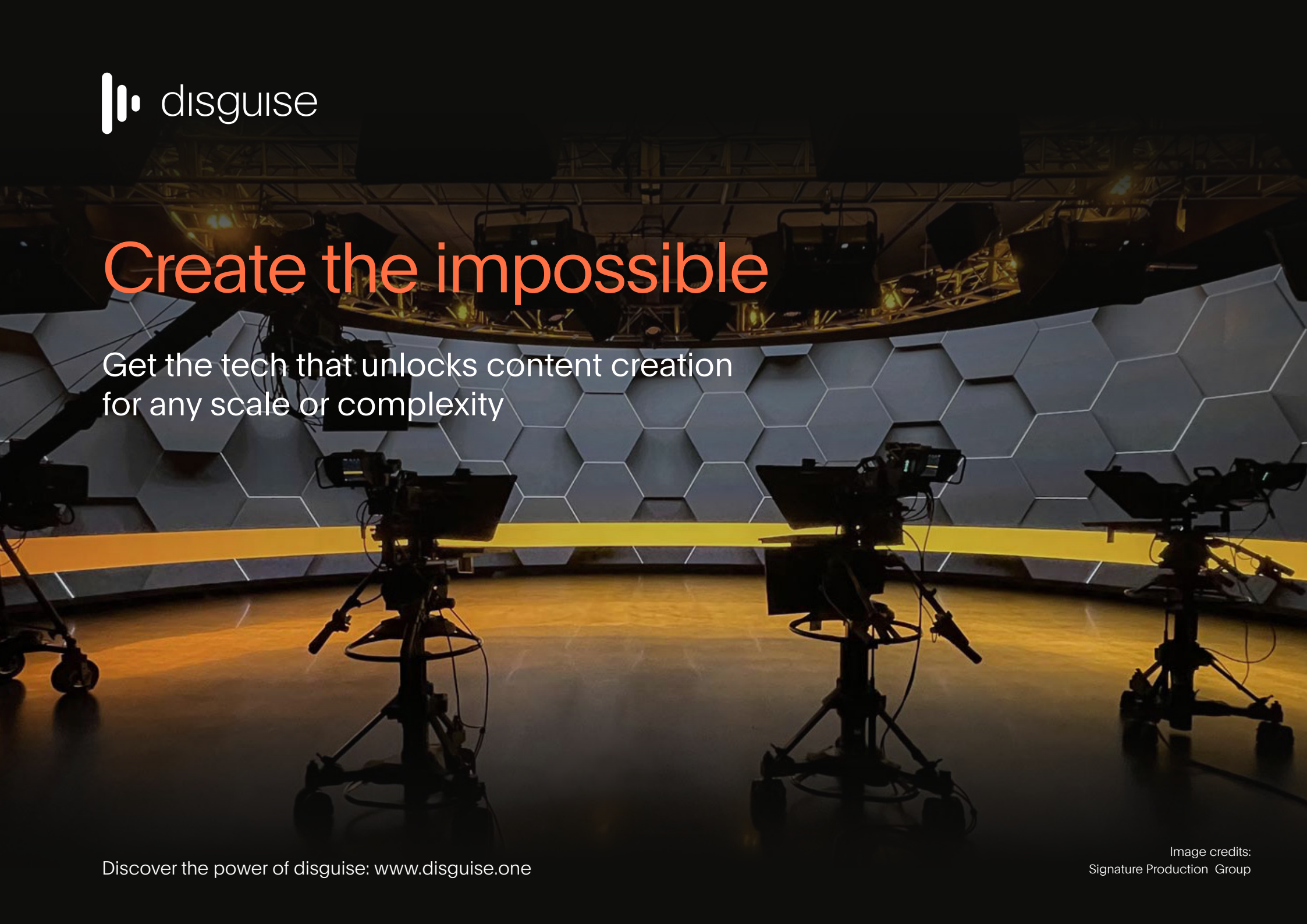
disguise

Create the impossible

Get the tech that unlocks content creation
for any scale or complexity



Discover the power of disguise: www.disguise.one

Image credits:
Signature Production Group

Can we create content without compromise?

