demo character included in the asset is already setup.

Case 1: Grid

1 In Project tab double click on Tuto_Optimize scene to open it

Assets > HPA > Scenes > Tuto > Tuto_Optimize

2 Click on Gizmo icon to activate gizmos visibility (spot 1)

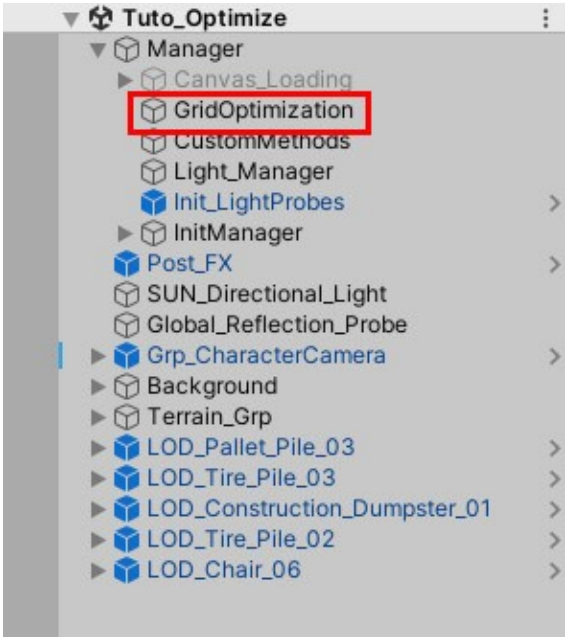


In the Scene tab you can see a dot grid.

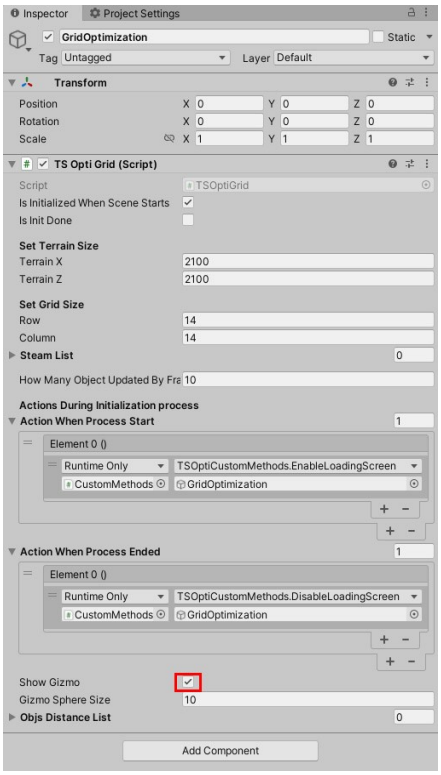
If you don't see dot grid:

In hierarchy tab select GridOptimization

Hierarchy Tab: Manager > Grid Optimization

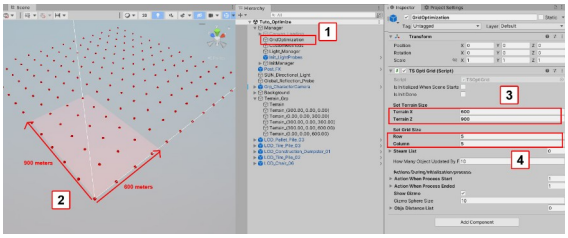


Check Show Gizmo checkbox



In hierarchy tab:
-select GridOptimization (spot 1)

Hierarchy Tab: Manager > Grid Optimization



In scene tab size of terrain is 900 x 600 (spot 2)
size of terrains = (3 terrains x 300m) x (2 terrains x 300m)

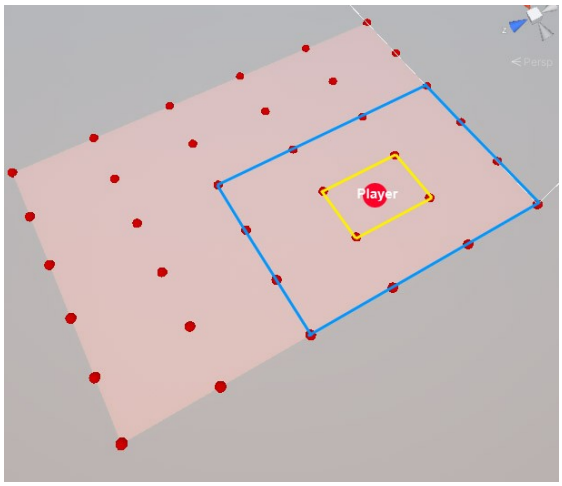
In Inspector tab :
-set Terrain X to 600
-set Terrain Y to 900 (spot 3)

-set Row to 5
-set Column to 5 (spot 4)

How it works

The player is in yellow area.
Blue aera consists of the 9 zones around the yellow zone.
Objects that are in blue area are activated
Objects that are not in this area are deactivated

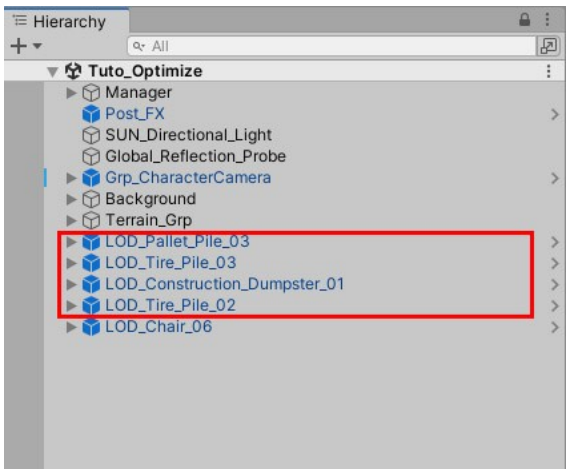
Set row and column according to your needs



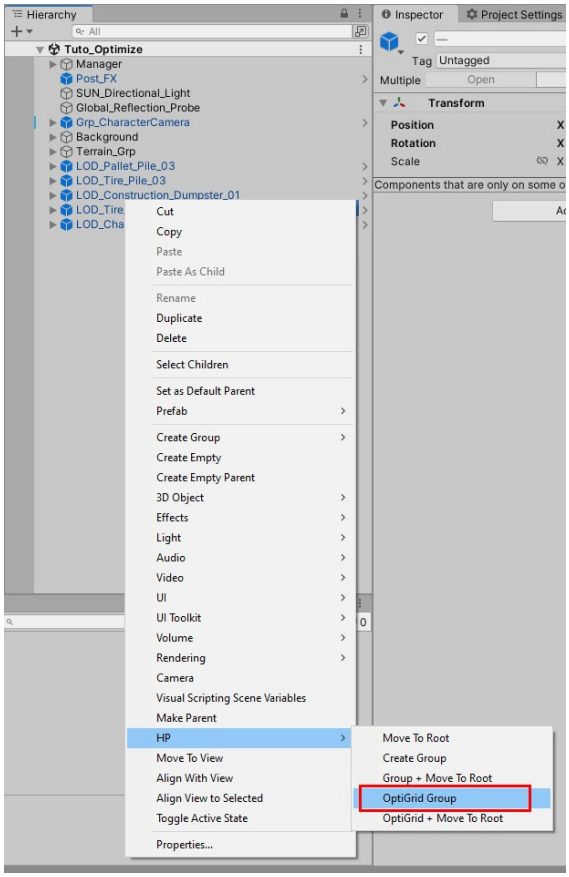
Important:
For the script to work, the objects must be in a group that has the script TSStreamGridTag

Add TSStreamGridTag script to group:

In hierarchy tab:
-select:
LOD_Tire_Pile_02
LOD_Construction_Dumpster_01
LOD_Pallet_Pile_03
LOD_Tire_Pile_03

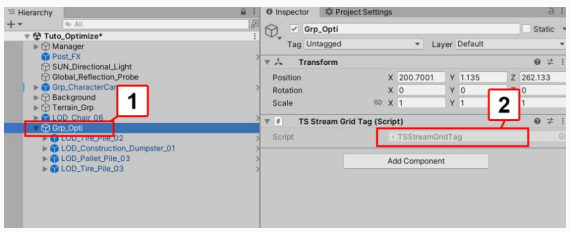


-Right mouse click
-In the menu choose HP > OptiGridGroup



A new group is created.
Script TSStreamGridTag is added to the group

In hierarchy tab:
-select Grp_Opti (spot 1)

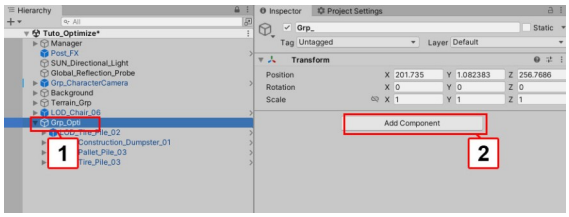


Script TSStreamGridTag is added to the group (spot 2)

Now this group works with the grid optimization system

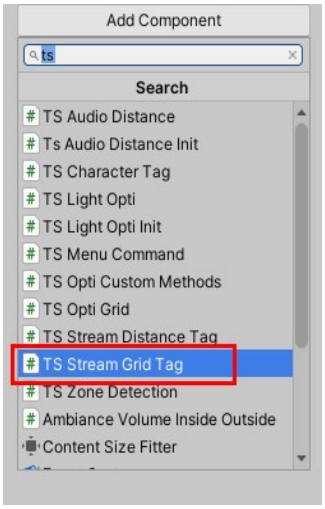
There is another way to add the script to a group:

-In hierachy tab select a group (spot 1)
-Press Add component button (spot 2)



-In search field type TS (spot 1)

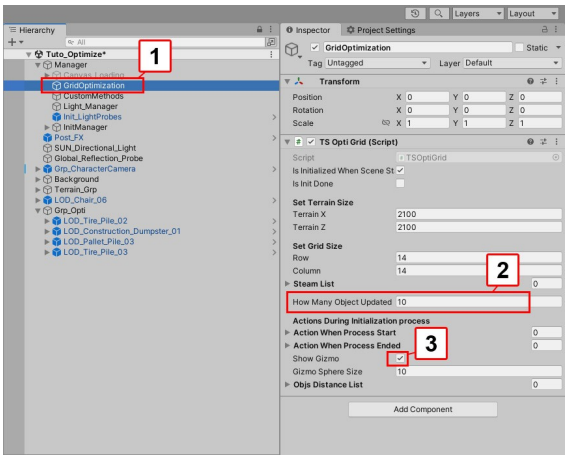
-Choose TS Stream Grid Tag (spot 2)



Optimization grid fine tuning

In hierarchy tab:
-select GridOptimization (spot 1)

Manager > GridOptimization



Important:
OptiGrid group activated or deactivated ten objects by frame.This avoids framerate drops.

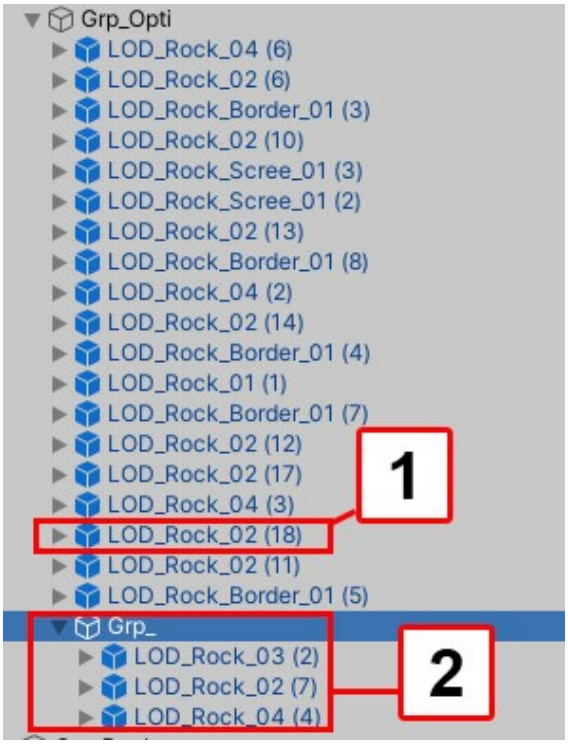
-If you want to activated more or less objects by frame set How Many Objects Update By Frame value (spot 2)

-If you want to hide Grid gizmo unckeck Show Gizmo checkbox (spot 3)

Important:
Each element included in Grp_Opti is considered as one object (spot 1)
If a grp containing many objects is included into Grp_Opti, it will be considered as one object (spot 2)

<u>For good optimization:</u>
In the Grp_Opti avoid putting groups containing too many objects.

