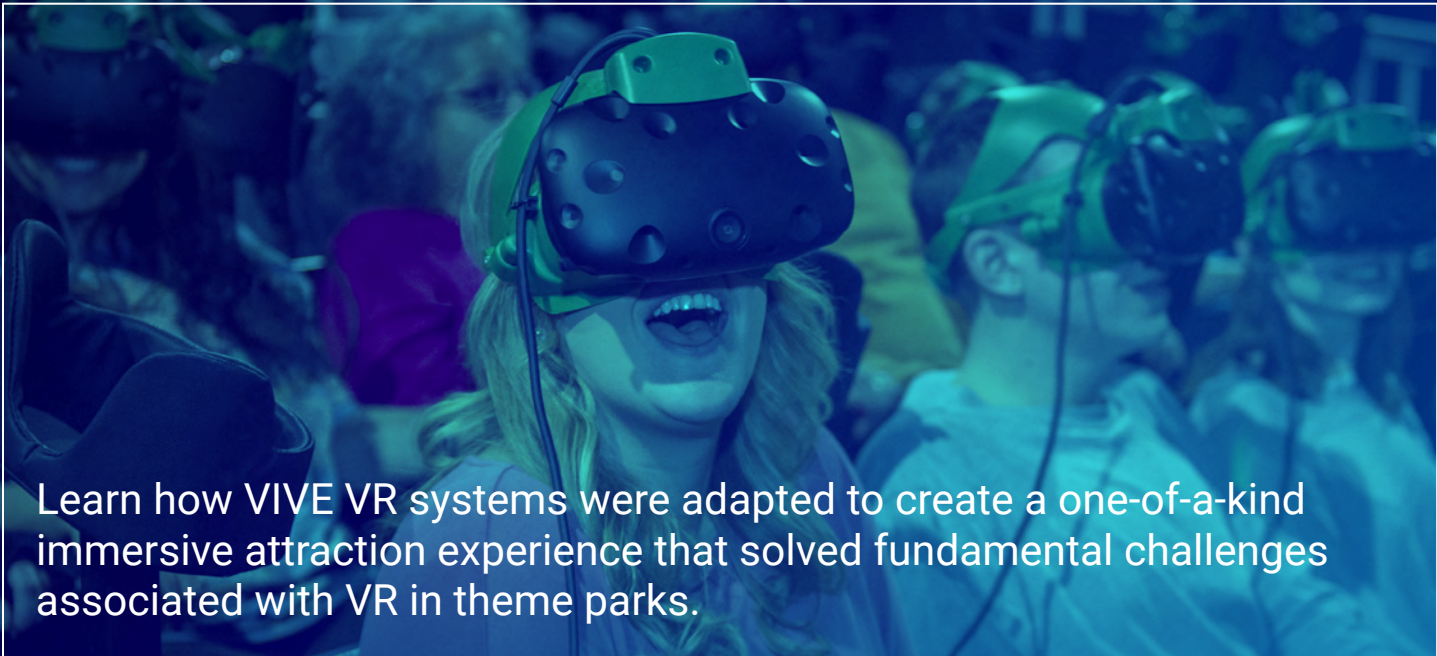# Busch Gardens® Thrills Theme Park Guests With An Innovative Attraction Powered by HTC VIVE

Learn how VIVE VR systems were adapted to create a one-of-a-kind immersive attraction experience that solved fundamental challenges associated with VR in theme parks.

Background

Busch Gardens Williamsburg is a stunning 135-acre action-adventure park based on authentic European themes. It has been voted the World's Most Beautiful Theme Park by the National Amusement Park Historical Association every year since 1990. Fully aware that guests are always looking for the next and best thing in entertainment, Busch Gardens wanted to reinvent an existing motion simulator attraction to bring an entirely new experience to the Ireland section of their park.

"We wanted to uniquely blend the immersive experience of high-tech virtual reality with the visceral experience from a state-of-the-art ride system to create a believable, 'you are really there,' feeling within the attraction," says Larry Giles, VP of Design & Engineering at SeaWorld Parks & Entertainment, the parent company of Busch Gardens.

