



Magio Core / PRO - User Instructions

Updated 23.09.2022

Version 1.0.0+

—

Arctibyte
Support@arctibyte.com
support.arctibyte.com

Quick Start	3
Requirements	3
Installation	4
How to upgrade to Magio Pro from Magio Core	6
Converting your first object	7
The Basics	12
Mesh Or Skinned Mesh	12
Effect Packs	12
Using Magio Originals HQ (Only in PRO)	13
Changing the Effects	15
Adjusting the VFX parameters	16
Adjusting the Material Animation	16
Basic behaviour	19
Tutorials	21
Convert Object to use One Effect	21
Convert Object to Multi-Effect Object (Only in PRO)	22
Create a splash effect	25
Enable/Disable wind and other external forces	28
Ignite effects by raycasting or by overlap sphere	29
Ignite effects by using your own particle system	30
Nullify/Extinguish Effects with raycast or overlap sphere	31
Nullify/Extinguish using your own particle system	32
Change Element Interaction Rules (ONLY IN PRO)	33
Create your own Magio effect with VFX Graph	36
Convert your existing VFX Graph to work with Magio	39
Create a effect pack	42
Use Magio with Unity Terrain Trees	44
Use Magio with Vegetation Studio Pro	46
Manually Control the Magio Effect Spread and timer	49
Hook to Magio Object events such as Ignited and Nullified	51
Detect when your object touches an effect	52
Pause effects through script	53
Optimize if you have lots of inactive Magio Objects / Use custom instancer or renderer	55
Animate lights with Magio effect	59
Add Sound FX to the effects	60
Attach your pre-placed sound effects to animate with the effect	61

Create Compatibility for a third-party shader	62
Compatibility	64
The Vegetation Engine	64
Vegetation Studio Pro	64
HQ FPS Animated Weapons	64
NatureManufacture Environments	64
FAQ/Quick Fixes	65
Magio does not work	65
Errors on Sample scene on all/some effects	65
I am using Magio Originals HQ/Flame Wild HQ and the smoke is green	66
Using lot of effects kills my Frames Per Second	67
I WANT MORE PARTICLES, BUT VFX MULTIPLIER DOES NOT ADD THEM	67
Can I use Magio with Oculus Quest?	68
Can I use Magio on mobile?	68
Can I enable effects through code?	68
The VFX does not spread on touch of other VFX	69
Can I create Magio Effect Packs from my effects and sell them in the asset store?	69

Quick Start

Requirements

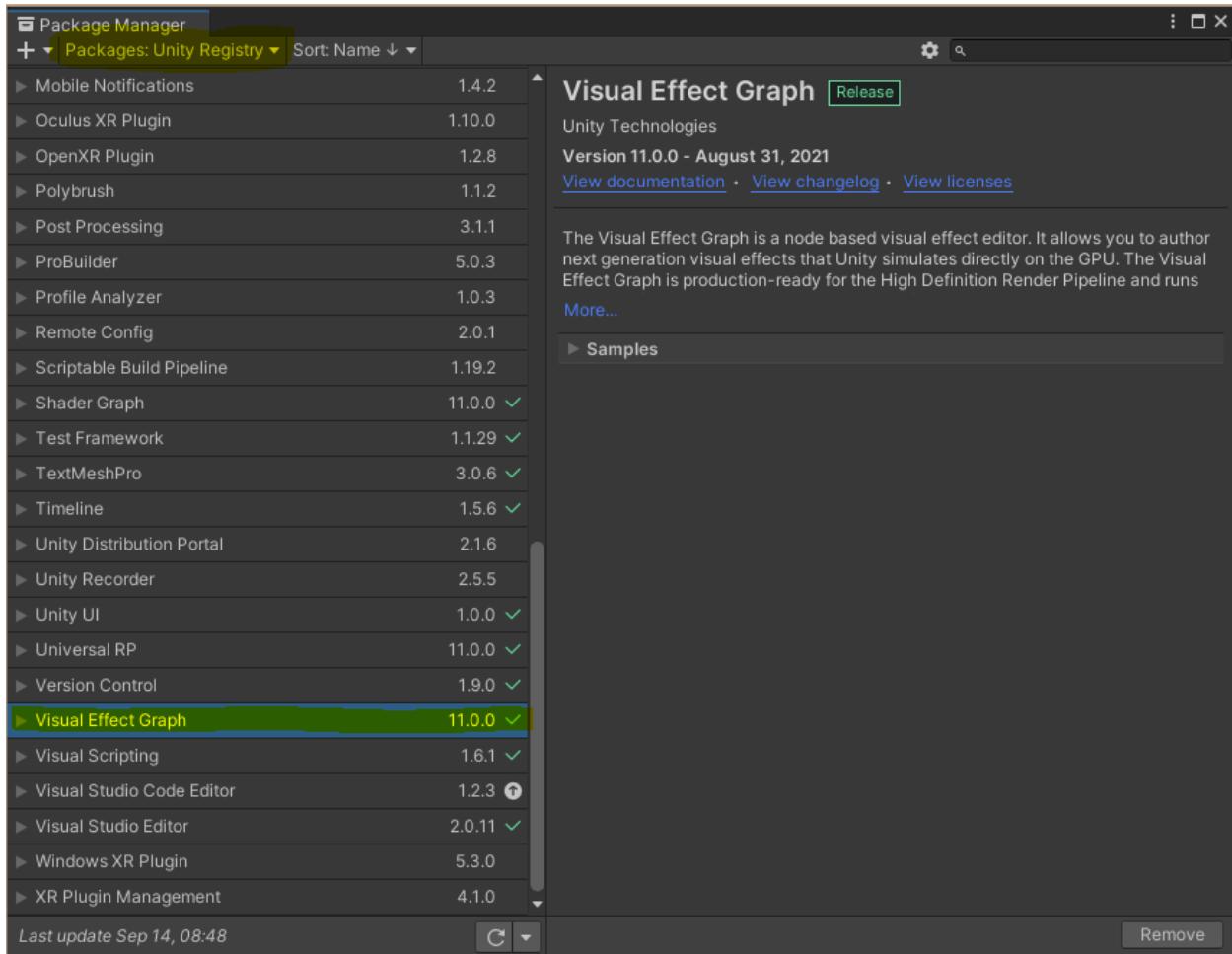
Unity Editor 2021.1+

Visual Effects Graph 11.0+

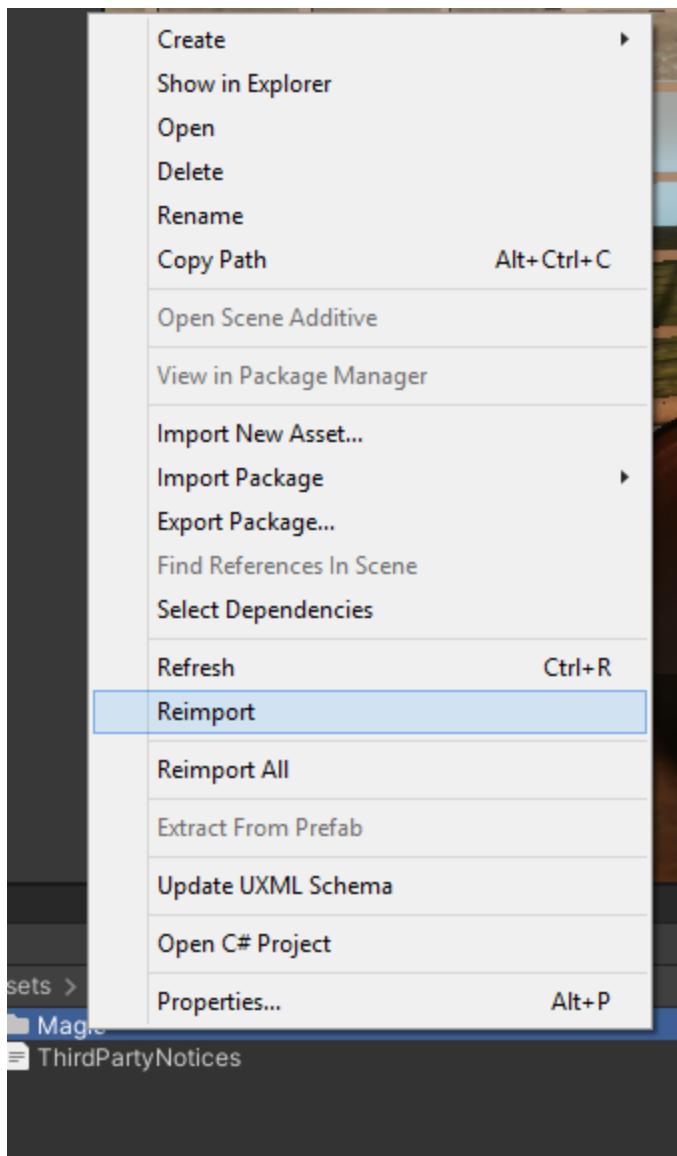
URP or HDRP

Installation

1. Always backup your project before installing new extensions
2. Make sure you have Visual Effects Graph 11.0+ Installed.
 - a. Go to Window->Package manager
 - b. Change Packages to Unity Registry
 - c. Find Visual Effects Graph
 - d. Install if not installed

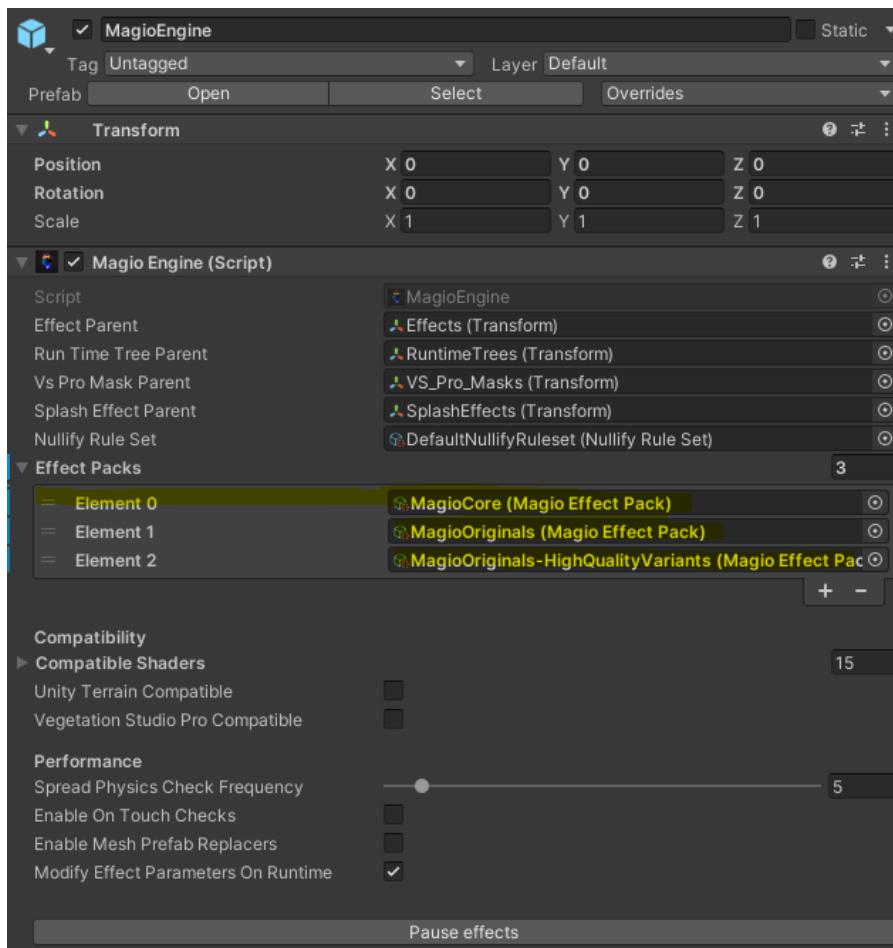


3. Open sample scene
 - a. URP -> Arctibyte/Magio/Demo/URP/Scenes/URP_SampleScene
 - b. HDRP -> Arctibyte/Magio/Demo/HDRP/Scenes/HDRP_SampleScene
4. Press play and play around in the demo scene making sure effects are applied.
5. Demo Scene controls: Q & E to change spells, left-click shoot, WASD to move
6. **If you are getting errors on all/some effects:**
 - a. Make sure you have visual effects graph installed
 - b. Re-import Magio folder (Right-click->Re-import)



How to upgrade to Magio Pro from Magio Core

1. Before upgrading, backup your project and make sure not to inspect magio objects before you have completed these steps.
2. Import Magio Pro to your project where you have Magio lite
3. If you already have Magio Lite objects in your scenes you just need to make them cross-compatible by adding the effect packs in the right order
4. Open MagioEngine gameobject in your scene.
5. Make sure the effect packs are in this order and add missing ones: MagioCore, MagioOriginals, MagioOriginalsHQ

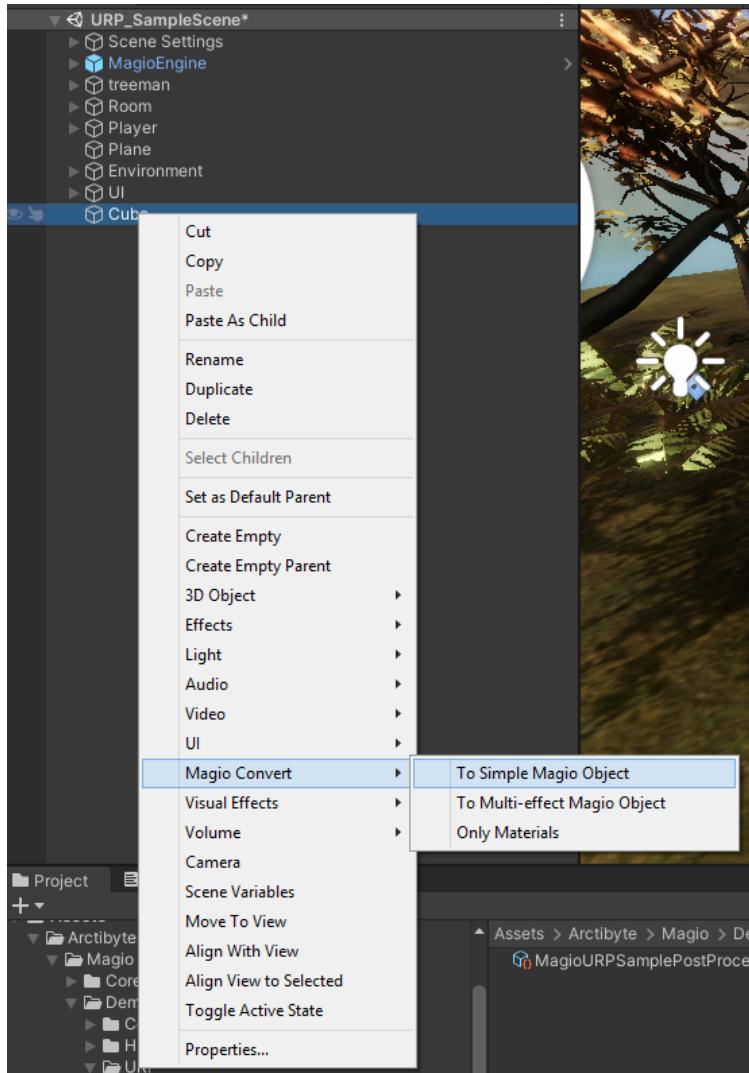


6. The effects should now be as before.

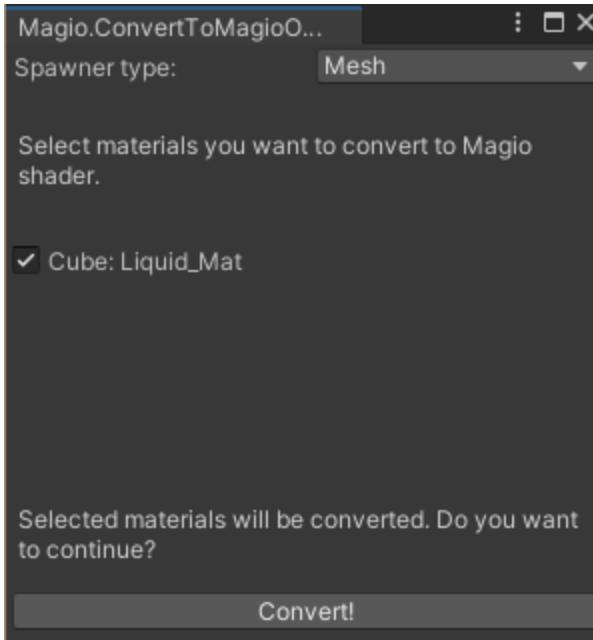
Converting your first object

Magio can handle spawning an effect on the object in various ways. Here are instructions for the simplest conversion. Mesh and Skinned Mesh are supported automatically.

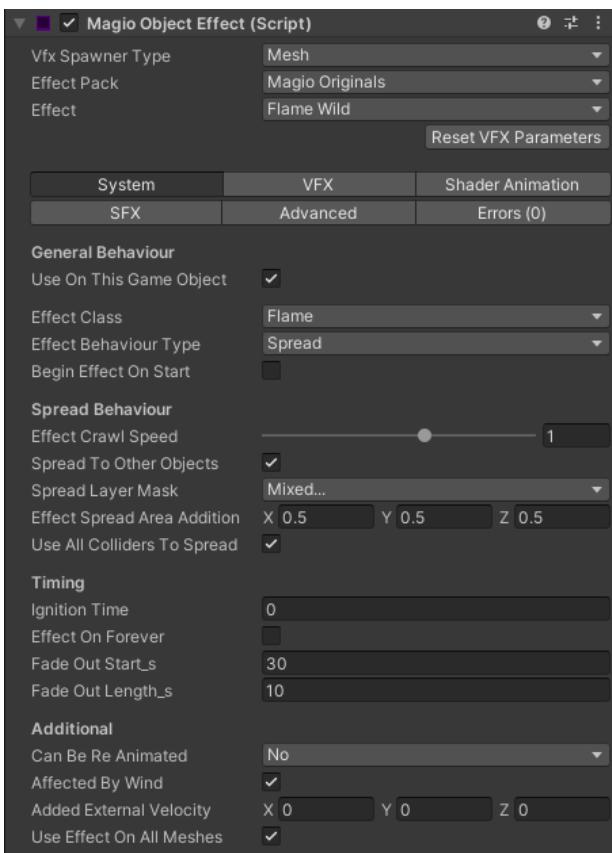
1. Select the object you want to convert from the scene hierarchy.
2. Right-click->Magio Convert->Simple Magio Object.