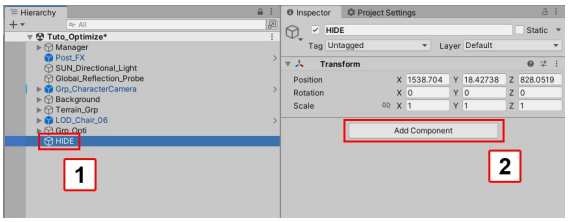
This also applies to distance groups (case 2)



Case 2: Group Distance

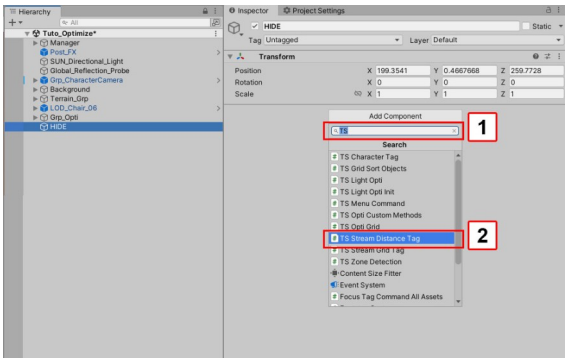
-In hierachy tab:
create an new empty (spot 1)

-Rename it HIDE for example (spot 1)
-In Inspector tab press Add component button (spot 2)

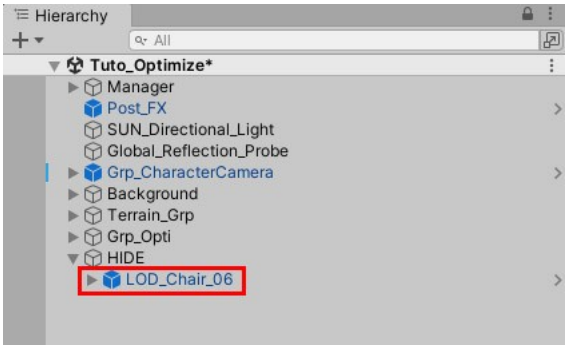


-In search field type TS (spot 1)

-Choose TSStreamDistanceTag (spot 2)



-Add LOD_Chair_06 to HIDE Group



-Set transform position of LOD_Chair_06 to
X =0
Y= 0
Z= 0

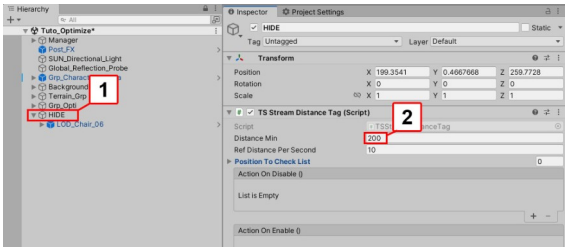
LOD_Chair_06 is now at the center of HIDE Group

Reminder:

To determine the distance, the optimization system takes into account the center of the group

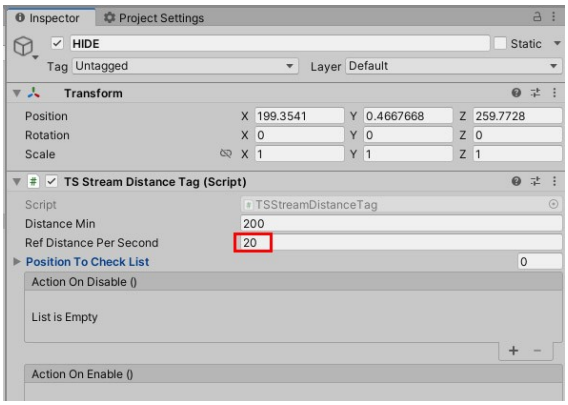
-Select HIDE Group (spot 1)

-Set Distance Min to 200 (spot 2)



When the player is within 200 meters of center of HIDE group objects are activated.
When the player is more than 200 meters of the center of HIDE group, objects are deactivated.

Test Interval:



The script tests the distance between the player and the group at regular intervals.
Depending on the player's movement speed, it is necessary to adjust the interval.

If the parameter is badly adjusted, the objects will appear too late (clipping) or too early (bad optimization)

To adjust the interval set Ref Distance Per second parameter as needed
Tips: If you find that objects appear too late (clipping) increase the value

Info:
In the demo scene:
OptiGrid (case1) and distance HIDE group (case 2) are already setup.

<u>Into project folder:</u>
There are two versions of building prefabs (Houses, Shops, Warehouses…).

-The first version: with optimization scripts
If you want to use the optimization script, use these prefabs.
HPA > Prefabs > Buildings > With_Optimisation

-The second version: without optimization scripts
If you don't want to use the optimization script, use these prefabs
HPA > Prefabs > Buildings > Without_Optimization

Lights optimization

Realtime point Lights and spots lights are resource intensive.
For more informations about realtime spot lights and point lights read link

A script to optimize realtime point lights and spots lights is included in the asset.

How it works:

Light is activated or deactivated regarding the player distance from the light source.
Light intensity increases with a smooth transition.
The shadow of the light is activated or deactivated regarding the player distance from the light source.
The shadow intensity increases with a smooth transition.

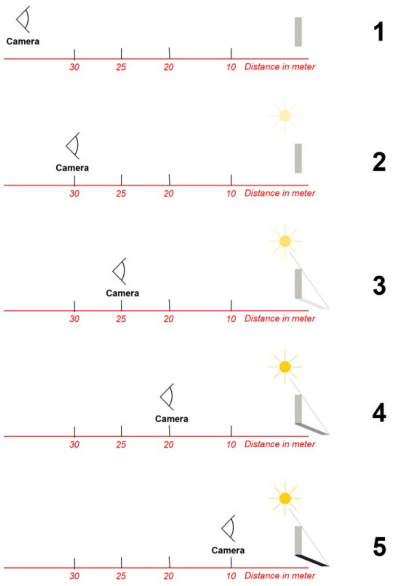
1 The camera is more than 30 meters away from the light.
Light is deactivated

2 The camera is 30 meters from the light
Light is activated. Light Intensity =0.

3 The camera is 25 meters from the light
Light intensity increase.
Shadow is activated. Shadow Intensity =0.

4 The camera is 20 meters from the light
Light reach maximum intensity.
Shadow intensity increase.

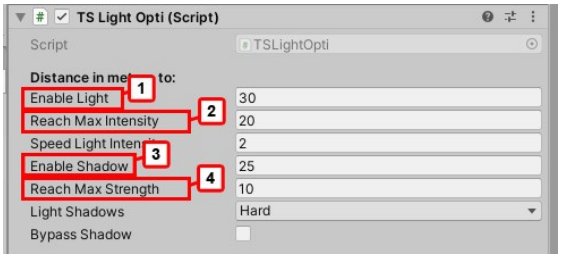
5 The camera is 10 meters from the light
Shadow reach maximum intensity



To modify the distances according to your needs:

In project tab:
-select Point_Light to view the script in the Inspector tab.

Assets > HPA > Prefabs > Lights > Point_Light



-Enabe Light : Light activation distance (spot 1)

-Reach Max Intensity : Distance at which the intensity of the light is at its maximum (spot 2)

-Enable Shadow : Shadow activation distance (spot 3)

-Reach Max Strength: Distance at which the shadow intensity is at its maximum (spot 4)

Important:
Shadow is activate at runtime by the script. In hierarchy tab, if you activate shadow for working:
-before play the game, deactivate the shadow

Important:

To activate the lights when the scene starts, you must put the script Light_Manager into the gameplay scene (in demo project the scene named Gameplay_Scene)

Assets > HPA > Prefabs > Lights > Light_Manager

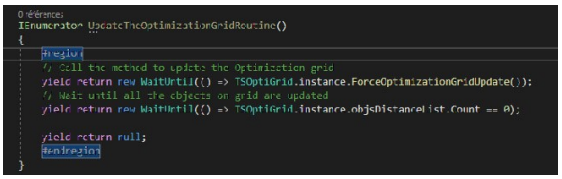
Info: Light_Manager script is already included in the demo scene and the starter kit

Grid optimization (coding)

If you want initialize manually the OptimizationGrid system from any script call:

```
HP.Generics.TSOptiGrid.instance.Init();
```

To update manually the OptimizationGrid System, from any script : call these 2 lines inside a coroutine:



(It is useful if you want to create a spawn system for example)

```
// Call the method to update the Optimization grid

yield return new WaitUntil(() => HP.Generics.TSOptiGrid.instance.ForceOptimizationGridUpdate());

// Wait until all the objects on grid are updated

yield return new WaitUntil(() => HP.Generics.TSOptiGrid.instance.objsDistanceList.Count == 0);
```

Disable ou delete Optimization

Overview

This chapter explains how to disable or remove the optimization scripts included in the asset

Disable Optimization grid

If you don’t want to use optimization grid script follow this step:

1 In the starter kit:
In Project tab double click on SK_Gameplay_Scene to open it (spot 1)

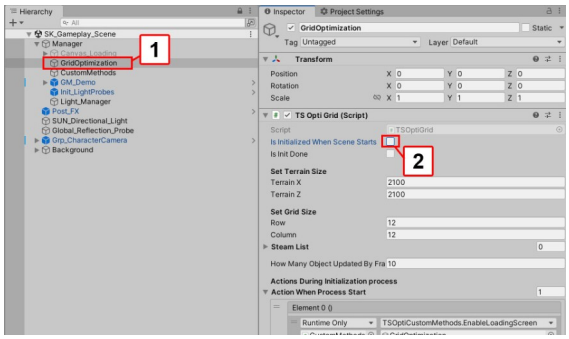
Assets > HPA > Scenes > Starter_Kit > SK_Gameplay_Scene

In the demo scene:
In Project tab double click on Gameplay_Scene to open it (spot 1)

Assets > HPA > Demo > Gameplay_Scene

2 In hierarchy tab:
In Manager group:
-select GridOptimization (spot 1)

3 Unckeck Is Initialized When Scene Start checkbox (spot 2)



Remove Optimization grid

In hierarchy tab:
delete GridOptimization

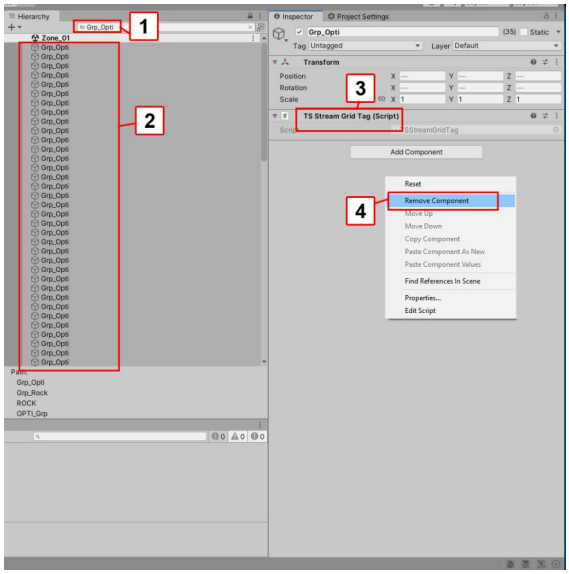
Delete Opti grid script on objects (case 1)

-In search text field type Grp_Opti (spot 1)

-In Hierarchy tab select all the Grp_Opti (spot 2)

-Mouse right click on TSStreamGridTag name (spot 3)

-Choose Remove component



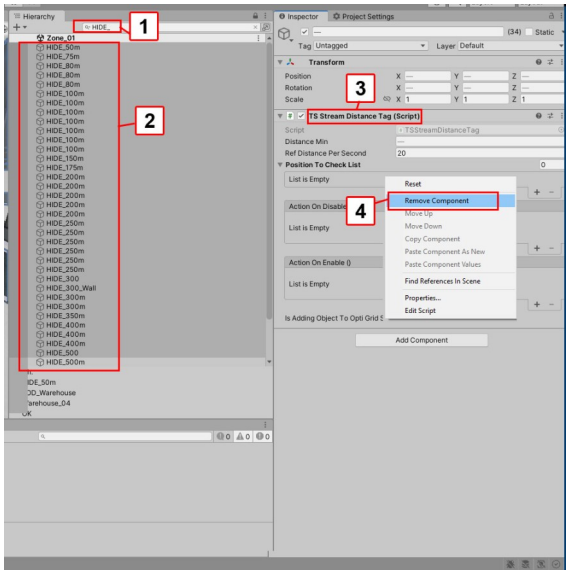
Delete Distance Group script on objects (case 2)

-In search text field type HIDE_ (spot 1)

-In Hierarchy tab select all the HIDE_ (spot 2)

-Mouse right click on TS Stream Distance Tag name (spot 3)

-Choose Remove component



Colliders and optimization scripts

The objects included in the optimization are disabled in the distance.

This means that the colliders included in these objects are disabled too. For example if these colliders are used for ground on which an enemy is moving, the collider must not be disabled.

In this case move the colliders outside of these group.

SSAO (Screen Space Ambiant Occlusion)

SSAO uses a lot of resources so you can disable it if you wish.

