Unity Content & Virtual Production

Unity

HITS SPRING HOLLYWOOD INNOVATION & TRANSFORMATION SUMMIT

May 2022

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Unity is not just a real time engine...

We’re building the infrastructure that will drive the future of content production.

The tip of that spear is **Accelerate Solutions**, tasked with solving storytellers problems today.

RT3D +

- Unity Pro
- Unity VP

Pro Artistry =

- Ziva Dynamics
- SpeedTree
- Art Engine
- + and more

Unity Accelerate Solutions

- Visualization
- World Builder
- Dev Network
- Vendor Scenarios
- R&D / Innovation Labs
- Production Staff
- Training & Standards
- Vendor Ecosystem (CCN, MDP, Bench)

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Accelerate M&E Vendor Ecosystem

88 M&E Vendors WW

Uniquely Augmented by In-House Solutions, "On-Demand" & Diverse Talent Pipe, and Global Training Initiatives

Our Programs

Global Training, Standards & Co-Delivery

- *"On-set" learning backstopped by Unity product owners and engineering leads*

Certified Creator Network

- *Management of Network of Verified Partners (Creators)*

Managed Delivery Partners

- *CCN Partners contracted by the External Delivery Team (EDT) for client project work*

Bench Partners

- *CCN Partners contracted by the External Delivery Team (EDT) as work for hire on retainer basis*

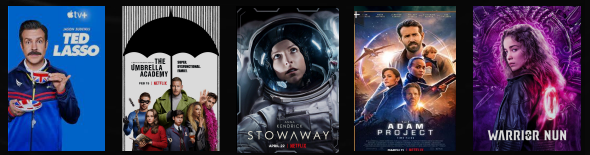
MWU Vendors by Region

1.	Americas	49%
2.	EMEA	37%
3.	APAC	14%

MWU Vendors by Use Case [1]

Interactive (Apps, Physical, XR)	38
VFX, Animation & 3D World-Building	30
Pre-Viz, Motion Capture & Tracking	28
Art, Assets & 3D Scanning	15
LED Studios & Projection Screens	6
Game Studios & Verticals	*85+*

Work Portfolio



1. Some vendors are excluded where use case is not immediately apparent

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Accelerate Training, Education & Standards

Content Production, Games, Interactive World-Building

Unity VP Beta Program

Developed to work with our partners to get early access to production ready tools to provide true Product-Led feedback and insuring industry support

Learn Platform

Online platform with Unity Tutorials and content that guides the user from start to RT3D creation with a range of tools focused on Unity Pro with over 750 hours of online training materials

Global Reach

40 offices across Americas, Europe & Asia

DEA Training

Designed for MWU partners who need a Unity expert to optimize a scene or project. DEA experts go on site and work directly with the team.

Unity In-House Talent

Direct access to a team that will help a MWU partner carry a project across the finish line. Full services available from Visualization to Virtual Production support led by a team of VFX and RT3D engine experts with industry credentials and experience.

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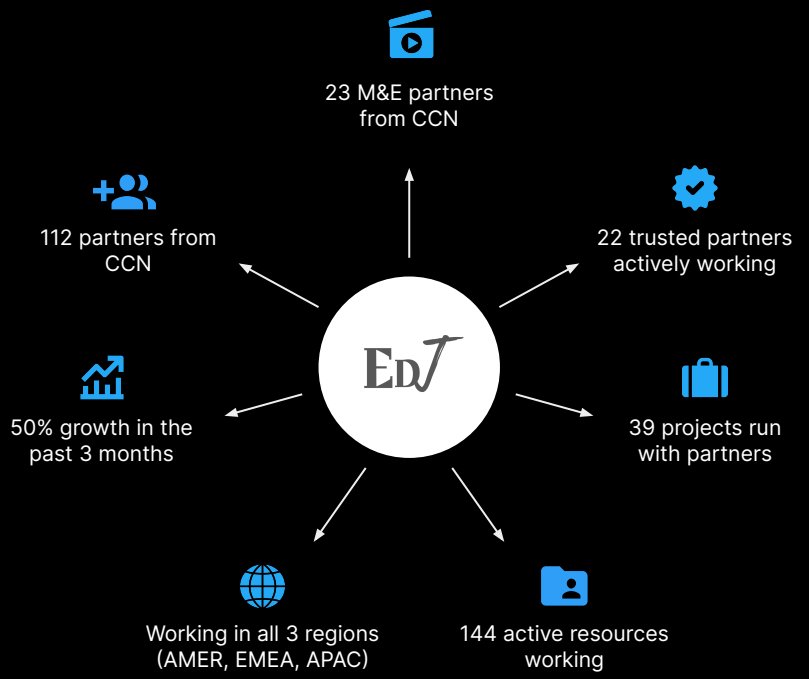
Accelerate Bench Partners Give Us Additional Capacity to Deliver

> The Vendor Ecosystem will double its global footprint by the end of the year.

Our current areas of focus are:

- Media & Entertainment and Virtual Production
- Visualization support and services
- Live Interactive
- Game Development
- Digital Twins
- XR Development



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Unity Products, Use Cases & Services

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Looking Back... Where We Started

Invented real-time system for Virtual Production code named Photon used on *Jungle Book* and *Ready Player One*, and Expozure used on *Blade Runner 2049* and Tom Hanks' *Greyhound.*

The Jungle Book:

Jon Favreau, Bill Pope, Rob Legato used Photon Virtual Camera and Lighting System to film virtually all of the film prior to filming live action.

Ready Player One:

Steven Spielberg used Photon to film movie on Mocap Stage.

Blade Runner 2049:

Denis Villeneuve used new system called Expozure to film new shots.