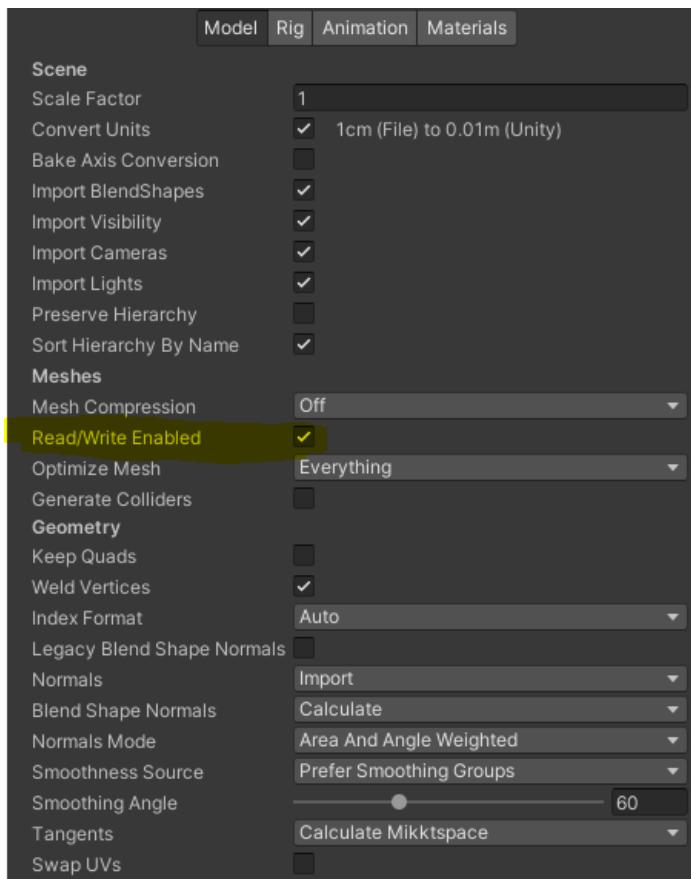
3. If you are using standard lit/unlit shaders, pop-up will ask if you want to convert the shaders. If you want to fully take advantage of Magio you need to convert shaders, but for some effects it is okay to not convert them. Select/De-select shaders you want to convert and click "Convert"



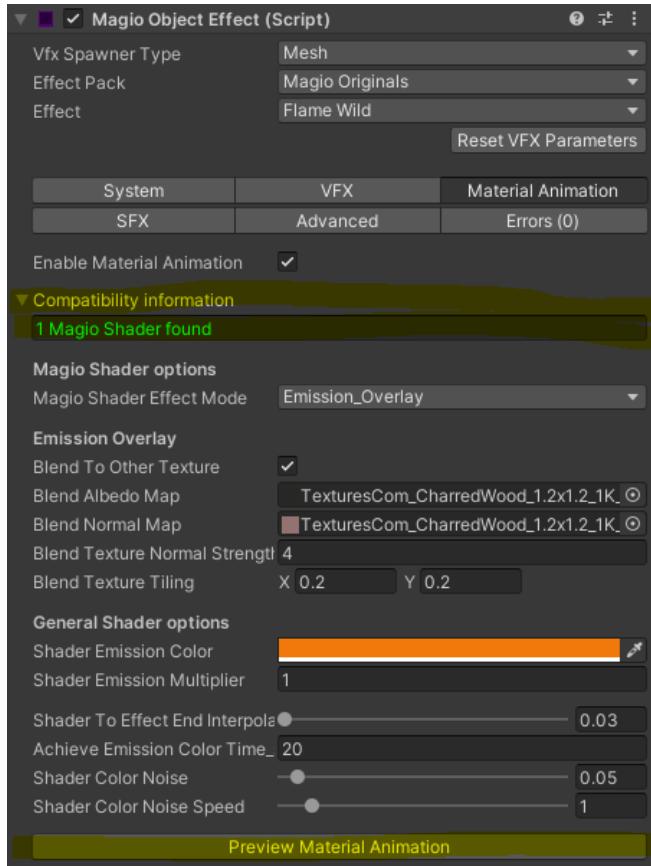
4. All the materials you selected should be now converted to Magio Shader and new script "Magio Object Effect" should appear



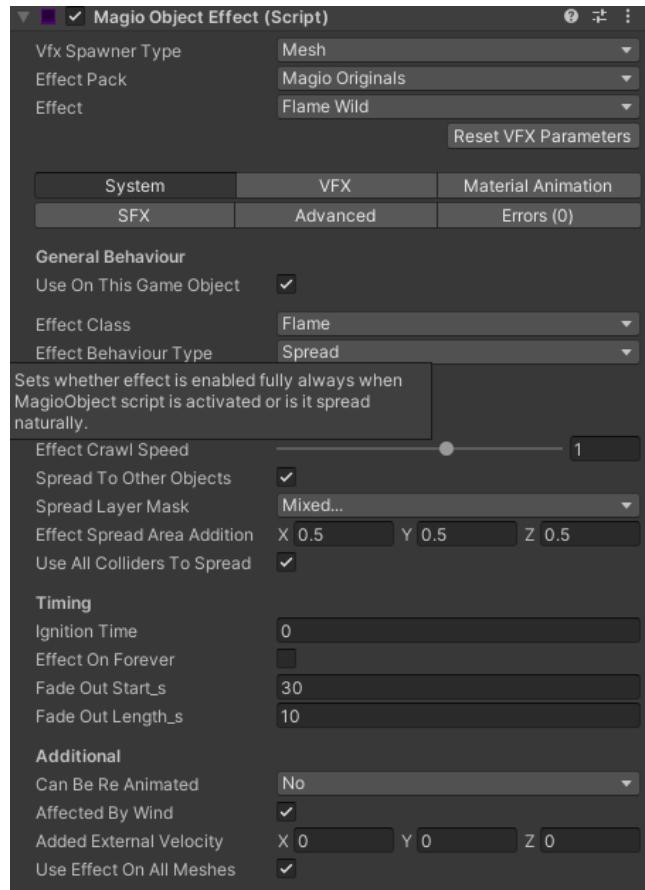
5. First see if there are any errors in the "Errors tab" and fix them. Note that your mesh model needs to have Read/Write enabled.
(<https://docs.unity3d.com/Manual/FBXImporter-Model.html>)



6. Go to MagioObjectEffect->VFX. Click the Preview VFX button. Flames should appear. Stop the preview.
7. Go to MagioObjectEffects->Material Animation
 - a. Magio shaders should be found if you converted the material
 - b. Press preview shader. Material should transform to "hot" emitting material. Stop the preview.



8. Go to MagioObjectEffect->System.
 - a. Tick Begin effect on start.
 - b. Hover your mouse on one of the properties to see documentation on the tooltip.



9. Press play and you should see Flames coming from your object.
10. Done! You are now ready to move on to changing the parameters of the VFX and shader or changing the effect!

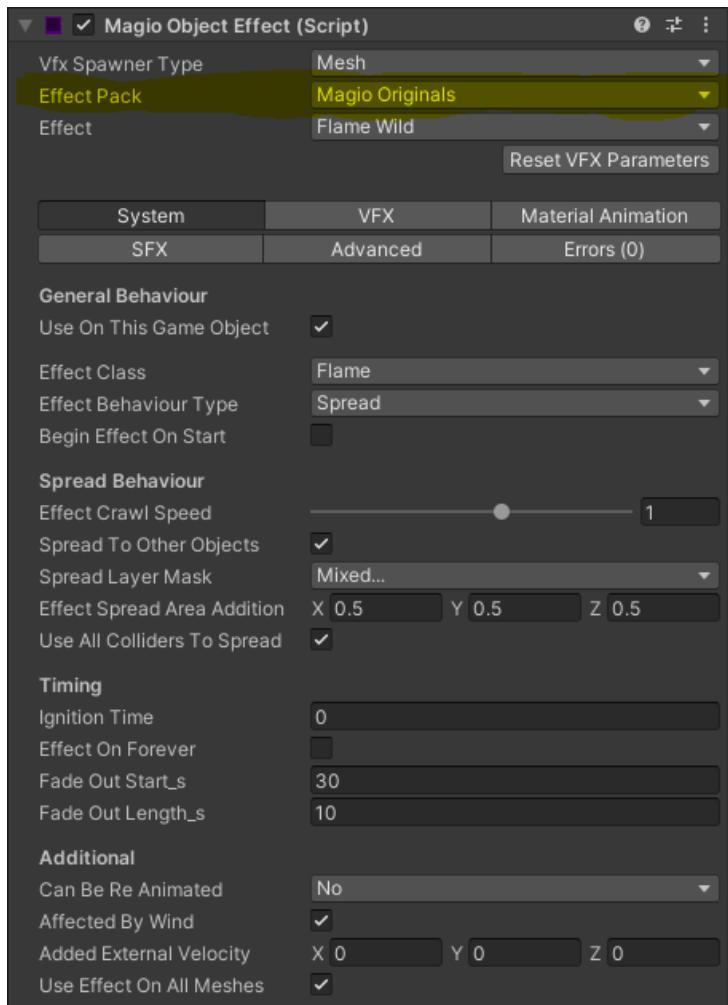
The Basics

Mesh Or Skinned Mesh

Magio should automatically detect if you are converting a mesh object or skinned mesh object. In case where you have meshes and skinned meshes on the same object, you may need to change it yourself. You can change it by choosing **VFX Spawner Type**.



Effect Packs



By default Magio comes with two effect packs: Magio Originals and Magio Originals HQ.

Magio Originals:

Performance first. Compatible with both URP and HDRP. Use this pack if you plan to have a lot of effects on the screen at the same time.

Magio Originals HQ (Only in PRO):

Some of the effects have HQ variants. Compatible with HDRP (Partial support with newer URP versions, test those out). These are Quality First variants and should be used with patience for high-end machines.

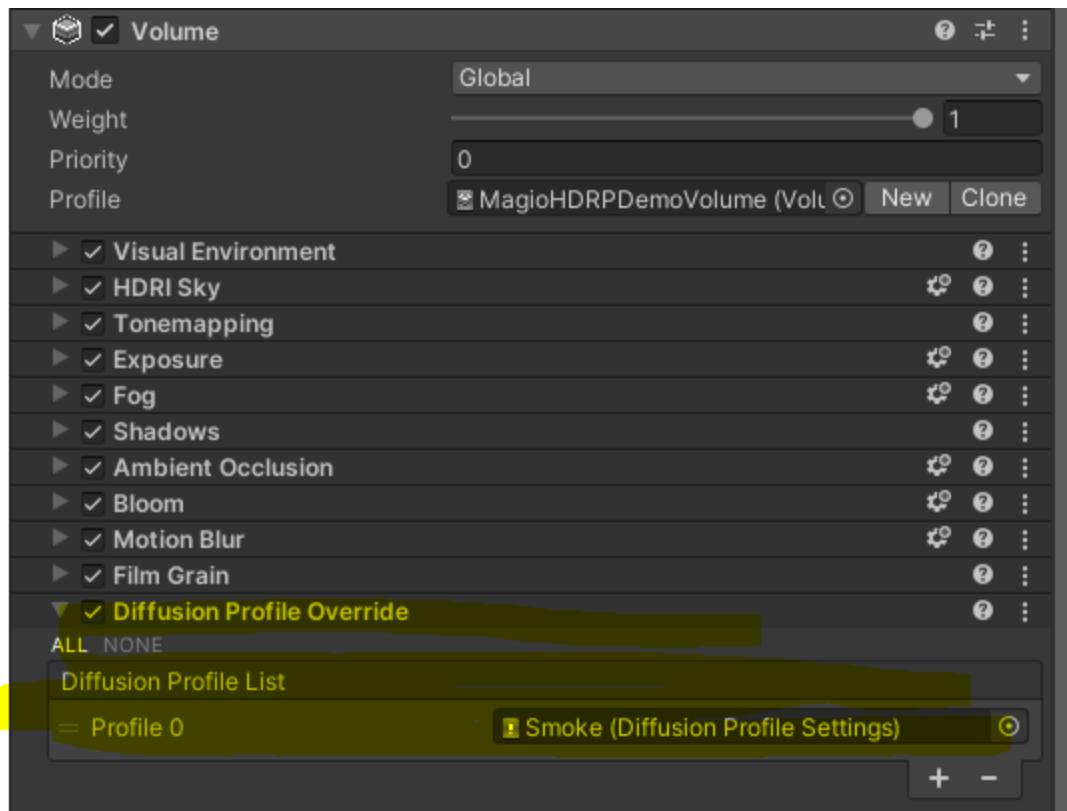
Using Magio Originals HQ (Only in PRO)

Some of the effects have HQ variants. Compatible with HDRP (Partial support with newer URP versions, test those out). These are Quality First variants and should be used with patience for high-end machines.

If smoke from your flame is green please follow these steps to add smoke diffusion profile:

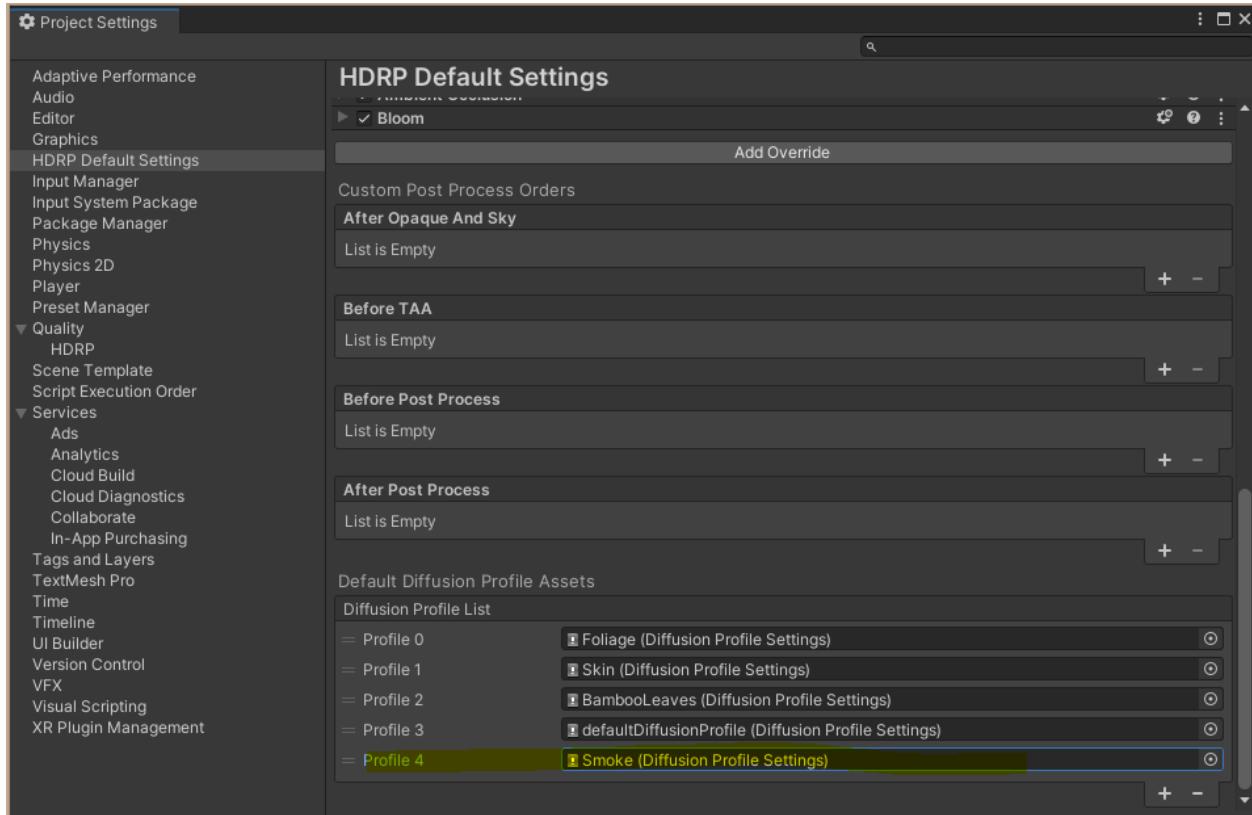
Steps to add it to scene:

1. Open your Global Volume in your scene
2. Add Diffusion Profile Override
3. Add Smoke

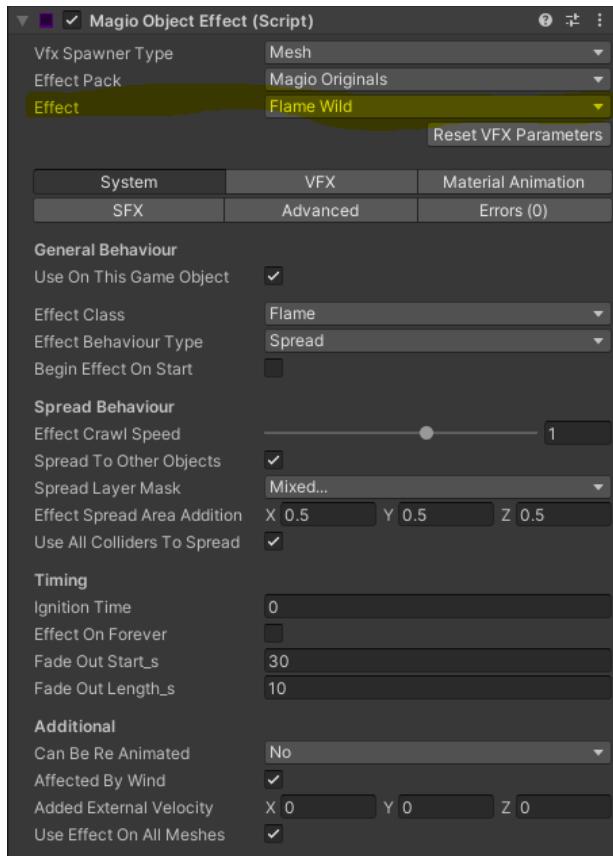


Steps to add it to project:

1. Open Edit..->Project Settings->HDRP Default settings.
2. Add smoke to Diffusion Profile List



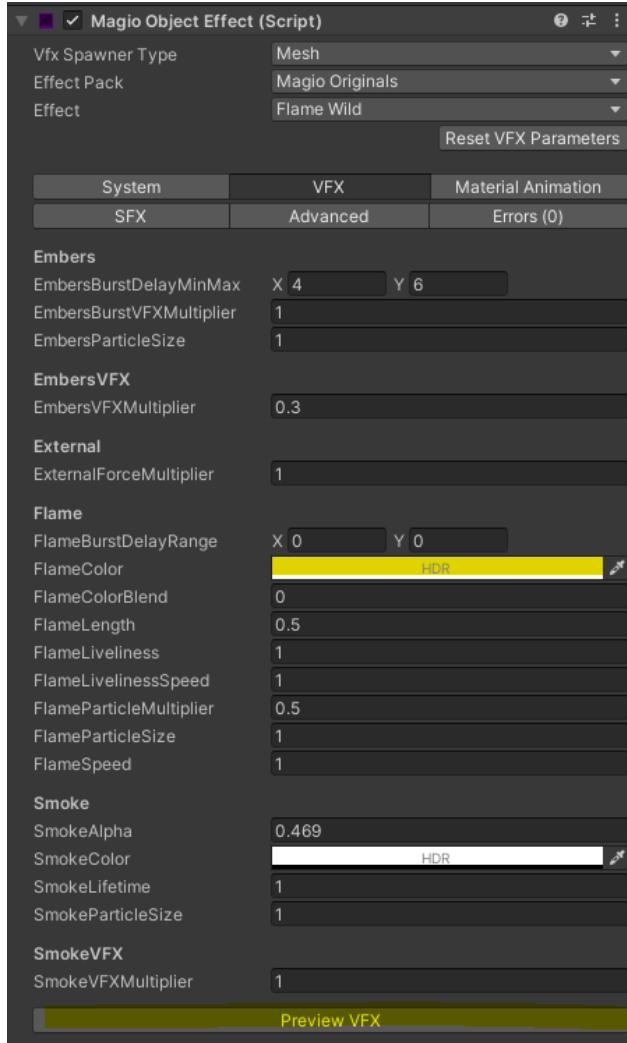
Changing the Effects



You can change the effect by choosing one you would like in the effect menu. The menu lists all the effects inside the pack. After choosing the effect head to the VFX tab and click "Preview VFX".

Adjusting the VFX parameters

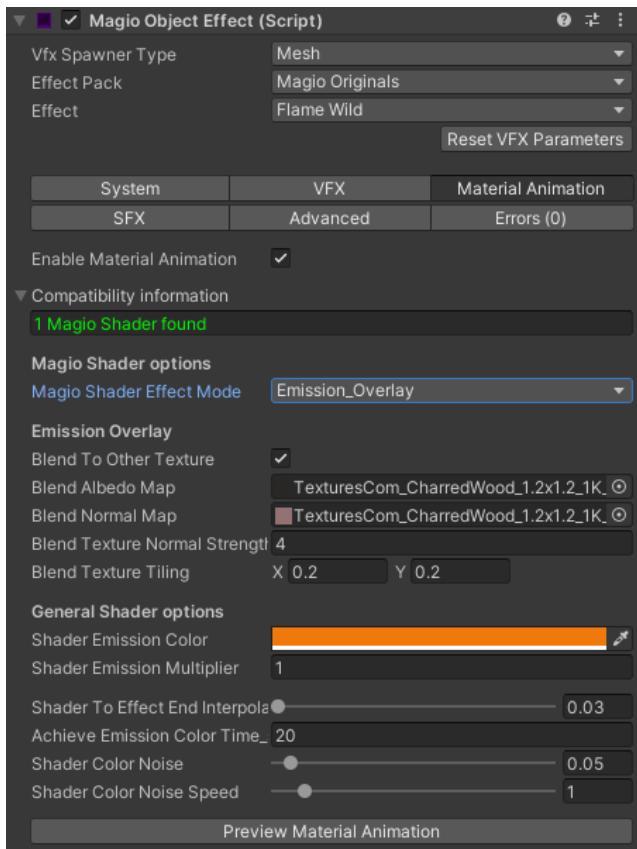
Objects come in various sizes, colors and shapes so one setup cannot cover all the cases. If you want the effects to fit your object perfectly, head to the VFX menu and adjust all the parameters there. It is usually good to have “Preview VFX” on while doing this.