To deactivate it:
In project tab select: Universal Render Pipeline Asset_Renderer (spot 1)

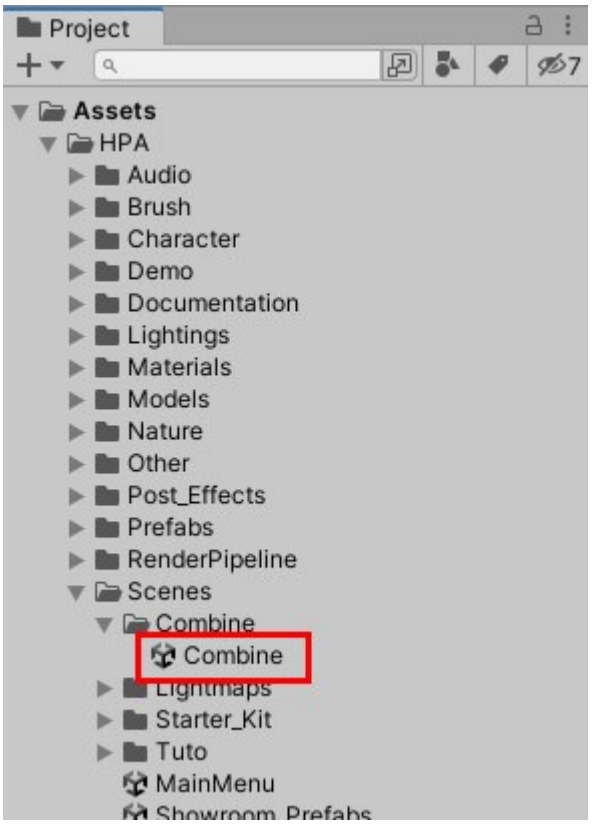
In Inspector tab uncheck Screen Space Ambiant Occlusion checkbox (spot 2)

13 Combine additive scene into one scene

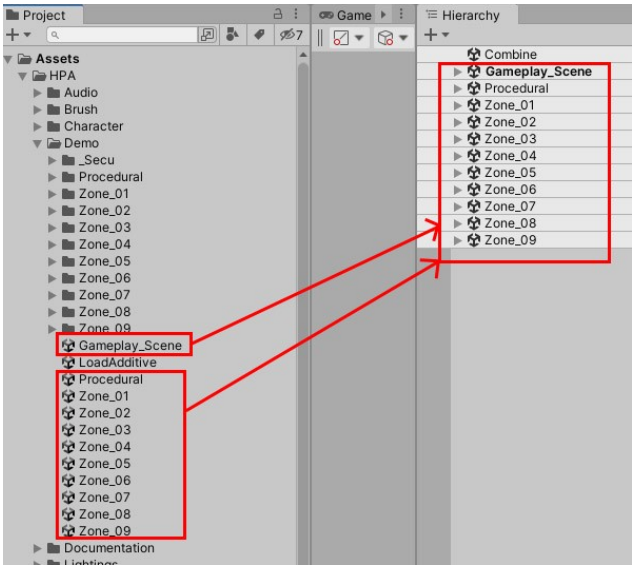
The asset is designed for use with additive scenes.
For whatever reason if you don't want to work with scenes additive and want to combine the demo scenes into a single scene follow this tutorial:

1 In Project tab double click on Combine scene to open it

Assets > HPA > Scenes > Combine > Combine

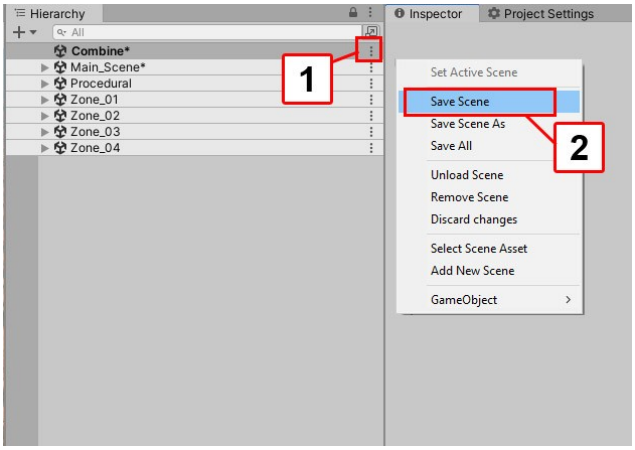


2 From Project tab drag and drop this scenes into the hierarchy tab:
Gameplay_Scene ,
Procedural
Zone_01
Zone_02
Zone_03
Zone_04
Zone_05
Zone_06
Zone_07
Zone_08
Zone_09



3 In hierarchy tab drag drop the contents of the Gameplay_scene, Procedural, Zone_01 to Zone_09 into Combine scene

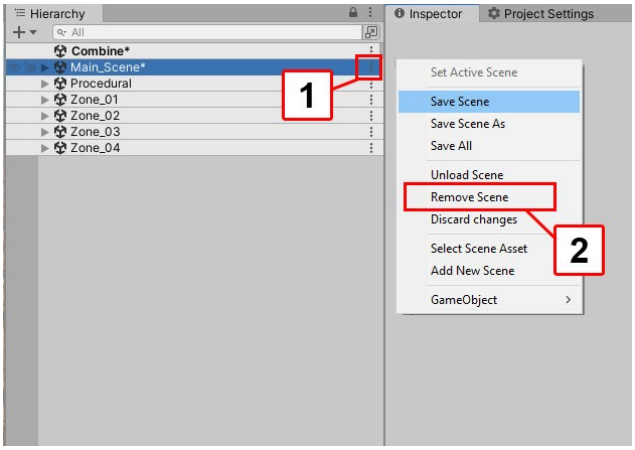
4 In the Hierarchy tab, click on the 3 dots icon next to scene Combine



5 Choose Save Scene

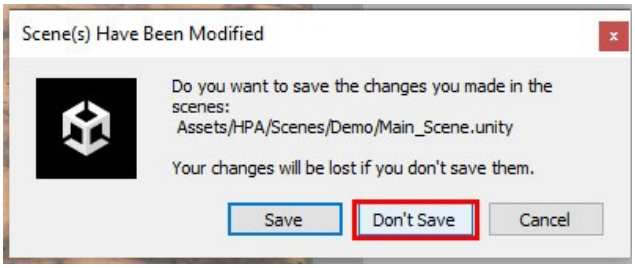
Caution:
-Don't choose Save All
-Don't use shortcut CTRL+ S

6 In the Hierarchy tab, click on the 3 dots icon next to scene Gameplay_Scene



7 Choose Remove Scene

A new window appears



8 Press Don't Save button

9 In the same way remove scenes: Procedural, Zone_01 to Zone_09.

The scene Combine is ready to use.

Important:
Don't forget to recalculate the lightmaps if you need it.

14 Compute lightmaps manually

When using additive scenes, you have to calculate the lightmaps for each scene separately. The lightmaps are recombined automaticaly afterwards when all the scenes are put into the hierarchy tab.

A script is included in the asset **to easily** calculate lightmaps with additives scenes.
If you want to learn more about calculate lightmaps script : Link

Calculating lightmaps without the script can be tedious, which is why it is better to use the script.

But whatever the reason, if you prefer to calculate lightmaps without the script follow this tutorial:

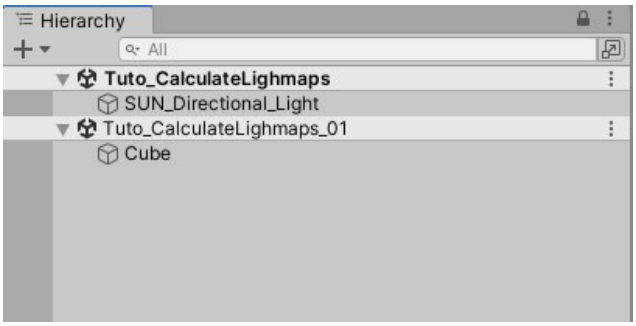
In this tutorial we will combine lightmaps from 2 different scenes. These 2 scenes use the same lighting.

1 In Project tab double click on Tuto_CalculateLighmaps scene to open it

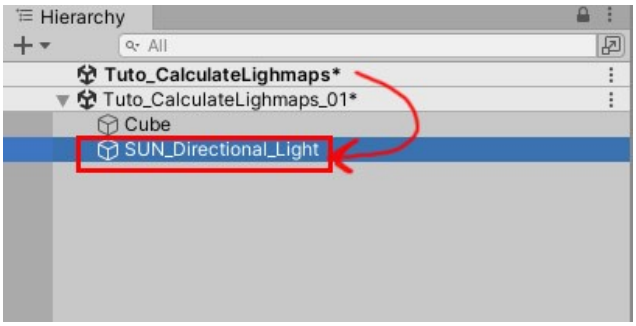
Assets > HPA > Scenes > Tuto > Calculate_Lightmaps > Tuto_CalculateLighmaps

2 From Project tab drag and drop Tuto_CalculateLighmaps_01 in the hierarchy tab:

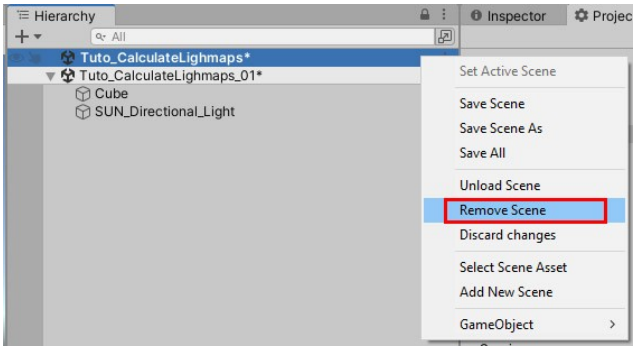
Assets > HPA > Scenes > Tuto > Calculate_Lightmaps > Tuto_CalculateLighmaps_01



3 From Tuto_CalculateLighmaps scene drag and drop SUN_Directional_Light to Tuto_CalculateLighmaps_01 scene

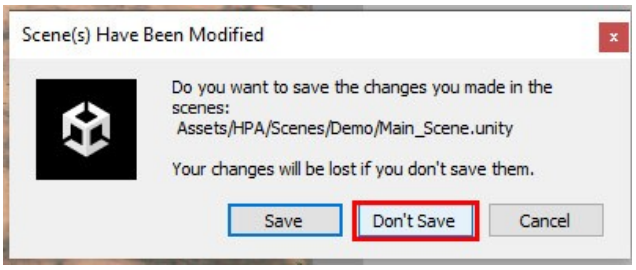


4 In hierarchy tab select Tuto_CalculateLighmaps scene
-Mouse right click
-Choose Remove Scene



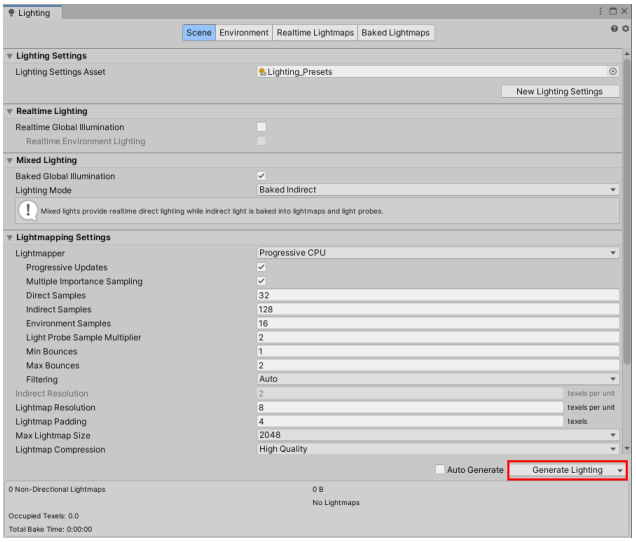
A new window appears

5 Press Don't Save button



6 Go to Window > Rendering > Lighting

-In Lighting tab:
Press Generate Lightmaps



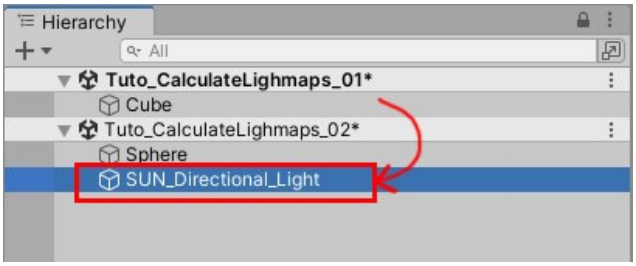
7 When lightmaps calculation is Done:

Use keyboard shortcut Ctrl + S to save the scene

8 From Project tab drag and drop Tuto_CalculateLighmaps_02 in the hierarchy tab:

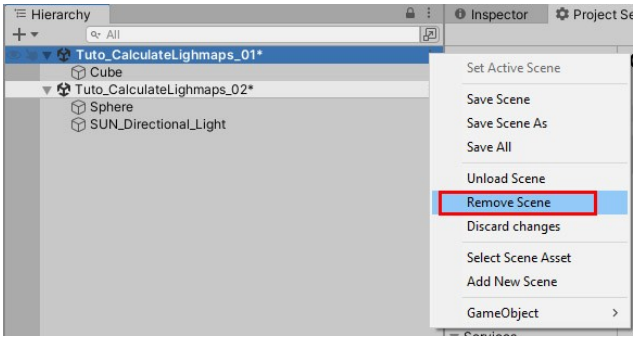
Calculate_Lightmaps > Tuto_CalculateLighmaps_02

