

Unity Visual Effect Graph

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What is Visual Effect ?



VFX

Game
VFX

Particle
VFX

Particle Effects

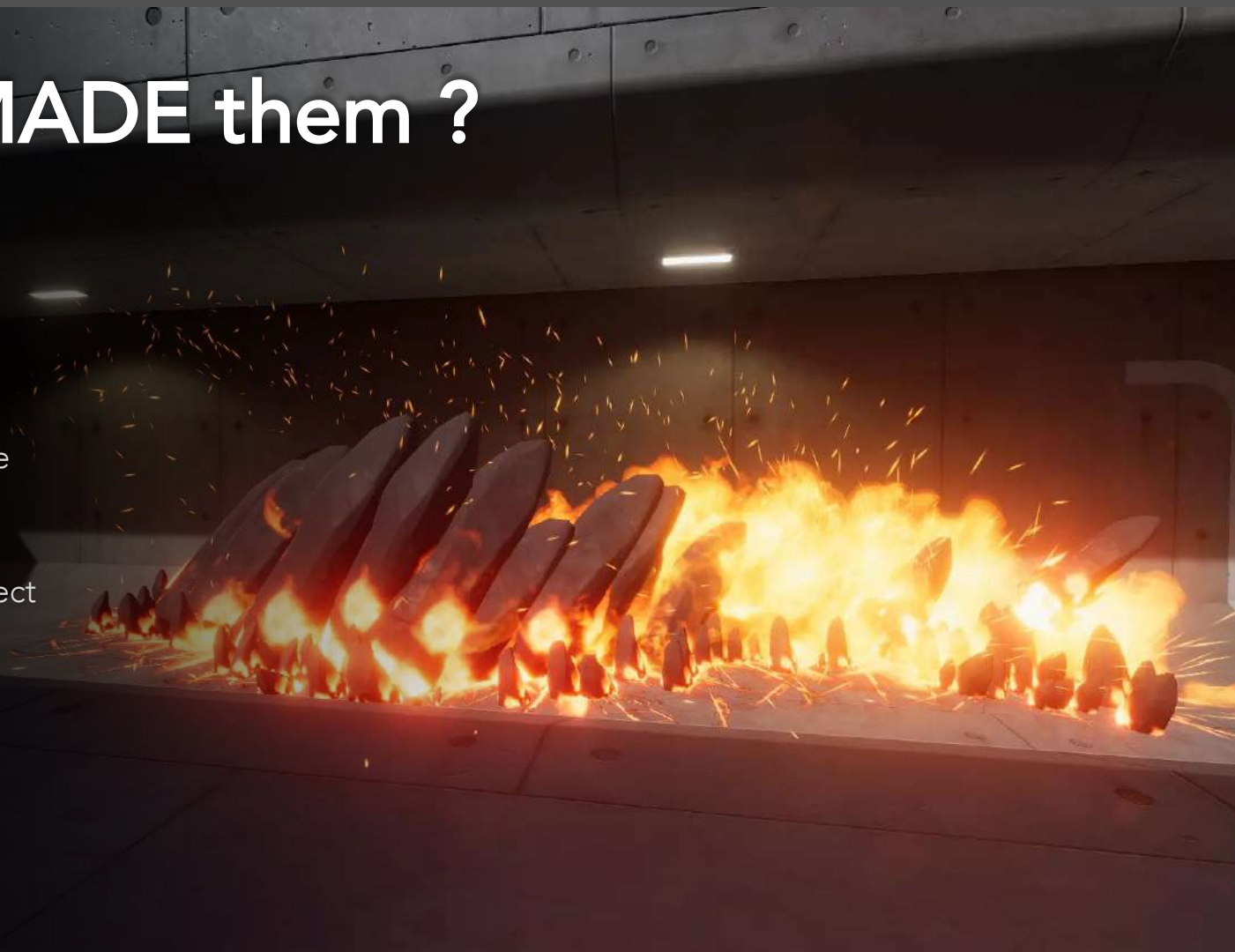
Effects made by many particles:

- Fire
- Smoke
- Dust
- Magic spells
- Projectiles
- Debris
- ...