Graphics creation, processing and rendering has seen some out-of-this-world changes in the past few years. At disguise, we are excited to be at the forefront of it.

With over twenty years' experience empowering some of the most technically complex and creatively challenging productions around the world, our hardware architecture is built with in-depth Research & Development, using the very latest and best components and technology.

The disguise software is purpose built and works seamlessly with 70+ integrations across the industry's leading technology. It can be scaled and upgraded to suit any future requirement.

With the ever-expanding innovation and functionality in RenderStream and the broader disguise ecosystem, disguise empowers users to deliver high quality real-time rendered content at any scale, speed and complexity.

disguise has partnered with Epic Games for better integration with Unreal Engine. Together we are working on redefining content workflows across any application imaginable.

Ed Plowman
disguise CTO

What you'll learn

Discover the technology empowering you to create content without compromise. This e-book will cover:

- Infrastructure (RenderStream)
- Real-time graphics engines
- Hardware
- Networking
- Software
- Applications
- Top 5 benefits
- How to get started

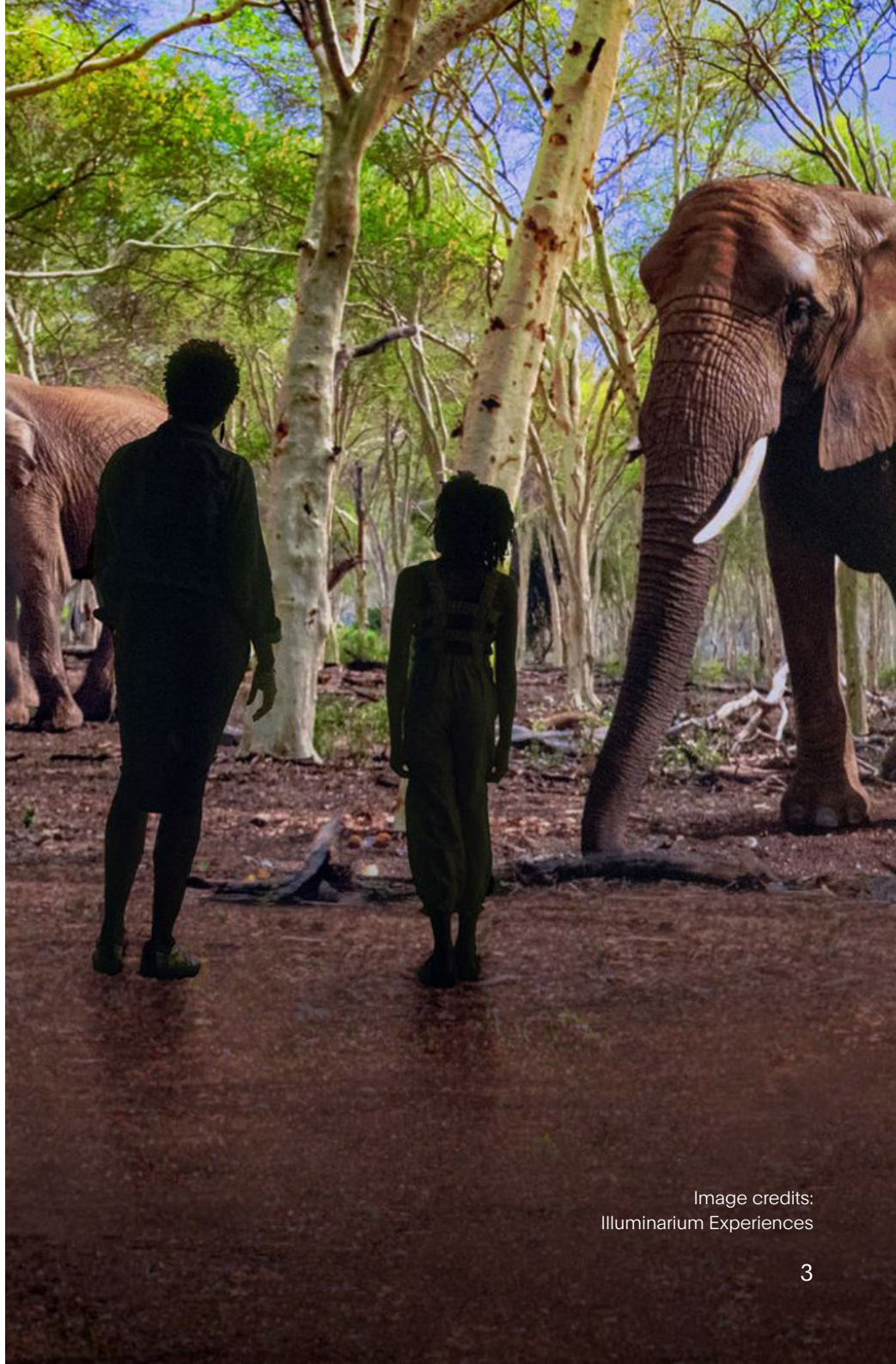


Image credits:
Illuminarium Experiences

The disguise ecosystem

The disguise ecosystem has evolved over twenty years into a unique system setup that, when working together, empowers the reliable, flexible and easy delivery of infinitely scalable, real-time content.