9 From Tuto_CalculateLighmaps_01 scene drag and drop SUN_Directional_Light to Tuto_CalculateLighmaps_02 scene



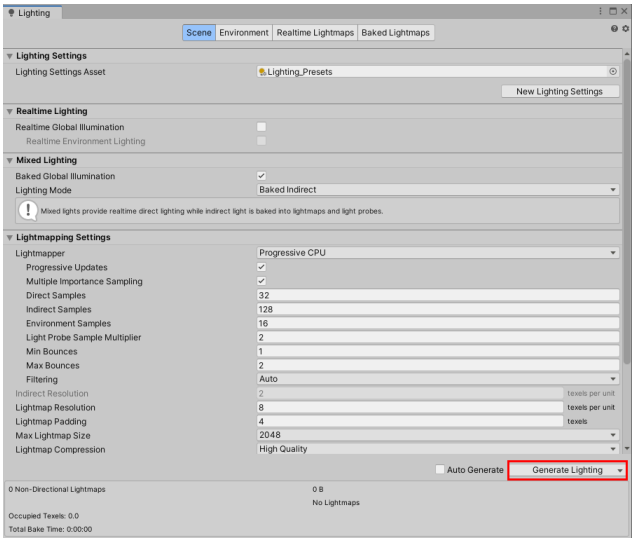
10 Ctrl+S to save all scenes

11 In hierarchy tab select Tuto_CalculateLighmaps_01 scene
-Mouse right click
-Choose Remove Scene

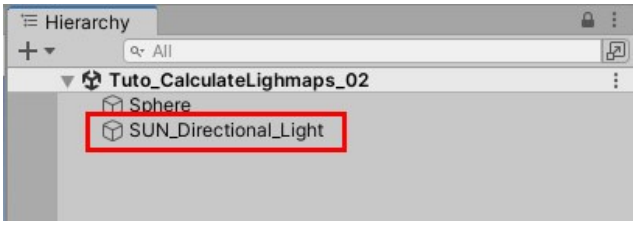


12 Go to Window > Rendering > Lighting

-In Lighting tab:
Press Generate Lightmaps



13 Delete SUN_Directional_Light
-Use keyboard shortcut Ctrl + S to save the scene



14 Go to Window > Rendering > Lighting

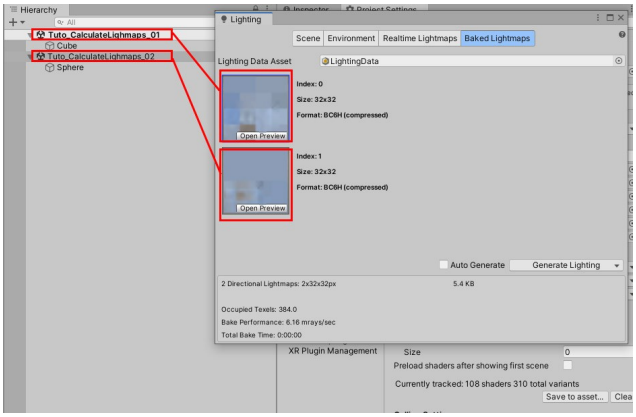
-In Lighting tab:
Open BakedLighmaps tab (spot 1)

Lightmap of scene Tuto_CalculateLighmaps_02 is displayed (spot 2)

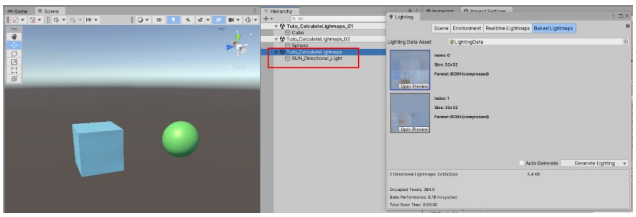
15 From Project tab drag and drop Tuto_CalculateLighmaps_01 scene in the hierarchy tab:

Assets > HPA > Scenes > Tuto > Calculate_Lightmaps > Tuto_CalculateLighmaps_01

In the lighting tab we can see the 2 lightmaps that correspond to the 2 scenes (cube and sphere).



16 <u>To add Directional Light(Sun) in the scene:</u>
From Project tab drag and drop Tuto_CalculateLighmaps in the hierarchy tab



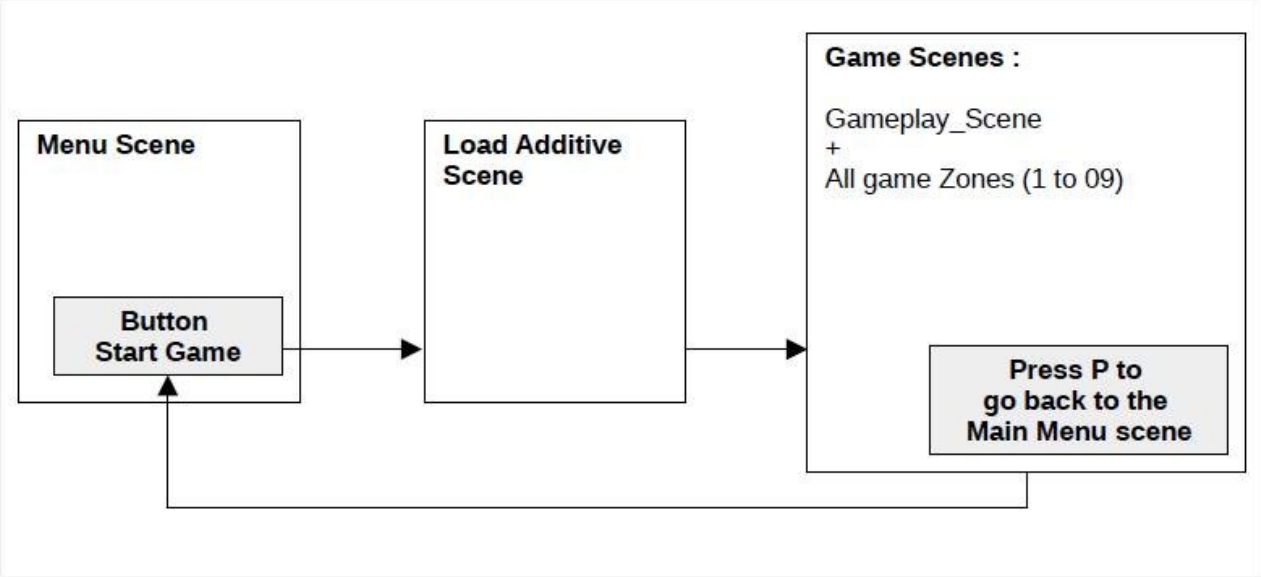
15 How to load the playground from a Menu Scene

Note: This section is designed to be read from the start to the end.

In most case it is useful to have a main menu scene in a game.

This section explains how to load the playground (Gameplay scene + All Zone scenes) from a Menu Scene.

How it works:



In a Menu scene:
When the player presses the Start Game Button.

The Load Additive scene is loaded and the scene Menu Scene is destroyed.

Then Load Additive scene loads all the Game Scenes.

When all the scenes are loaded, Load Additive scene is destroyed.

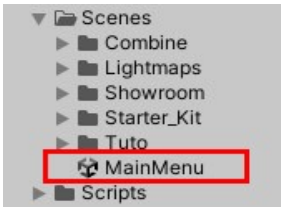
When the player want to go back to the Menu scene: the player presses P key.

How to setup a button in the Menu scene to load the game

As an example a Menu scene is available in the asset.

Open the scene MainMenu.

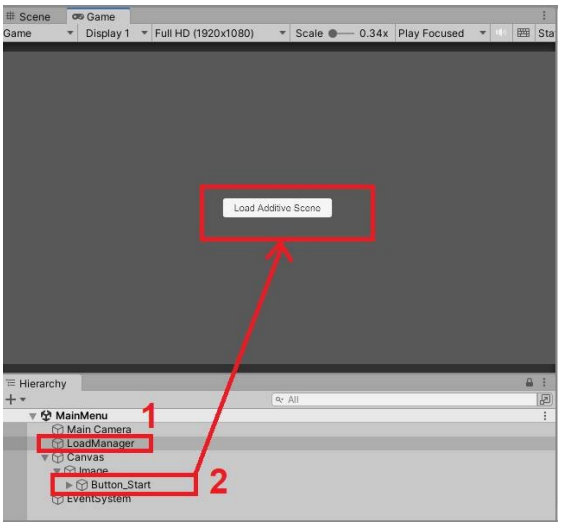
Assets > HPA > Scenes > MainMenu



In the MainMenu scene we have LoadManager object that contains:

- A script to load the game (spot 1).

- A button that call the method to load the game (spot 2)



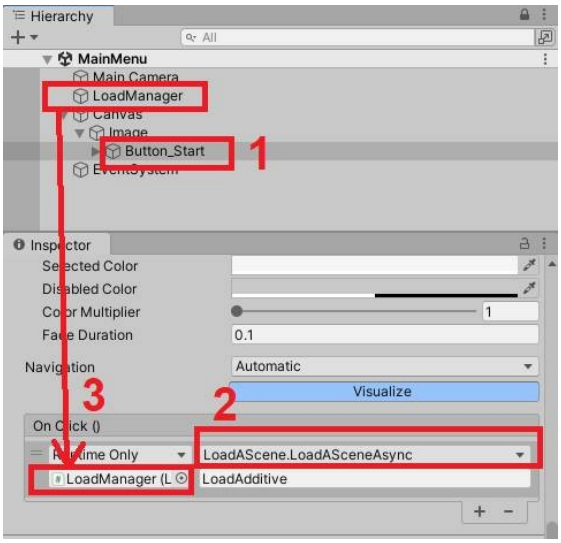
-Select Button_Start in the Hierarchy (spot 1).

Canvas > Images > Button_Start

<u>In Inspector tab:</u>

When the player click on the button:

The method LoadASceneAsync (spot 2) attached to LoadManager object is called (spot 3)

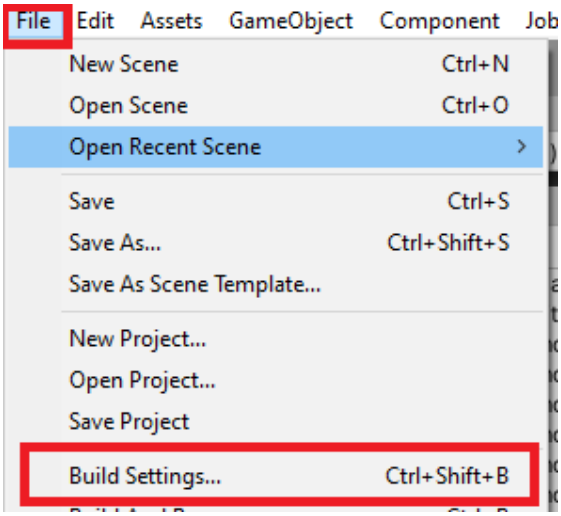


The method LoadASceneAsync allows to load a scene.

In our case it loads the scene named LoadAdditive
(spot 1).

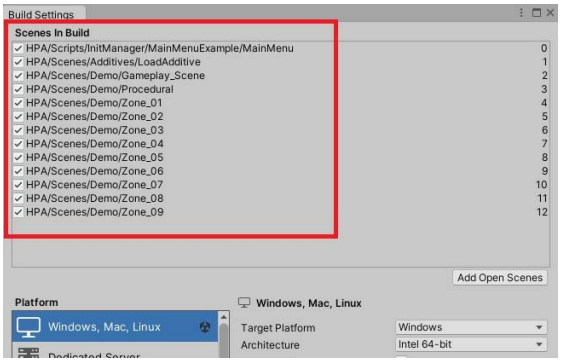
IMPORTANT: You **MUST** use the name of a scene available in your build.

(File → Build Settings)



<u>In build settings window:</u>

Your scene **MUST** be set into the list



IMPORTANT: The name you write in the field (spot 1) **MUST** be exactly the same as the name of your scene.

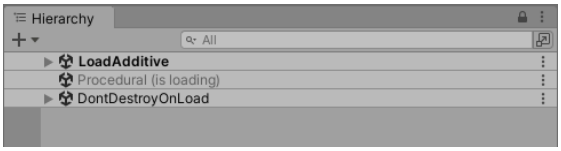
If there is an error in the name the scene won't be load.

- Press Play to start the game.

- Press the button.

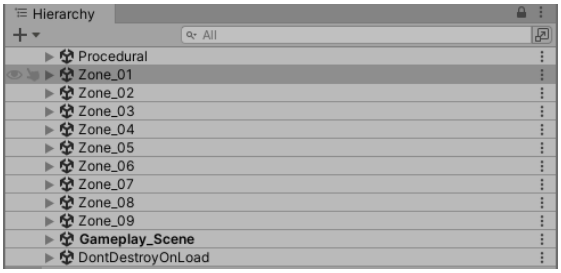
LoadAdditive is loaded and MainMenu scene is destroyed.

When LoadAdditive starts it automatically loads all the scene needed for the game.



When all the gameplay scenes are loaded:

LoadAdditive scene is destroyed automatically.

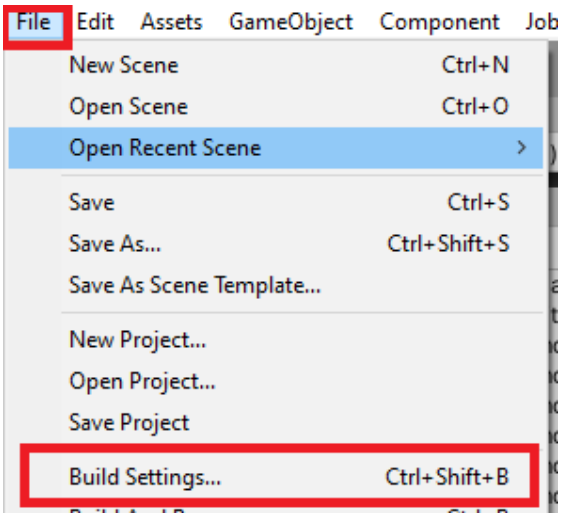


- Press Stop to stop the game.