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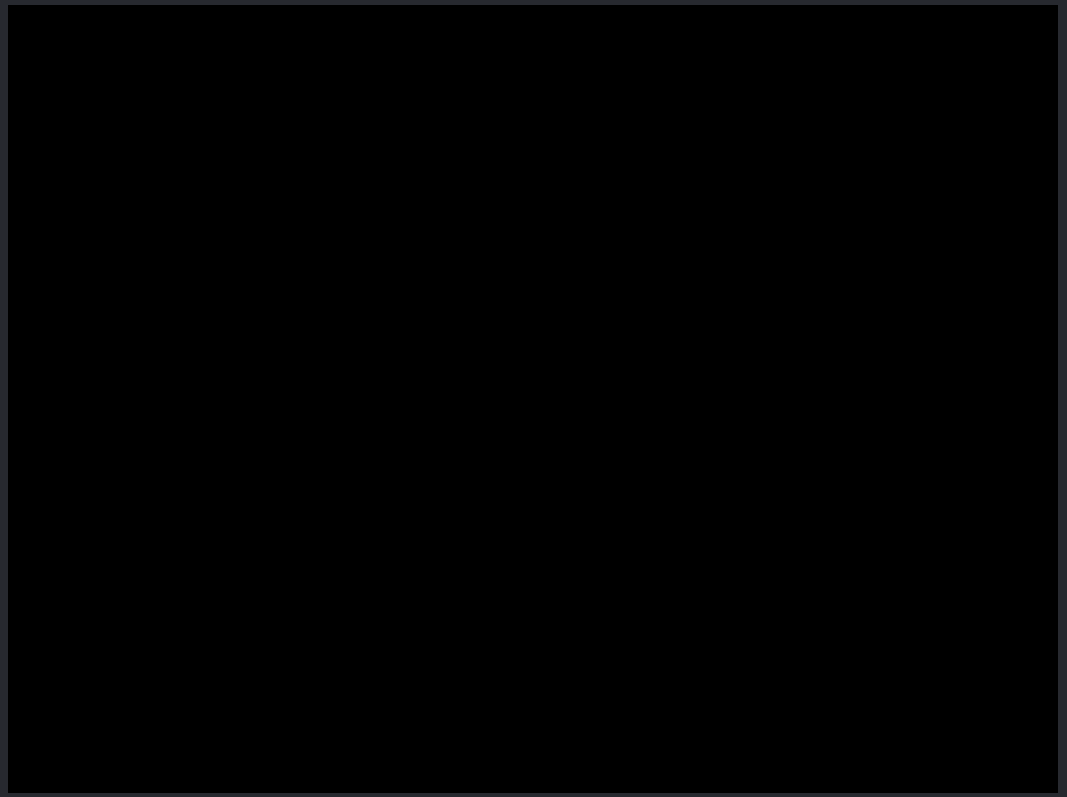
Unity for Virtual Production

Where we are today...

- Location Scouting
- Shot Blocking
- Virtual Cinematography
- AR Mocap
- Simulcam
- Photorealistic Content



*Virtual Production on the set of **The Adam Project***

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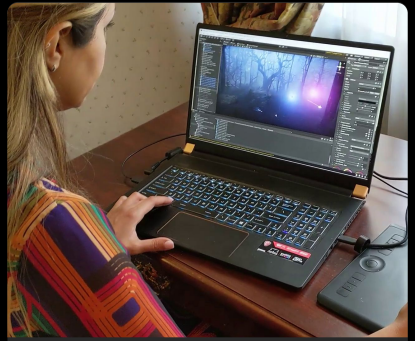
Virtual Production — The Unity Building Blocks



01

Visualize w/ Previs, VR

Using the Unity real time engine to visualize all your locations and shots.

02

Greenscreen

Some elements can be shot on Greenscreen and inserted into a virtual environment.

03

LED Screens

Virtual environments projected on LED screen while camera is being tracked. In-camera vfx.

04

Post & Final Pixel

Rendering all CG shots directly from the engine.

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Virtual Production and Mixed Reality Production

- Unity provides the tools to create beautiful, compelling content in real-time. Pro Art tools for Material Authoring, Biome creation, VAD Art Development and Digital Human Characters all available to our MWU network and Solutions team

- Combining the tools with our experiences with AR/VR/XR and Virtual Production support everything our users from story planning all the way to storytelling

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Modeler

Create Freely

Bring your vision to life with an intuitive modeler, featuring procedural generators and a cutting-edge photogrammetry workflow that converts real scans to customizable models. Match concept art with freehand art tools, grow assets around any obstacle, and animate dazzling growth sequences.

Engine

Bring Worlds To Life

SpeedTree Engine supports your pipeline. Use our scalable integration to tackle complex wind, lighting, and rendering.

Library

Build Your Biome

Find dynamic models for every environment. Browse a living library of plants with infinite potential: PBR textures, seasonal variations, and customizable wind settings are built right in. Shop assets individually or buy access to the entire collection.

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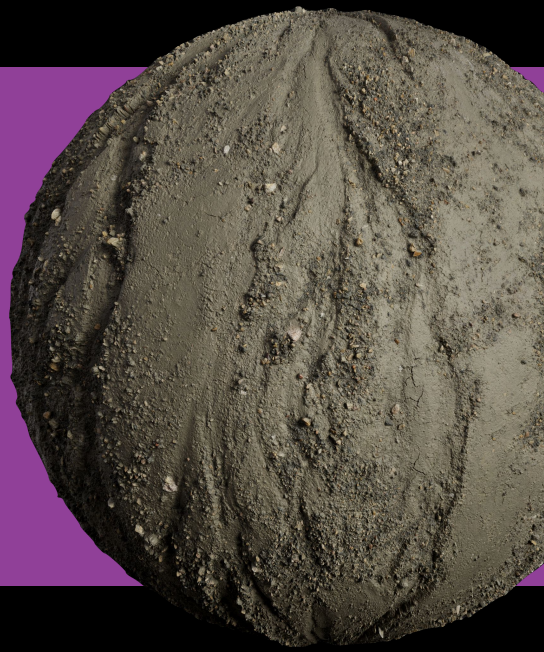
Content Library



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Unity Pro and MiddleVR for LED Wall display. Easy to configure LED display volumes using tool integrated with Unity.

