WWE

IMPACTING GLOBAL AUDIENCES WITH AUGMENTED REALITY

For WrestleMania, WWE used InfinitySet to create spectacular content broadcasted across WWE's media platforms, including the award-winning direct to consumer WWE Network, digital outlets and broadcast partners.

World Wrestling Entertainment (WWE) is an integrated media organization and recognized leader in global entertainment. The company consists of a portfolio of businesses that create and deliver original content 52 weeks a year to a global audience, reaching more than 800 million homes all around the world, in 25 languages. WWE's events, and especially the flagship WrestleMania are some of the world's most visually stunning, constantly looking to create new and innovative visual content to enhance production value and the WWE Superstars' presence. For WrestleMania 34 in 2018, WWE decided to include high-end Augmented Reality content and technology to enhance the production in a new and exciting way, and decided to use Brainstorm's InfinitySet.

WWE was interested in Infinity Set's ability to render realistic content with convincing reflections and transparencies. WWE especially liked the quality of InfinitySet's rendering with PBR materials and advanced shaders like refractions, that they could add to their existing models. And, on top of that, WWE is planning to use the Combined Render Engine with Unreal Engine, for providing an even more realistic output. WrestleMania was phase one of an

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> "Brainstorm's InfinitySet allows WWE to achieve the Virtual and Augmented Reality results we need to bring world class content to our audience."
>
> **KC Acampora, Vice President, Television Production Systems, WWE**

ambitious project aimed to create new ways to impact global audiences by using advanced imagery mixed with live entertainment.

"The AR graphics package we developed for WrestleMania included substantial amounts of glass and other semi-transparent as well as reflective materials. We knew InfinitySet handled these materials exceptionally well" says KC Acampora, Vice President, Television Production Systems of WWE. "We also needed an engine that could render particles well and we knew this was something InfinitySet was very capable of. We also wanted to be able to change scenes and place objects very quickly and we knew Infinity Set would be able to meet that requirement."

In the virtual environment, WWE required a powerful graphics solution to create content that is a convincing representation of real life mixed with virtual elements, striving to create a composite that feels married together to where one cannot discern the real from the computer generated. The toolset available in InfinitySet allowed WWE to accomplish this objective better than other solutions in the market. Especially useful were the depth of field/focus feature, and the ability to easily adjust the virtual contact shadows and reflections to achieve very realistic results. Also, refractions and virtual lighting proved essential to help WWE achieve the results they were looking for.

InfinitySet allows WWE to create a wide range of different content, from on-camera wrap arounds to be inserted into long format shows, to short self-contained pieces. The complete setup comprises three different studios: a multi-render Virtual Studio, a smaller AR Studio and a portable AR system. The Virtual Studio includes three cameras with an InfinitySet Player renderer per camera with Unreal Engine plugins, all controlled from the InfinitySet Controller via a touchscreen in the control room, and Blackmagic Ultimatte 12 chroma keyers.

For receiving the live video signal, InfinitySet integrates with three Ross Furio robotics on curved rails, two of

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them on the same track with collision detection. The setup also includes an OnDemand license to manage the playout of data-driven AR graphics.

The AR Studio, is a compact version of the multi-render one, and relies on a single camera on a jib with Mo-Sys StarTracker with InfinitySet +Track license. The AR Studio receives only video from the camera, and all the keying required is done using InfinitySet's internal chroma keyer. This smaller studio, suitable for more compact events, allows the creation of AR content with simpler setups and requires less resources to install, drive and derig.