Overview of the ecosystem

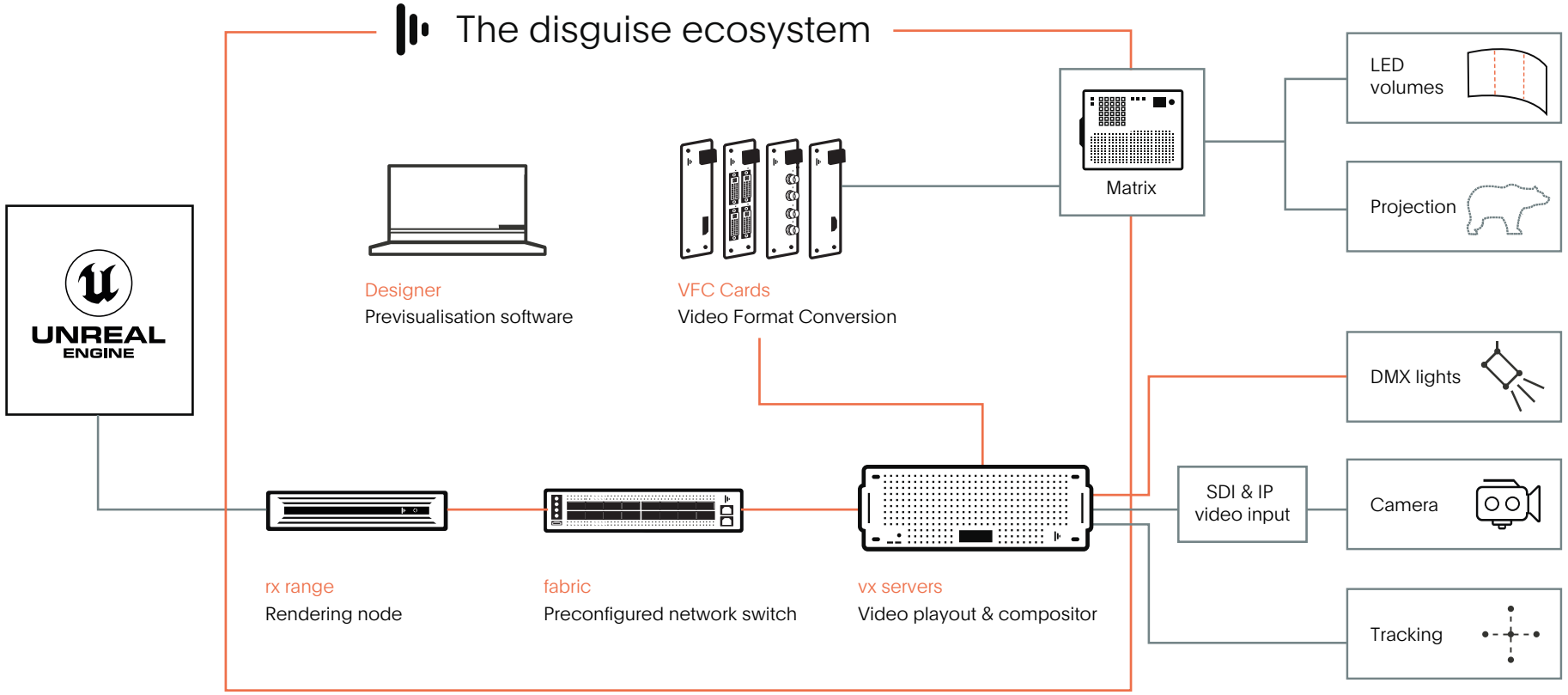


Image credits:
Framestore, All of it Now, XR Stage

Infrastructure

RenderStream

Seamlessly connect your physical stage to your virtual set

Sitting at the heart of the disguise ecosystem, RenderStream is the infrastructure that underlies any production. It is a bidirectional data transfer that allows content to be delivered with the highest possible accuracy and quality.

RenderStream synchronises the disguise hardware and software with content engines and camera tracking seamlessly.

Where in the ecosystem does RenderStream operate?

- Between third-party content engines and Designer, allowing for easy workflows while transporting camera tracking information throughout.
- Between rx and vx servers via the fabric high-speed network switch.
- As a layer seen in the disguise Designer software, allowing for changes to be made in the software and reflected throughout the workflow - including the parameters that can be released from the content engine, lighting and camera tracking etc.
- Between render nodes, allowing cluster rendering to take place.

The secret to rendering any content imaginable

Cluster rendering is about taking high quality content with high frame rates and resolution, to be cut up and spread across multiple render nodes. All slices will then be delivered to your LED screen or any other display canvas as one coherent piece, at the highest possible frame rate and resolution. This process of allocating dedicated jobs across multiple render nodes is called cluster rendering, and RenderStream is the technology that makes it possible.

RenderStream connects rx units effortlessly, meaning the scaling of content is almost linear. The impact of adding a fourth machine for cluster rendering, for example, is practically equal to that of adding your second or third. It also allows for the rendering load to be transferred to another machine if one fails.

With RenderStream, creators and technical teams are able to work with photorealistic, real-time content from graphics engines and share them across render nodes. The end result is improved resolution and quality of the graphics.