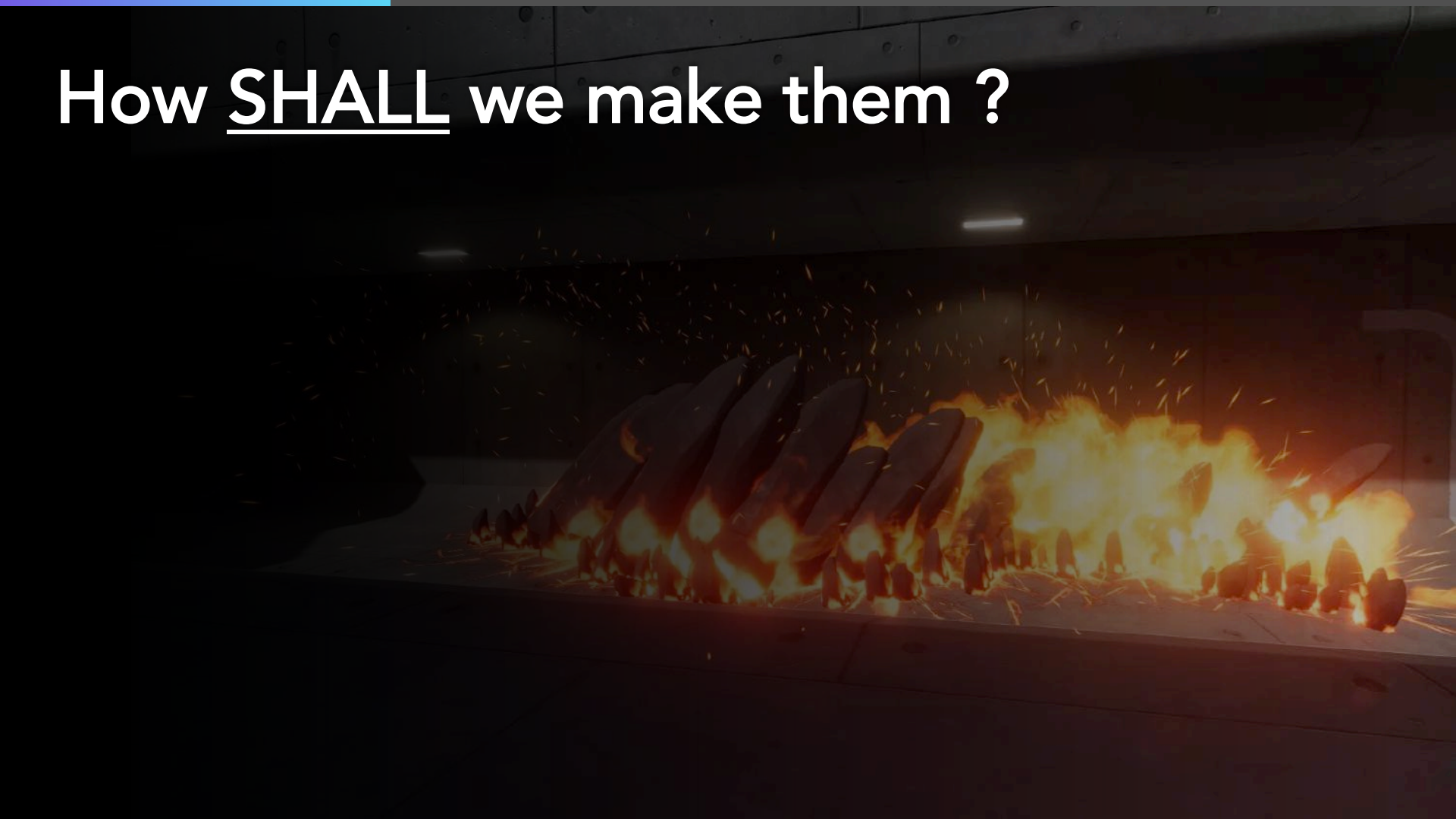


How we MADE them ?

- Particle Systems:
 - Unity's Shuriken
 - Unreal's Cascade
 - Houdini
 - Adobe After Effect
- Sprite Sheet



How SHALL we make them ?