- **Motion Tracking - with Vicon and Stretch-Sense Gloves**
- **Camera Tracking** - with Mo-Sys Star Tracker currently at Mo-Sys Refinery
- **DMX Lighting Control -** Testing at ARRI
- **Sequences for Dynamic Scene shot bocking**
- **Recorder for playout for controlled playback**
- **Integrated Chroma Keyer**
- **Photo-real content for scene creation**

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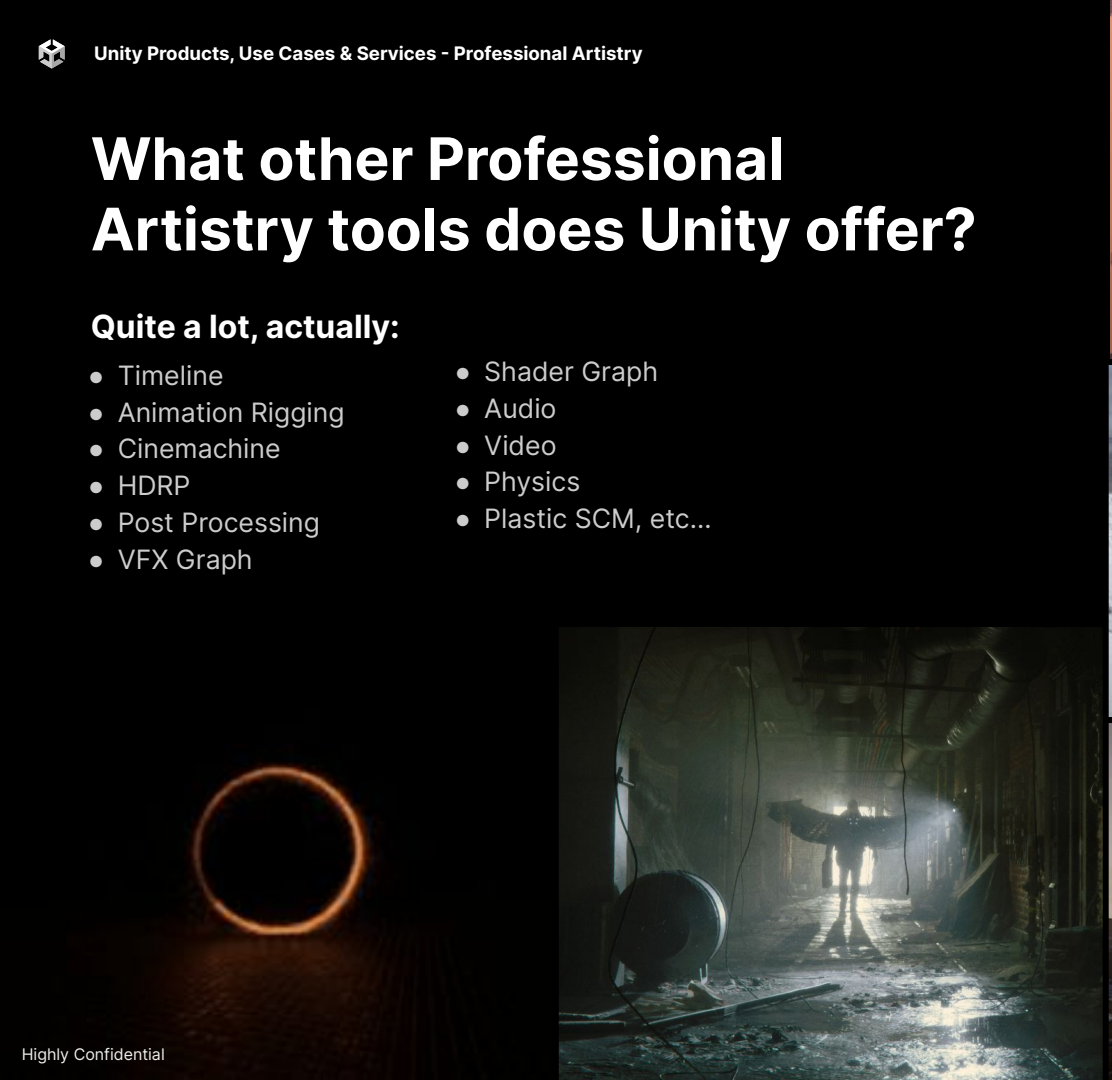
What other Professional Artistry tools does Unity offer?

Quite a lot, actually:

- Timeline
- Animation Rigging
- Cinemachine
- HDRP
- Post Processing
- VFX Graph
- Shader Graph
- Audio
- Video
- Physics
- Plastic SCM, etc...