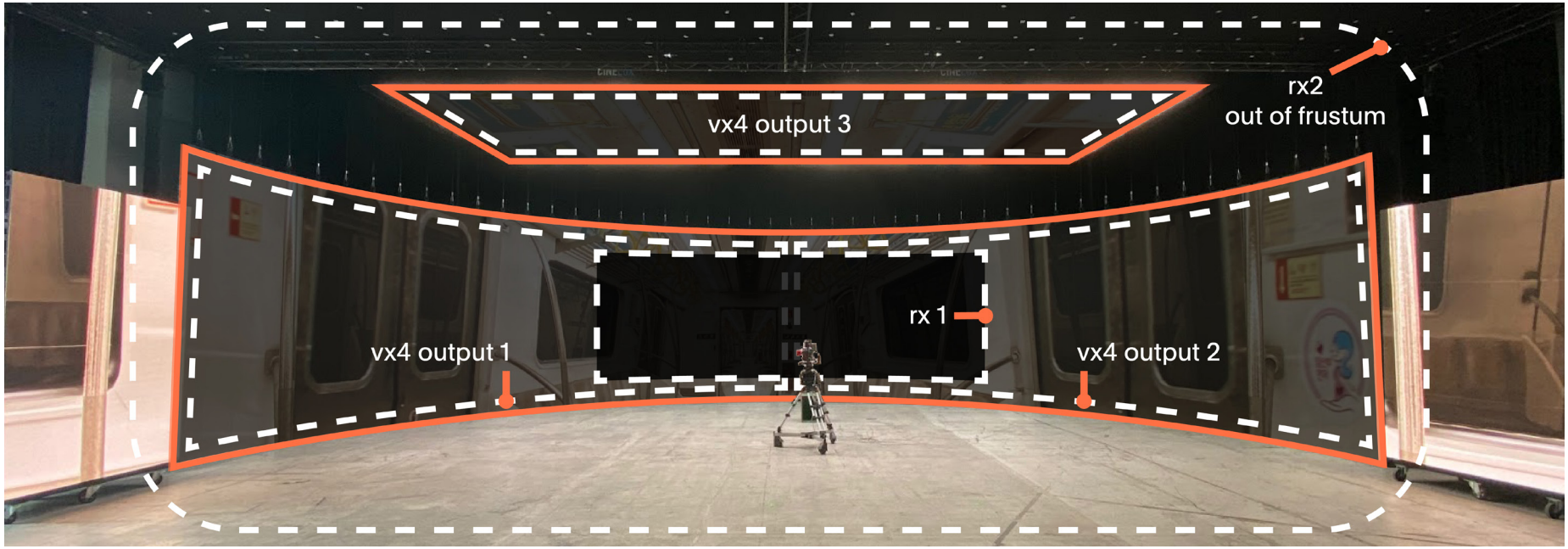


Image credits: Orca Studios - Edited by: disguise

Benefits of RenderStream

- Accurately synchronise your physical stage with your virtual set.
- Immediately impact productivity by automating workflows with Unreal Engine, Notch and other content engines.
- Bring live imagery and video input from Designer into the virtual scene.
- Synchronise tracked objects with 3D object transform for free object rotation.
- Send parameters and tracking data between hardware and software.
- Distribute rendering power across multiple render nodes, with automatic adjustments in case of failure.
- Automatically sync frames and minimise latency.
- Deliver high fidelity graphics through cluster rendering.
- RenderStream, together with the rx, connects units for near-linear scaling.

RenderStream licences are available for users with an rx machine and come included in your first year of rx ownership.

→ **Book a demo to learn more**

Image credits: Tazio Simoncioni, Netick Group

> "disguise is very flexible to work with. Through RenderStream we can implement set extension, which gives us far more options because, unlike other alternatives, when you update things in the Designer software, it updates everywhere across your whole production."
>
> Fatih Eke, Chief Technology Officer, MGX Studios

Real-time graphics engines

Graphics have seen major advancements in the past few years in terms of increased speed of graphics processing units (GPUs). Powerful graphics engines, like Epic Games' Unreal Engine, generate photorealistic content - enabling creatives and technical teams to create the immersive environments we see in extended reality and virtual production projects.

Even though the quality of the graphics is high, rendering these graphics for LED panels and surfaces can still be a complex and difficult process, with many systems unable to render and process these graphics effectively. disguise's rx render nodes, together with the RenderStream Infrastructure and vx media servers, allow for these graphics to be processed, composited and delivered at the highest frame rates with minimal latency, so viewers can enjoy quality content without compromise.

Epic Games has recently backed disguise with a MegaGrant - allowing disguise to advance its integration with Epic's Unreal Engine and embark on groundbreaking new research to dramatically enhance how content is delivered in film and episodic TV, broadcast, corporate events, live music and fixed installations.