Adjusting the Material Animation

Magio supports using Magio shaders and your own custom/third-party shaders. Third-party/custom shaders can animate the color and float properties while Magio shader can override texture, overlay emission or dissolve. All effects in effects packs come with ready-made defaults for the material animation.

Magio Shader:



Has three modes which can be toggled:

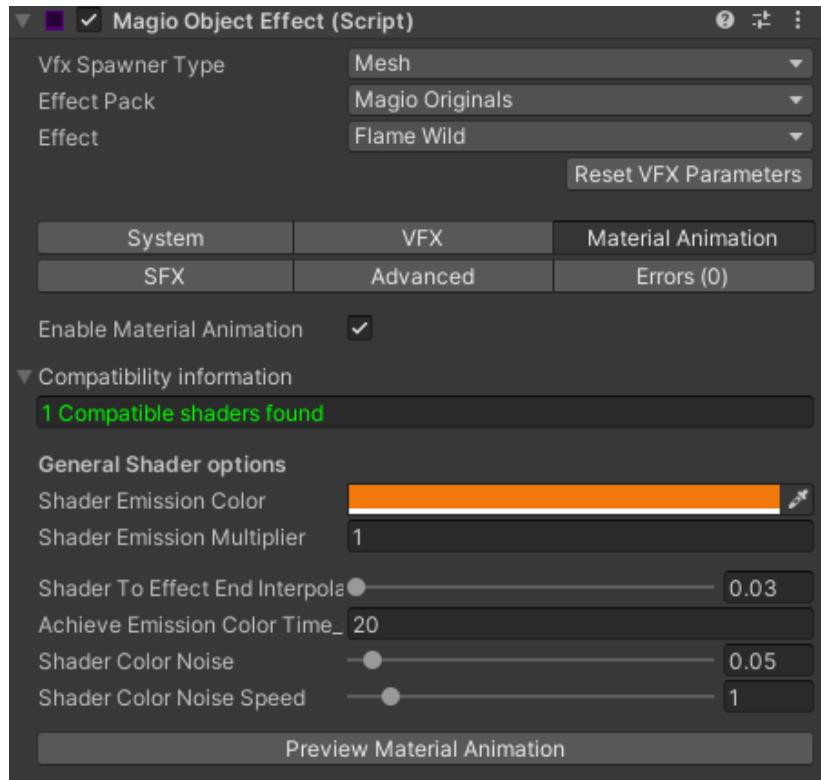
Emission_Overlay: Overlay emitting texture over the current texture according to the spread.

Texture_Override: Override the texture according to spread.

Dissolve: Dissolve according to spread.

Third-party/Custom Shader

Some shaders have ready made compatibilities out-of-the-box and should look like this in the editor:

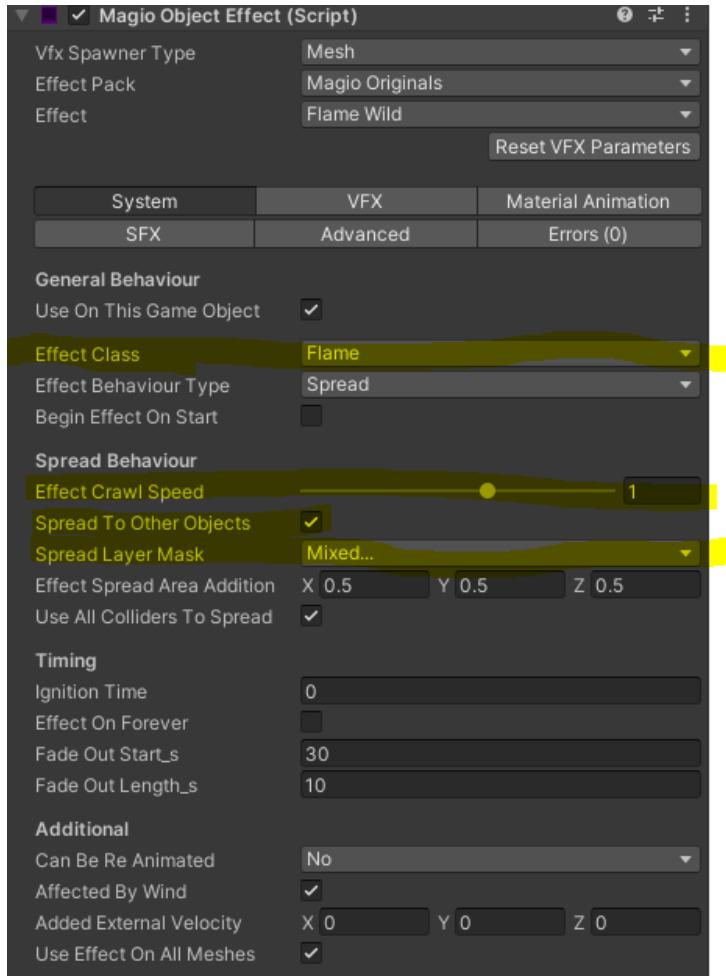


You can create compatibility manually for any shader. Follow instructions on “Create Compatibility for a third-party shader”.

Basic behaviour

Effects can be either spreading or enabled. The effects will start to fade out by default after **Fade Out Start_s** seconds is reached and will transition to completely faded out after **Fade Out Start_s + Fade Out Length_s**

Spreading (default):



- Effect will spread with a speed of **Effect Crawl speed** from the **origin** where it was ignited.
 - If "**Begin Effect On Start**" is ticked
 - Default starting point is origin of the transform
 - Custom start origin can be assigned by assigning the other transform to **Custom Start Origin**.
 - Else: The origin is where ignition of the effect happened.
- Effect can be only ignited by objects/Ignition scripts that have the **Effect class**. E.g. grass cannot ignite the flames and vice versa.
- Effect will spread to other objects if **Spread to Other Objects** is ticked. It will use the **Spread Layer mask** to look for collisions around its **COLLIDERS** (Not the mesh or VFX for performance reasons).

- Accepted colliders are all excluding the Mesh collider. If you want to use Mesh colliders on your objects - add other colliders for spreading and enable "Is trigger" or move them to the "No physics" layer to disable the physics collisions for them.
- Object will ignite after it has stayed in the igniting effect/script for **Ignition Time**

Enable:

Effect will be fully enabled right after the script or game object is enabled.

Tutorials

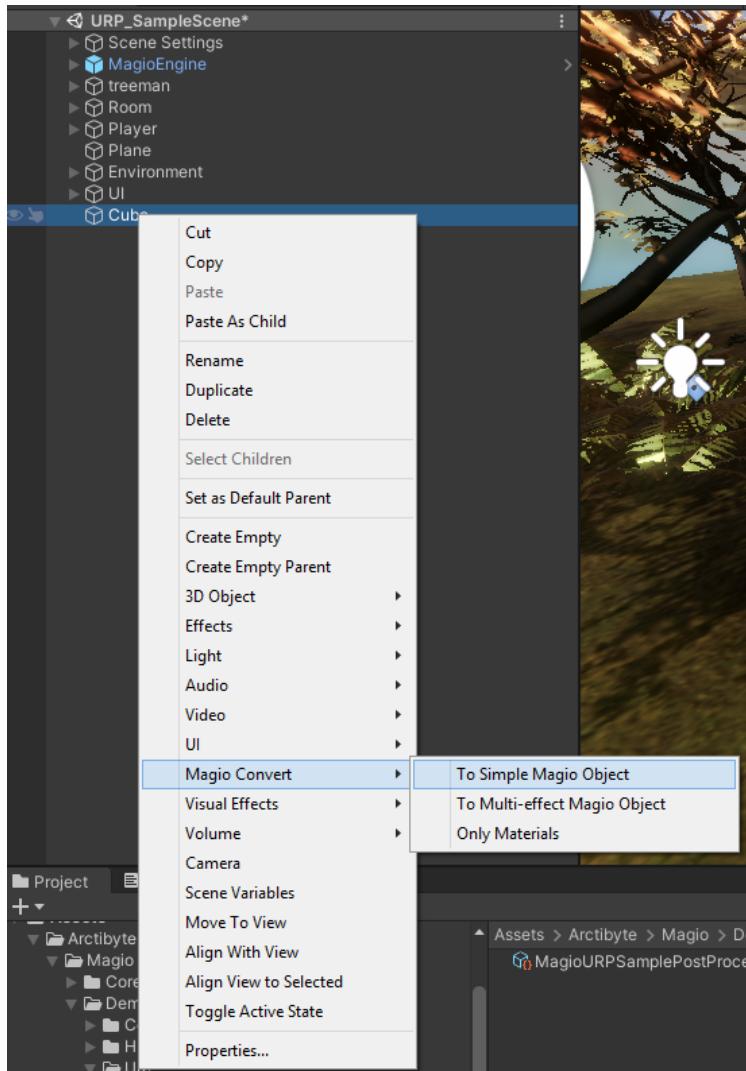
Tutorials assume that you have read the Quick-Start Guide.

Convert Object to use One Effect

Example use case: You want the object to be able to catch fire, nothing else. Mesh and Skinned Mesh are supported automatically.

Steps:

1. Select object in the scene hierarchy.
2. Right click->Magio Convert->To Simple Magio Object



3. Select the materials you want to convert to Magio (Recommended to convert all)
4. Click Convert.
5. Validate that everything works.

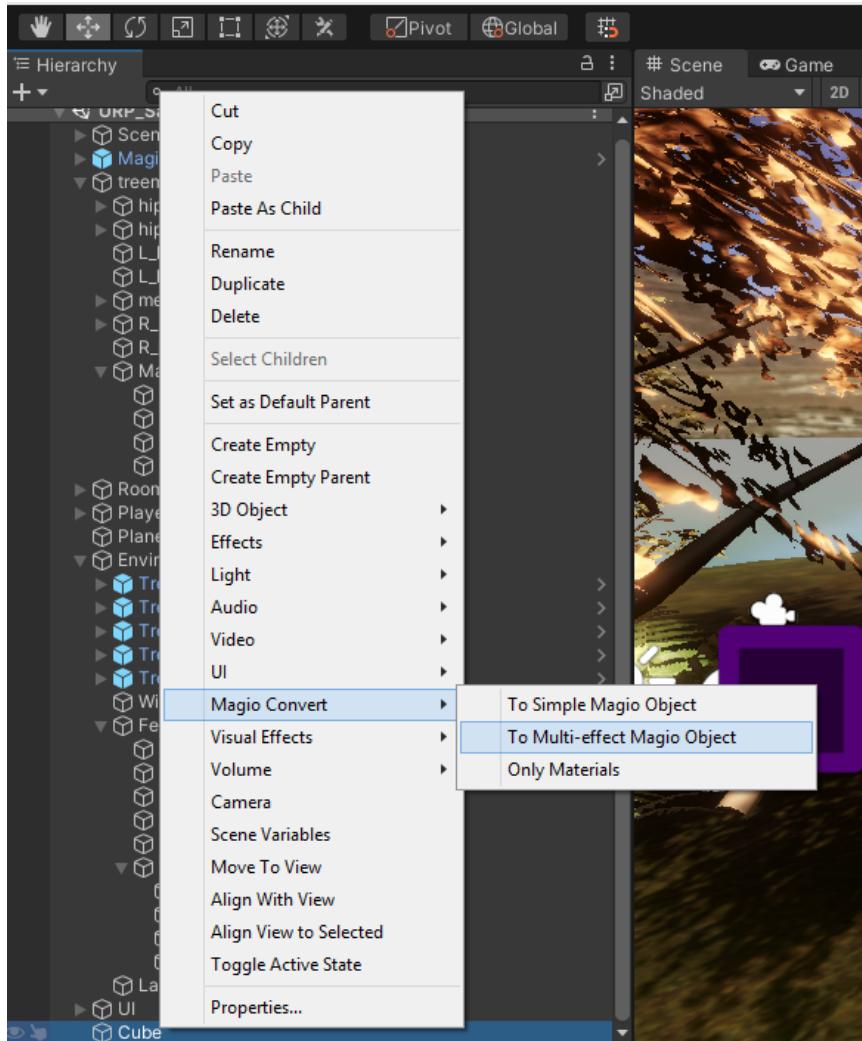
- a. See the MagioEffectObject-> Errors.
- b. VFX->Preview VFX
- c. Material->Preview Shader

Convert Object to Multi-Effect Object (Only in PRO)

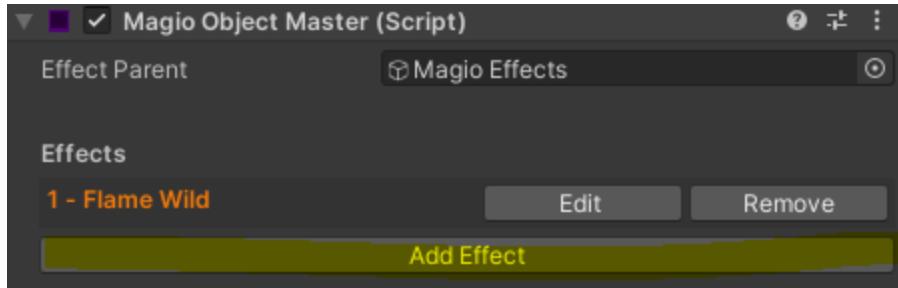
Example use case: You have an enemy that can be affected by all the main characters' magic: Flame, Ice, Electric etc. Mesh and Skinned Mesh are supported automatically.

Steps:

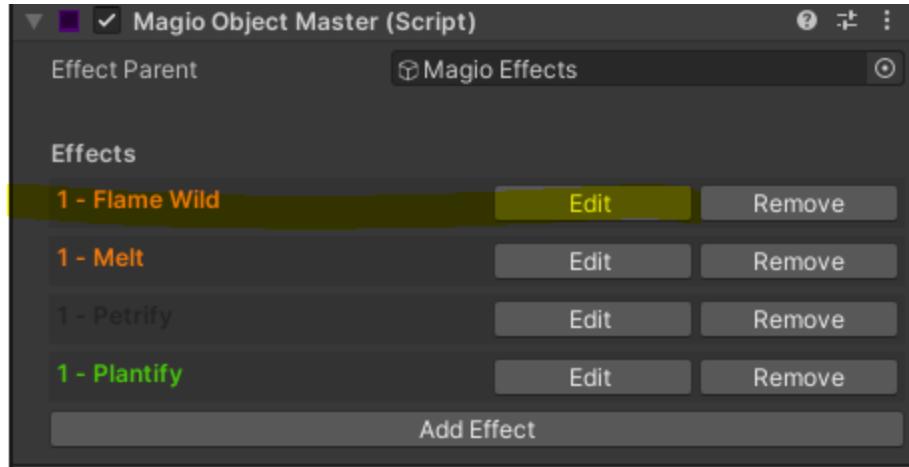
1. Select object in the scene hierarchy.
2. Right click->Magio Convert->To Multi-effect Magio Object



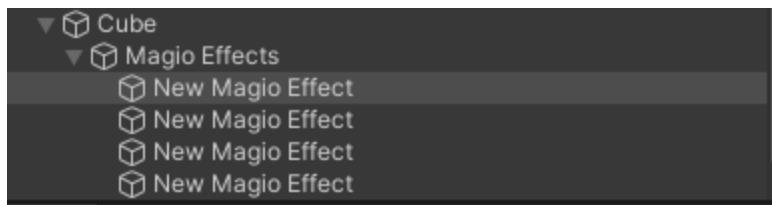
3. Convert the materials you want to be converted (Recommended to convert all)
4. Magio Effect Master will spawn in the root of your object. This shows all effects that your object has.
5. Click "Add Effect" as many times as the count of effects you want (Make 4 effects in total for this tutorial).



6. Click Edit on the first one;



7. This will take you to hierarchy where the effect handles are created:

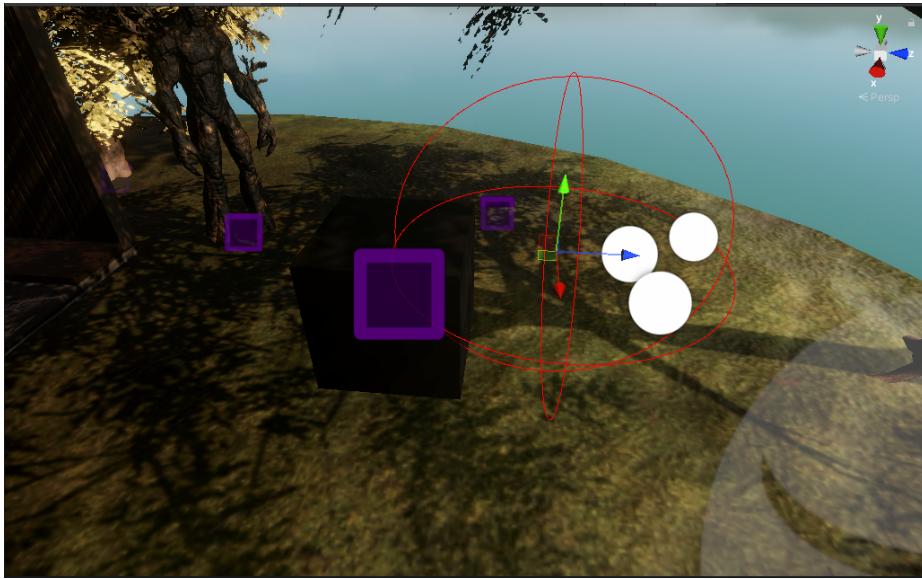


8. Give some descriptive names to your effects, such as "Cube flame" or "Long plants".

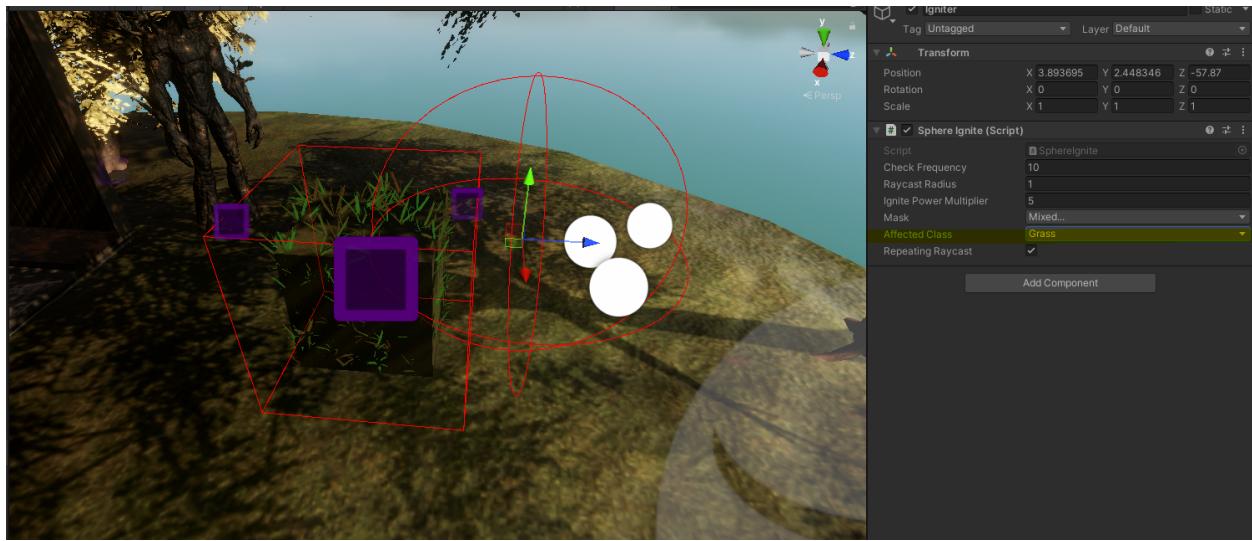
9. After this you can inspect and customize all effects like Simple Magio Effects.