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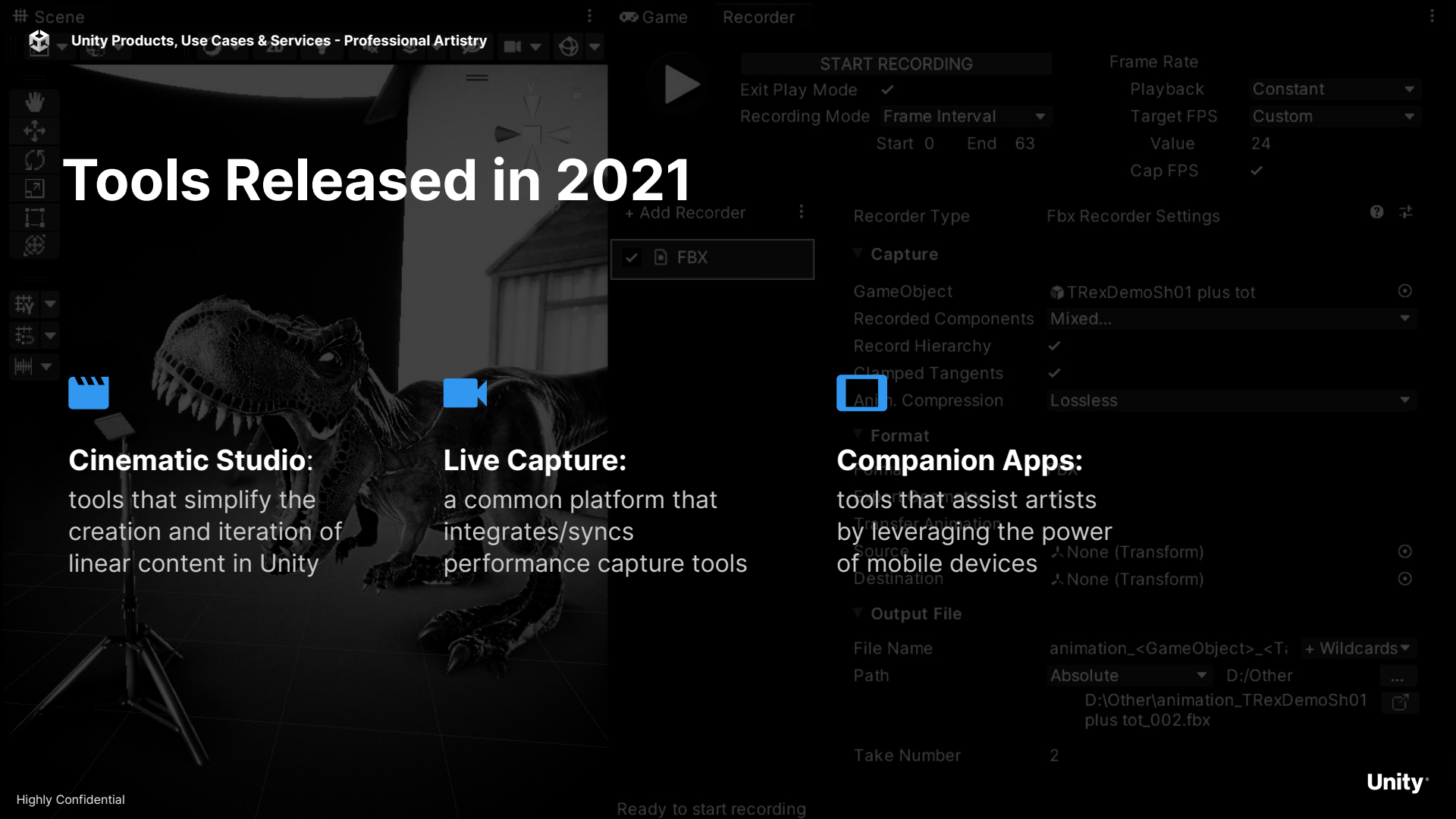
Unity®

Tools Released in 2021



Cinematic Studio:
tools that simplify the creation and iteration of linear content in Unity

Live Capture:
a common platform that integrates/syncs performance capture tools

Companion Apps:
tools that assist artists by leveraging the power of mobile devices

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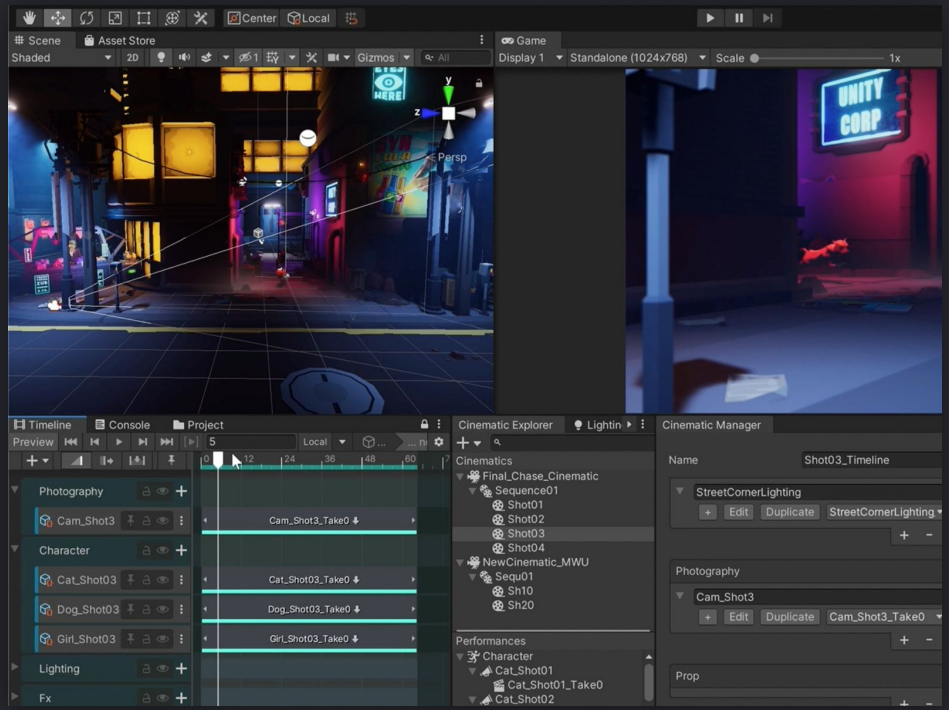
Tools Released in 2022

2021 was a year for foundational tools available to all users, all licenses.