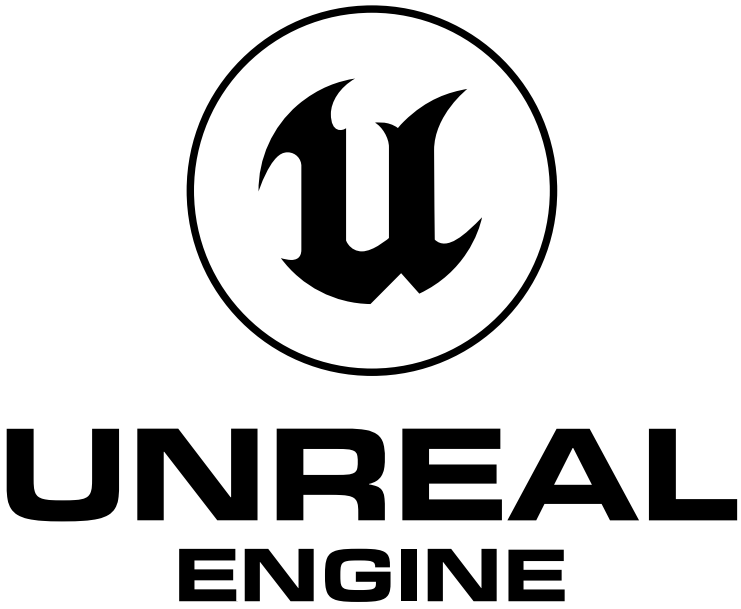


Image credits:
Orca Studios

Hardware

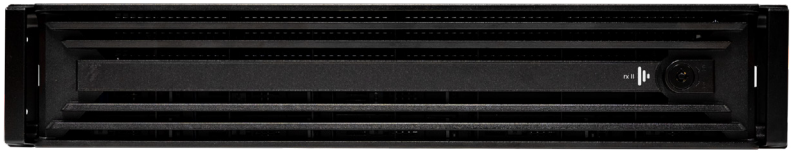
disguise

Create the impossible. Your guide to the disguise ecosystem

rx

The render node

disguise rx machines operate as render nodes. They process graphics - rendering content from graphics engines and enabling content to be displayed on display canvases of any size or complexity.



rx machines allow creatives and technical teams to create and deliver generative content, augmented reality and pixel perfect graphics for any surface - no matter how big or complex the final output is. Those who use multiple rx machines can split the graphics processing job across different machines. By splitting up content processing power, each individual machine is only given what its individual GPU needs to render. This allows for increased possibilities including the rendering of content with high frame rates across large-scale or complex surfaces.

rx II is the latest in disguise's rx range, and the fastest and most powerful professional GPU available on the market. Use for reliable rendering of larger and higher quality scenes from real-time engines on any display canvas and across any industry application.

→ **Learn more about the rx range here**

vx

The video playback and compositor

disguise's vx range are new, industry-leading networking hardware servers that allow users to, together with the rx range, stitch together and play back generative content completely uncompressed.

With the vx range, the content rendered from the rx machine is transferred at up to 25Gbps at 60 frames per second. This networking capability means that high quality content can be rendered from rendering nodes, stitched together and played back with minimal time delay. This achieves 4K video outputs with minimal latency and high frame accuracy.