10. Try it out:

- Create a new empty gameobject.
- Add component->Sphere Ignite
- Move it so the sphere will touch your newly converted Magio Object

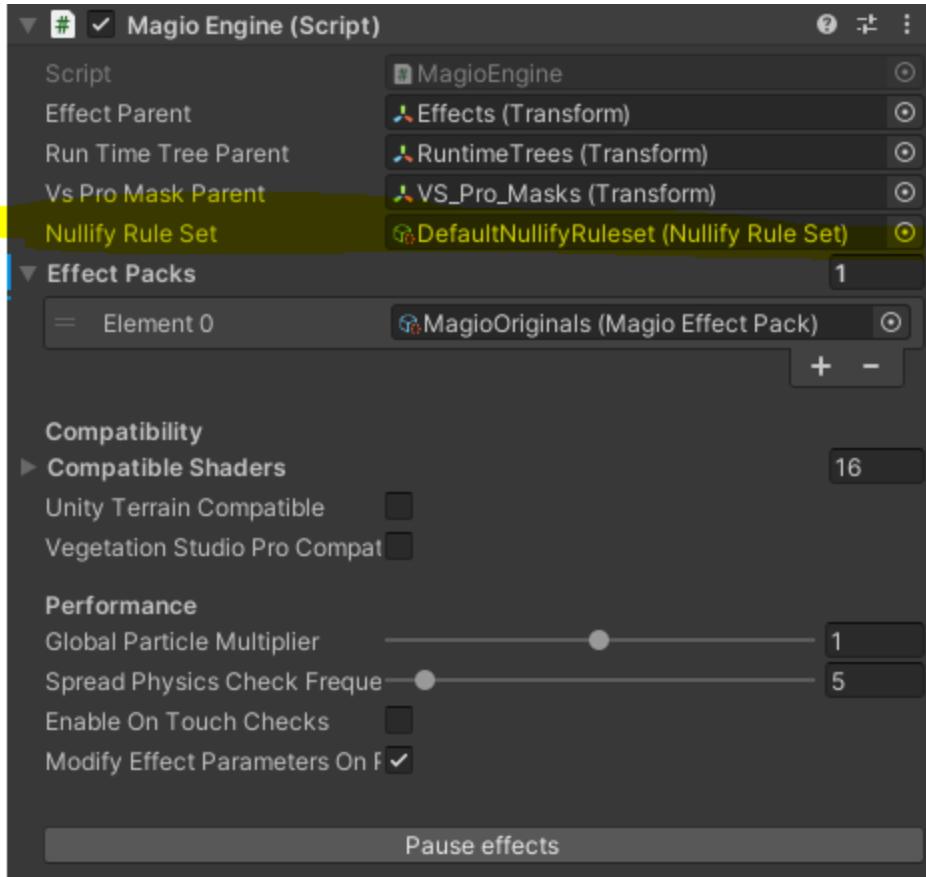


- d. Play the scene.
- e. Change Sphere Ignite affected class to "Grass" (You need to have a Plantify effect inside your object)



- f. Change affected class to "Flame" and see the grass burn.
11. All the interaction between two different effects is defined in FlameEngine->Nullify Rule Set.

- a. Nullify Rule set is a set of rules for how objects behave.
- b. E.g. Flame can burn grass, Petrifying the object will put out flames, Grass cannot spread if the object is already in flames.
- c. If you want to modify these rules see "*Change effect internal interact rules*"



Create a splash effect

Example 1: Your main character does lots of magic attacks. You do not want to go through all the trouble to convert everything to magio objects, but want just a crude effect where your magic lands.

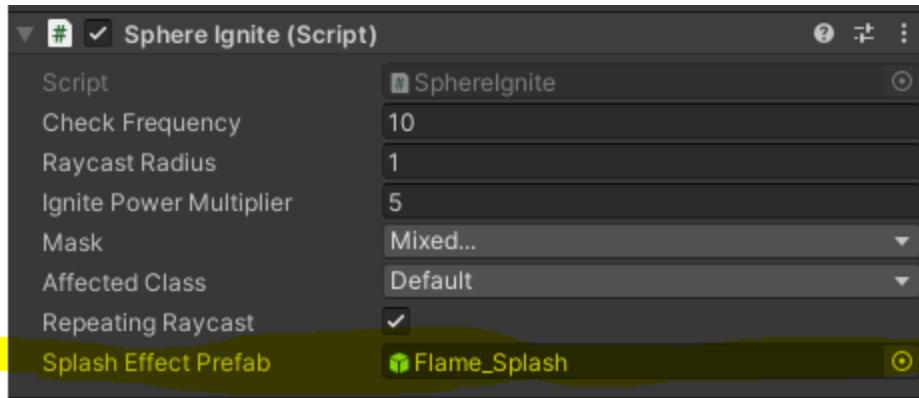
Example 2: Your player can throw molotovs. You want a flame effect wherever the molotov lands, but do not want it to spread.

Limitations:

- Effects which rely on VFX and not material animation such as flame and plantify works fine as splash effects out-of-the-box with any shader. For material animation effects (petrify/melt/etc..) all the objects would need to be converted to Magio shader. You can convert only shader by Right-click->Magio Convert-> Only Materials. There can be only one material animation effect enabled per object.
- Effects can look small or too big depending on the object, since there is no way to customize the effect per object

Steps to use splash effects:

1. There are default splash effects for you to use in the demo directory.
2. Create empty gameobject.
3. Add Sphere Ignite Script to the game object.
4. Add Arctibyte/Magio/Demo/Common/ExampleSplashEffectPrefabs/...._Splash to Sphere Ignite "Splash effect prefab".



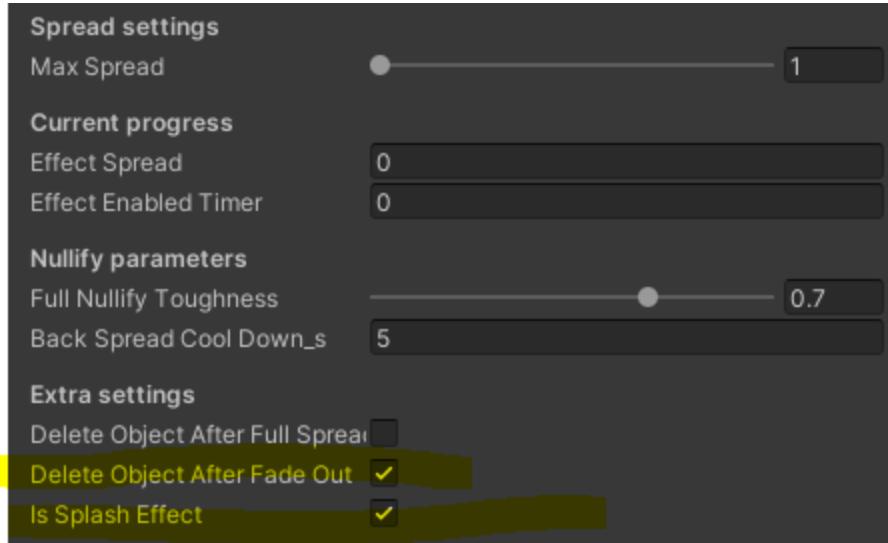
5. Play the scene and move the "sphere ignite" sphere close to some object with a default layer mask. Sphere ignite adds the effect to the first object it touches. You can refresh this by disabling and enabling it.
6. You can also use Particle Ignite and Raycast Ignite the same way. You can also add splash effects yourself from code like this:

```
GameObject obj = Instantiate(splashEffectPrefab, MagioEngine.instance.splashEffectParent);
MagioObjectEffect eff = obj.GetComponent<MagioObjectEffect>();
eff.targetGameObject = hit.gameObject;
eff.useOnThisGameObject = false;
eff.Setup();

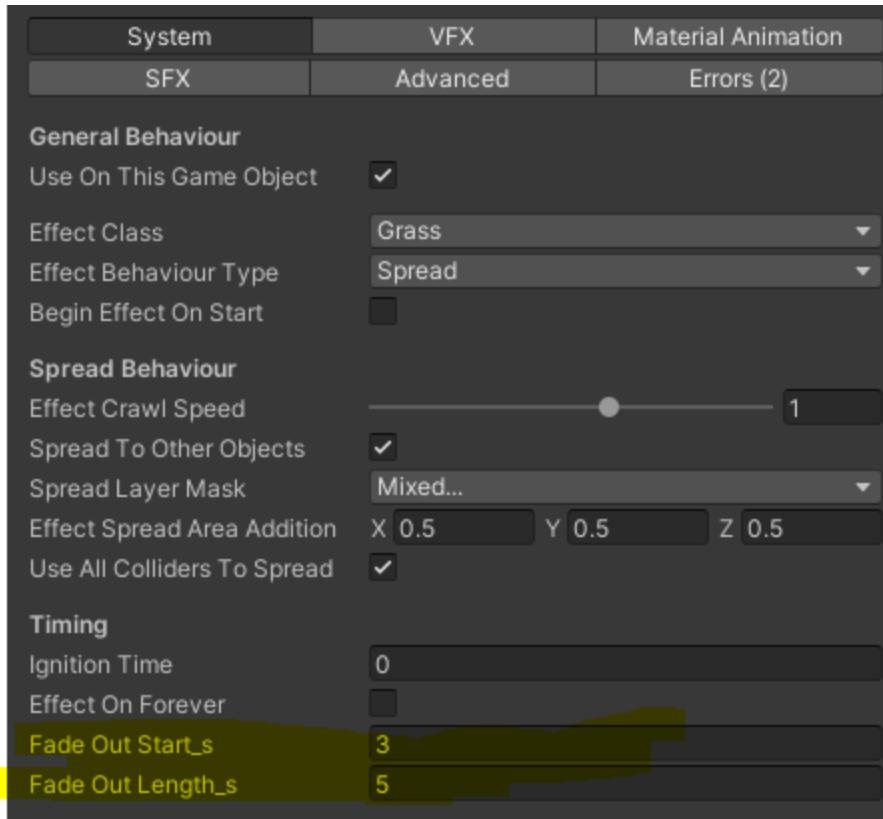
eff.TryToAnimateEffect(hit.ClosestPointOnBounds(transform.position), IgnitePowerMultiplier);
```

Steps to create splash effects prefab from any effect:

1. Create an empty prefab.
2. Add MagioObjectEffect script.
3. Enable Advanced-> Deleting the object after fadeout and IsSplashEffect



4. Customize Advanced->Max Spread and System->Fade out



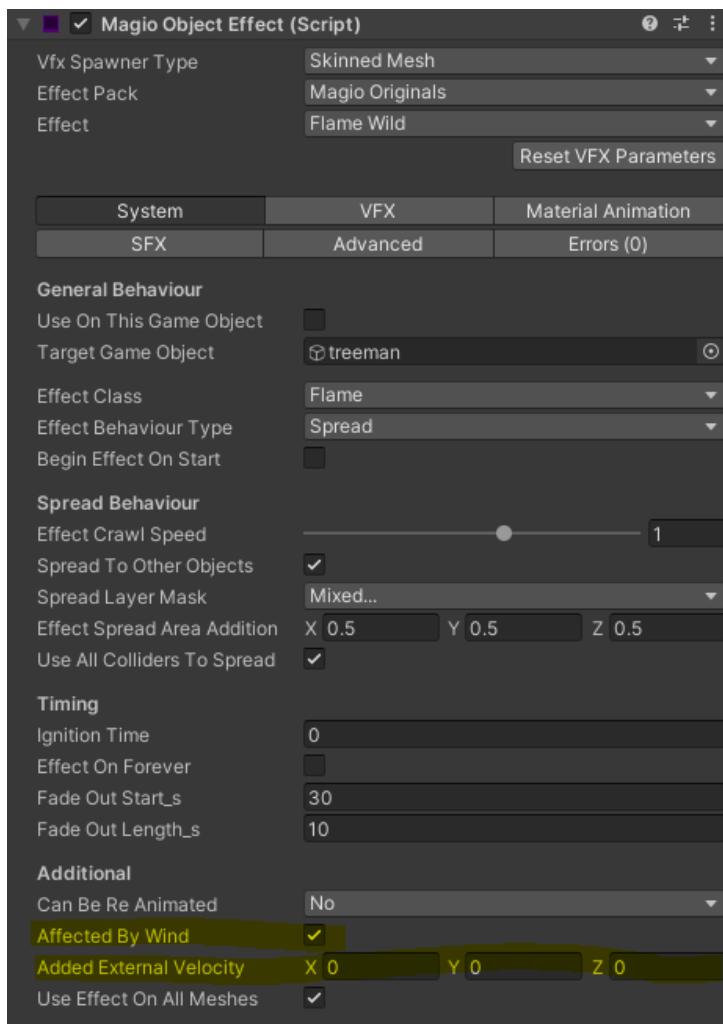
Enable/Disable wind and other external forces

Example 1: Your scene has a basic wind zone. You want the effects to interact with the wind.

Example 2: You want to display the impact force of some action on the effect.

Steps:

1. Wind interaction should be enabled by default. Magio Supports Unity WindZone and The Vegetation Engine Wind.
2. Enable/Disable wind in MagioObjectEffect->System->Affected By Wind.
3. Add external velocity to the effect by MagioObjectEffect->System->Added External Velocity. (You can reference this in code by: `myMagioObjectEffect.addedExternalVelocity`).



Ignite effects by raycasting or by overlap sphere

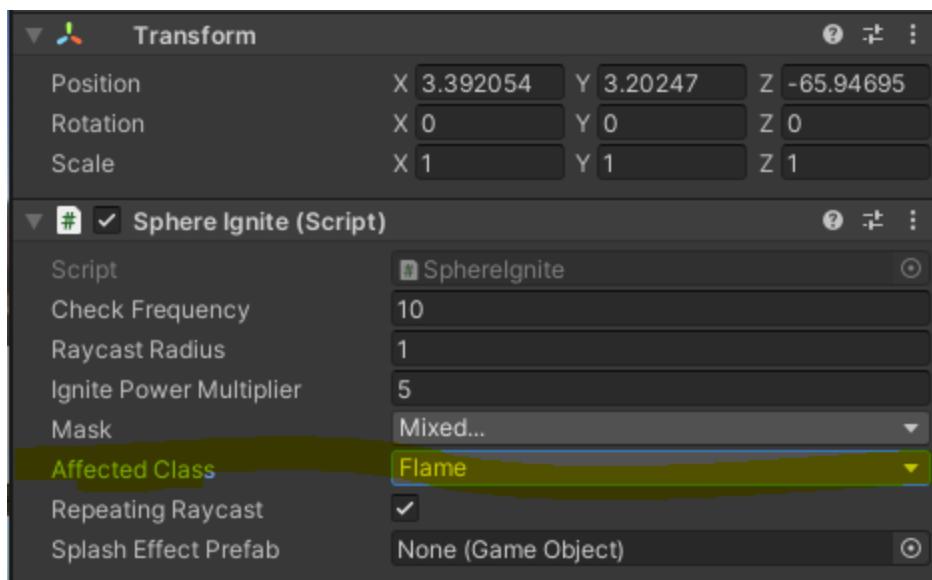
Example 1: You want to start the plantify effect when the player does nature magic or attacks with a grass blade.

Example 2: You want to ignite objects in the range of your grenade.

Example 3: You want the effect to start where your bullet hits.

Steps:

1. Create Empty GameObject
2. Add Component->Sphere Ignite
 - a. You can also Add Component->Raycast Ignite for bullets etc.
3. Choose wanted affected class (In this tutorial “Flame” is chosen to light up the object)



4. Test it out by moving the sphere gizmo close to the object you have converted.

Tips:

- You can also make this as a prefab which you instantiate in case of explosion/magic/etc.
- You can control the cast by disabling “Repeating raycast” and calling SphereligniteCast() or CastRayCastIgnite()

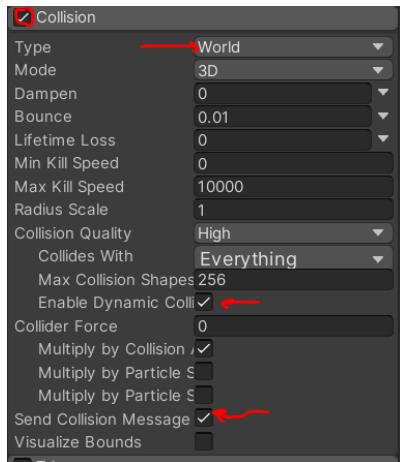
```
public void SphereIgniteCast()
{
    if (!enabled) return;
```

Ignite effects by using your own particle system

Example: You have a mage that can cast a fire spell which uses a particle system. You want the environment to catch fire from the spell.

Steps:

1. Your own particle systems can be used to ignite the effects. The ignition effect is done using particle collisions and can be used with any custom particle system.
 - a. First you need to make sure that your particle system:
 - b. Has enabled Collision
 - c. Has collision type-> World
 - d. Has enabled Collision->enable dynamic collisions
 - e. Has enabled Collision->Send collision message



2. Add "Particle Ignite" Component to your gameobject which has the particle system.
3. Adjust IgnitePowerMultiplier and radius parameters
4. Done. Now you can test the effect and adjust the parameters.
5. Note that if you don't have any colliders (triggers don't count) on your object particles cannot detect collisions. In this case:
 - a. Use the raycast method "*Ignite effects by raycasting or by overlap sphere*"
 - b. Add a collider with a layer that rigidbodies and other objects do not collide with.

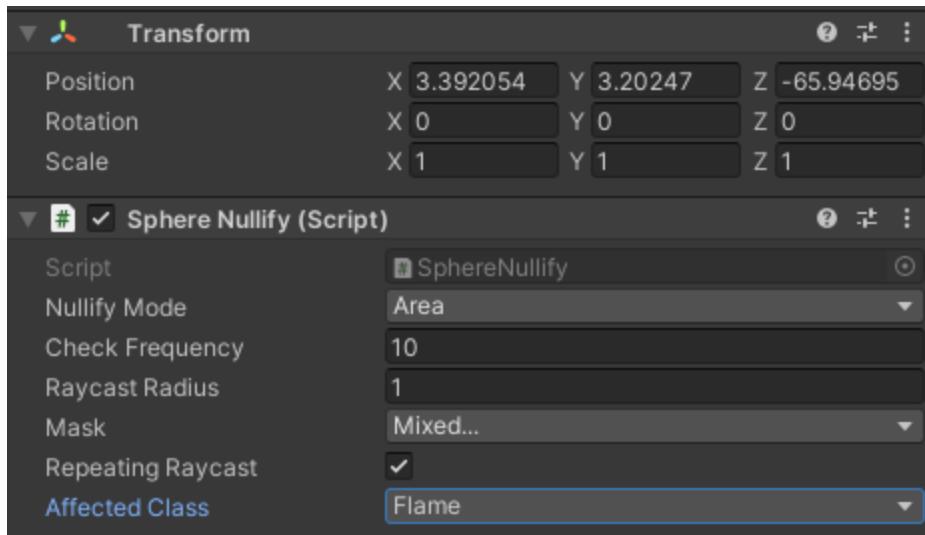
Nullify/Extinguish Effects with raycast or overlap sphere

Example 1: You want to extinguish flames with some area effect.

Example 2: You want to remove the plants from some area of your object.

Steps:

1. Create empty game object
2. Add Component -> Sphere Nullify
 - a. You can also Add Component -> Raycast Nullify in case of weapon fire etc.
3. Choose affected class (In this tutorial, flame is used to extinguish the flames)



4. Test it out by moving the sphere to the object you are burning/want to nullify!
Remember to have the right affected class!

Tips:

- You can also make this as a prefab which you instantiate in case of explosion/magic/etc.
- You can control the cast by disabling “**Repeating raycast**” and calling SphereNullifyCast() or CastRayCastNullify()

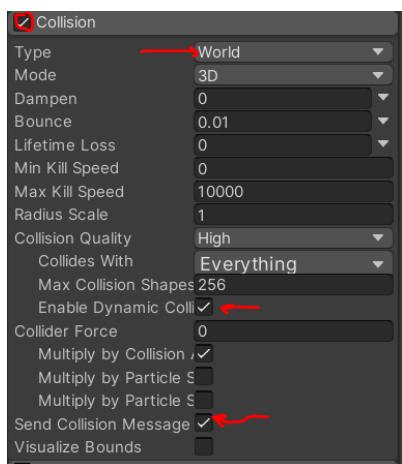
```
public void SphereNullifyCast()
{
    if (!enabled) return;
```

Nullify/Extinguish using your own particle system

Example: You have a firefighter who shoots water from a hose. You use your own particle system and want the flames to be extinguished by it.