Now we are going to add a prefab in the Gameplay_Scene that allows the player to go back to the Menu Scene.

To be able to load the Menu scene we **MUST** add the scene to the Scenes in Build list.

(Go to: File → Build Settings)



-Add the MainMenu scene at the beginning of the list.

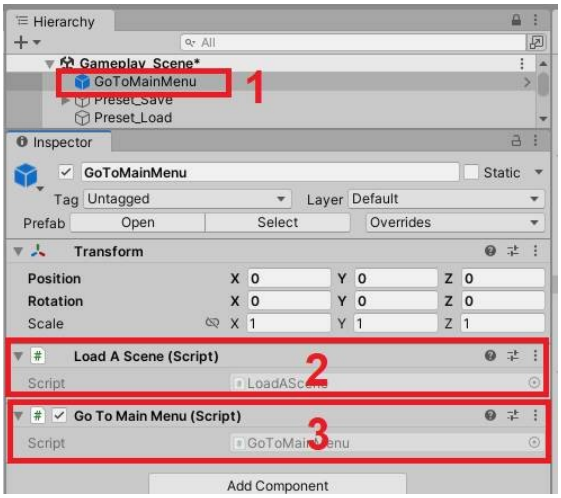
Important:
MainMenu must be added first into the list.
The first scene in the list is automatically loaded when the game starts.

-Open the Gameplay_Scene.

-From project tab drag and drop GoToMainMenu prefab in the Hierarchy.

Assets > HPA > Scripts > InitManager > MainMenuExample > GoToMainMenu

GoToMainMenu object contains 2 scripts (spot 1):



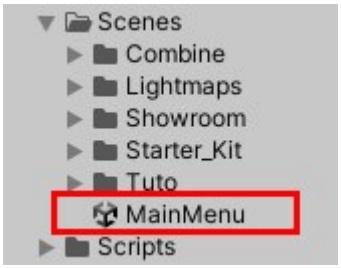
- LoadAScene.cs (spot 2).
It contains the method to load a scene.

- GoToMainMenu.cs (spot 3).
This script has a method to check if the player presses P key.
When P key is pressed, the LoadAScene.cs is called to load the Main Menu scene.

- Save the Gameplay_Scene (CTRL+S)

- Open the scene MainMenu.

Assets > HPA > Scenes > MainMenu

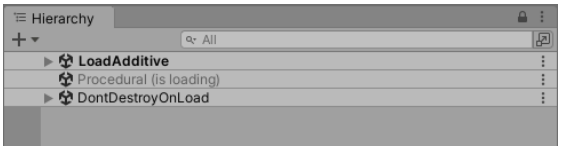


- Press Play to start the game.

- Press the button.

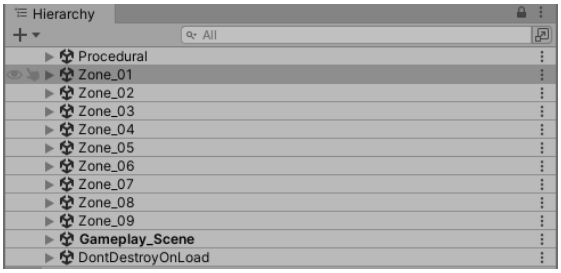
LoadAdditive is loaded and MainMenu scene is destroyed.

When LoadAdditive starts it automatically loads all the scene needed for the game.



When all the gameplay scenes are loaded:

LoadAdiitive scene is destroyed automatically.



- Press P key.
The Main_Menu scene is loaded. Other scenes are destroyed.

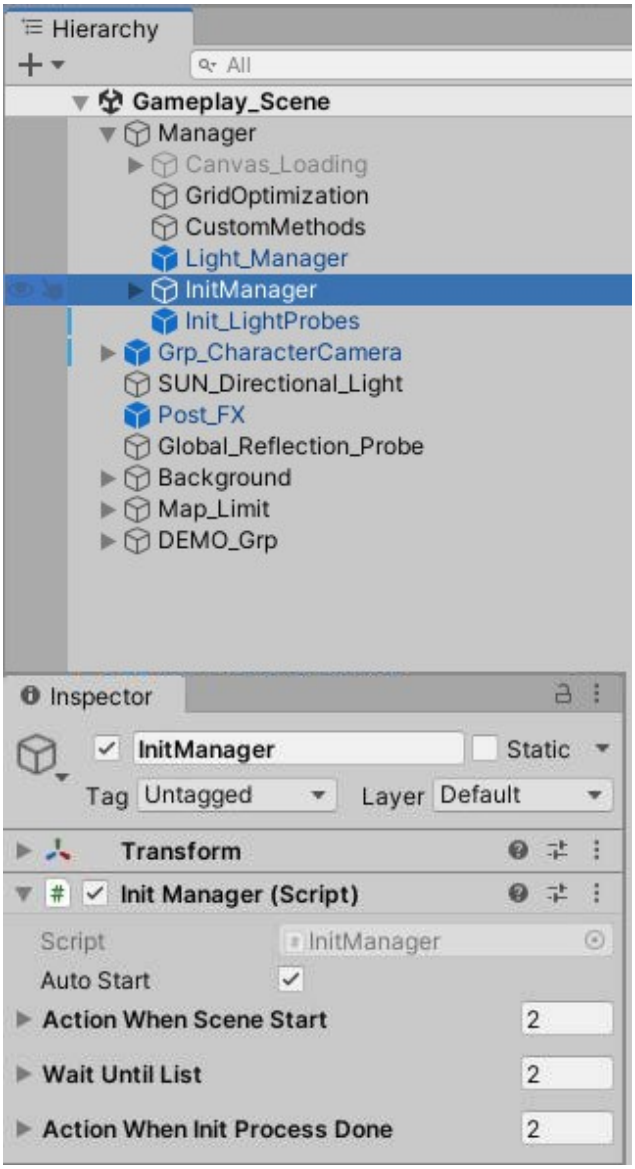
- Press Stop to stop the game.

16 Adapt the initialization of the Gameplay_Scene to your game

Note: This section is designed to be read from the start to the end.

In most case it is important to have the control on the initialization of your game.
It is useful to know when the initialization starts and when all the modules of your scene are initialized.
When everything is initialized in the scene, the player can start playing the game.

The asset contains a system to help you during the initialization phase.
If you don't want to use this system it possible to remove the InitManager object from the Hierarchy.



This section explains how to do actions during the initialization of the game.

For example: This system is useful if you want to disable the character until all the game initialization are done.

As an example: In the demo scene
When the scene starts:
- A loading screen is displayed.
- The character movement is disabled.

Then when the optimization system is initialized:
- The loading screen is disabled.
- The character movement is enabled.

This chapter explains how to customize the object InitManager in your Gameplay scene to fit your game needed.

Summary:

- Special case: The character is not contained in the Gameplay_Scene.
The character is instantiated manually in the scene

(Example:
The scene starts
then the character is instantiated in the scene manually.

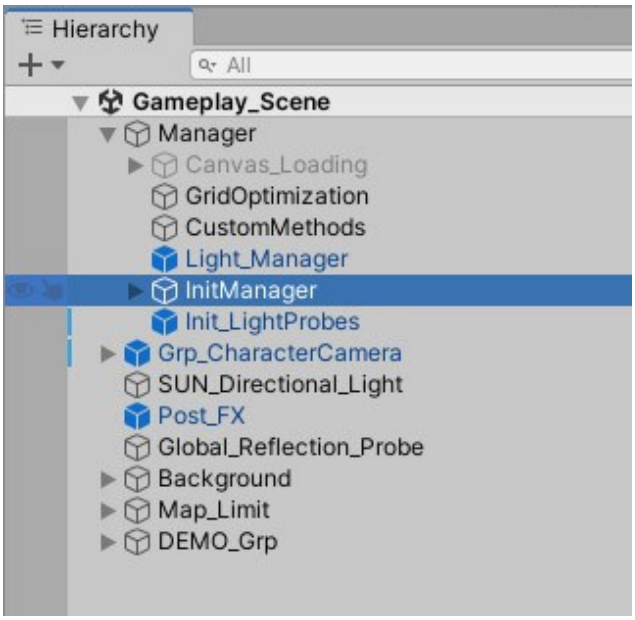
In that case you need to load your character then you need to initialize the grid optimization system depending the position of the character in the scene. This chapter explains what to do in that case)

Link

How it Works

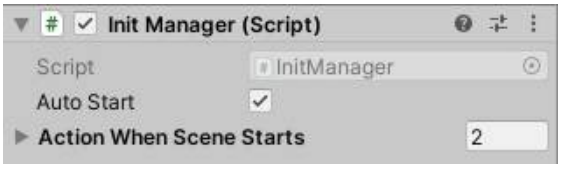
In the Gameplay_Scene the object InitManager allows:

- To do actions when the scene starts.
- Wait until the scene is initialized.
- To do something when the game is initialized.



Note: It is possible to delete InitManager object if you don't want to use this system.

In the Inspector:
- Section Action When Scene Starts allows to calls methods when the game starts.



By default a method is called to displayed the loading screen and disabled the character movement.

- Section Wait Until List is used to check if all the process of the game initialization are done.

By default this section check if the system to optimize the scene has finished its initialization.

- Section Action When Init Process Done allows to calls methods when all the process of the game initialization are done.

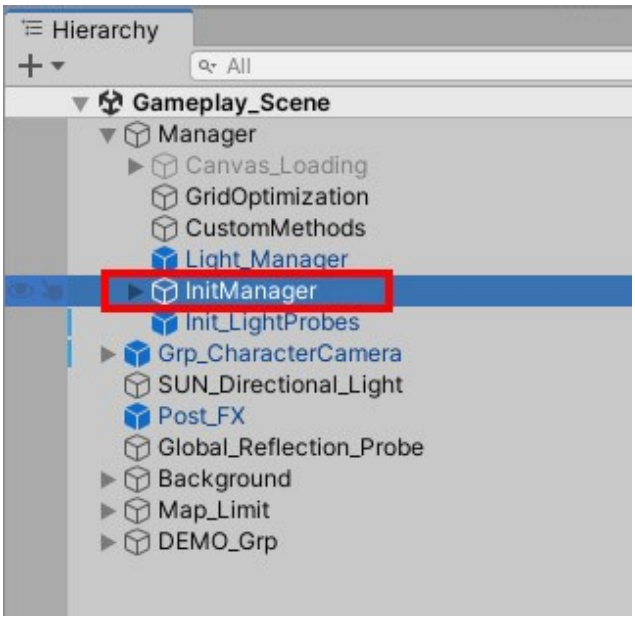
By default a method is called to disabled the loading screen and enabled the character movement.

Do something when the scene starts

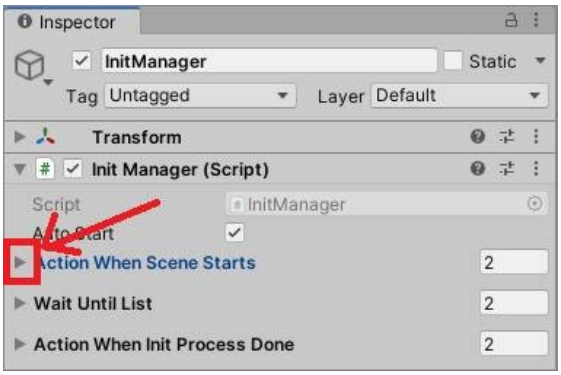
This section explains how to call your own methods when the Gameplay_Scene starts.

As an example we are going to call a method that display “Gameplay scene starts” in the console tab.

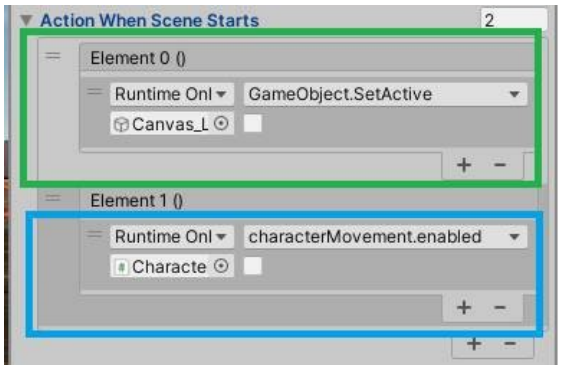
-In the Gameplay_Scene select the object InitManager
(hierarchy tab: Manager → InitManager)



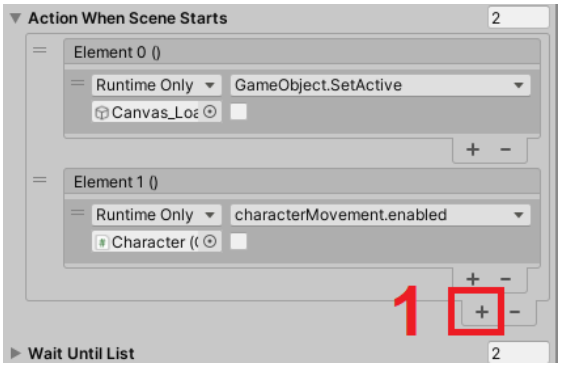
-In the inspector press the triangle button to open the section ActionWhenSceneStarts



By default there are 2 methods already setup:
A method is called to displayed the loading screen (green square).
A method disabled the character movement (blue square).