Unity Visual Effect Graph

<https://www.youtube.com/watch?v=rqMcPZoEc3U>

When

How

Where

VFX
Graph

Why

What

Visual Effect Graph



Next Generation Visual Effects tool for Unity



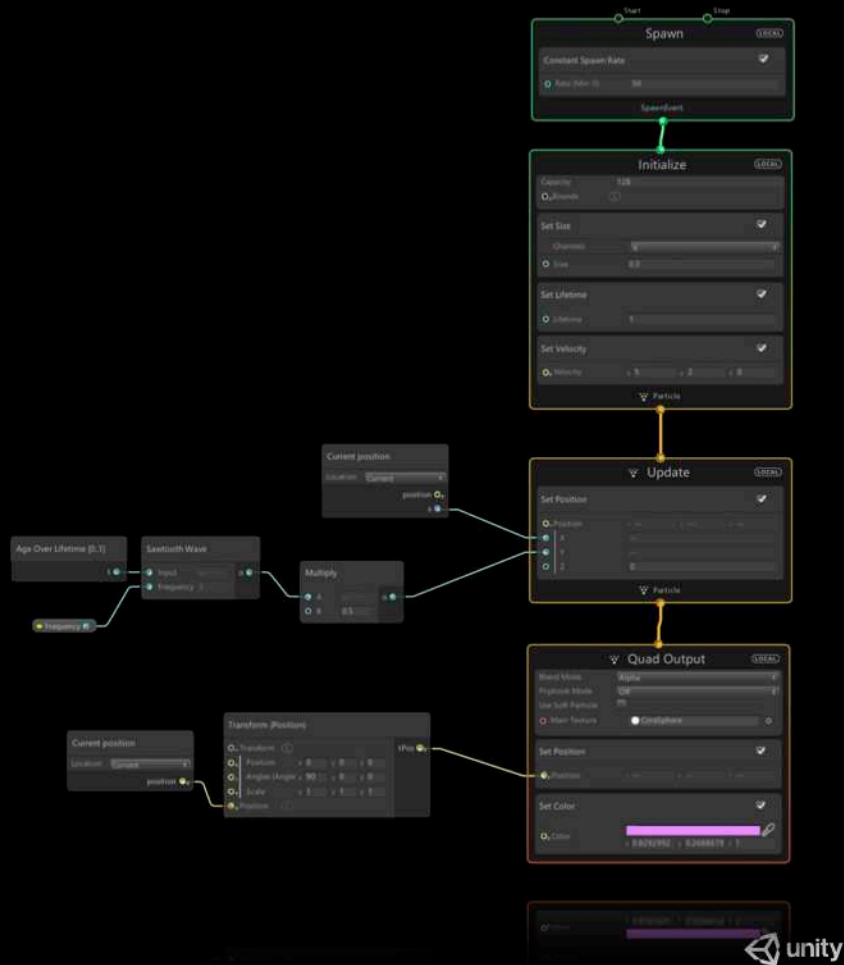
Programmable, hybrid, Stack/Node-Based
Effect behaviors



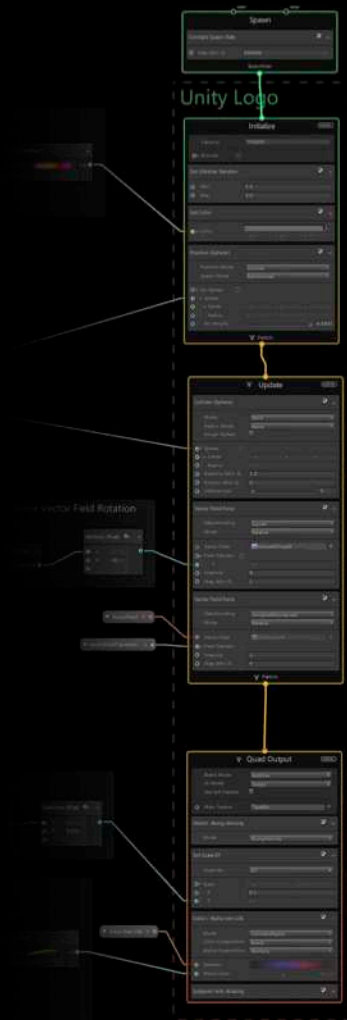
Self-contained asset templates with Event and
Parameter interface



Tailored for Next-Generation platforms
(GPU/Compute)



Graph Flow



Logic Flow

- Chained States (Contexts)
- Contexts made of Blocks
- Blocks can be parametrized

Spawn

How many particles?