The vx range also acts as the interface for the RenderStream infrastructure. Since the media servers run Designer, users simply create a new project and add a RenderStream layer to it.

Image credits: Signature Production Group

As the 'swiss army knife' of your system's infrastructure, the vx range's VFC outputs allow you to, together with a preconfigured, high performance network switch, connect with any type of output - even DMX lighting fixtures. This eliminates the need for any adaptors or mid-point processors that will introduce additional latency. It also means operators using multiple types of output don't need to buy multiple versions of the same unit - they simply switch the attachment points and get straight back to work.

The vx range is made for live shows and changing environments. Network cables are ruggedised and securely attached - leaving less opportunity for mishaps, such as tripping on cables or any type of damage.

→ **Learn more about the vx range here**

fabric

The network switch

fabric is a preconfigured network switch that was built to connect your vx and rx servers at the highest bandwidth possible so that each frame is delivered accurately.

Unlike other network switches, it is an out-of-the-box solution allowing you to connect rx and vx servers within minutes without the need for extensive network engineering knowledge.

It is built to be flexible for your needs. Connect your rx range and vx servers via 16 configurable 100G ports and add additional fabric switches as your production grows.

→ **Learn more about fabric here**

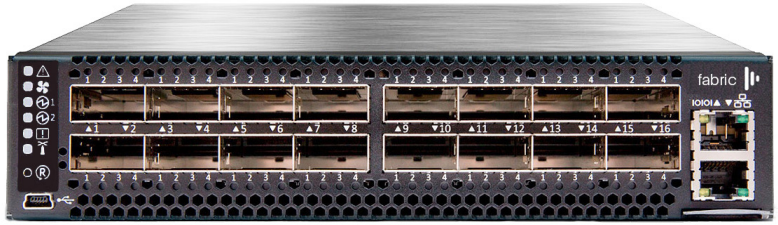


Image credits:
Nathan Reinds

Software

Designer

Sequence all elements to perfection

Previsualise and sequence your full production through our timeline-based software named Designer.