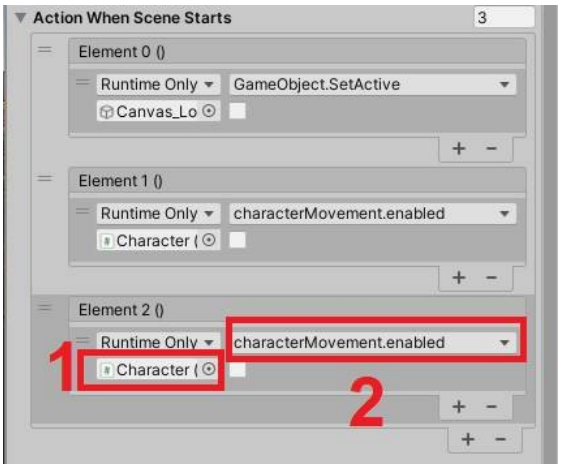
-At the end of the list press the + button (spot 1)



A new slot is created.

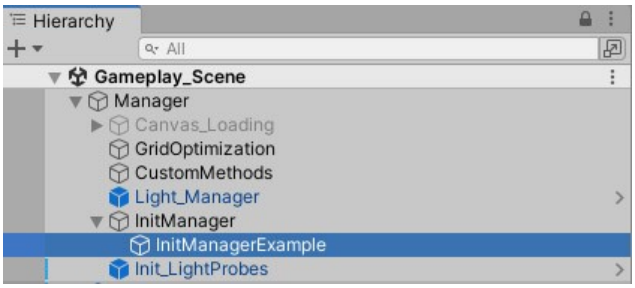
Now we are going to drag and drop the object in the hierarchy that contained the method we want to use.
(spot 1).

Then we are going to choose the method to call (spot 2)



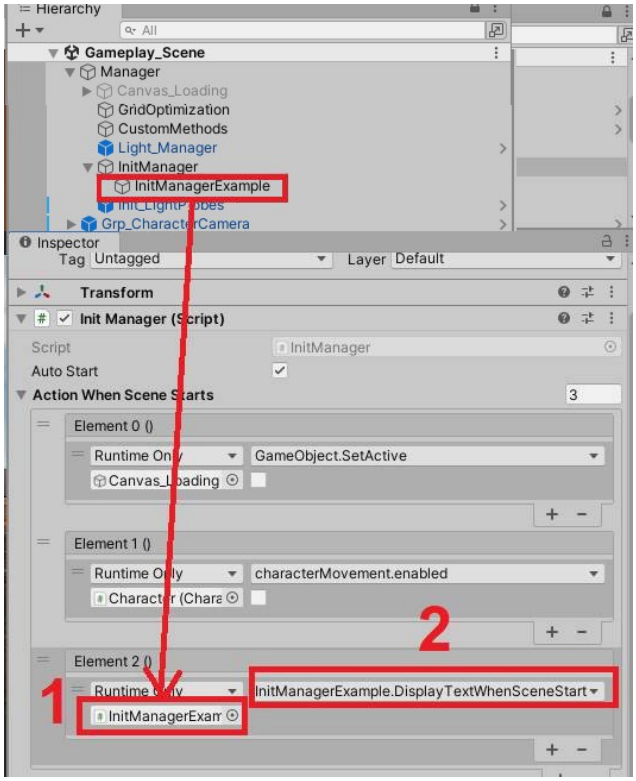
Very Important:
The object you drag and drop **MUST** be in the scene Gameplay_Scene.

The methods we are going to use for this example are contained in the object InitManagerExample.



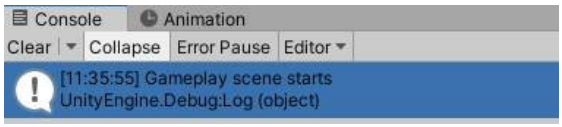
-Drag and drop InitManagerExample object inside the new slot (spot 1)

-Choose the method DisplayTextWhenSceneStarts in the dropdown menu (spot 2)
(InitManagerExample → DisplayTextWhenSceneStarts())



- Press Play to start the game.

The text is displayed in the console tab when the scene starts.

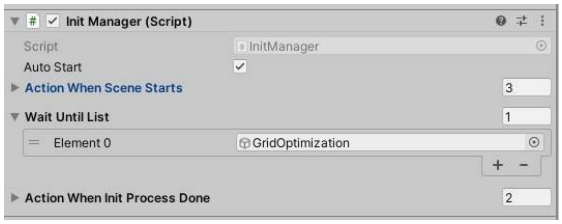


- Press Stop to stop the game.

Wait until something is done

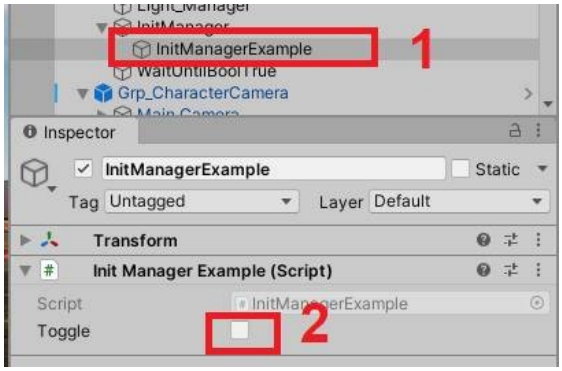
Section Wait Until list is used to checked if all the process of the game initialization are done.

By default Wait Until list verifies that grid optimization is completed.



As an example we will also check if toggle is true

Toggle is inside InitManagerExample object (spot 1)



As a consequence, the InitManager object will return that the scene is initialized when:
-The Optimization system is initialized(by default).
And

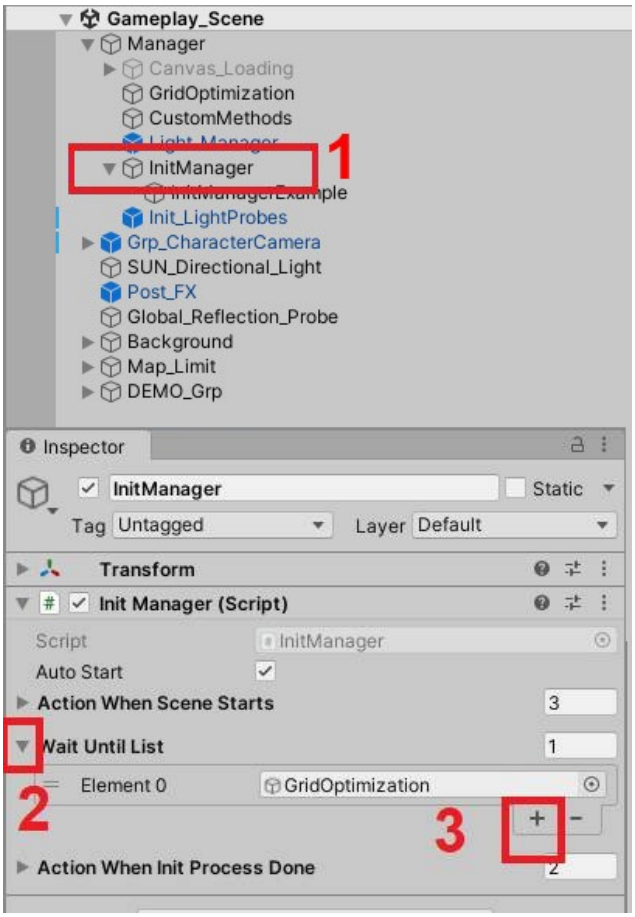
-Toggle boolean is set to true.

Both conditions must be met to continue.

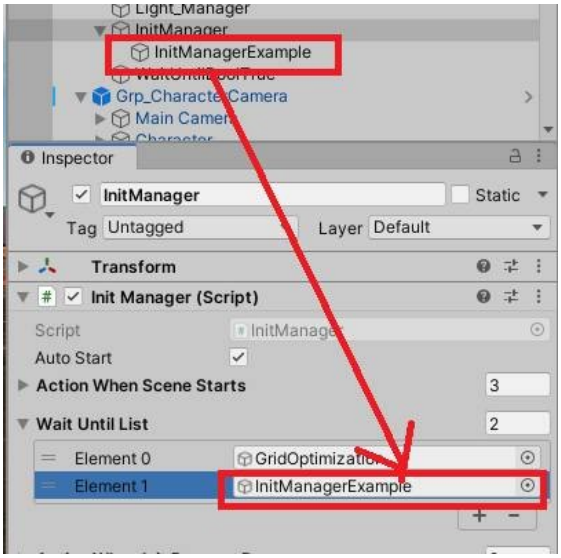
- In the Gameplay_Scene select InitManager (spot 1)
(Hierarchy: Manager → InitManager)

- Press the triangle next to Wait Until List to opened the section (spot 2).

- Press + button (spot 3) to add a new slot.



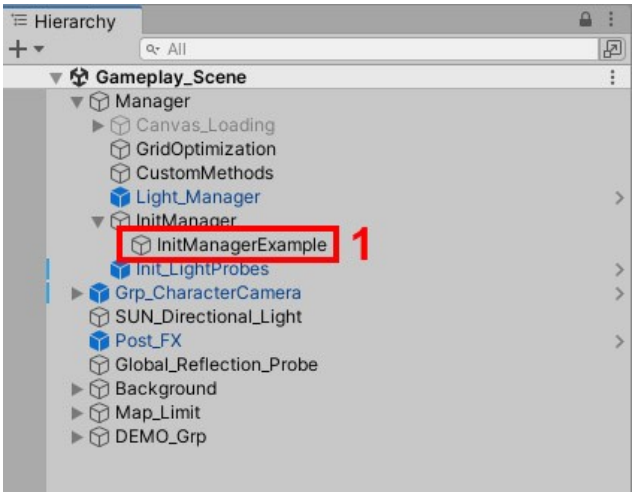
-inside the new slot drag and drop the InitManagerExample object.



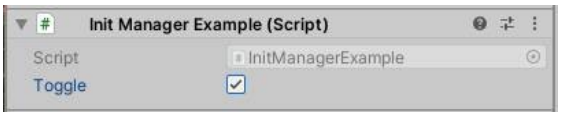
- Press Play to start the game.

The loading doesn't disappear.

In hierarchy tab:
- In the Gameplay_Scene select InitManagerExample (spot 1)
(Hierarchy: Manager → InitManager → InitManagerExample)



- In the Inspector check Toggle variable.



The loading screen disappear.

- Press Stop to stop the game.

Very Important:

The object you drag and drop:

- **MUST** be in the scene Gameplay_Scene.

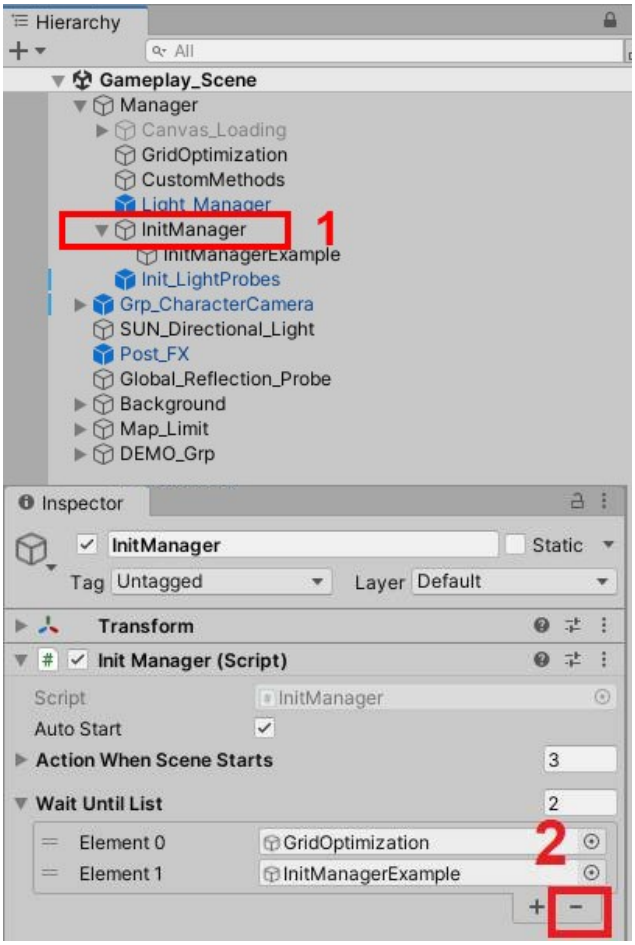
- **MUST** have a script attached to it that access the Interface `HP.Generics.IInitable` and a boolean method named `IsInitDone()`

In the next section we will see how to setup a script.

This section is finished so **don't forget** to remove the example.

- In the Gameplay_Scene select InitManager (spot 1)
(Hierarchy: Manager → InitManager)

- In section Wait Until List press - button (spot 2) to remove InitManagerExample object from the list.