Initialize

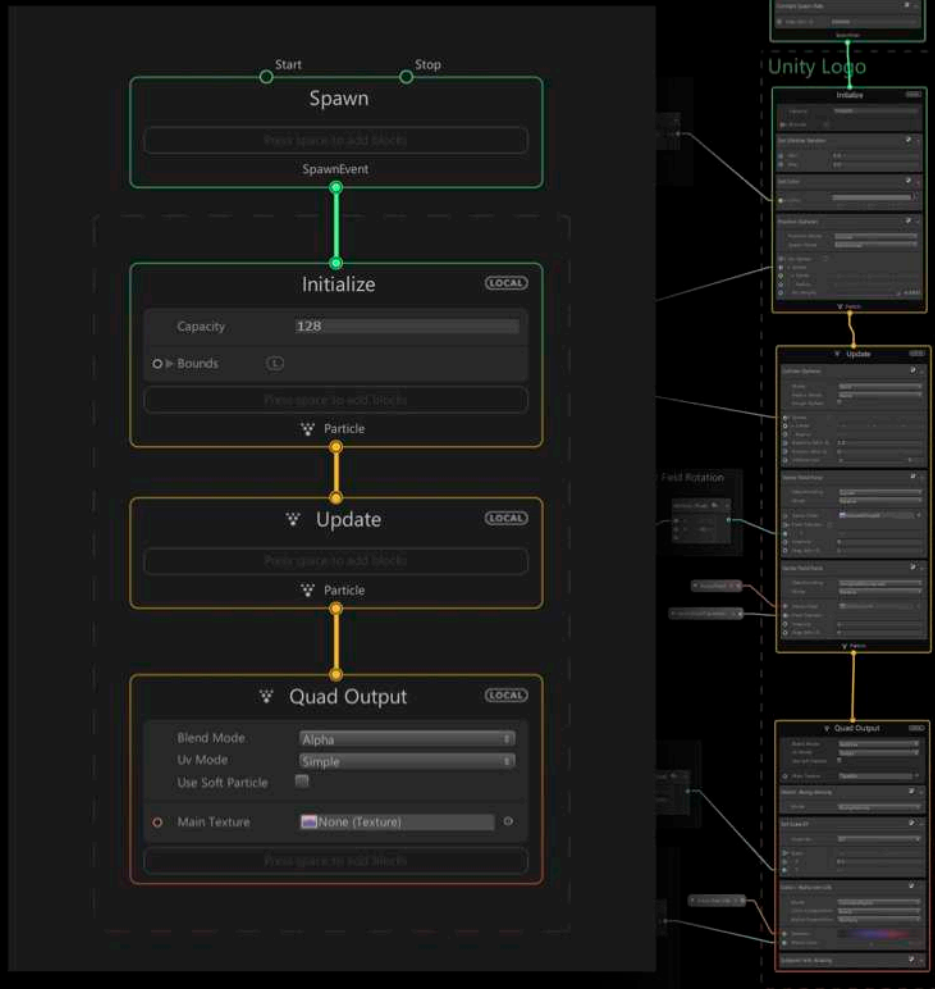
What are their initial values?

Update

How do they behave over time?

