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## Delivering the World's First **4K UHD IP Remote Production Trial**

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### **CUSTOMER**

Gearhouse Broadcast & UEFA,  
Australia/Germany/UK/US

### **CHALLENGE**

UEFA live remote 4K UHD production tests during the  
2017 UEFA European U21 Championship Final

### **SOLUTION**

Kahuna Multiformat Switcher  
LiveTouch Replay & Highlights System  
Orbit IP Routing Control System  
MV820 Multiviewers



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Simon Nicholls, System Designer, Gearhouse Broadcast

Live broadcasts of major sports tournaments, especially those that take place over multiple days and in multiple locations, is a huge undertaking. It normally requires multiple large outside broadcast trucks, a team of production staff, a team of technical staff to set up ahead of the event and meter upon meter of cabling.

Remote production has been trialed as an alternative before, but with 4K UHD now a de facto format for high-end sports production, the bandwidth requirements make it a more complex and expensive business. Until now.

UEFA contacted Grass Valley and Gearhouse Broadcast to examine how this could be done more efficiently, and whether it could be achieved without the need to compress and decompress UHD signals.

Early discussions about this project started back at the beginning of 2017 with UEFA setting out its requirements for a remote production trial. In early March 2017, UEFA confirmed the date and venue for the trial, deciding on the 2017 UEFA European Under-21 Championship Final, held in Poland in June.

UEFA identified IP technology as the only viable solution to meet their exacting technical requirements. Working closely with Gearhouse Broadcast to ensure the system design would result in smooth integration with the rest of the workflow, Grass Valley delivered a complete — ready configured — Proof of Concept (POC) IP-based remote production system.

Simon Nicholls, System Designer, Gearhouse explains, “Gearhouse approached Grass Valley for an IP solution and 4K UHD workflow as we knew that they have proven technology and a range of products that fitted perfectly into this model. This was to be a test at the very edge of innovation and as such required a manufacturer who we could trust. Gearhouse have been researching and working live more and more in remote production to deliver solutions that production companies will find both efficient and exciting.”

The POC system comprised Grass Valley’s IQMIX (SDI) and IQAMD (MADI) IP conversion cards, Orbit IP Routing Control System and MV820 2 RU Multiviewers. Grass Valley’s Kahuna production switcher and LiveTouch replay and highlights system were also part of the workflow. In addition, Grass Valley provided and commissioned the Cisco Nexus network infrastructure and Tektronix PTP Grandmaster timing solutions for the trial.

On Friday 30 June 2017, the day of the Championship Final, the system went live on-air with 4K UHD signals from five Sony HDC 4300 4K/HD cameras at the stadium, then sent to London via a specially installed and commissioned pair of fully redundant 100 GbE links, provided by Level3, Orange and BT Sport. As a multi-vendor, multi-hop network, the logistics had to be carefully managed.



The signals were delivered to UEFA at BT Sport's facility at the Queen Elizabeth Olympic Park in London — around 1600 km away, ready for live edit and playout. BT Sport had a dedicated production control room set up with a Director, Vision Mixer, PA, Graphics, Audio Supervisor, LiveTouch operator and Producer.

The LiveTouch server was used in a 2 in/2 out 4K UHD configuration to play 4K UHD replays, packages and graphics. The LiveTouch replay workstation also offered a complete craft editor offering a powerful creative toolset unique to LiveTouch, enabling operators to instantly trade media from edit to live.

The trial represented a milestone on several fronts. It was the world's first uncompressed 4K UHD remote production workflow using IP technology, and was also conducted over the longest distance yet

for a remote production operation. Other than the camera rigs and camera operators on location at the stadium in Poland, there were no other technical facilities or personnel on site. The workflow deployed by Gearhouse and Grass Valley was able to completely eliminate the need for an OB presence during the live game.

Robert Szabó-Rowe, EVP and General Manager, Live Production and Infrastructure at Grass Valley comments, "This project is a real milestone for remote production, and we are very proud to be part of it. It is the first time that uncompressed 4K UHD signals have been delivered over such a distance with ultra-low latency. The production team didn't see any perceived difference to sitting in an OB truck on location and that for us is a testament to how effective the Grass Valley remote production technology is."

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