

envrmnt

by verizon

WWW.ENVRMNT.COM



Raheel Khalid - @rkhalid890

A game industry and operating systems veteran that serves as the Chief Engineer for Verizon Labs. Using years of experience in building large scale game engines and graphics platforms I work to architect and set the technical vision for Verizon's future in VR & AR streaming services



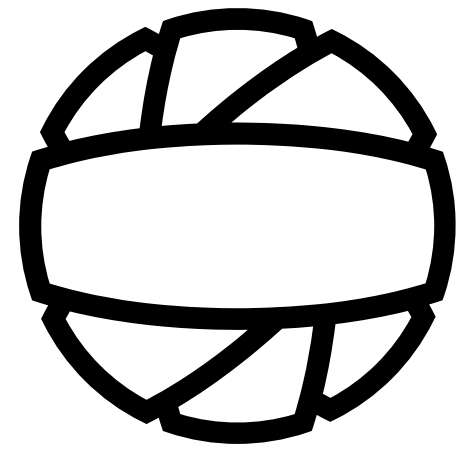
Carl Keifer

A veteran in the realm of pipeline and technical art. Providing lead development and architecture to keep scalable content in check and streaming low latency resources over the Verizon network. Currently he's interested in reinventing the way that people can interact with content by solving problems through the cloud, native devices, and Verizon Network making it possible to deliver greater functionality.



Vito Messina

A Full Sail University graduate with a Bachelor's degree in Computer Science - Game Development, Vito strives to pave way for high speed, low latency VR and AR streaming experiences and services.



About us

What we do at Envrmnt

Expertise and Distribution

Envrmnt is built with democratization of creation and distribution in mind so that creating and viewing VR is as easy as flipping channels.

The creation of AR and VR experiences currently requires some knowledge of game development and in many cases experience in 3D content creation or computer vision

Once created, creators struggle to get users to try experiences that are often only a few minutes in length, but require massive downloads and lengthy installs.



Latency and Bandwidth

It is generally accepted that the greatest acceptable time it takes to update the screen from a user's movement is roughly 20ms. This is referred to as motion-to-photon latency.

Typical displays on VR/AR devices have a refresh rate of between 60Hz and 90Hz or 16.66ms to 11.11ms. This is the time to update pixels on a screen.

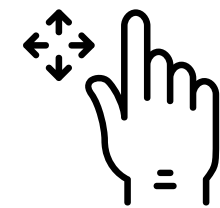
The fastest networks in the US provide 40-200ms latency round trip.

On 5G, however, there is a theoretical 1ms latency.



Envrmnt's Technology Advantage

Envrmnt has filed over 50 AR/VR patents focused on enabling enterprises to rapidly deliver scalable and ubiquitous XR experiences without the need for an experienced development staff.



Self-Service Tools

Web self-service 'drag and drop' tools, powered by Envrmnt's technology platforms, allow existing marketing or IT resources to create their own AR/VR experiences with a few simple clicks.



Streaming SDK

Streaming AR/VR graphics engine decodes experiences on the fly without the need for massive downloads. This enables enterprises to rapidly scale AR/VR experiences across Android, iOS, and the web.



Cloud Hosting

Cloud Hosting enables the processing and delivery of AR/VR experiences across a wide range of platforms and devices enabling the instant deployment of new content to mobile or web.



Augmented
Reality

AR DESIGNER

AR Designer is an easy-to-use drag and drop tool that lets anyone build AR experiences and deliver them to their customer base by integrating Envrmnt SDK into mobile apps.

This tool can be leveraged to promote brands and monetize via on-demand content and integration with e-commerce platforms.



5G Mobile Edge Compute

Deliver superior AR experiences via faster network transmission and ultra-low latency.