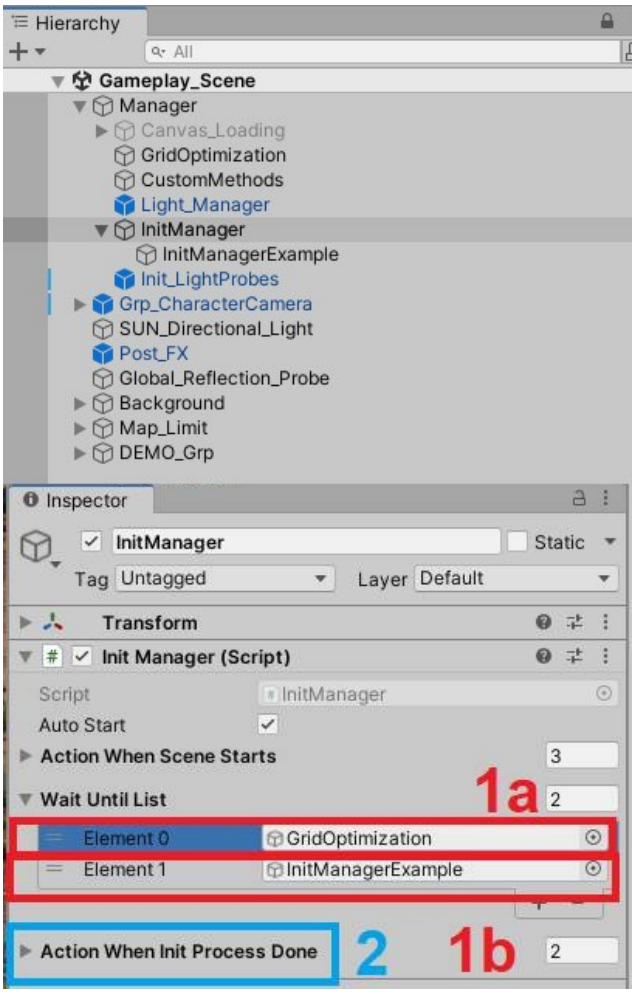
How to setup a script to be used in the WaitUntilList section

How WaitUntilList section works:

Each object in WaitUntilList has a script attached to it that contained a boolean method named IsInitDone(){} (spot 1a, 1b)

For each object inside WaitUntilList the script InitManager check if all IsInitDone(){} methods return **True**.

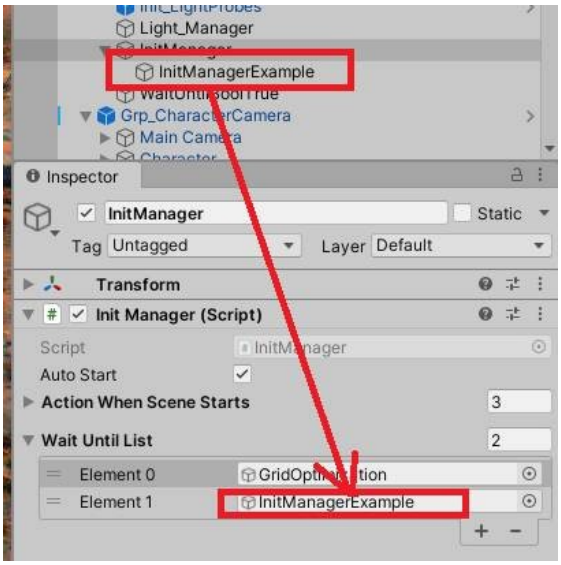
When all the methods return **True** the InitManager script call the methods included in the section ActionWhenInitProcessDone (spot 2).



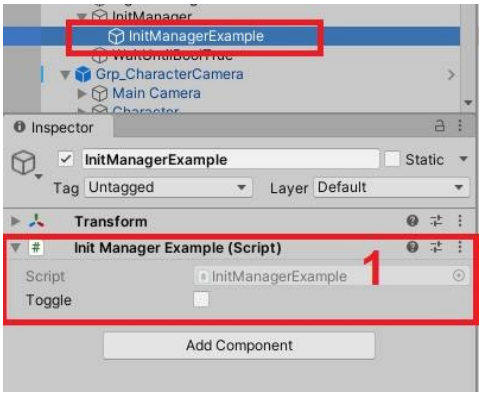
How to create your own IsInitSection(){}

As an example to show how to create your own IsInitSection(){} we will see the example from the previous section.

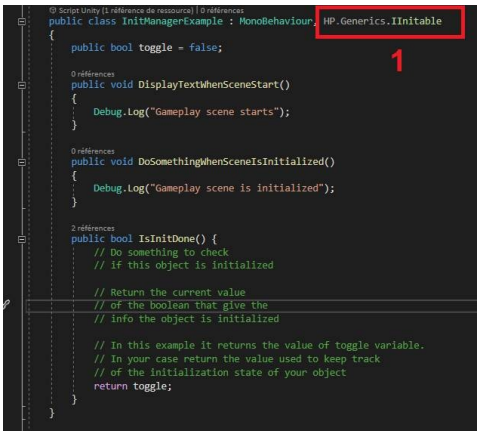
In the previous section we added InitManagerExample object to the WaitUntilList



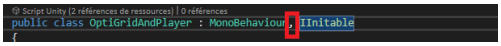
InitManagerExample object has InitManagerExample.cs script attached to it (spot1).



Inside the script:
- The interface `HP.Generics.IInitable` is listed after MonoBehaviour inheritance (spot 1).

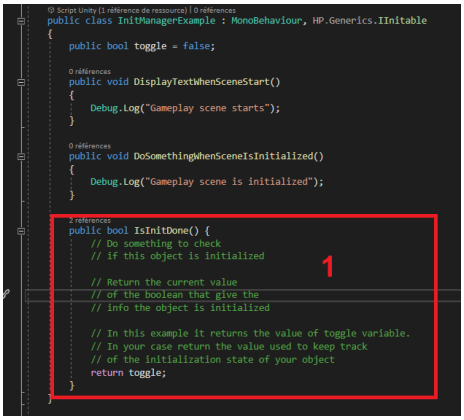


In your script you must listed this interface after any inheritance of your script. Use comma to separate the 2 inheritances.

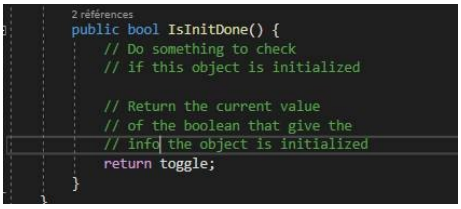


-The boolean method `IsInitDone()` is declared at the end of the script (spot 1).

In your script you must declare this method.



You can write your own code to return the state of the initialization for this object.



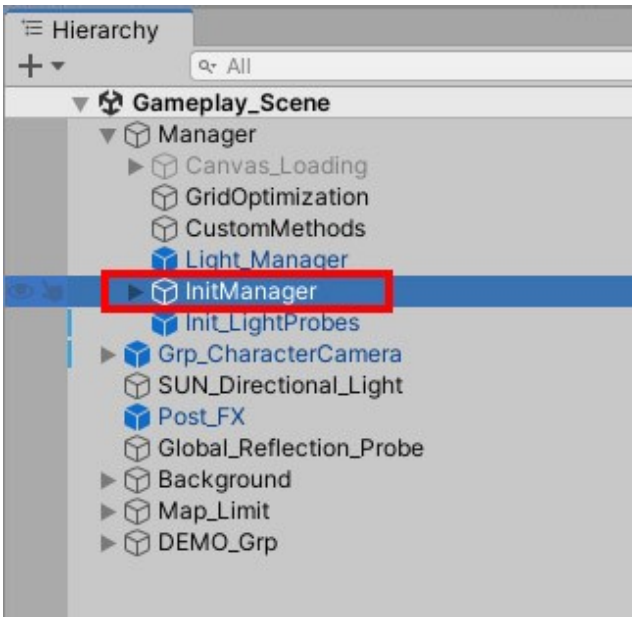
Important:
The object **MUST** have only **ONE** script with the Interface `HP.Generics.IInitable` connected to it.

Do something when the game is initialized

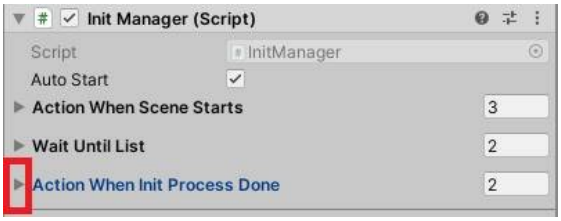
This section explains how to add your own methods when the scene is initialized.

As an example we are going to call a method that display “Gameplay scene is initialized” in the console tab.

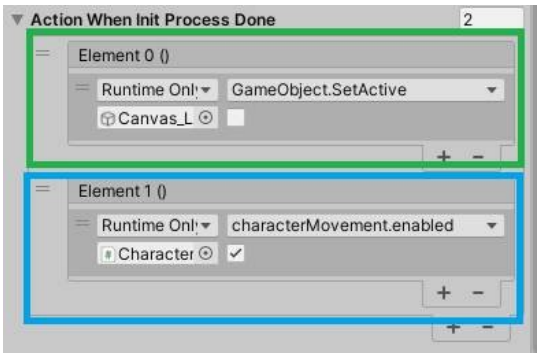
-In the Gameplay_Scene select the object InitManager
(hierarchy tab: Manager → InitManager)



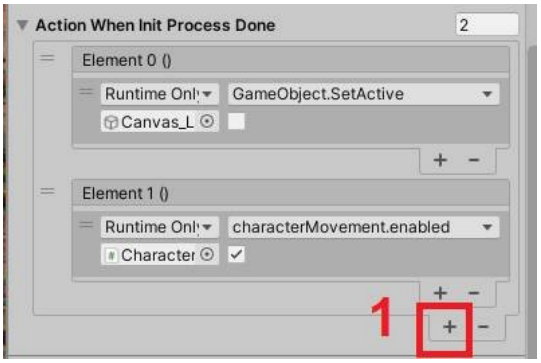
-In the inspector press the triangle button to open the section ActionWhenInitProcessDone



By default there are 2 methods already setup:
A method is called to disable the loading screen (green square).
A method enabled the character movement (blue square).



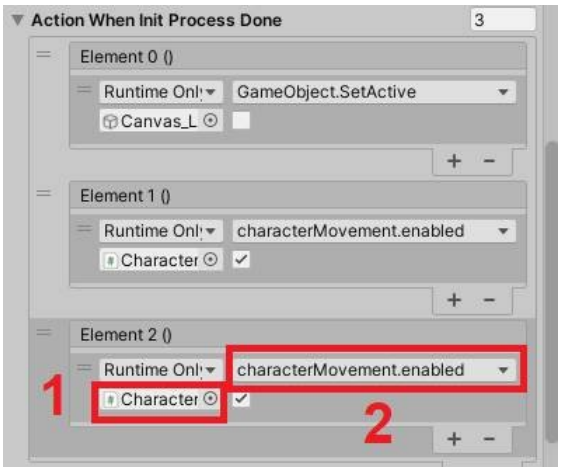
-At the end of the list press the + button (spot 1)



A new slot is created.

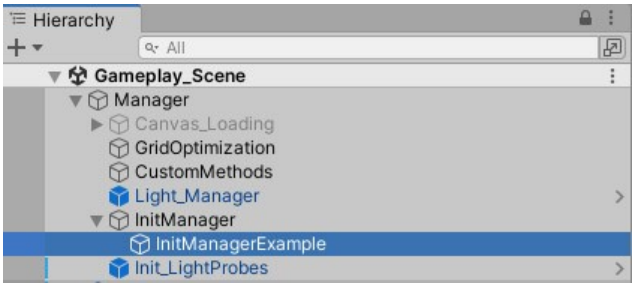
Now we are going to drag and drop the object in the hierarchy that contained the method we want to use.
(spot 1).

Then we are going to choose the method to call (spot 2)



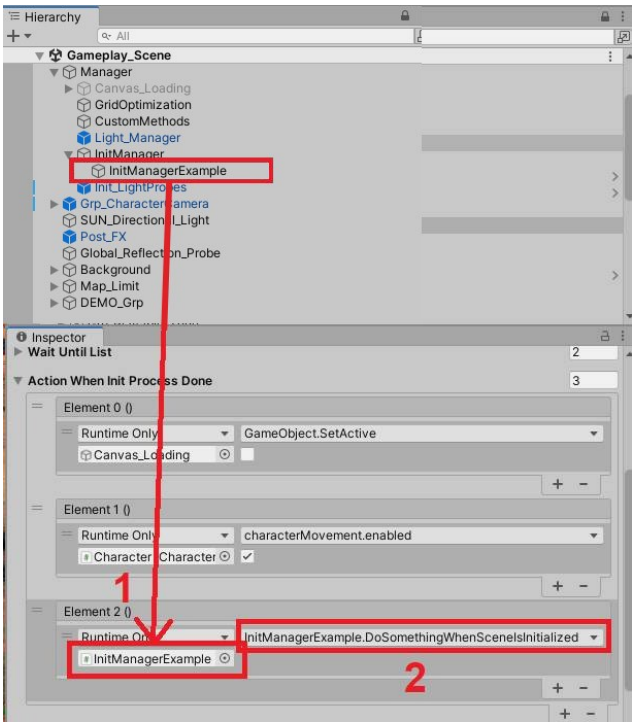
Very Important:
The object you drag and drop **MUST** be in the scene Gameplay_Scene.