> **In 2022 the focus is on virtual production workflows**

Including advanced support with

- Blackmagic Video (2022.1)
- Keyer (2022.2)
- Cluster Displays (2022.2)



Unity

Live Performance Capture

What we offer

- An **input hub** to capture streaming performance data
- A **take system** to manage multiple performance versions
- **Connection management** between Unity and external data sources, such as our cinematic companion apps and 3rd-party solutions like Faceware, Vicon, XSENS, Optitrack, Mo-Sys, etc.

Open Sound Control

OSC (planned 2022.1)

What we offer

- **Live Capture plugin**
  - Open Sound Control support, allowing a range of on-set devices to communicate with Unity.
  - Currently in Beta 2022.1

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Example of Live Virtual Production

Ted Talk 2022
ICVR/KALEIDOCO

unity

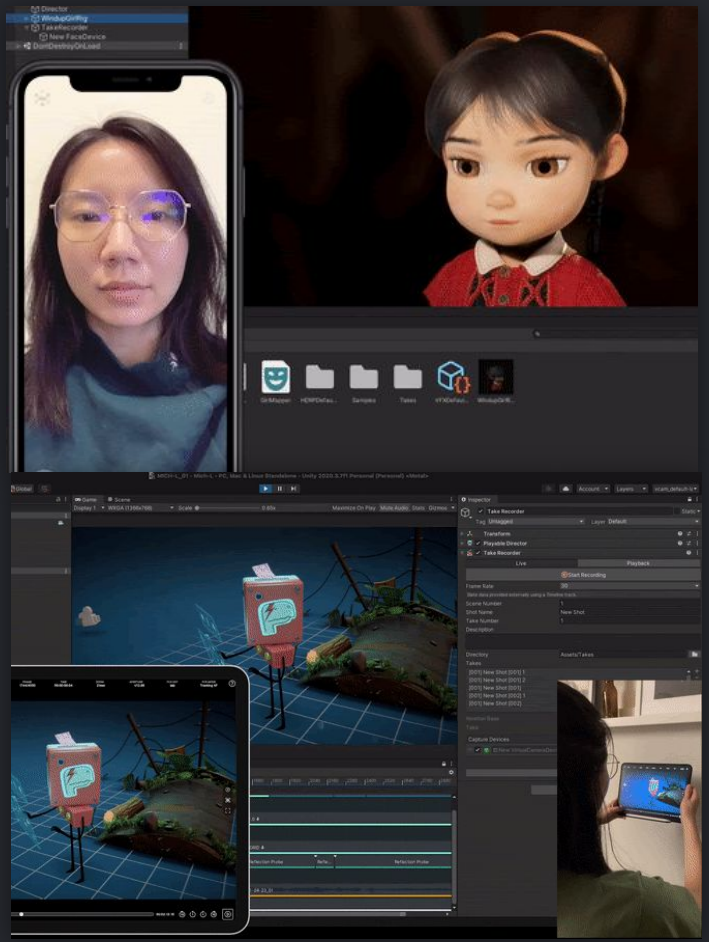
Cinematic Companion Apps

What we offer

- **Virtual Camera** – use a mobile device to drive a Unity camera
- **Face Capture** – use a mobile device to capture facial performances
- Both integrate seamlessly through Live Capture

Planned for 2022.2

- Improved scene and Timeline navigation
- Improved workflows for runtime use cases
- Better Timeline playback and camera controls from the app



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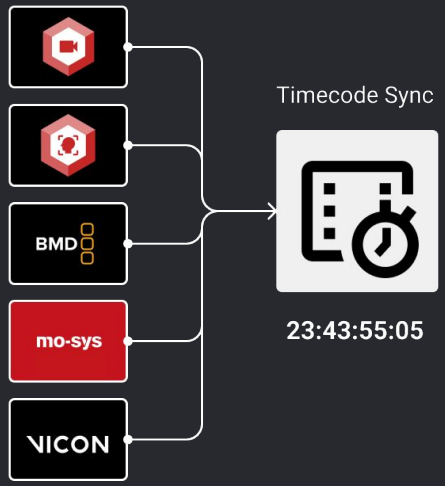
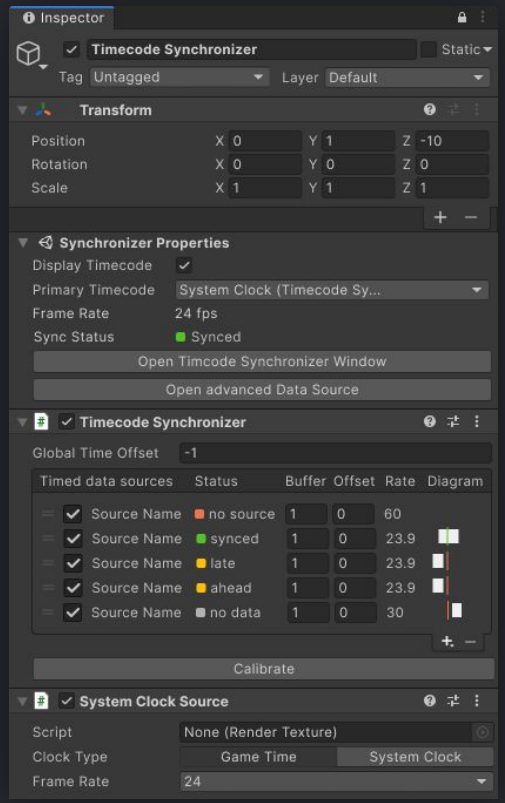
Timecode Synchronization Across Devices

(planned 2022.1)

What we offer

- **Part of Live Capture:**
  Synchronization of devices across a shoot
  - Recordings of multiple devices are synced and aligned in the timeline.
  - Real-time output are synchronized in live scenarios.
  - Support both Editor and Runtime
  - Support multiple sources