Output

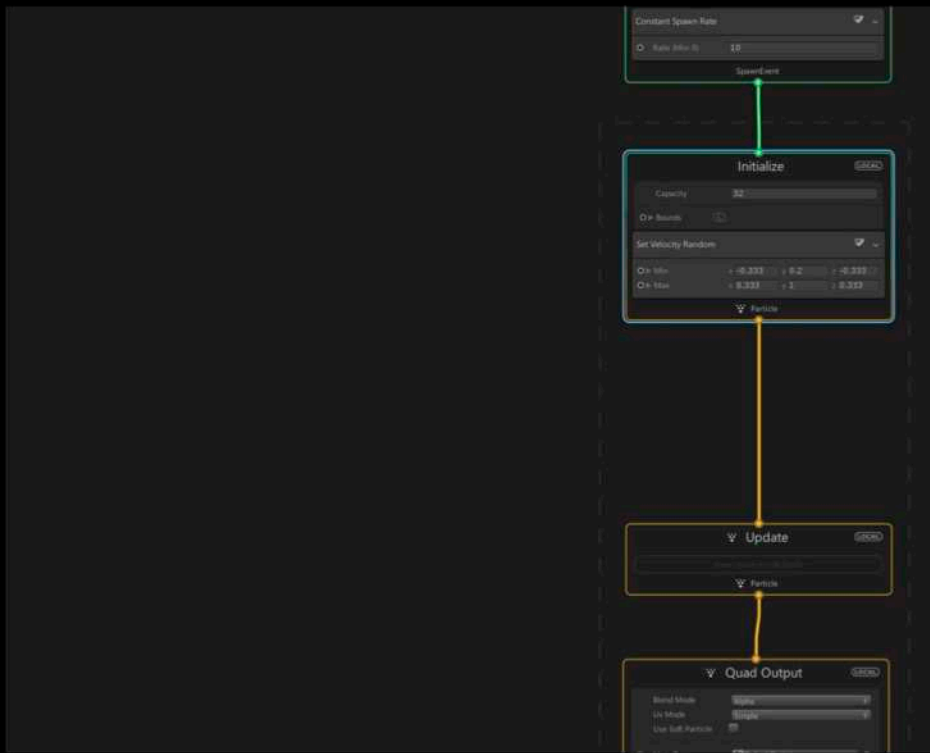
How are they rendered?



Logic Flow

- Chained States (Contexts)
- Contexts made of Blocks
- Blocks can be parametrized

Blocks



Node Blocks

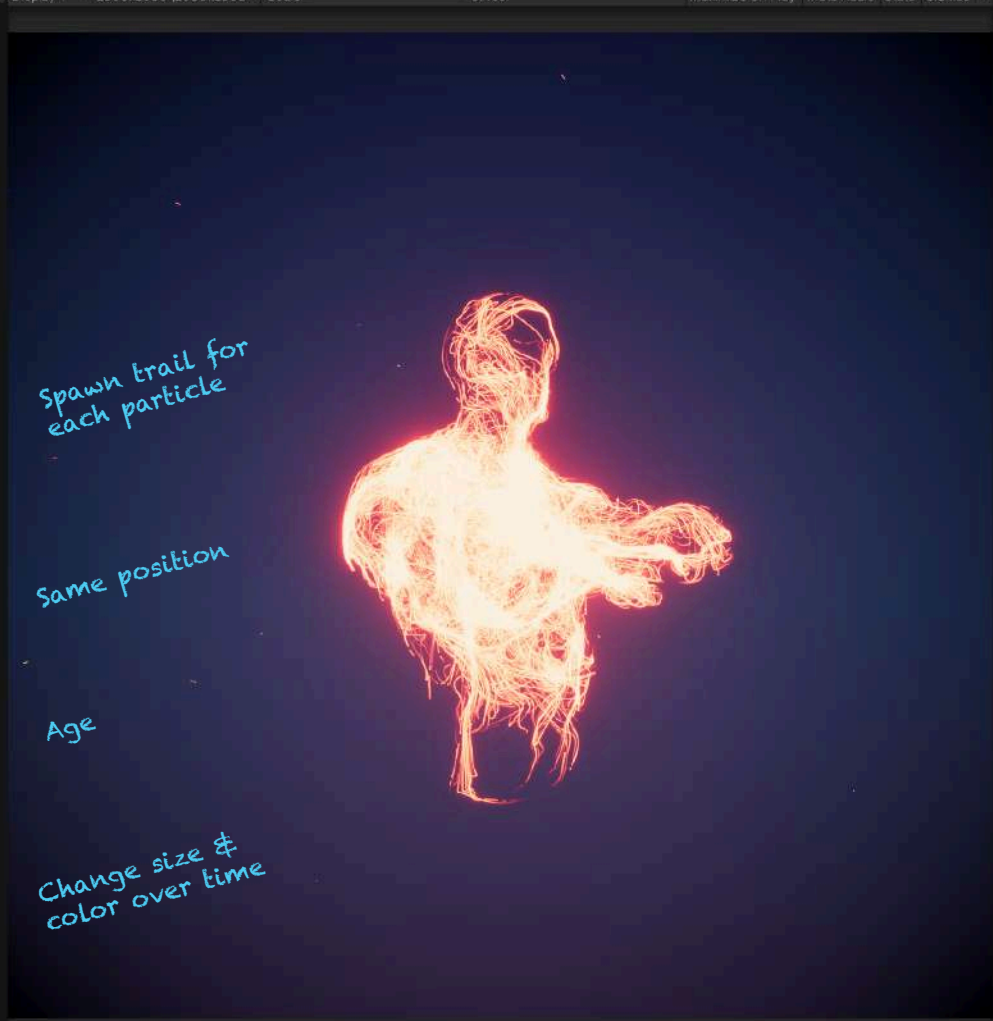
- Reorderable Stack
- Define Context Behaviour
- Alter Simulation Attributes
- Expose Slots that can be fed by operators