Designer is the interface empowering the setup of your project.

With Designer, you are able to:

- Integrate hardware systems within and outside the disguise ecosystem.
- Ensure all the graphics are shown with pixel perfect accuracy.
- Run colour, camera and spatial calibrations that are crucial in order to accurately read and adjust the content shown on the LED stage.
- Flawlessly integrate with Unreal Engine, Notch, and other real-time graphics engines to streamline creation processes.

→ **Learn more about Designer**

Applications for the disguise ecosystem

Virtual production and extended reality

Virtual production or extended reality (xR) refers to the blending of virtual and physical worlds together in-camera. It is a combination of Augmented Reality (AR) and Mixed Reality (MR) to create fully immersive experiences that can be used in multiple industries. In film and TV, it's referred to as Virtual Production, whereas in broadcast, corporate events and live music it is extended reality.

How does it work?

xR is a workflow that orchestrates LED technology, camera tracking systems, and real-time graphics engines. LED walls are set up to display projections of the virtual environment. disguise xR then takes real-time generated front and backplate visual effects from graphics engines like Unreal Engine, and projects them onto the LED panels. Meanwhile, camera tracking data allows content to be rendered from the camera's view - updating with each camera movement. This means that the scene remains 3D and immersive no matter how far the camera moves and the virtual world can extend beyond the physical LED screens.

RenderStream is the driving force behind xR and creates a three dimensional, immersive experience.

→ **Learn more**

Image credits: Hibino

"This is going to be a virtual production game changer. Adding cluster rendering functionality and the ability to scale processing to an already impressive xR workflow is exactly what we've been looking for."

Boum Creative

Live events

disguise's RenderStream Infrastructure, in essence, provides the ability to easily render content at scale. This allows for video and images to be projected on large-scale surfaces - increasing the wow factor for live events.

→ **Learn more**

Image credits: Ralph Larmann

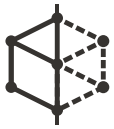
Fixed installations

With the combined power of rx machines as well as the ability to sequence and control the content rendered using disguise's RenderStream protocol, graphics can be rendered across any surface possible - perfect for projecting images onto fixed installations.

→ **Learn more**

Image credits: SACO Technologies

Top 5 benefits of the disguise ecosystem



Empower scalable cluster rendering

Connect multiple render nodes to enable near-linear scaling of rendering performance.

Make changes on the fly

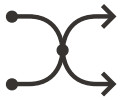
RenderStream's bidirectional connectivity allows technical and creative teams to change content dynamically. For example, they can change a scene rendered in the content engine, release changes into the timeline, or move an element of the set which is then reflected back in the content engine.

Maximise output quality

The challenge with cluster rendering is optimising processing power across the cluster. disguise's RenderStream infrastructure allocates jobs between the nodes automatically, so that you can focus on making the most stunning scenes possible.

Backup your processing power

RenderStream allows for backup processing to be added and failover rules to be set. If a server or node fails, RenderStream shifts the processing workload to the next - creating a reliable system that won't fail.



Deliver and compose content at maximum network speed

The vx range's enhanced networking power together with fabric (our high bandwidth network switch) allows for high quality 4K content, rendered from rendering nodes, to be stitched together and played back accurately at the highest frame rate possible.

How to get started

RenderStream synchronises your systems.
Speak to us about your individual infrastructure needs.

→ **Explore our latest hardware and software solutions**

→ **Speak with us today!**

About disguise

The disguise technology platform enables creative and technical professionals to imagine, create and deliver spectacular live visual experiences at the highest level.

Combining real-time 3D visualisation-based software with high performance hardware, disguise delivers challenging creative projects at scale and with confidence. Its new award-winning Extended Reality (xR) workflow is empowering users to bring to life immersive visual experiences that inspire and engage remote audiences everywhere.

Image credits:
Orca Studios