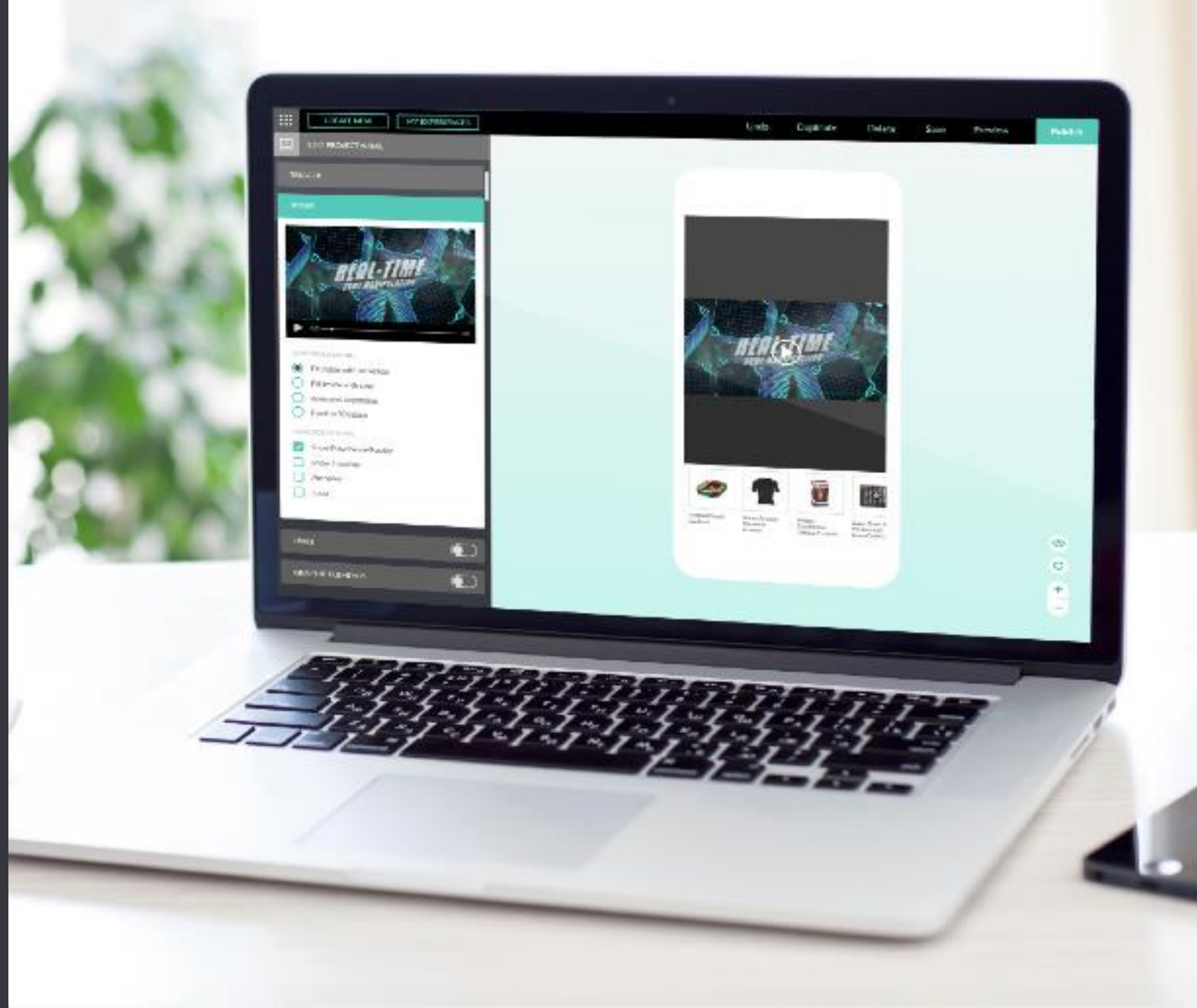
360 Live Streaming

Stream 360 live content and include transitions from 2D to 360 videos .



Videos, Games & 3D Objects

Incorporate interactive features, such as mini-games and animated 3D objects.