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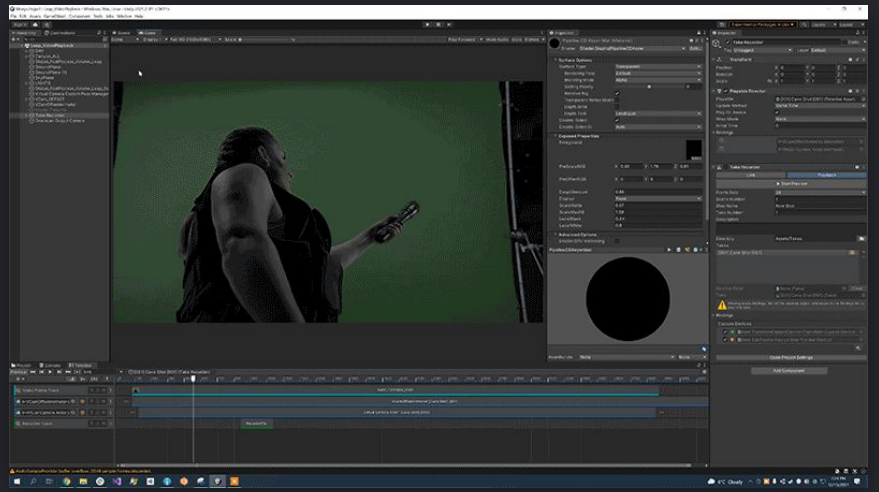
Keyer

(in Beta 2022.2)

What we offer

- **Enterprise SKU**
  - Generate color mattes by shooting live images against blue or green screens
  - Composite live and digital images
  - Key from an image or video clip, or from
  - a video stream on a live set
  - Apply post-processing to the keyed imagery



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Sequences

What we offer

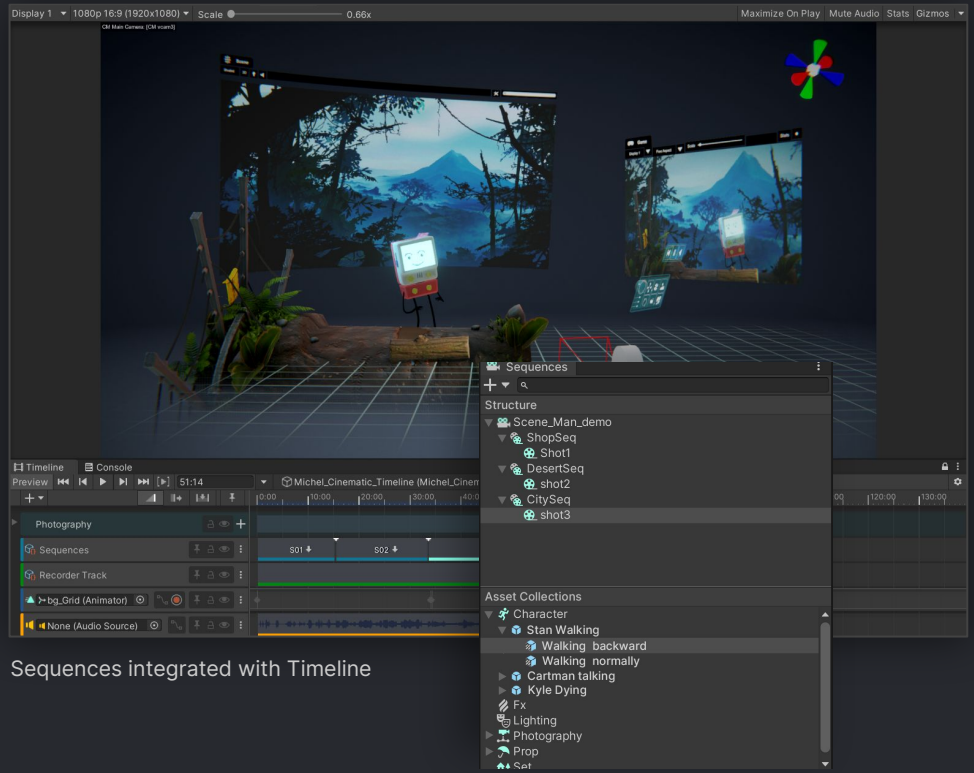
- Assemble all the key elements necessary to create and organize linear content
- Organize editorial structure, folders, and assets for authoring and collaboration
- Try out new ideas nondestructively

Planned for 2022.1

- Improved prefab handling
- Improved hierarchy management

Planned for 2022.2

- Improved search/filter/sorting
- Duplication/multi-select
- Asset naming consistency
- Improved API



Sequences integrated with Timeline

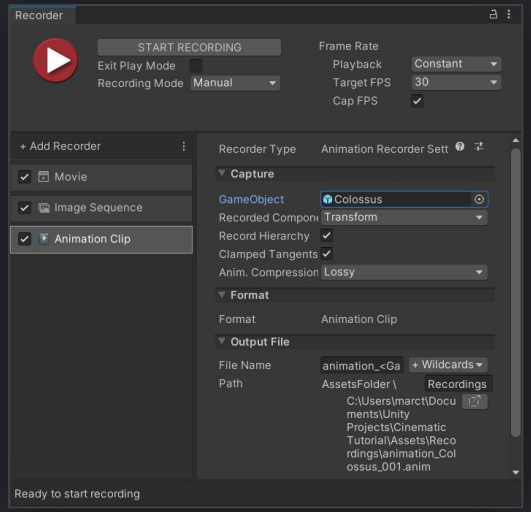
Recorder

What we offer

- Export video, audio, animation data, high quality frames, and more
- Integrated AOVs, Accumulation Motion Blur, Path Tracer, ProRes export

Planned for 2022.2

- **Standards for video export** (e.g., to YouTube)
- Restore **GIF recording** *
- Performance improvements
- Complete API
  - **ProRes** scripting support
  - Support for users to integrate their own movie encoders