To accomplish this, Busch Gardens enlisted Falcon's Creative Group, a theme park experience design company and long-time creative collaborator, to develop and produce a fantastical virtual reality adventure inspired by Celtic folklore and mythology: *Battle For Eire*.

Solving for VR in Theme Parks

When developing *Battle For Eire*, Falcon's wanted to address three fundamental challenges that have long plagued virtual reality theme park attractions and

limited their potential:

- Long wait times for equipping/unequipping of VR headsets
- Hygiene and unreliable/inefficient cleaning processes for VR headsets between uses
- Poor performance monitoring and tracking of multiple VR headsets

"We understood the need to keep people moving through the experience to enhance their time spent there—we call that ride capacity," Giles explains. "We also knew other [theme park] VR experiences had much lower ride capacity, which was the most common complaint among riders."

With some clever adaptations to the VIVE VR systems, Busch Gardens was able to improve ride capacity by simplifying and streamlining the fitting process and decreasing time spent loading and unloading guests. This helped maximize the time spent in the experience and even contributed to a more sanitary environment.

Adapting VIVE VR Systems With DreamSet™

Solving these fundamental problems was made possible through Falcon's partnership with DreamCraft Attractions, creator of the DreamSet™—the world's first head-mounted display system for use on VR attractions. Referred to in the *Battle For Eire* universe as an "Emerald Mask," this novel two-piece display uses powerful magnets to safely secure and detach separated VIVE VR lenses ("Enchanted Lens" in *Eire*). This solution enabled them to accommodate high ride volumes in the most hygienic and efficient way possible.

"The flexibility of the VIVE headset allowed for the creation of a whole-new, easy-to-use adapter that could physically separate the head mount from the display," says Jason Ambler, Executive Producer and Director of Production at Falcon's Creative Group. "Once guests are seated on the ride, they can quickly and easily attach the display, which is held in place with a magnet system. At the end of the experience, the VIVE display remains on the ride while the head mounts are collected and industrially washed before being redistributed."

The Final Experience

While waiting in the *Battle For Eire* queue line, each guest receives an Emerald Mask. Next, a pre-show room introduces the story, characters, what to expect, and how the ride works before boarding the motion simulator.

Once guests are safely seated, they are free to attach the Enchanted Lens to their Emerald Mask.

The ride itself consists of two identical 59-passenger motion simulator platforms. This allows operators to quickly alternate groups of guests through *Battle For Eire*. Even with VR applied to the attraction, it can accommodate nearly one thousand people per hour.

To deliver and process high-fidelity VR content in *Eire*, each rider's seat is equipped with an Intel® NUC Mini PC containing DreamCraft's custom-developed real-time playback engine software. This platform optimizes *Battle For Eire* media and ensures all headsets can be synchronized and monitored for quality of service by operations.

The engine software also enables each rider to individually engage with interactive elements throughout their experience. This innovative solution provides the unique ability to blend the highest possible quality pre-rendered content by using Redshift on NVIDIA GPUs to play back at a high-fidelity frame rate within the real-time engine. Thanks to these capabilities, the media for *Battle For Eire* could be produced with the same techniques and cinematic processes as big-budget animated feature films while still allowing for interactivity.

The end result: A technical triumph for theme park VR entertainment with real-time interactive elements, wind-on-guest effects, original score orchestration, and a theatrical 7.1 surround sound mix—all of which are synchronized to the dynamic movements of a six-degrees-of-freedom (6DoF) motion simulator platform.

VIVE Meets Technical Demand

Aside from solving design and functionality, there were also high technological ambitions. The development teams wanted to achieve the highest frame rate, resolution, and field-of-view possible while providing accurate head-tracking in a large volume of people on a moving platform. After looking at many different virtual reality headset providers, Busch Gardens and partners all agreed that VIVE VR systems were both flexible and powerful enough to meet the visual and immersive demands for *Battle For Eire*.

"VIVE proved to be a great product and provided the support to help us with our unique setup," says Giles. "Guests really enjoy the experience. It's fun to watch riders look all around the cabin with their headsets and hear their reactions during the ride and exuberant comments afterwards. It makes the hard work worthwhile."