Virtual Reality

WORLD MAKER

WorldMaker is a powerful drag and drop tool that lets anyone create and modify immersive streaming virtual spaces, impacting players in real time and providing rich communication services.

This tool can be used to promote brands and services or monetize via subscriptions, on-demand content, micro-transactions or dynamic advertising.



Navigable and Social Experiences



Streaming in Real Time



Customized Worlds



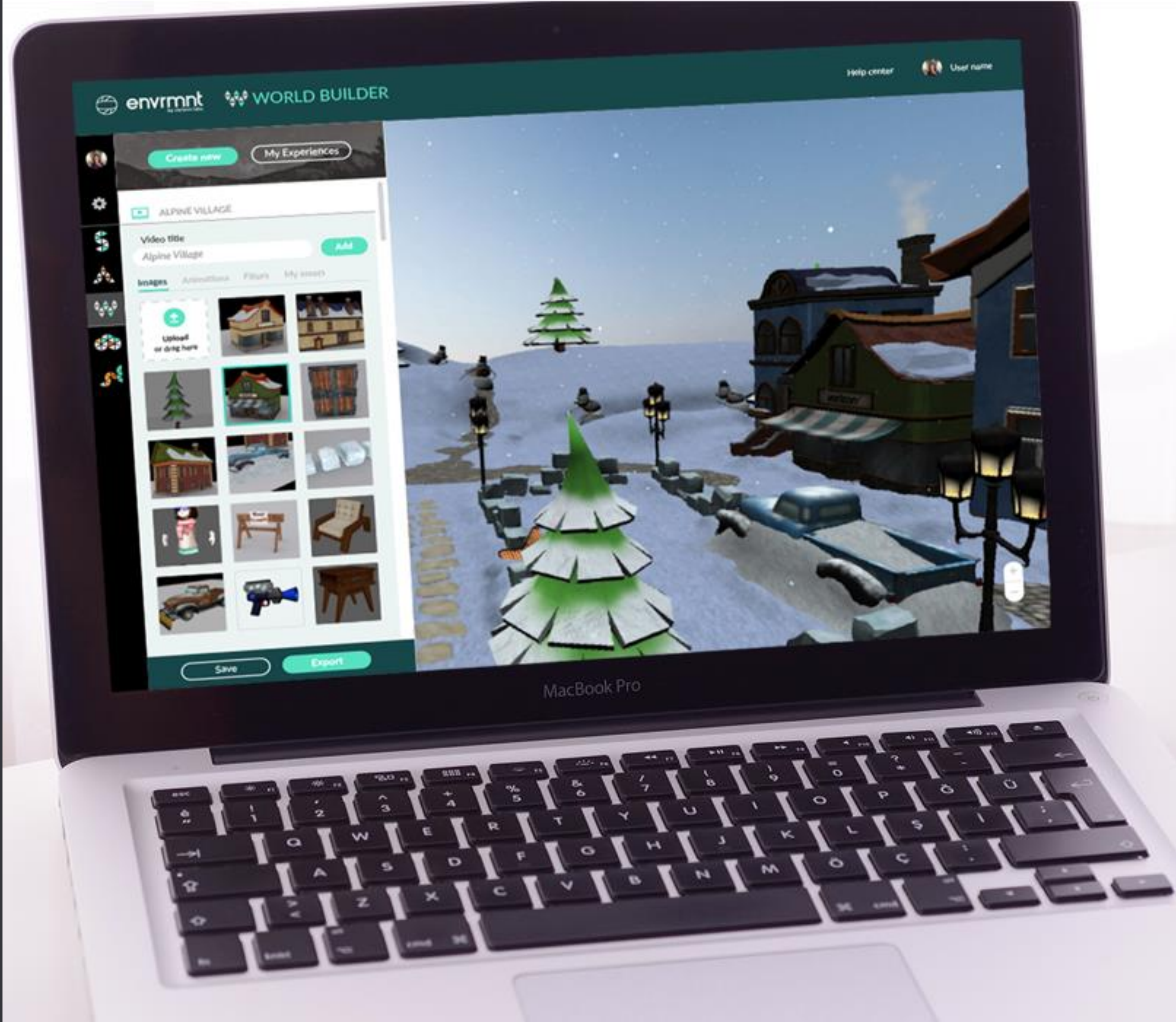
Any Platform



VR Monetization



Customer Data





Virtual +
Augmented
Reality

STREAMING XR?