Steps:

1. Your own particle systems can be used to nullify/extinguish. The nullify/extinguish effect is done using particle collisions and can be used with any custom particle system.
2. First you need to make sure that your particle system:
 - a. Has enabled Collision
 - b. Has collision type-> World
 - c. Has enabled Collision->enable dynamic collisions
 - d. Has enabled Collision->Send collision message

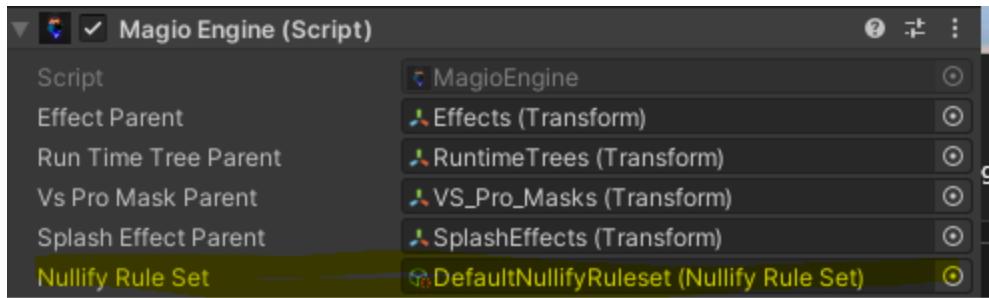


3. Add "Particle Nullify" Component to your gameobject which has the particle system.
4. Adjust particleNullifyRadius and incrementalPower parameters
 - a. Should be low with high number of particles
 - b. Should be high with a low number of particles.
5. Done. Now you can test the effect and adjust the parameters.
 - a. Note that if you don't have any colliders (triggers don't count) on your object particles cannot detect collisions. In this case:
 - b. Use the raycast method Nullify/Extinguish Effects with raycast or overlap sphere
 - c. Add a collider with a layer that rigidbodies and other objects do not collide with.

Change Element Interaction Rules (ONLY IN PRO)

Example: You want your own effect (e.g. water) to extinguish the fire effect. You need to create a rule for this elemental interaction.

1. You can extend the default rule set but a better thing to do is to create/duplicate a new one. First duplicate the default ruleset by selecting it in MagioEngine GameObject and pressing Ctrl+D.



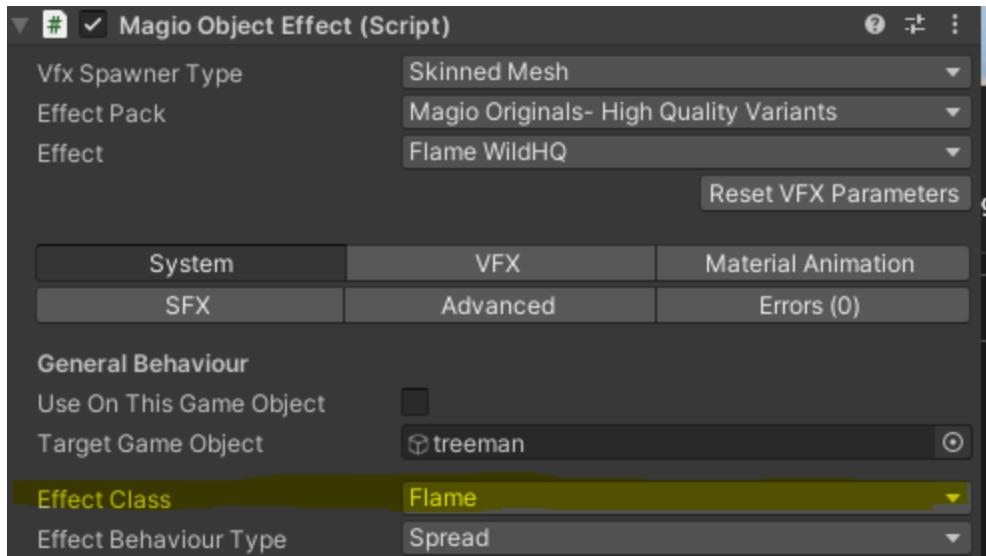
2. Add a new rule. Lag behind means how much the nullified effect will overlap the nullifying effect. E.g. you want the fire to be on plants a while before the plants are destroyed.

Nullify Rules 9

=▼ Element 0	Origin Class	Melt
	Target Class	Grass
	Nullify Lag Behind_m	0
=▼ Element 1	Origin Class	Melt
	Target Class	Flame
	Nullify Lag Behind_m	0
=▼ Element 2	Origin Class	Melt
	Target Class	Stone
	Nullify Lag Behind_m	0
=▼ Element 3	Origin Class	Melt
	Target Class	Ice
	Nullify Lag Behind_m	0.1
=▼ Element 4	Origin Class	Melt
	Target Class	Electricity
	Nullify Lag Behind_m	0.1
=▼ Element 5	Origin Class	Flame
	Target Class	Grass
	Nullify Lag Behind_m	1
=▼ Element 6	Origin Class	Stone
	Target Class	Flame
	Nullify Lag Behind_m	0
=▼ Element 7	Origin Class	Grass
	Target Class	Stone
	Nullify Lag Behind_m	0
=▼ Element 8	Origin Class	Flame
	Target Class	Ice
	Nullify Lag Behind_m	0.1

+ -

3. Make sure that your effect belongs in this “Origin class” or “Target Class”

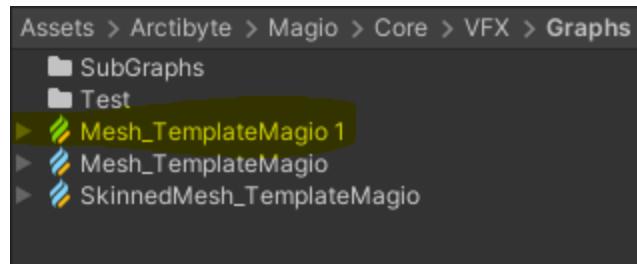


Create your own Magio effect with VFX Graph

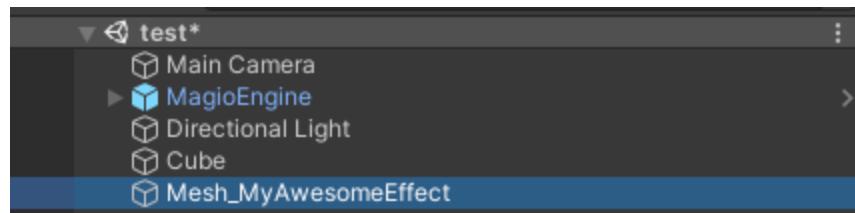
Example: You want to create your own, let's say, spreading snow effect to use with magio.

Steps:

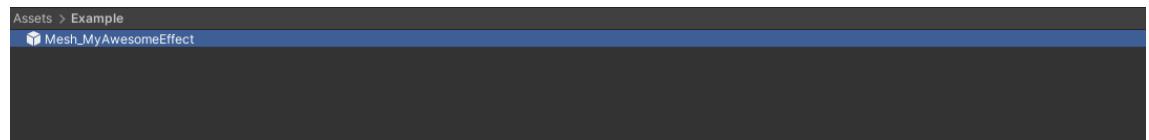
1. Easiest way is to duplicate the default magio template to start building your own effect.
 - a. Navigate to Arctibyte/Magio/Core/VFX/Graphs
 - b. Duplicate Mesh_TemplateMagio (Ctrl+D)
 - i. You can also duplicate the Skinned Mesh template if you want.
 - ii. You can also duplicate the "MutableRenderer" template.
MutableRenderer can handle both mesh and skinned mesh, but you have to be a little more flexible with it.



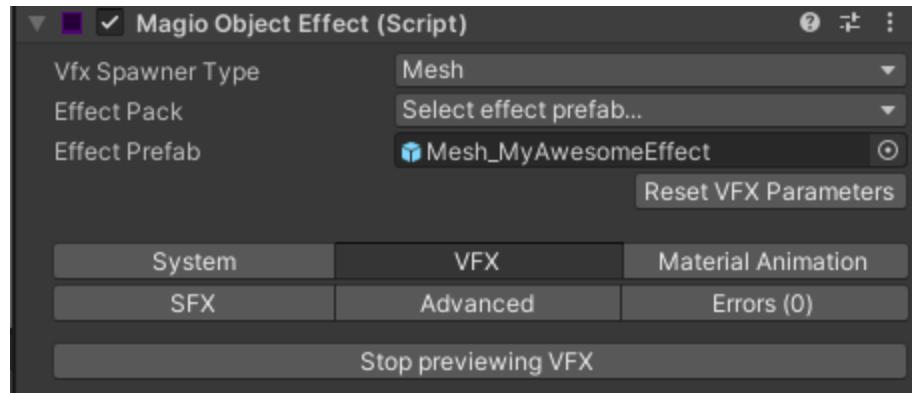
- c. Rename it to anything you like, but start with "Mesh_"
 - d. Drag it to the scene to make it a game object.



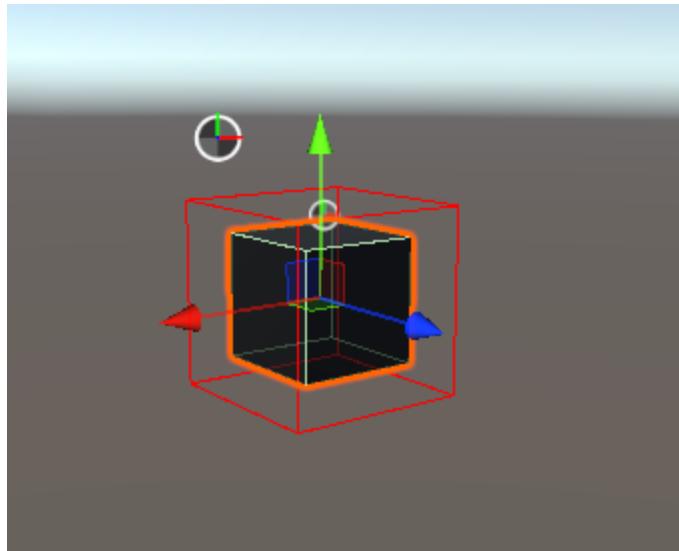
- e. Drag it back from the scene to the project window to make it a prefab.



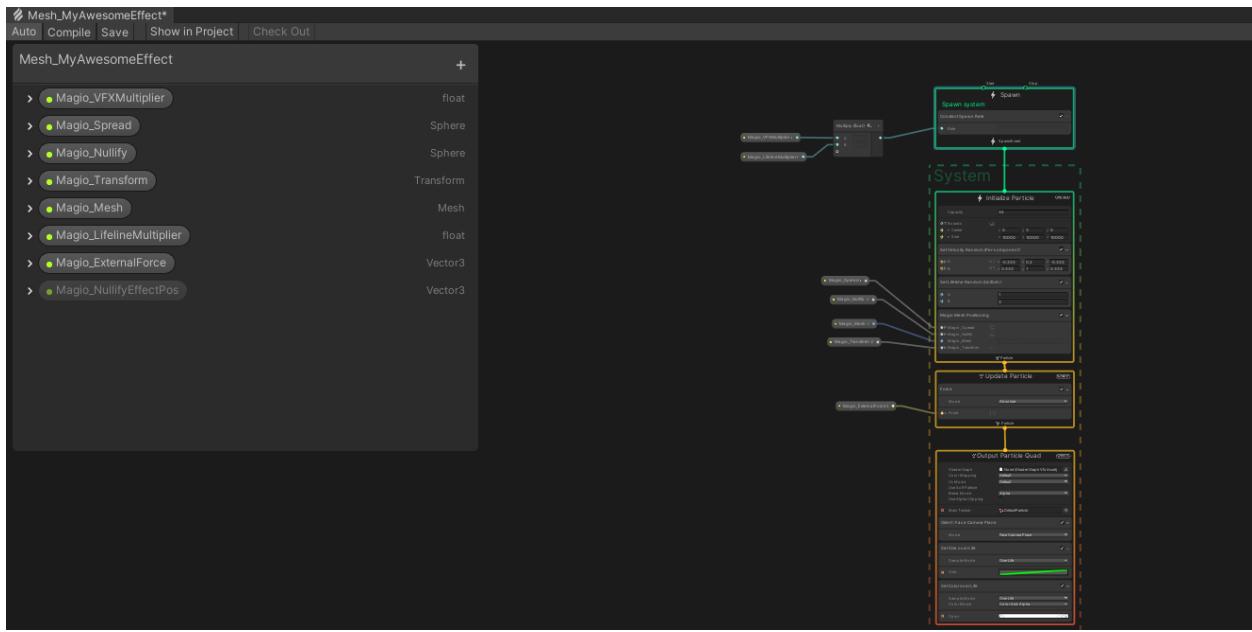
- f. Select your target game object which has been converted to magio object.
 - i. Change Effect pack->Select effect prefab
 - ii. Drag your new effect to the effect prefab slot
 - iii. Go to VFX tab
 - iv. Press Preview VFX



- g. Your object should start emitting the default VFX right from it's surface!



2. Now you can start modifying the VFX graph you created earlier by double clicking.
 - a. See some tutorials of Unity Visual Effects graph if you are not familiar with it.
3. Magio property documentation can be seen in
[Arctibyte/Magio/Core/VFX/Graphs/VFX_Property_Documentation.txt](#)

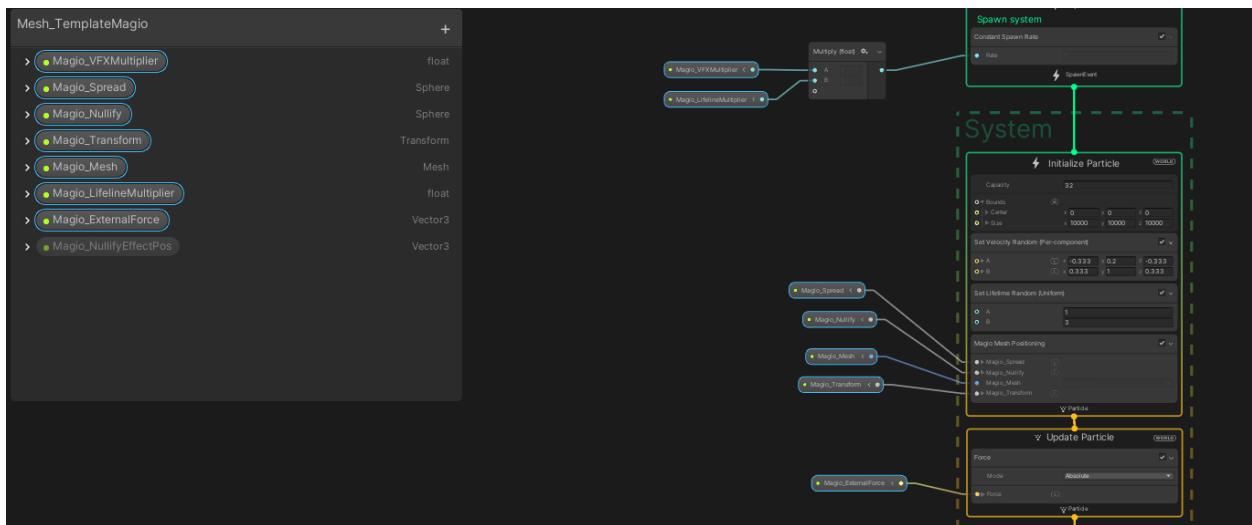


Convert your existing VFX Graph to work with Magio

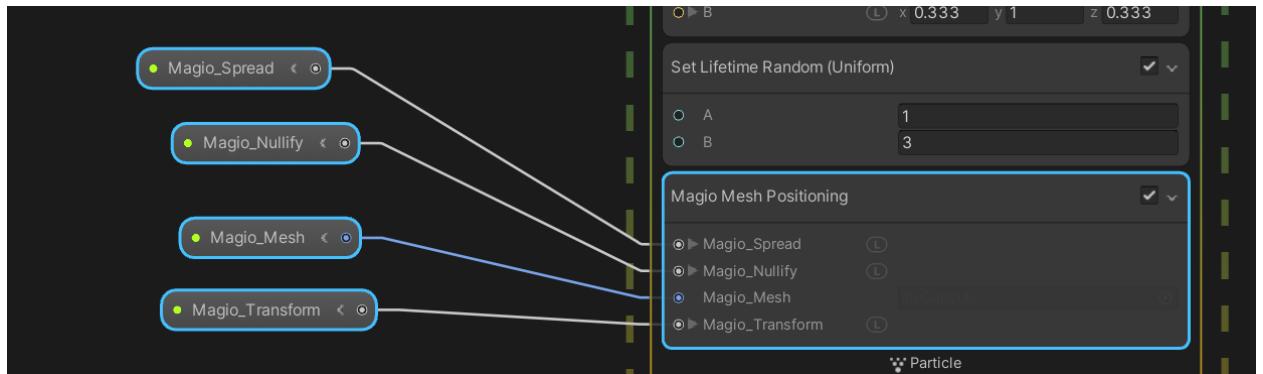
Example: You have an awesome spreading rainbow effect and you would like to integrate it with Magio to interact with other effects and spread it on the object smoothly.

Steps:

1. Navigate to Arctibyte/Magio/Core/VFX/Graphs
2. Open Mesh/Skinned Mesh/Mutable Renderer template Graph
 - a. “MutableRenderer” template: MutableRenderer can handle both mesh and skinned mesh, but you have to be a little more flexible with it.
3. Copy all the properties from there (Paint them + Ctrl+C)



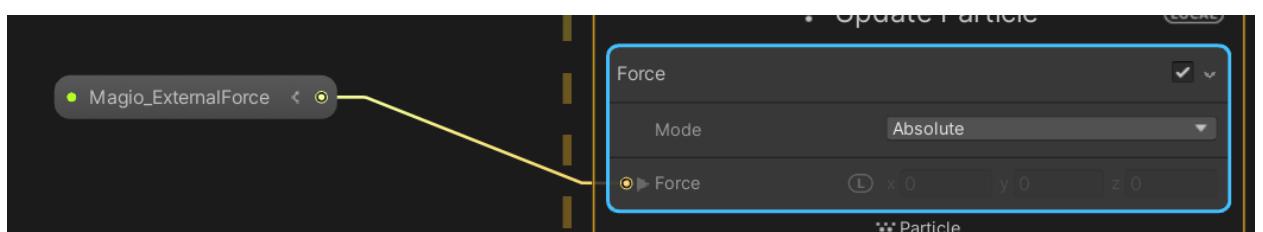
4. Paste the properties to your graph (Open your graph + click the window + Ctrl+V)
5. Add Magio Mesh/Skinned Mesh/ Mutable Renderer positioning block to your initialize context
 - a. This can be also added to other contexts.
 - b. See templates for examples on how to use these blocks.
 - c. Or you can use the positioning variables your own way. The Plantify effect graph has an example of how to use them with a VFX shader graph.
6. Connect transform, spread, nullify and mesh to the positioning block



7. (Optional) Connect VFX multiplier and Lifeline multiplier to spawn context



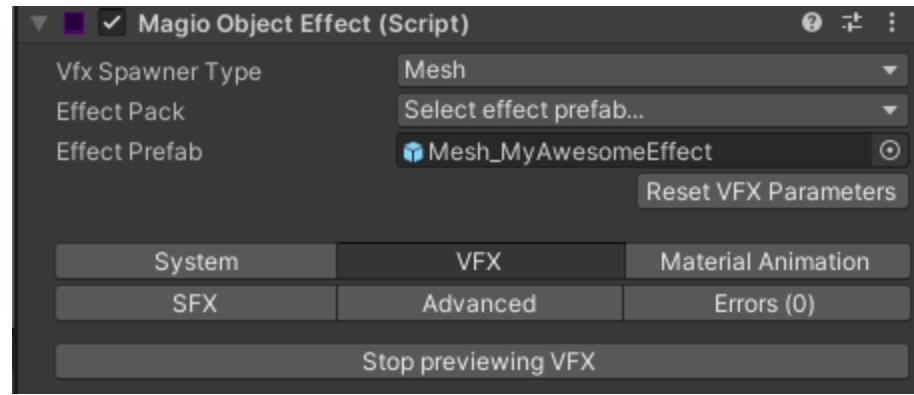
8. (Optional) Connect External force to absolute force block in Update context



9. Magio property documentation can be seen in
Arctibyte/Magio/Core/VFX/Graphs/VFX_Property_Documentation.txt

10. Test out your effect:

- Select your target game object which has been converted to magio object.
- Change Effect pack->Select effect prefab
- Drag your new effect to the effect prefab slot
- Go to VFX tab
- Press Preview VFX



- f. Your object should start emitting your VFX right from it's surface!
- g. Depending on the use case you might need to do more fine tuning such as multipliers etc. In this case please read Property documentation to understand the variables.