ProRes
MP4

PNG, JPG, EXR

FBX

Alembic

WAV

Final pixel for distribution, trailers, cutscenes

NETFLIX YouTube

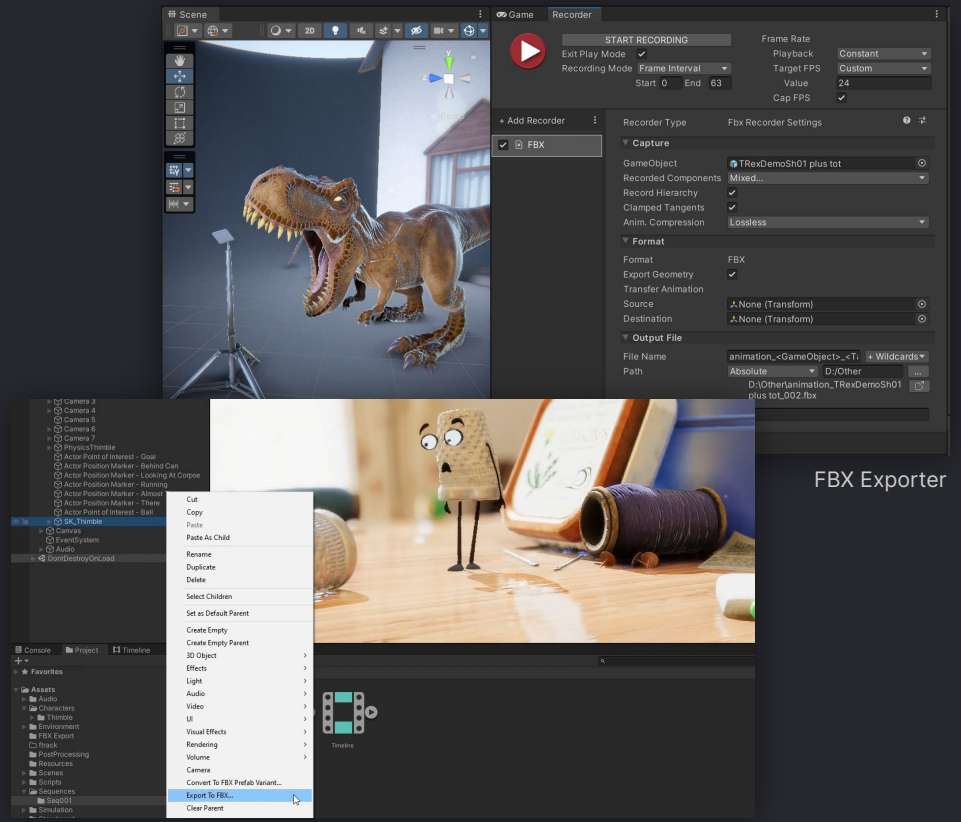
Output for VFX, Comp, Editing

Roundtrip to DCCs

FBX Import/ Export

What we offer

- What we offer
- FBX is the main file format for importing files into Unity
- FBX Exporter allows for a certain degree of round-tripping between Unity and tools like Maya and 3ds Max
- Record and export animation as FBX clips



FBX Exporter

Alembic Import and Export

What we offer

- Alembic is a key format for hair, cloth, and effects
- Import: Mesh / XForm/ Camera / Point Cloud / Curve
- Export: Mesh / XForm / Camera

Planned for 2022.1

- SubD imports resolve as Unity meshes
- Material metadata survives import

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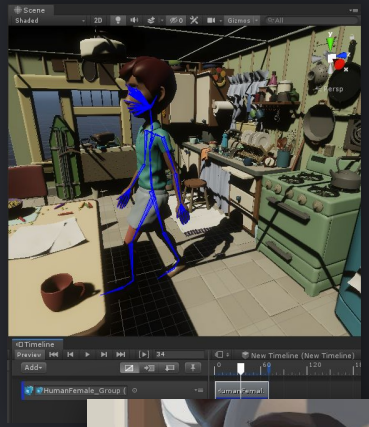
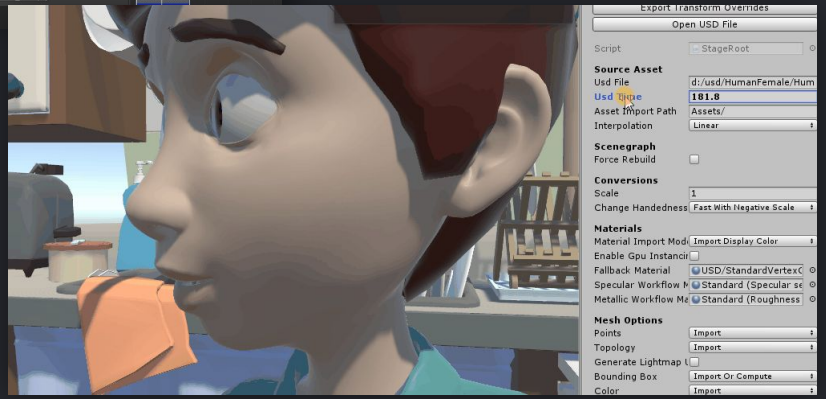
USD Import/ Export

What we offer

- Import and Export USD model files
- Integration with Weta Tools will be USD based