*Users should be able to instantly move
between experiences without waiting*

We define streaming XR as a method of distributing logic/assets in a format where it can be created, distributed and cached without the need of downloading first or installing.



Navigable and Social Experiences



Streaming in Real Time



Real time world changes



Any Platform



VR Monetization



Customer Data



Multiplayer





Virtual +
Augmented
Reality

STREAMING XR!

Envrmnt set out to deliver a scalable infrastructure that is modular, fast and accessible.

The pipeline allows for massively scalable distribution and uses machine learning to deliver more effectively over time.

Edge compute appliances deployed at our CDN and last mile network are designed specifically to offload AI, compute, vision and render while allowing composition and hyper latency sensitive activities to still happen on device through our custom rendering engine.



Data is chunked, transient and adaptive



Streaming in Real Time



Logic can change on the fly

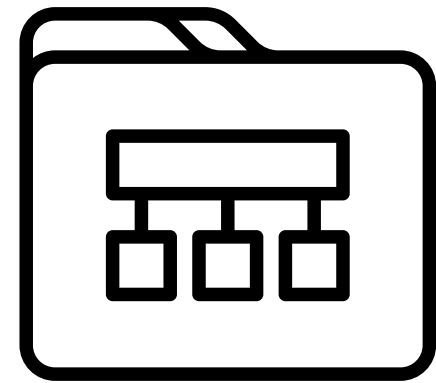


Cross-platform



XR Monetization





Ultimate Vault and Flat Asset pipeline

Flat Assets

Why would you want this?

- FlatAsset Pipeline

Accept all types of assets on the web.

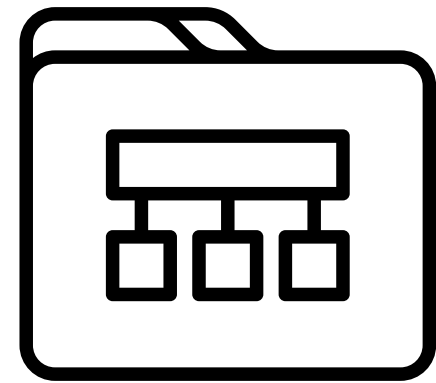
Process and convert on massively parallel GPU's on the cloud

Keep only the data you want or need to use the file.

Generate new data not supported by current interchange formats

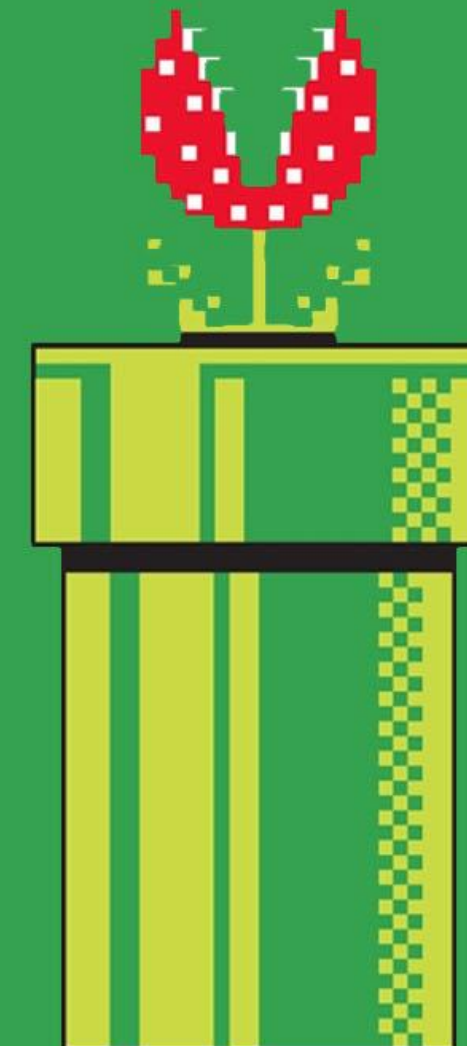
Collect information about the file so we can automate the remaining bits of the pipeline.