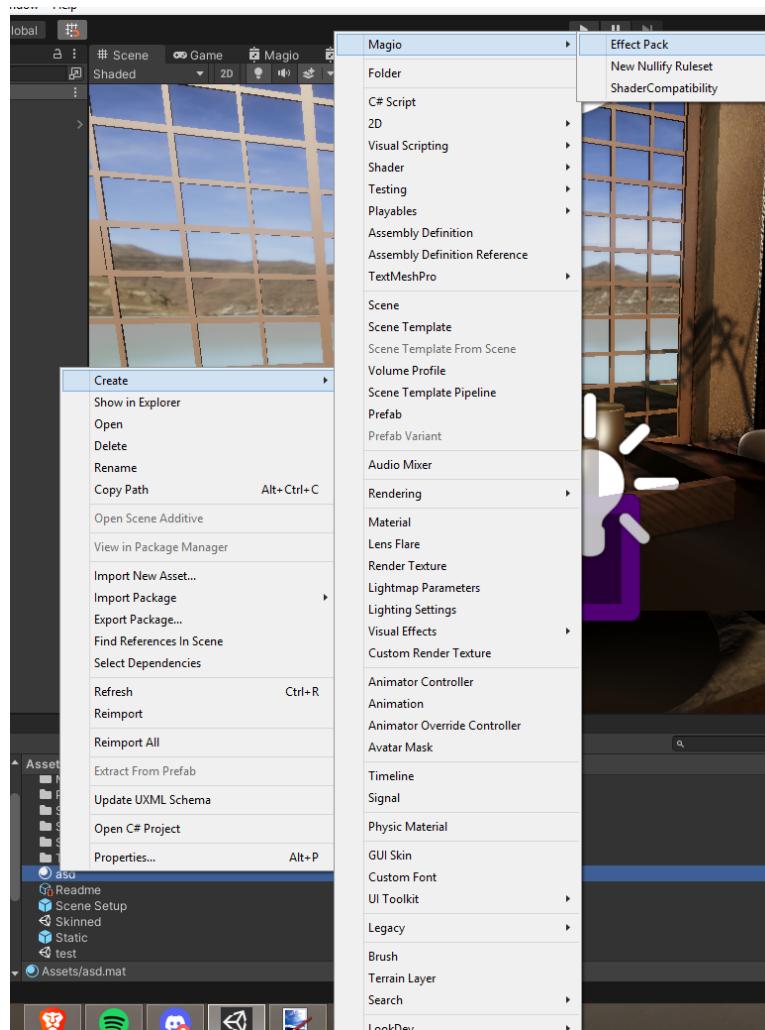
Create a effect pack

Example 1: you want to bundle your effects to find them easier on the editor.

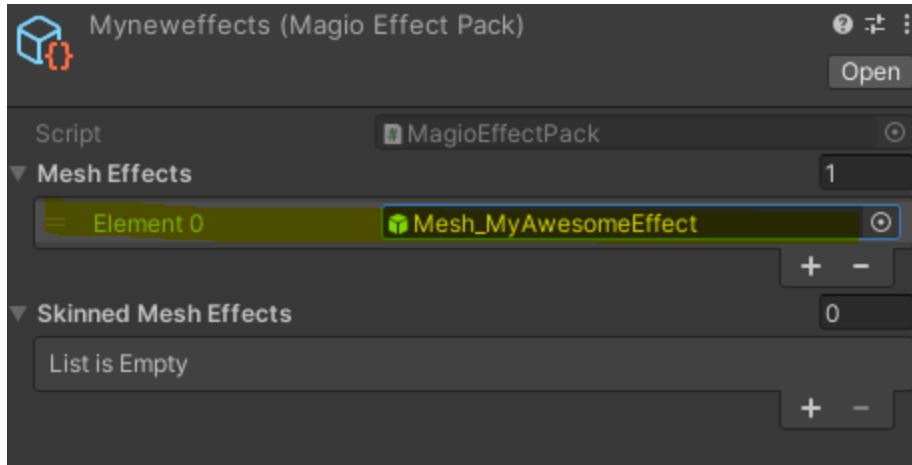
Example 2: You would like to package your effects and sell them as add-on for Magio in the asset store.

Steps:

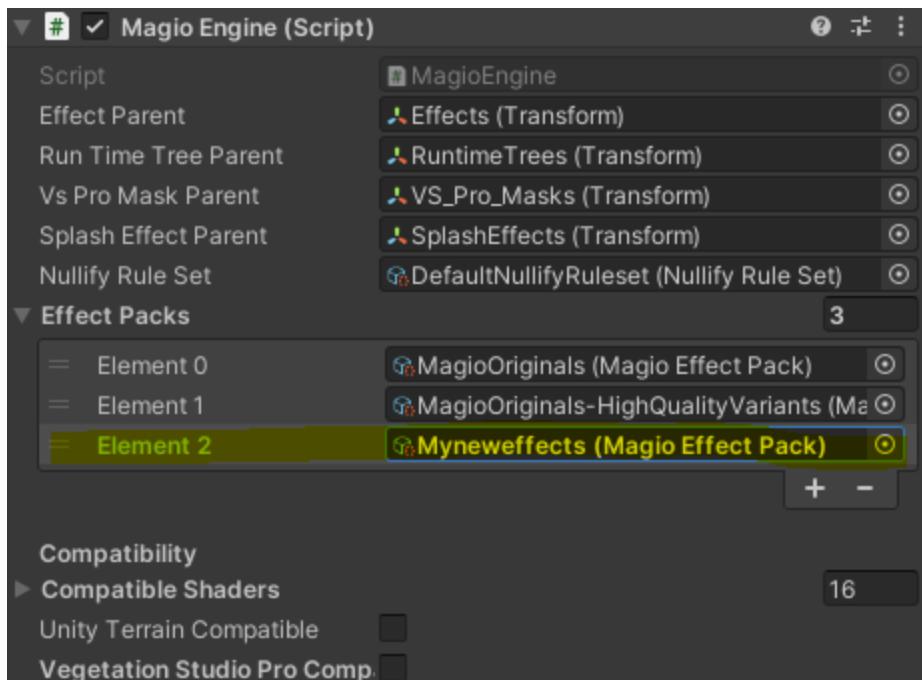
1. Project window->Right-click->Create->Magio->Effect Pack



2. Add your effects in the pack



3. Drag your effect pack to Magio Engine



4. Done! Your pack should be now in Magio Object Effects->Effect pack.

Use Magio with Unity Terrain Trees

Example: You are using built-in Unity terrain in your project. You want some of the grass or trees or everything in your terrain to be able to catch flames.

Additional information:

Backup your terrain! Magio will manipulate trees in runtime, so in case of a rare blue screen on your computer you can lose data!

Magio can be used with Unity Terrain (Prefabs placed as trees. Can be bushes etc as long as they are placed with a tree tool). Magio checks with predefined intervals if there are any fires close enough to unity terrain trees. If some tree is close enough, Magio will replace a tree instance with a prefab on the same position/scale/rotation as the tree. After that it will act like any flammable object and is deleted if it is not ignited and the fire moves farther away.

If your scene has a huge amount of trees and a huge amount of magio objects, be sure to cull far away/non-important magio objects and trees to avoid unnecessary checks and draining the performance. Also this will leave faded out gameobjects (effect already faded away, whole life cycle completed). So if you have a large scene you should replace these with faded tree instances or destroy them when the player is farther away.

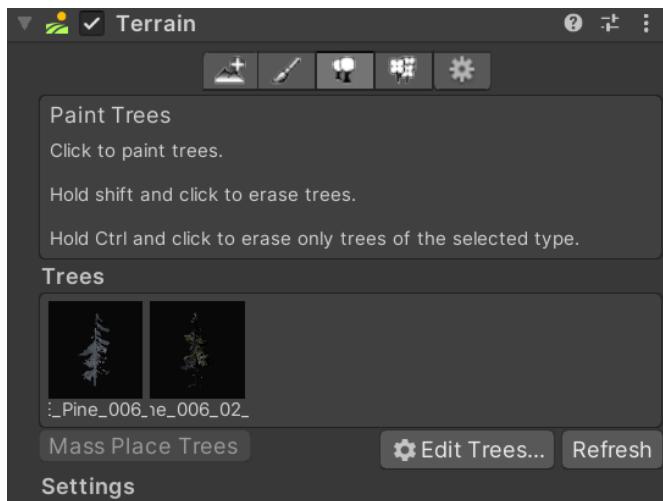


Steps:

1. Backup your terrain! Magio will manipulate trees in runtime, so in case of a rare blue screen on your computer you can lose data!
2. Enable "Unity Terrain Compatible" from MagioEngine in your scene.
3. Convert your tree prefab you intend to use normally to the Magio object using instructions in "*Convert Object to use One Effect*" or "*Convert object to multi-effect Magio Object*" or use splash effect explained in "*Create a splash effect*".



4. Add the converted object normally to your terrain trees:



5. Note that you can add bushes also to trees if you want.

Use Magio with Vegetation Studio Pro

Example: You are using Vegetation Studio Pro and want to convert some of the vegetation to Magio objects.

Additional Information:

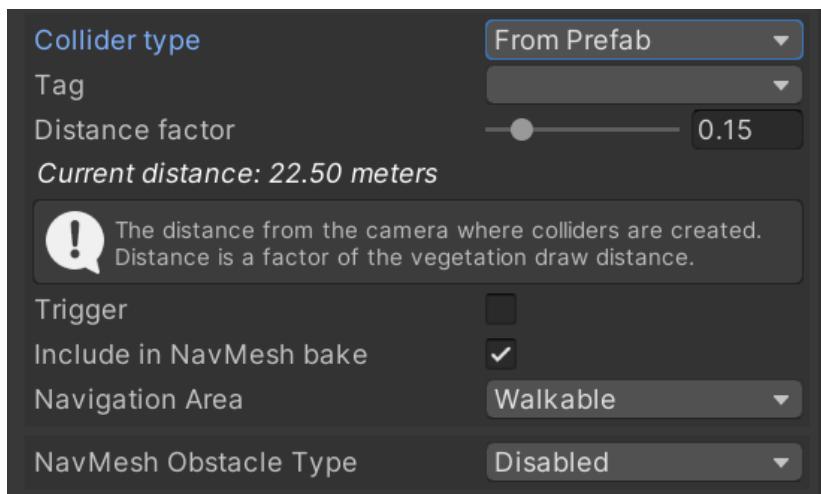
Since objects can be masked with Vegetation Studio Pro, Magio can mask instanced objects and generate the same prefab as a Magio object.

If your scene has a huge amount of trees and huge amount of flammable objects, be sure to cull far away/non-important Magio objects and trees to avoid unnecessary checks and draining the performance. Also this will leave faded gameobjects (Effect already faded away, whole life cycle completed). So if you have a large scene you should replace these with faded away tree instances or destroy them when the player is farther away.

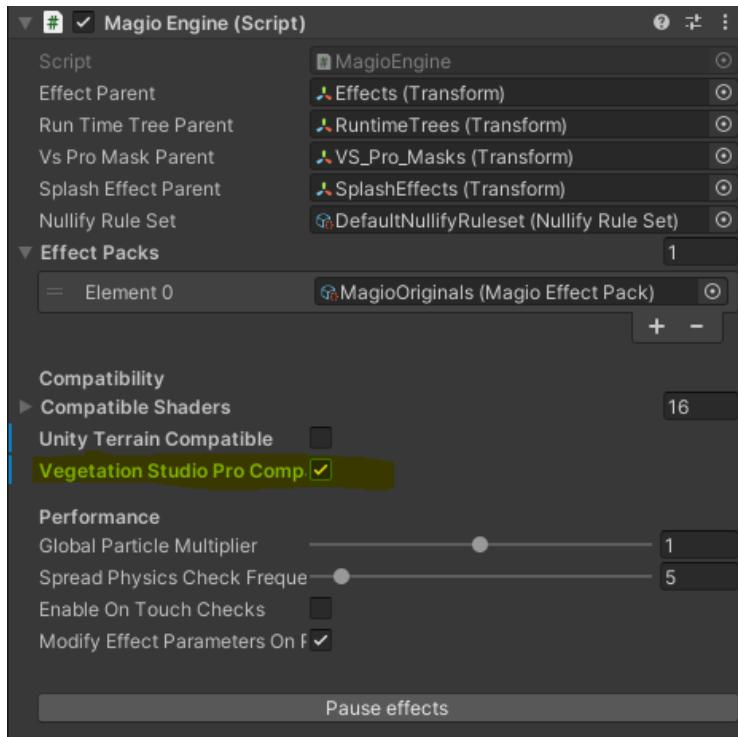
Steps:

Trees:

1. Enable a collider for the vegetation object in Vegetation Studio System
2. Collider can be a cube, capsule or other primitive or it can come from a prefab.

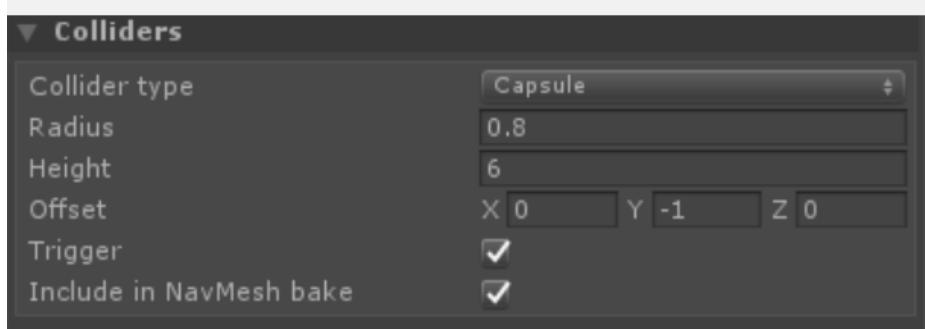


3. Convert your tree prefab you intend to use normally to the Magio object using instructions in "*Convert Object to use One Effect*" or "*Convert object to multi-effect Magio Object*" or use a splash effect explained in "*Create a splash effect*".
4. Enable Vegetation Studio Pro Compatibility inside MagioEngine.

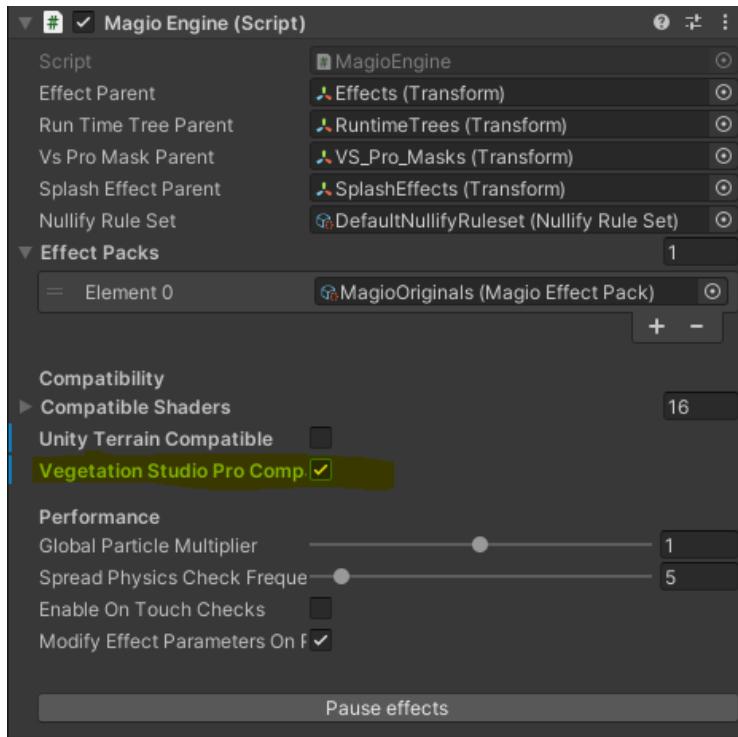


Grass and foliage:

1. Enable a collider for the vegetation object in the Vegetation Studio System. For this you need to import grass e.g. as an object (We need a collider to detect if we should ignite it!) You most probably want a capsule or a box collider (or "from prefab").



2. Tick "Trigger" or Change the collider layer from inside the prefab. We do not want our player to collide with grass.
3. Convert your tree prefab you intend to use normally to the Magio object using instructions in "*Convert Object to use One Effect*" or "*Convert object to multi-effect Magio Object*" or use a splash effect explained in "*Create a splash effect*".
4. Enable Vegetation Studio Pro Compatibility inside MagioEngine.