Finally, the Portable AR system is a custom-made road case with a redundant InfinitySet with tracking and internal chrom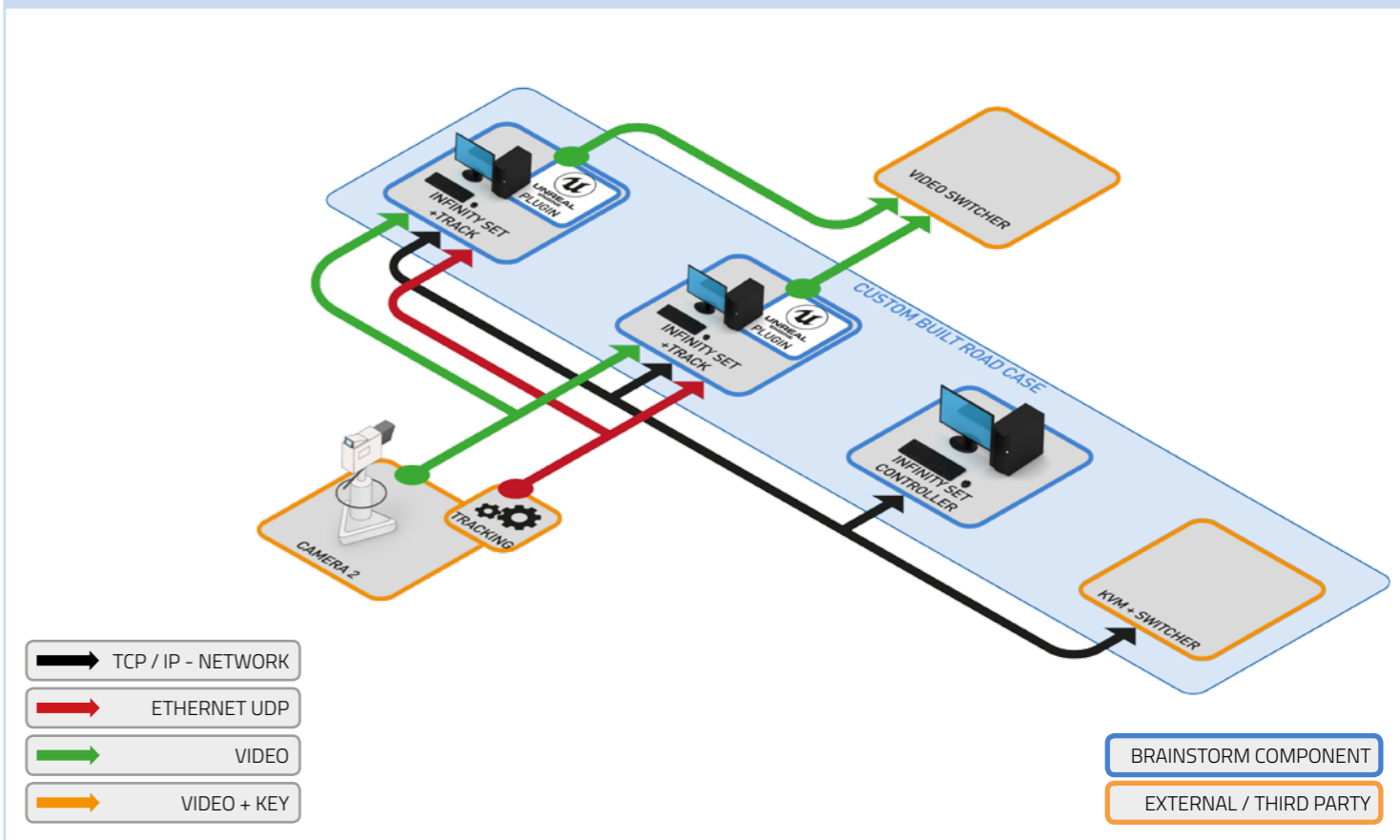a keyer for live AR productions on the road, which will deliver this advanced AR content to a wider range of WWE productions and special events held throughout the year. This kit has been designed to be sent anywhere in the world and requires minimal installation. Operators just need to take it to the event, open the lid, plug the power in, and they instantly have a turnkey AR system with redundancy which ensures a reliable operation in remote sites.