Package assets flat so they can be read with very low latency

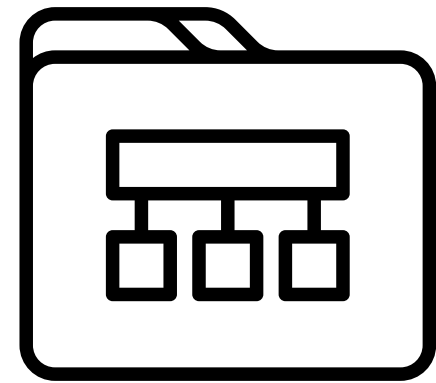


File Ingest and Flat Asset Build Demo

Looking at the pipeline from the perspective of how the user wants to work. instead of focusing on what tools are there.



Ceci n'est pas une pipe ligne



Material / Level Editor demo

CONTINUOUS INTEGRATION EFFECTS ON PRODUCTION

WHY WOULD WE DO THIS?



Tracking the users decisions on the cloud enables us to construct the game using their decisions in different scenarios



Because we have already reduced lots of pipeline steps the game can be reassembled quickly



Packaging assets into streaming formats and separating out LOD works really well

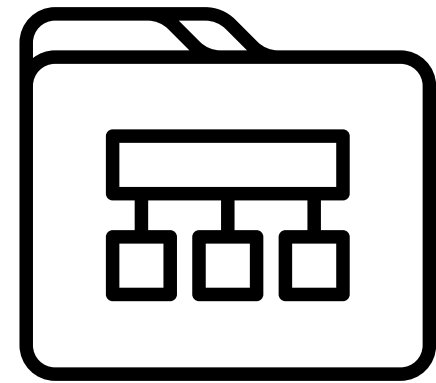


Big data analysis can help optimize routines by comparing users decisions

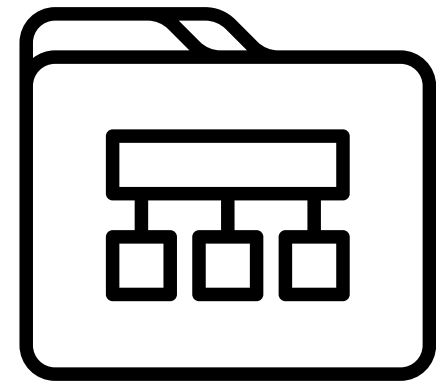


Players at home see the game updates live.





VR Headset Real Time Changes



Designing for the Mobile Edge



INTELLIGENT EDGE BY VERIZON + ENVRMNT

AR and VR is uniquely suited to leverage Edge Computing

The boundaries of compute and latency on AR and VR can quickly fade away when leveraging next generation networks.

In these use cases we begin to focus on offloading and amortizing the heaviest tasks to nodes that are only a hop away



Low latency, high bandwidth networks allow offloading of tasks that were local only



Data and scene formats specifically designed for cache and reuse on the edge



Utilize vast amounts of compute and VRAM to push lightweight devices further



Reduce costs for users and providers



Stay in touch With us



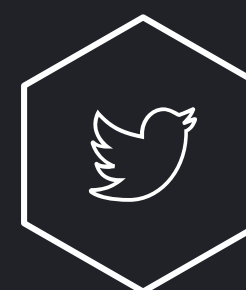
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Thank You.