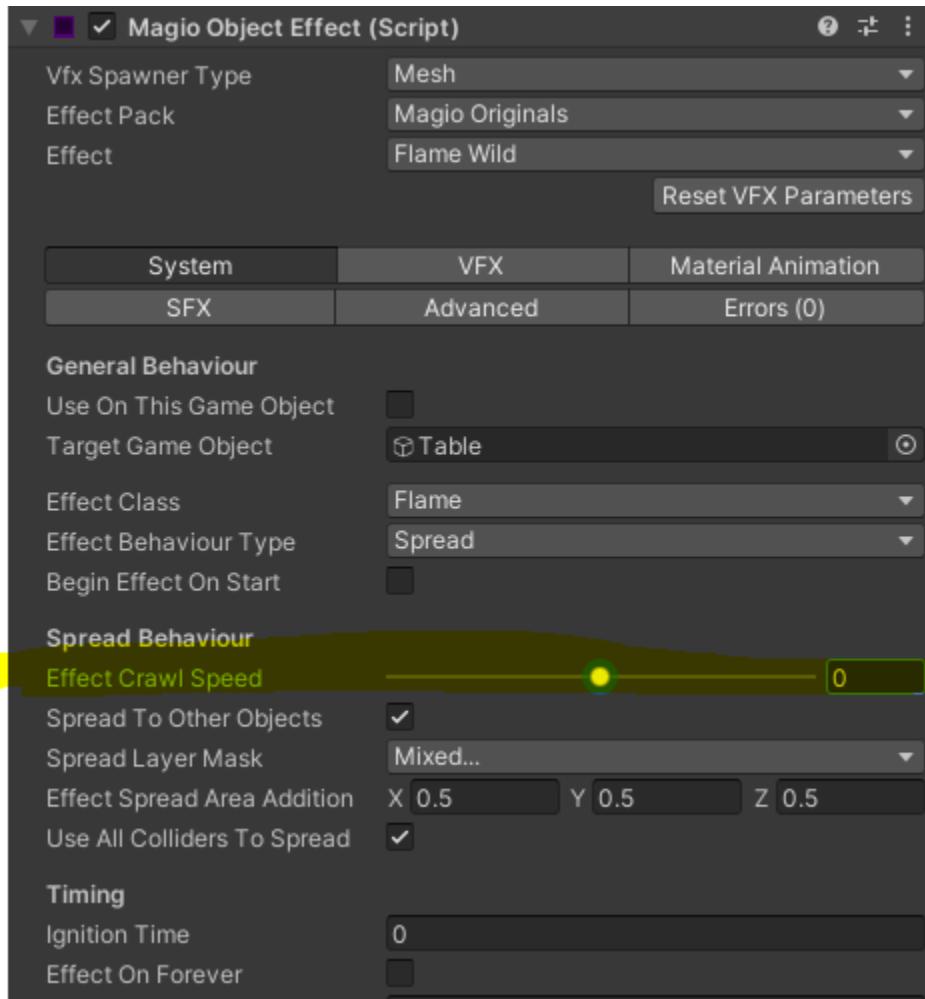


Manually Control the Magio Effect Spread and timer

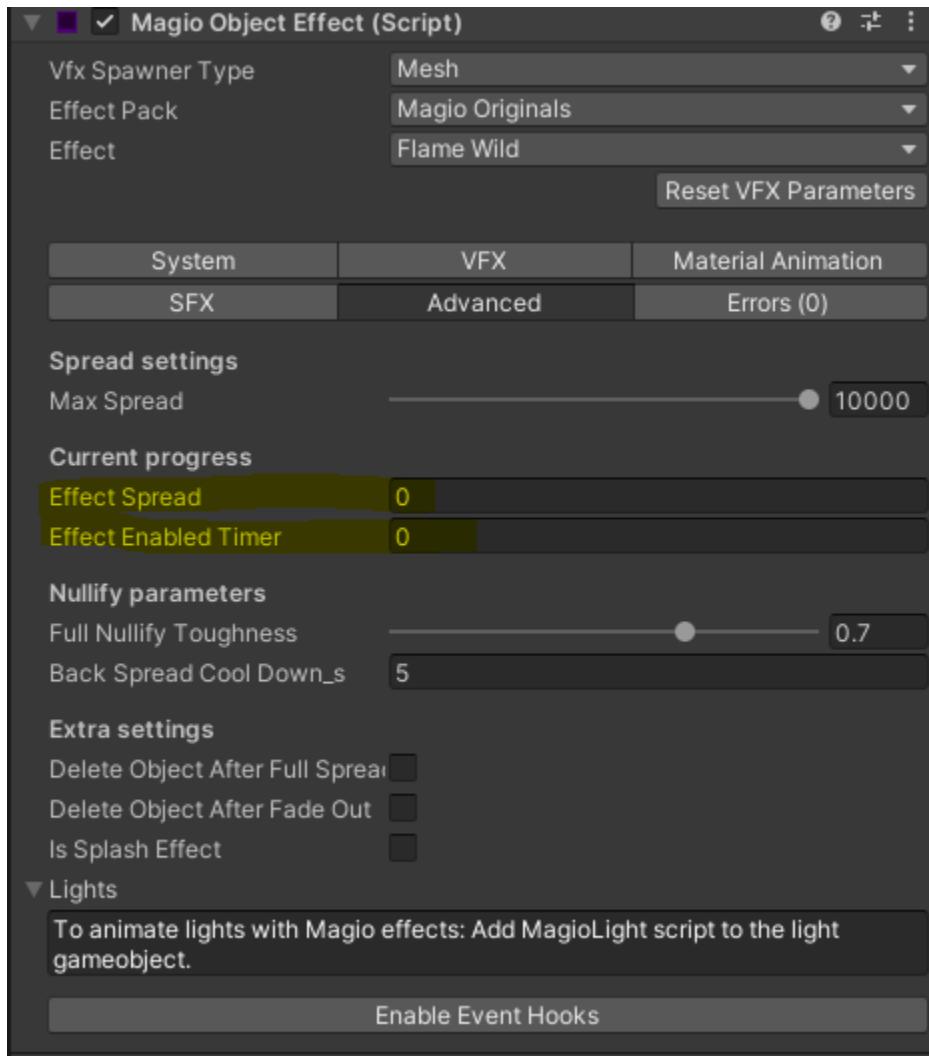
Example: You want to synchronize the effect spread between clients of your multiplayer game. You want to manually control the effect's progress and spread.

Steps:

1. Set System->Effect Crawl Speed to 0



2. Control the progress by myMagioObject.effectSpread and myMagioObject.effectEnabledTimer

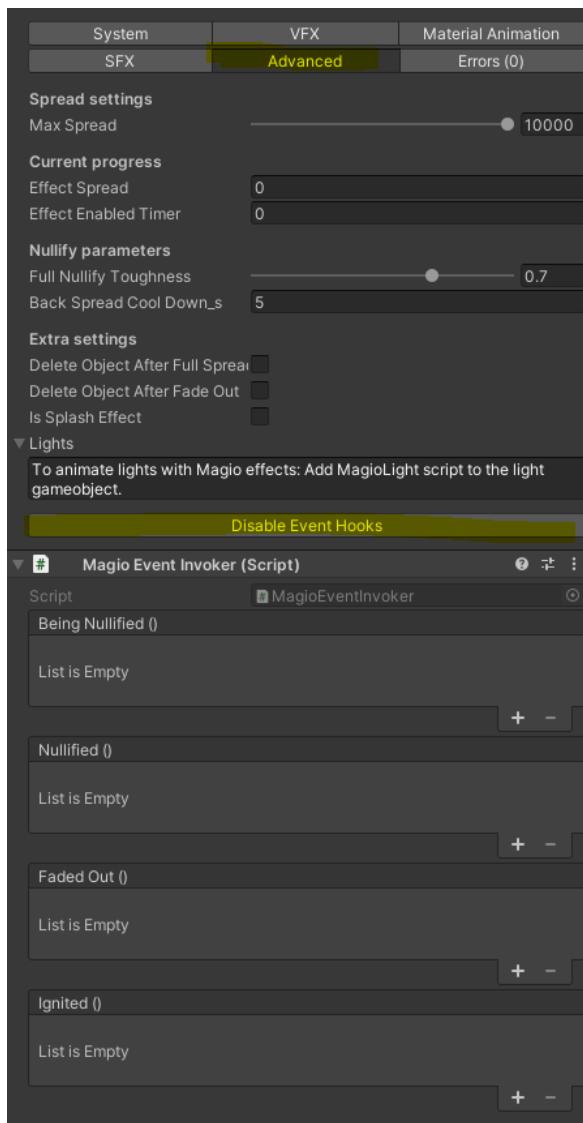


Hook to Magio Object events such as Ignited and Nullified

Example: You want to run your own logic when Magio Object Effect (Flame, plants, etc.) is Ignited or Nullified

Steps:

1. Go to Magio Object Effect->Advanced
2. Press “Enable Event Hooks”
3. Add your own event hooks to the created script.
 - a. These are basic Unity Events
 - b. <https://docs.unity3d.com/ScriptReference/Events.UnityEvent.html>



Detect when your object touches an effect

Example: You want your player to take damage when it touches an object that is burning/has some other magic effect.

Steps:

1. Implement IInteractWithEffect on your class
2. Example in
Arctibyte/Magio/Core/Scripts/Interact/Examples/SimpleInteractWithEffect

```
namespace Magio
{
    /// <summary>
    /// A template for interacting with MagioEffect using IInteractWithEffect interface.
    /// </summary>
    public class SimpleInteractWithEffect : MonoBehaviour, IInteractWithEffect
    {
        public void OnCollisionWithEffect(GameObject magioObject)
        {
            MagioObjectEffect obj = magioObject.GetComponent<MagioObjectEffect>();
            Debug.Log("Object: " + gameobject.name + " Interacted with effect object: " -
        }
    }
}
```

Pause effects through script

Example: You have a pause menu and would like to freeze all the effects.

Steps:

1. Call `MagioEngine.instance.PauseEffects()` to pause
2. Call `MagioEngine.instance.ResumeEffects()` to resume

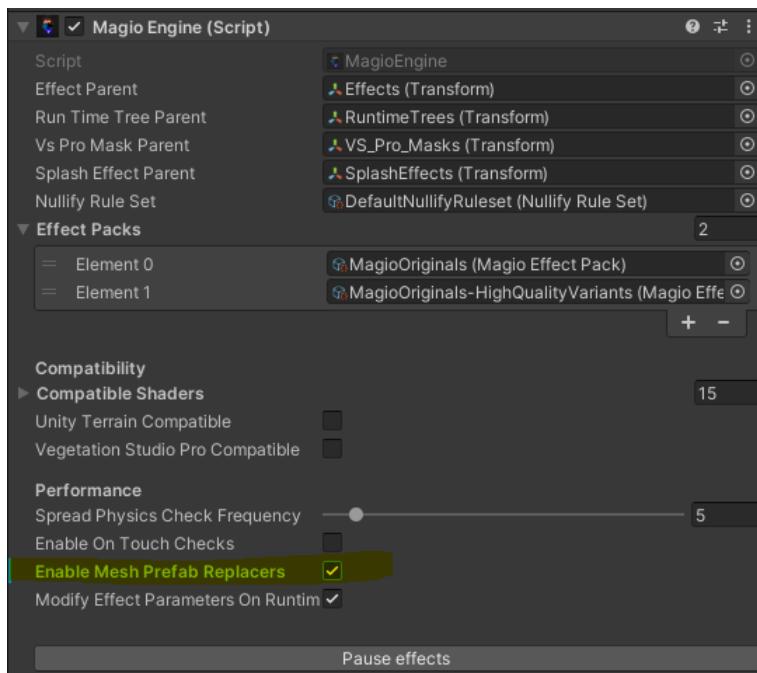
Optimize if you have lots of inactive Magio Objects / Use custom instancer or renderer

Example 1: You have a huge amount of box prefabs on the scene. You want to convert them all to magio, but with each active Magio object there is a small overhead.

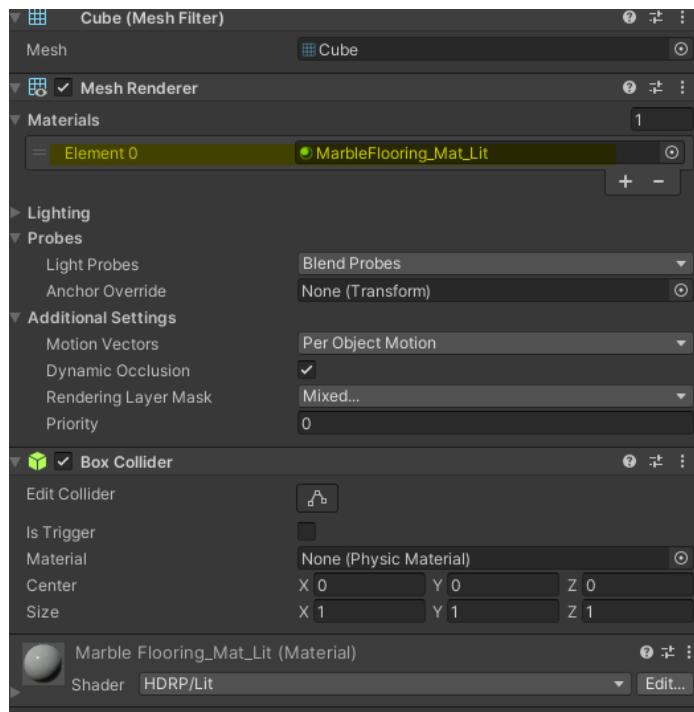
Example 2: You are using Instance Indirect or some other GPU instancing using renderer. The method you are using spawns colliders and uses GPU to draw meshes. You want to use Magio with all objects.

Steps:

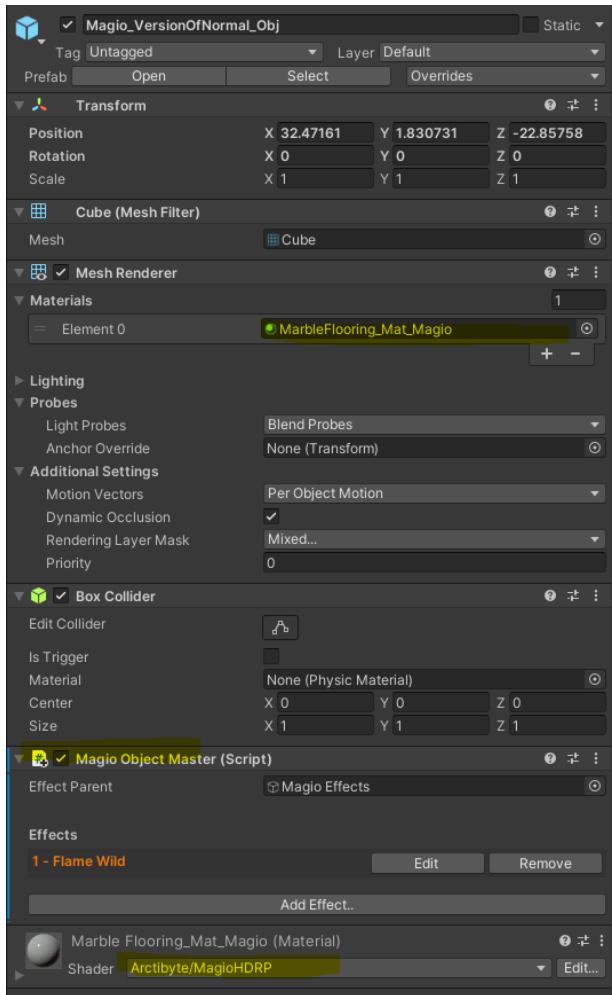
1. Enable MagioEngine->Enable Mesh Prefab Replacers



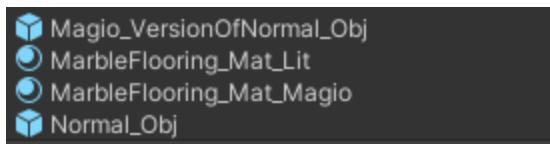
2. Open the prefab you want to use. Duplicate all the materials (If you do not want to use Magio materials on your in-active object).
3. Duplicate the prefab.
4. Drag the duplicated prefab to the scene and convert it to Magio Object normally.
5. You should now have two prefabs with two different materials.

"Normal" version:

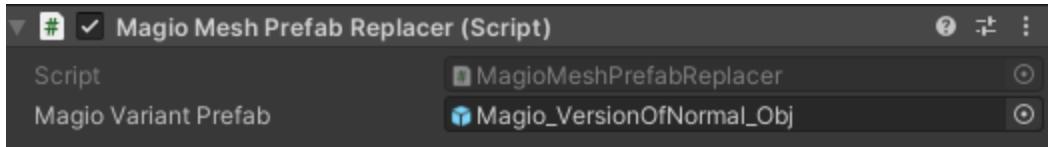
Magio Version:



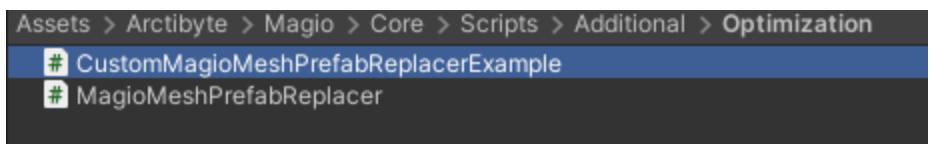
Project view:



6. Attach a “Magio Mesh Prefab Replacer” component to the “normal” object without any Magio components. Assign the Magio Object you just created as the variant.



7. Now your “normal” prefab should be replaced at runtime with Magio prefab.
8. (Optional) If you want to have custom functionality done when the prefab is being replaced, e.g. mask an instance on renderer or something else, you can implement a class which inherits Magio Mesh Prefab Replacer. An example is here:

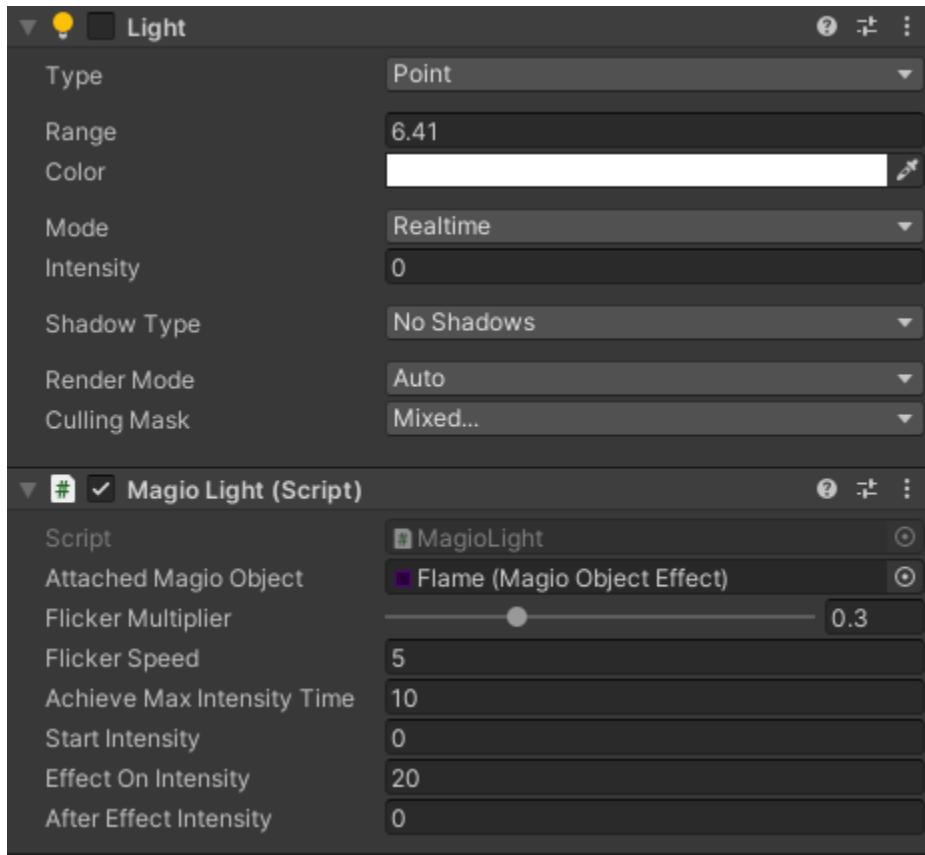


Animate lights with Magio effect

Example: You want to boost the flame effect by adding a point light to contribute to Global Illumination.

Steps:

1. Add MagioLight component to your light game object



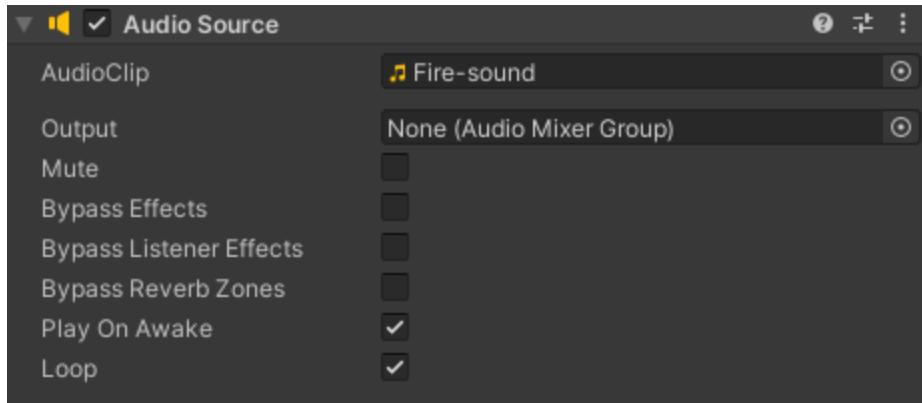
2. Set the Start intensity, Effect On intensity and After effect intensity.
3. If you want your light to be turned off before the effect you can disable the Light component.

Add Sound FX to the effects

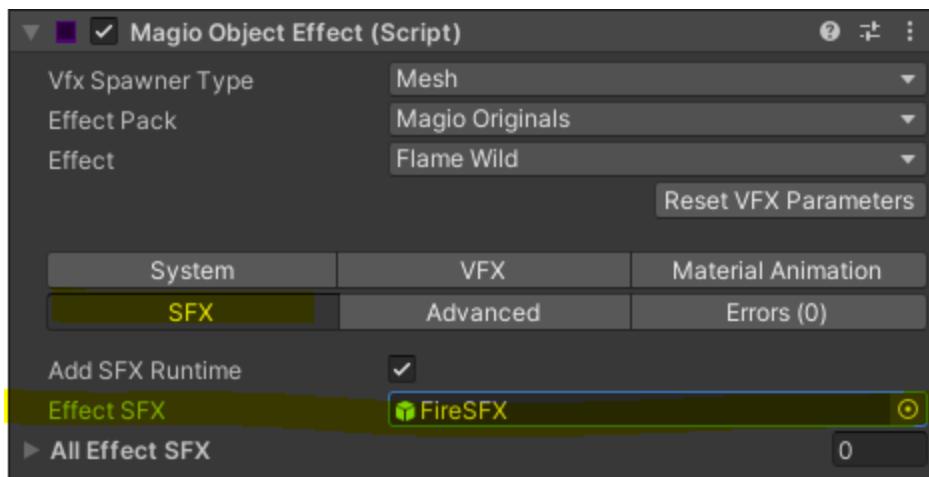
Example: You want to dynamically add a sound effect to Transform of the effect when it is on.

