Portal documentation

Run demo:

1. Open Knife/Portal/Demo with VFX/Scenes/Demo scene.
2. Press play.

Quick Start Guide to create portal:

1. Find Knife/Portal/Prefabs/PortalTunnelStarter or Knife/Portal/Demo with VFX/Prefabs/PortalTunnel prefab.
2. Drag'n'Drop the prefab on scene.

This portal is very basic. You can add your own effects and animation to this.

Components.

PortalView is component that render scene on other side of portal.

It contains:

1. PlayerCamera – GameView Camera.
2. PortalViewCamera – camera of other side of the portal. Must be child of PortalRoot2
3. PortalViewResolution – resolution of RenderTexture of PortalViewCamera (Script automatically creates rendertexture and assign to camera, in scripting you can get this RT from PortalView.RenderTexture).
4. PortalRoot1 – entry of portal.
5. PortalRoot2 – entry of other side of the portal.

PortalTransition is component that do transition of objects between portals. Object that will need transit should inherit IPortalTransient interface in any component of object's components. Also, object must have rigibody (dynamic or kinematic) and collider to call OnTriggerEnter and OnTriggerExit events in PortalTransition component. Always you can use SimpleTransient component to create object Transient.

It contains:

1. EntryPlane – all transformations are doing with that transform. PortalTunnelStarter prefab use PortalMesh (quad).
2. TransitThreshold – threshold of depth position (Z) to teleport object from one side to other side.
3. PlaneSize – size of intersection plane to transit object to other side.
4. Exit – PortalTransition of other side.
5. GizmosColor – color of rectangle gizmo to visualize PlaneSize.
6. IsPortalOpened – portal state. If it is not opened objects will not transit.

PortalAnimation is component that plays animation on selected animator when PortalTransition will open or close.

It contains:

1. PortalAnimator – animator that will play open and close animation.
2. OpenPortalAnimation – this animation will be played on portal open.
3. ClosePortalAnimation – this animation will be played on portal close.
4. PortalTransition – open/close events source.

PortalPhysicsAffector is component that affects on physics object when PortalTransition will open or close. Repel on open and attract on close.

It contains:

1. PhysicsMask – mask that will be used in Physics.OverlapSphere function.
2. Radius – affect radius.
3. Force – max force of affect.
4. DistanceCurve – curve of force by radius.
5. PortalTransition – open/close events source.
6. ApplyForceToClosestPointOnCollider – should be force applied to ClosestPointOnCollider or to center of mass. If true rigidbodies will have angular speed because force will be applied on some point instead of center of mass.

PortalOptimization is component that will help you gain performance.

It contains:

1. CullRadius – culling sphere radius.
2. PortalView – view that will be disabled or enabled.
3. PortalTransition – open/close events source.
4. CullCamera – culling camera (should be GameViewCamera)
5. FrustumCulling – is portal rendering should be disabled by frustum culling of CullCamera. Unity 2017.4.13f1 has bug with CullingGroup OnStateChanged event (Unity Culling API), you should disable FrumstuCulling with that version of Unity. Unity 2019.3.6f1 does not has this bug. Other versions are not tested.

Shaders.

Distortion, with that shader you can achieve space distortion by distortion texture.

1. Alpha – alpha mask of distortion amount.
2. Distrotion – distortion map (screen space uv offset).
3. DistortionAmount – amount of distortion.
4. AlphaSoftness[1, 2] – remap alpha sliders.

Portal Alpha is main shader of portal effect.

1. Line[Power, Mul, Tint, Sub] – first noise parameters. Changing of power value helps to create noise gradient more softness or hardness. Mul – intensity. Tint – color. Sub – inverted length (greater – shorter, less – longer).
2. Noise – noise texture to achieve vortex effect.
3. NoiseSpeed – speed of noise UV.
4. UVRemap – remap of mesh uv. (from XY to ZW).
5. LineTex – line texture, used to draw line on portal mesh.
6. ThinLineColor – color of LineTex.
7. NoiseFactor – noise factor. Greater factor – less noise, but more gradient amount, less – more noise, but less gradient amount.
8. NoiseSub – inverted length of noise factor mask.
9. DisplacementNoise – noise of displacement animation.
10. DisplacementNoiseSpeed – speed of DisplacementNoise uv.
11. DisplacementNoiseRemap – remap of noise values.
12. GradientPower – additional gradient hardness.
13. GradientLength – additional gradient length.
14. Gradient – gradient color.
15. SoftDepthDistance – softness of depth fading to achive more softness intersections.
16. HueOffset – hue offset of all colors.

Portal Border is simple shader with displacement animation.

1. Color – color of surface.
2. DisplacementNoise – displacement noise texture.
3. DisplacementNoiseSpeed – speed of DisplacementNoise uv.
4. DisplacementNoiseRemap – remap of noise values.
5. HueOffset – hue offset of all colors.

Triplanar is simple shader that samples Albedo texture by world vertex position.

1. MainTex – albedo texture.
2. Falloff – falloff of samples blending.
3. Tiling – sampling tiling.
4. Color – color of albedo.
5. Smoothness – smoothness of surface.

PortalView is shader that draws other side of the portal on surface.

1. MainTex – screen RT of other side of the portal.
2. DistortionMap[1, 2] – distortion textures, sampled in vertex XZ space.
3. DistortionTiling[1, 2] – tiling of distortion textures.
4. DistortionAmount[1, 2] – amount of distortion.
5. DistortionSpeed[1, 2] – speed of distortion UV.
6. TotalDistortionAmount – final distortion multiplier.
7. DistortionDistanceSoftness – softness of distance gradient that controls distortion amount by distance.
8. DistortionDistanceMul – multiplicator of distance from camera to surface.