- Defined in Blackboard
- Exposed at Component Level
- Access to Parameters in Graph
- Edit Gizmos in Scene



Let's make one !





Change color
over time

Change size & color over time



Let's break one !

Count: 10000
Delay: 0
⚡ spawnEvent

Loop by sine wave

Convert ranges

Loop by sine wave

Convert ranges

A large, irregularly shaped, metallic object with a highly reflective, crystalline surface. The object is composed of many small, sharp, and jagged facets that catch the light, giving it a shimmering, almost iridescent appearance. The colors range from bright silver and white to deep blues and purples, suggesting a complex internal structure or a specific mineral composition. The object is set against a dark, solid background, which makes its reflective surface stand out prominently.



Shuriken

- Work on CPU
 - 10K particles
 - Average performance
- All options are visible
- For all Unity versions, all platforms
- Limited options
- Limited tools
- Fixed
- Need engineer for dynamic ones
- Bad for collaborations

VFX Graph

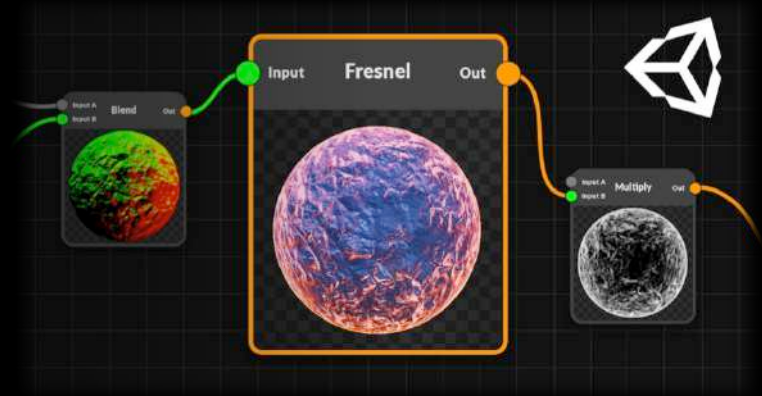
- Work on GPU
 - 10M particles
 - Great performance
- Steep learning curve
- Only for new Unity versions / platforms
- More freedom
- More tools (Point-Cache, Vector Field ...)
- Variants by exposed properties
- Dynamic via binders
- Pack-able support from engineer (SubGraph)

Why should I learn it ?






- Alternative for complex effects
- Production-ready after 2 years in Preview

Why should I learn it ?

- Alternative for complex effects
- Production-ready after 2 years in Preview
- Node-based editors are the future
 - Unreal's Blueprint, Material Editor
 - Unity's Shader Graph, Bolt
 - Substance Material Editor ...



References

- [Official homepage](https://unity.com/visual-effect-graph)  <https://unity.com/visual-effect-graph>
- [Latest documentation \(incompleted\)](https://docs.unity3d.com/Packages/com.unity.visualeffectgraph@7.4)  <https://docs.unity3d.com/Packages/com.unity.visualeffectgraph@7.4>
- [Block list \(out-dated\)](https://docs.unity3d.com/Packages/com.unity.visualeffectgraph@6.9/manual/Blocks.html)  <https://docs.unity3d.com/Packages/com.unity.visualeffectgraph@6.9/manual/Blocks.html>
- [VFX Graph Samples](https://blogs.unity3d.com/2019/03/06/visual-effect-graph-samples/)  <https://blogs.unity3d.com/2019/03/06/visual-effect-graph-samples/>
- [Spaceship demo](https://blogs.unity3d.com/2019/08/19)  <https://blogs.unity3d.com/2019/08/19>

More topics about Unity Graphics

- Shader Graph
- Post Processing
- Global illumination