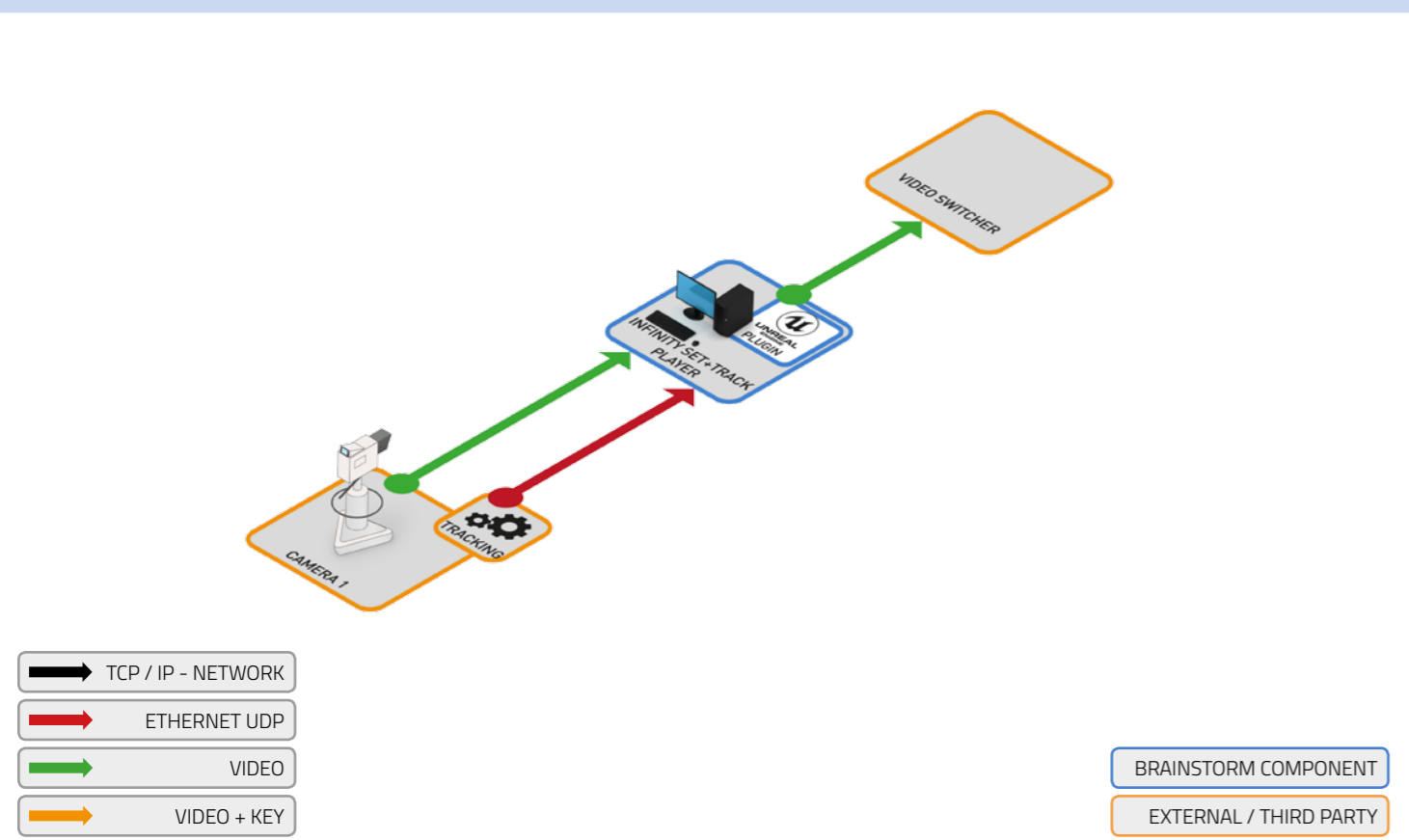
InfinitySet is used to create content that airs across WWE's many media platforms including their award winning direct to consumer WWE Network as well as their various digital outlets and through their broadcast partners.

WWE PORTABLE AR STUDIO

→	TCP / IP - NETWORK
→	ETHERNET UDP
→	VIDEO
→	VIDEO + KEY

BRAINSTORM COMPONENT
EXTERNAL / THIRD PARTY

WWE AR STUDIO

→	TCP / IP - NETWORK
→	ETHERNET UDP
→	VIDEO
→	VIDEO + KEY

BRAINSTORM COMPONENT
EXTERNAL / THIRD PARTY

WWE MULTI-RENDER

→	TCP / IP - NETWORK
→	ETHERNET UDP
→	VIDEO
→	VIDEO + KEY

BRAINSTORM COMPONENT
EXTERNAL / THIRD PARTY