Managing Bones with UsdSkel



Scrubbing time interactively updates the USD cache in Unity

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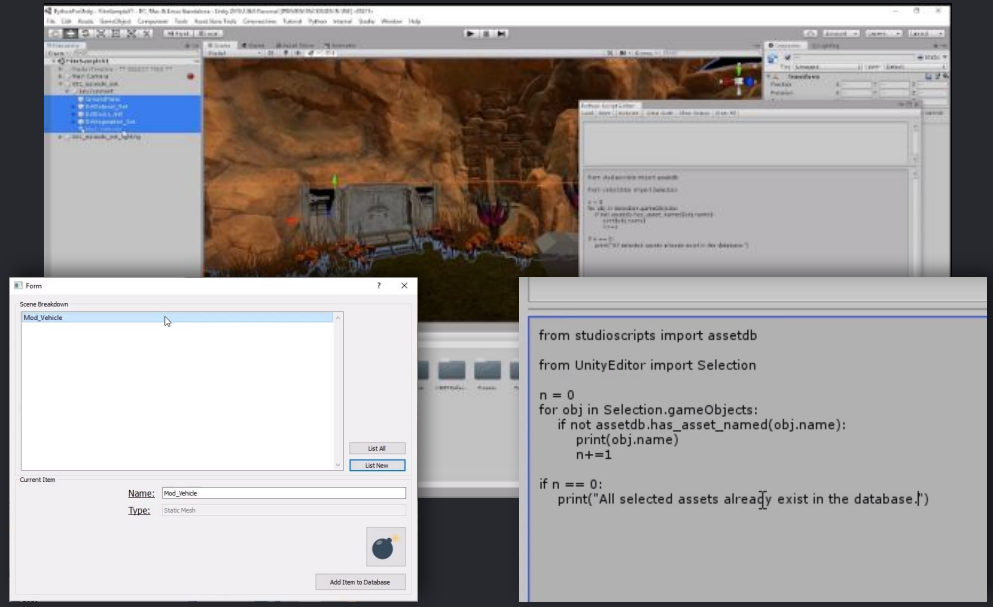
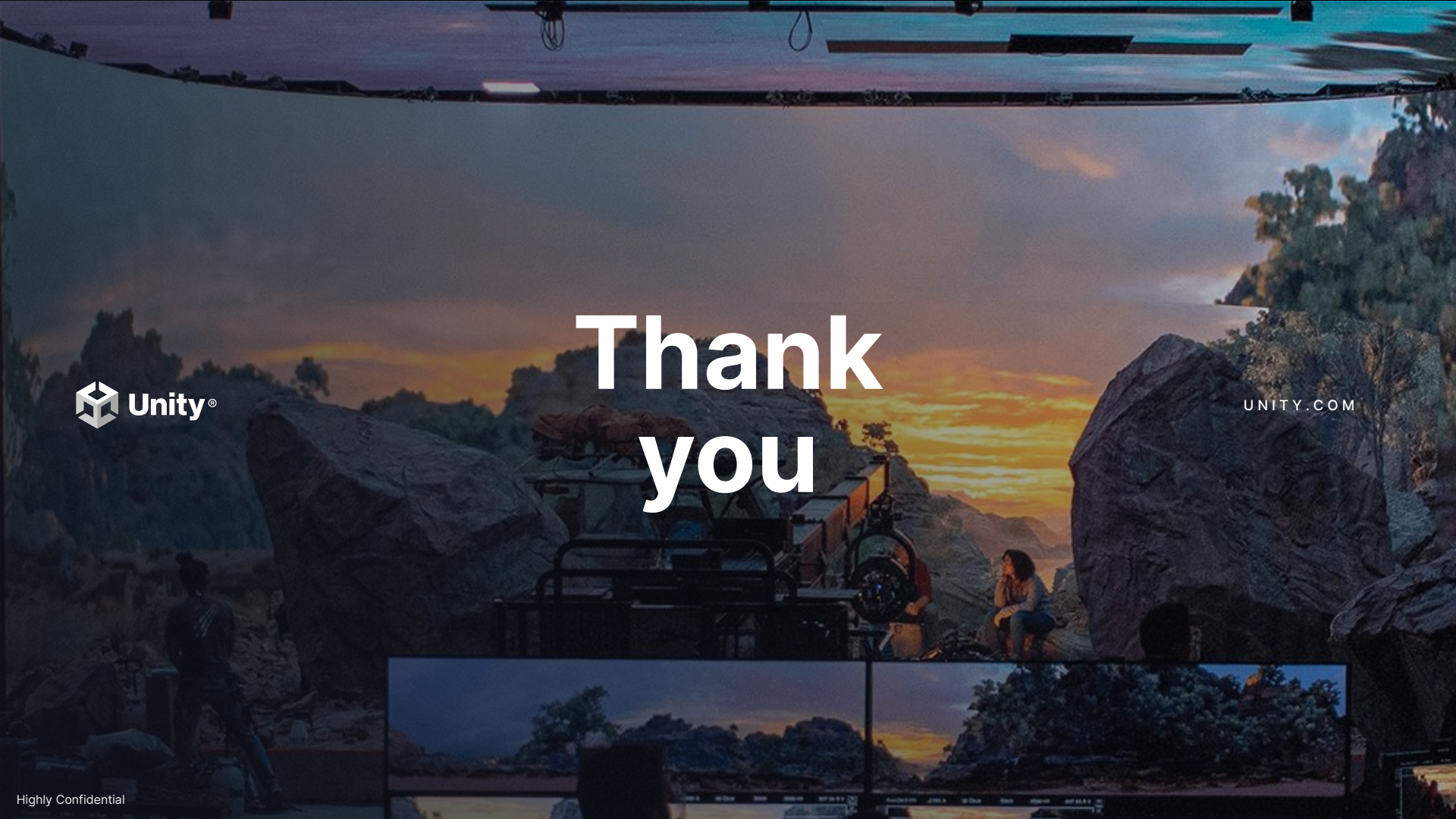
Python for Unity

(planned 2022.2)

What we offer

- **Integrate Unity into your existing Python pipeline**
- **Access C# APIs from Python**
  - public Unity APIs
  - custom code
  - 3rd party plugins
- **Call Python code from C#**
  - leverage the vast universe of existing Python packages
- **Qt tools supported via PySide**
- **Support for Python 2.7 & 3.7**





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