The methods we are going to use for this example are contained in the object InitManagerExample.



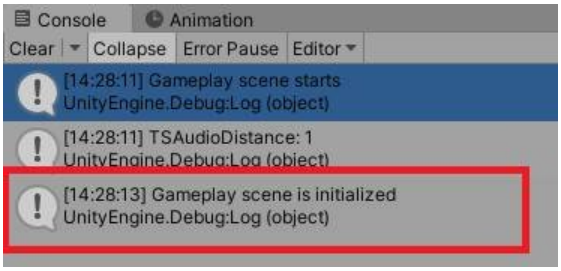
-Drag and drop InitManagerExample object inside the new slot (spot 1)

-Choose the method DoSomethingWhenSceneIsInitialized in the dropdown menu (spot 2)
(InitManagerExample → DoSomethingWhenSceneIsInitialized())



- Press Play to start the game.

The text is displayed in the console tab when the scene is initialized.



- Press Stop to stop the game.

Special case: The character is not contained in the Gameplay_Scene.
The character is instantiated manually in the scene

Case:
There is no character in the Gameplay_Scene. The character is instantiated by script in the scene.

(Reminder: The character must have the script TSCharacterTag attached to it. This script is used by the optimization system to know the position of the character. This is the reason why we need to be sure the character is loaded in the scene before we try to initialized the optimization system.)

In that case:
- You need to load the character in the scene.
- Then you need to initialize the grid optimization system depending the position of the character in the scene.

This chapter explains what to do in that case. Each game is different so you probably need to adapt the example to your game.

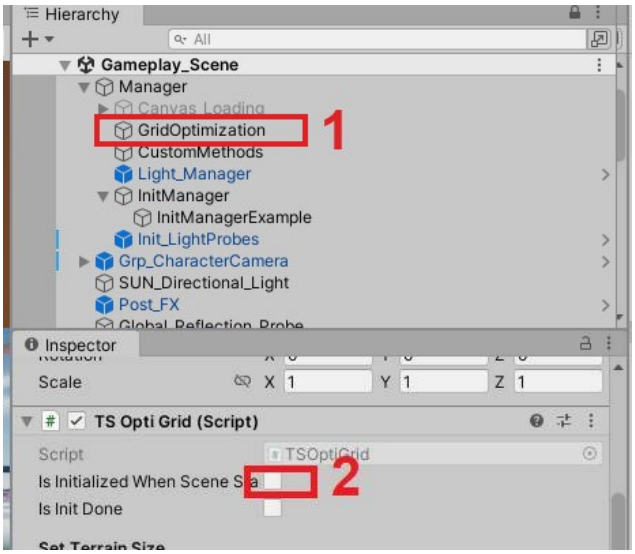
The steps we need to do:

Disabled the auto initialization of the Optimization system.

- In Gameplay_Scene select GridOptimization (spot 1) *(Hierarchy: Manager → GridOptimization)*

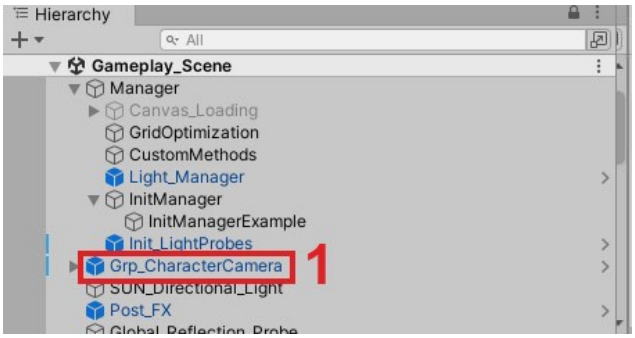
- In the Inspector uncheck IsInitializedWhenSceneStarts (spot 2)

Now we can initialize the object when we want by script.



Remove the character from the Hierarchy

- In the Gameplay_Scene delete Grp_CharacterCamera (spot 1) *(Hierarchy: Manager → Grp_CharacterCamera)*

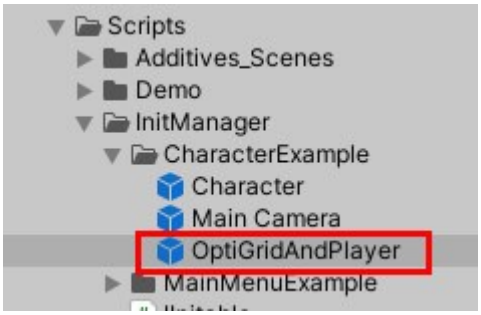


Setup the scene for the new character

For this example:

- In the Gameplay_Scene drag and drop the OptiGridAndPlayer prefab.

(Project Tab: Assets → HPA → Scripts → InitManager → CharacterExample → OptiGridAndPlayer)



The object contains:
-The character camera.

- OptiGridAndPlayer prefab has also a script attached to it.

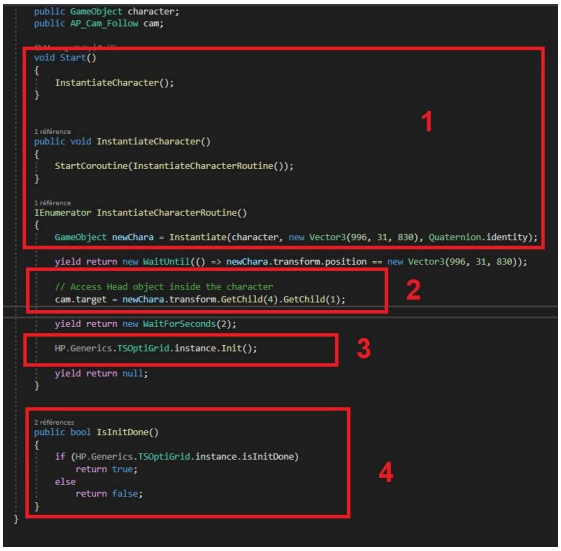
The OptiGridAndPlayer.cs script contains the methods to:

- Load the character when the scene starts (spot 1).
(When the scene starts the script automatically load the character in the scene)

- Connect automatically the camera to the character (spot 2).

- Start manually the initialization of the optimization system when the character is loaded in the scene (spot 3).
use the method
`HP.Generics.TSOptiGrid.instance.Init();`

- Check if the optimization system is initialized (spot 4).

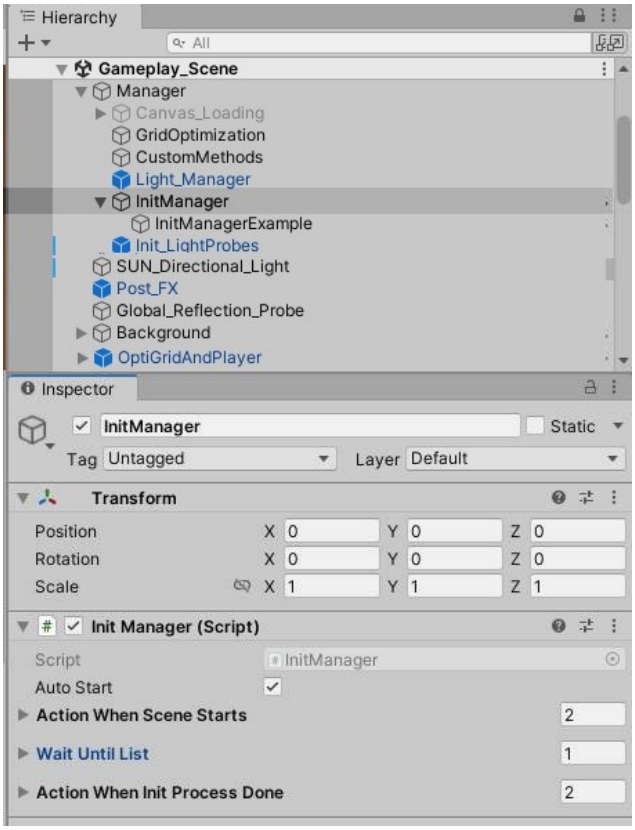


Setup InitManager object

(more info about InitManager in the previous sections)

InitManager allows to check if some scripts are initialized in the scene.

In our case we want to check if:
- The player is loaded and moved to its default position.
- The Optimization system is initialized.



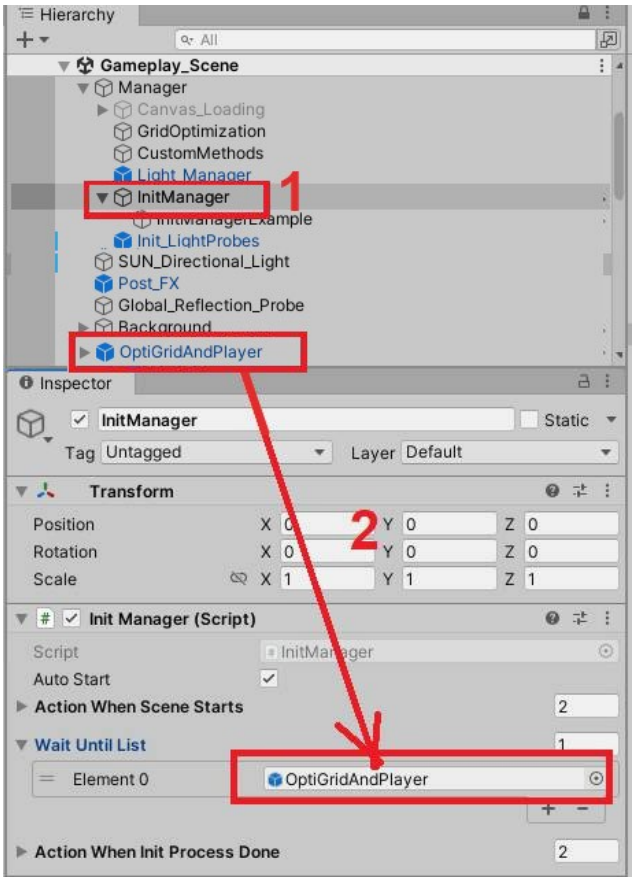
To do that we are going to use the method `IsInitDone()` from the interface `IInitable`
(more info about how to setup the interface in the previous sections)

```
2 références
public bool IsInitDone()
{
    if (HP.Generics.TSOptiGrid.instance.isInitDone)
        return true;
    else
        return false;
}
```

This method return if the Optimization system is initialized.

- In the Gameplay_Scene select InitManager (spot 1)
(Hierarchy: Manager → InitManager)

- Drag and drop OptiGridAndPlayer object inside
Wait Unitl List slot Element 0 (spot 2)



Now the method `IsInitDone()` from the interface `Iinitable` is checked to know if the initialization of the scene is done.

- Press Play to start the game.

The loading screen is displayed
Then the player is loaded in the scene.
Then the optimization system is initialized
Finally the loading screen is disabled.

- Press Stop to stop the game.

17 Troubleshooting

Console Warning :

The type or namespace name universal does not exist

This means that URP Package is not installed.

If you do not have URP installed, other error messages may appear in the console. Install URP to make console errors disappear.

All shaders are pink

This means that URP Package is not installed or configured correctly.

Install URP to solve the problem

For more information Link

The textures of roads and pathroads does not integrate well with the textures of the ground

You must calculate lightmaps of Procedural Scene.

To learn how to calculate lightmaps Link

Snap is not working

To learn how to use snap Link

Building lighting doesn't look right, reflections look weird, or the building doesn't look well integrated with the terrain:

-Check if the reflection prob encompasses the whole building
-Check that the center of the reflection is inside the building

For more informations about Reflection probs Link

Lods prefabs disappear too close to the camera

-Set Lod Bias to 3
For more informations Link

During the game, some objects do not appear or appear / disappear at the wrong moment

Try these different solutions:

-Set Lod Bias to 3. For more informations Link

-To determine the distance, the optimization system takes into account the center of the group. Check that the center of the group. For more informations Link
-Set up GridOptimization row and columns. For more informations Link
-Set up Distance Min. For more informations Link
-Set up Ref Distance Per second. For more informations about optimization system Link

Road doesn’t work correctly

If roads are included in a group:

Set group to:

Position 0 0 0 Rotation 0 0 0 Scale 1 1 1

I can't draw the points to create a road

To solve this problem:
-Verify that gizmos are activate in scene tab
-In scene view select the terrain
-In hierarchy tab select again the new Road
-Press keyboard shortcut N

For more informations Link

When I work in scene view, it's slow

Do not display the scene view and the game view at the same time

Console Warning :
Cross scene references are not supported

This warning appears when working with several scenes in the hierarchy tab (scene additives).
Do not take this warning into account.

Console Warning :
There are x objects in the scene with overlapping Uv's

Do not take this warning into account: it has no impact on rendering quality or performance.

There are invisible colliders on terrain:

After creating roads you must delete roads colliders

For more informations Link

Console Warning :
InitializeLighmapData job with hash .... exit code 2

This means that there is not enough RAM to calculate the lightmaps

To solve the problem:

-Cut the scene into 2 scenes to reduce the number of objects to calculate. For more informations how to work with additives scenes Link

or

-Reduce the number of prefabs into the scene

Build is stuck at 100% and won't start

You must put in the build all the scenes indicated in the LoadAdditive scene

For more information Link

Issue: at the bottom right in the unity editor: grey bar blocked once the lightmap calculation is complete.

For more information Link