Steps:

1. Create a prefab from your sound effect



2. Add it to Magio Object Effect->SFX->Effect SFX

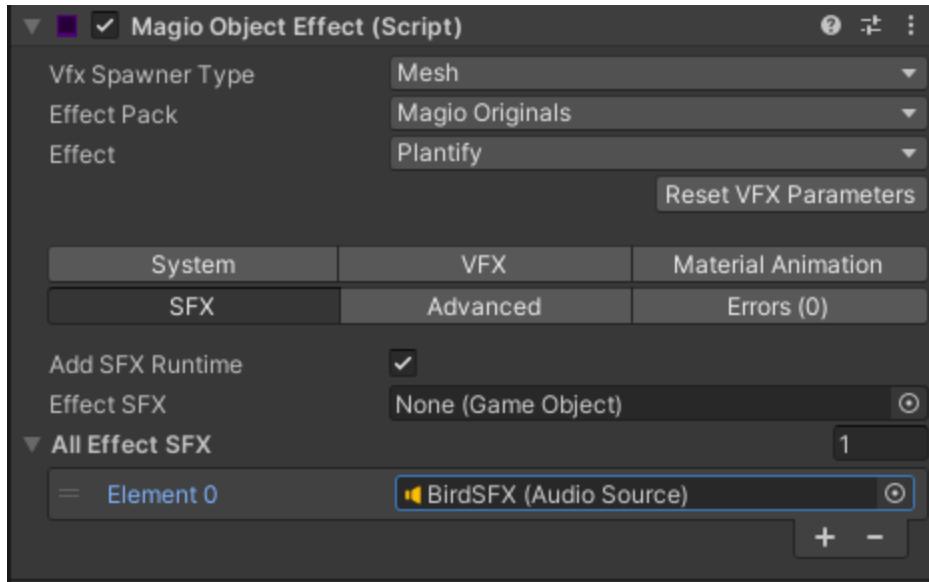


Attach your pre-placed sound effects to animate with the effect

Example: You want some bird chirping from the sky when plantify effect is activated

Steps:

1. Attach your Audio source to the MagioObjectEffect->SFX-> All Effect SFX.

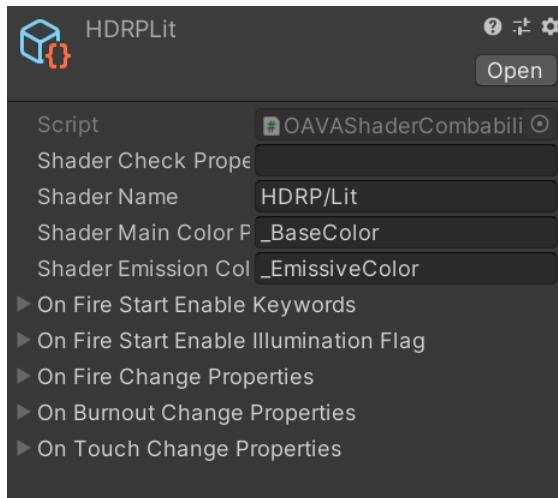


Create Compatibility for a third-party shader

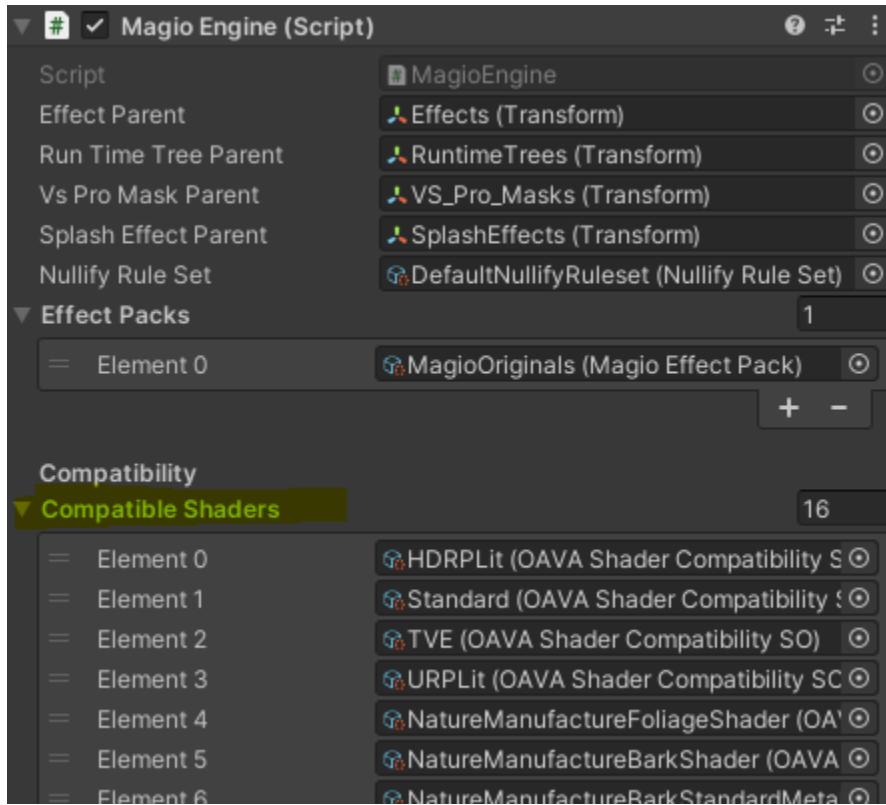
Example: You have an object in your scene that you want to ignite in flames. Your object uses this underground/less-known shader from the asset store, let's call it "Jimbo's awesome party shader" and it is not supported by Magio out-of-the-box.

How to implement:

1. You can add compatibility with any shader that has at least a color parameter exposed.
2. To create a new compatibility object right click on your project assets window-> Create->Magio->ShaderCompatibility.
3. Scriptable object looking like this will be created:



4. It is better if your shader has a property like `_IsYourShader`, to be checked, but you can also use the name of the shader. These are used to detect your shader.
5. Set the color property names, if you want the colors to be animated. Colors can be later set in Magio Object Effect component->Material Animation individually for all the objects.
6. Add float properties to be animated at different life points. E.g. leaves/wind multipliers.
7. Check the Arctibyte/Magio/Core/Compatibility/CompatibleSettings folder for examples.
8. Add your created compatibility in MagioEngine->CompatibleShaders



Compatibility

The Vegetation Engine

Magio supports The Vegetation engine out-of-the-box. Just Convert TVE object normally like instructed in the tutorials for converting magio objects or using splash effect.

To enable snow melt check On Touch Trigger Check from MagioEngine

Vegetation Studio Pro

Instructions in Tutorials->Use Magio With Vegetation Studio Pro.

HQ FPS Animated Weapons

You can add Spherelgnite to your molotov burning effect etc to easily integrate HQ FPS Animated Weapons with Magio.

NatureManufacture Environments

Should work without any extra effort. Shader compatibility settings should be included and applied in the package.

Convert NM Assets like instructed in the tutorials for converting magio objects or using splash effect.

FAQ/Quick Fixes

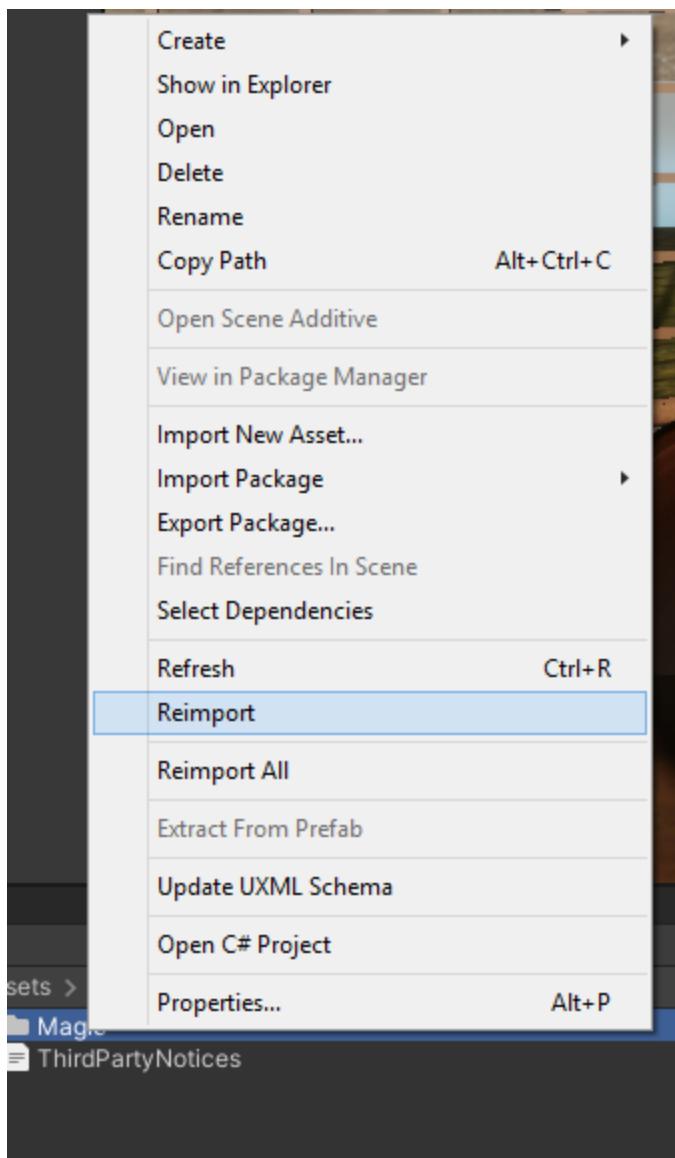
Magio does not work

Make sure you are using URP/HDRP with Visual effects graph 11.0+ and you have read at least a Quick-start guide. Also see MagioObjectEffect->Errors tab for any errors with your object setup. For bugs, please submit an issue in support.arctibyte.com.

Errors on Sample scene on all/some effects

Make sure you have visual effects graph installed

Re-import Magio folder (Right-click->Re-import).

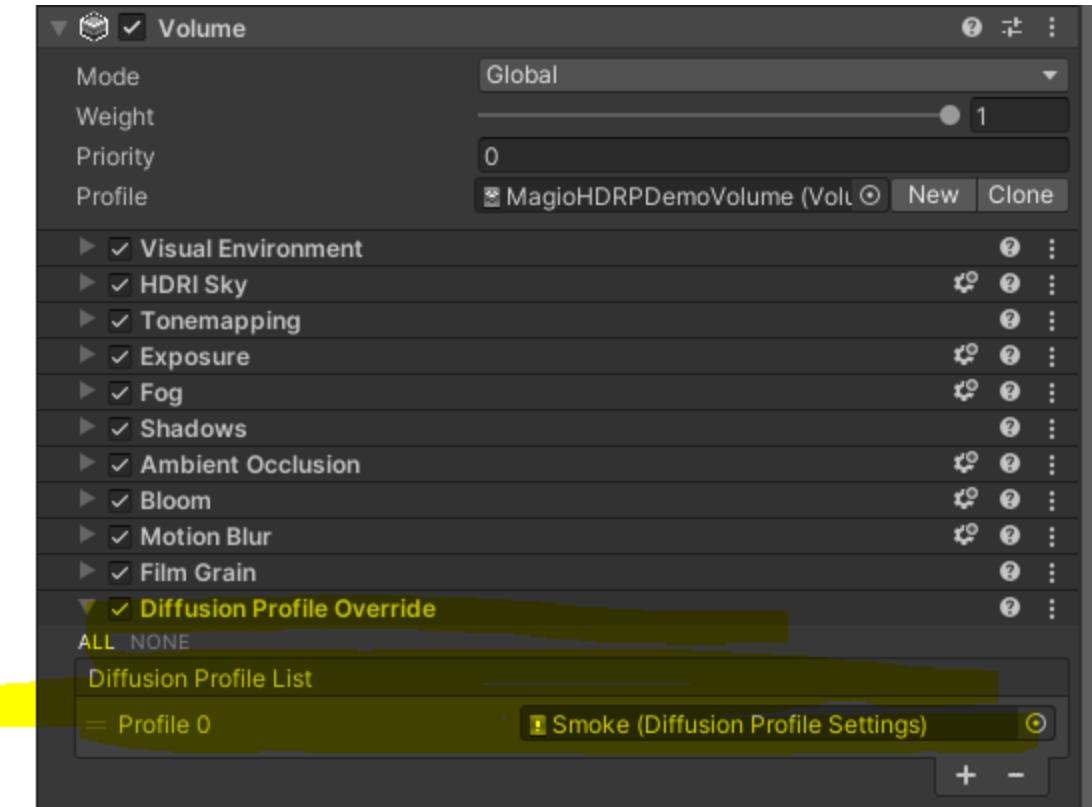


I am using Magio Originals HQ/Flame Wild HQ and the smoke is green

To use HQ Flame you need to add a diffusion profile for the smoke in your diffusion profiles in the scene or project.

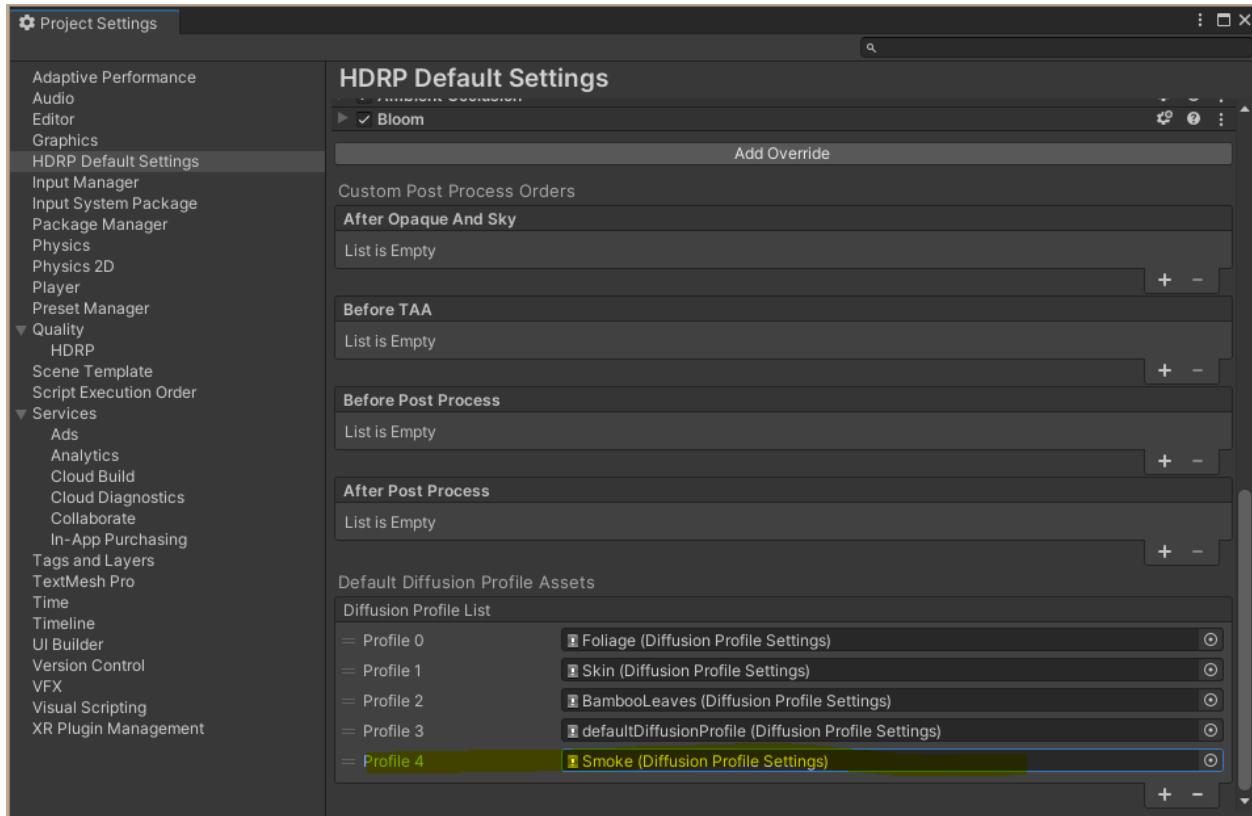
Steps to add it to scene:

1. Open your Global Volume in your scene
2. Add Diffusion Profile Override
3. Add Smoke



Steps to add it to project:

1. Open Edit..->Project Settings->HDRP Default settings.
2. Add smoke to Diffusion Profile List

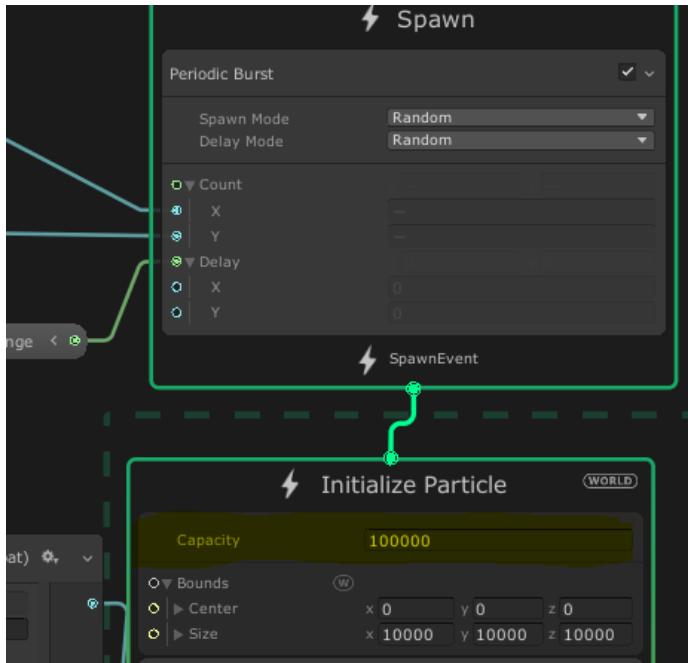


Using lot of effects kills my Frames Per Second

Well yes. You have to be smart using these effects. A lot of effects will probably have a performance impact. MagioEngine->Performance has some settings you can try out and optimize. Other ways to optimize is culling etc.

I WANT MORE PARTICLES, BUT VFX MULTIPLIER DOES NOT ADD THEM

That's because the VFX effect has a fixed capacity set to something to not crash your system and damage your performance. You can always chop your objects into smaller pieces to add more precise effects. To up the capacity you need to open VFX graphs and set the capacity higher:



Can I use Magio with Oculus Quest?

Visual effect graph should work with Oculus quest. However you need to build the project to VULKAN instead of OpenGL for it to work. VFX Graph is not yet out-of-preview for mobile platforms so use it at your own risk.

Can I use Magio on mobile?

The VFX graph has issues with some mobile GPUs so Magio does not officially support mobile builds. However Mobile support is on product board of VFX Graph, follow it here:

<https://portal.productboard.com/unity/1-unity-platform-rendering-visual-effects/c/119-upr-support-compute-capable-devices-only-high-end-mobile-support>

Can I enable effects through code?

Yes. In the case of “Enabled” effect behaviour mode you can just enable the game object. In case of “Spread” effect behaviour mode, you can call `myMagioObject.TryToAnimateEffect()`.

The VFX does not spread on touch of other VFX

This is due to the design. Effects VFX particles are simulated on GPU to gain that lightning fast performance and due to that cannot interact with other objects. This means that ignition is done with math based on colliders. You can change the Ignition area in MagioObjectEffect->System->Effect Spread Area addition. This adds an area around your collider. You can see the ignition area around the magio object as red gizmos.

Can I create Magio Effect Packs from my effects and sell them in the asset store?

Yes, absolutely you can. Just include an effect pack scriptable object, graphs and graph prefabs in your package. Do not include any scripts/graphs/files from Magio asset, this is not allowed.