EMG selects Arista Networks to help deliver media services innovation through modular and scalable IP architecture

Highlights

Challenge

EMG needed to gain more operational efficiency by utilising an IP-based media workflow that can seamlessly scale from small productions to the largest international events.

Solutions

- Innovative leaf / leaf architecture to provide flexible deployment options

- Arista Arista 7000 series deployed within a mesh network with wire speed layer 2 and layer 3 features combined with SDNsquare's overlay technology

- Open SDNsquare's GRID uses software-defined networking to deliver IP network orchestration in complex, convergent, scaled up media networks

Results

- High density switching within a mesh architecture for extreme scalability and reliability

- Simplified network operation via the EOS® single image capability

- Physical reduction in equipment footprint and operational complexity though modular design to allow improved operational efficiency

As a service provider to some of the world's largest TV events, EMG has pioneered the use of innovative IP technology that combines Arista Networks with SDN software to create a scalable and modular architecture able to handle some of the most exacting workloads ever envisaged within the broadcast industry.

Project Background

EMG is a leading provider of broadcasting and audio-visual services to the Global Live Production community. The Group combines unique know-how and world-renowned expertise to master the entire value chain, from image creation to distribution, including a diverse range of studios and one of the largest fleets of mobile outside broadcast trucks in Europe. New-media driven, EMG is a valued partner for major international events, including Tour de France, Ryder Cup, FIFA World Cup, UEFA European Championships and Formula One. EMG employs over 1500 staff at several sites across Belgium, France, Germany, Italy, Luxembourg, Netherlands, Switzerland, and the United Kingdom.

Challenge

The company has grown over the last 35 years and continually invested in technological innovation to meet the needs of its diverse media and entertainment clients. One of the most significant investments is a long-term project that started in 2017 to increase the efficiency of broadcast systems using modular technology that is able to scale to meet the needs of different types of projects.

At the heart of this strategy is a shift to IP-based technologies across EMG, along with increased use of commodity hardware and software instead of the traditionally proprietary systems common within broadcast environments.

As Joost Davidson, Project Manager (diPloy) at EMG explains, "The three keywords of the project were modular, scalable, and flexible – and the last part, flexibility, is something that is really now translating into remote production as well."

As one of Europe's largest broadcast service providers, the transition would endeavor to gradually phase out EMG's significant investment in SDI-based architecture so as to get the most value out of its assets. EMG also wanted to standardise on the emerging SMPTE 2110 standard for IP workflows, but unlike other broadcasters, Davidson explains that the emerging spine leaf architecture that was starting to gain popularity would not quite work for their innovative approach.

"As part of the modular setup it was quite clear from the beginning that we weren't going to work with a monolithic switch approach," he says, "there were a lot of vendors that proposed to put one big central core somewhere, basically replacing a big router with a big switch. And that's it."

Davidson and his team recognised that because they wanted to be able to reconfigure modular elements to serve small, multi camera events all the way up to international football tournaments, the proposed monolithic - or leaf and spine architectures - would not be flexible enough and would limit the scale of the system. Instead, they looked at creating a versatile leaf-on-leaf infrastructure where each module could scale independently to effectively create a mesh architecture. Although admittedly a more complex design, it had the advantage of increased flexibility, resilience and would allow them to add capacity based on need, rather than having to build over-capacity into the modular design.

Solution

EMG looked at several vendors and as Francois Flagothier, Network Architect at EMG explains, "Arista was the only networking vendor that could support this mesh architecture with support for the SDN software defined networking that we intended to use to help us build our modular concept."

The solution creates mobile modules that combine Arista 7000 series switches, along with use case specific elements for handling video, audio, data, and other signaling methods used for delivering its array of media services. Each module has between 200Gbps and 1200Gbps of interconnect which is configured and managed based on the specific use by the SDN software layer.

EMG has built 100+ modules so far, primarily to meet the needs of a major, international sporting event that was unfortunately postponed due to the pandemic. In this project, the modules are shipped to various sites around the host country and reconfigured to meet the event's massive workload of simultaneous, televised competitions. The innovative approach allows EMG to deploy modules on an as-needed basis – smaller events that would traditionally require an entire OB vehicle can now be served by several of its mobile modules.

"The initial philosophy we set out to do was ambitious, to say the least," says Davidson. "The arguments were that eventually we would be able to use these modules and equipment only where necessary. We are no longer sending a 30-camera truck to an eight-camera job which means our solution is more efficient and financially beneficial," he adds.

At an operational level, Arista's use of a single EOS® across its entire switch family has significantly reduced management complexity for EMG engineering teams, while the open API based architecture has facilitated the in-house development of additional automation tools and integration with an SDNsquare orchestration layer. SDNsquare's GRID uses software-defined networking to deliver IP network orchestration in complex, convergent, scaled up media networks

Conclusion

Arista Networking technology has also been deployed in core EMG data centers and the modules themselves have been used for several remote production tasks during the recent pandemic. This was proven in the field during deployment of the system at the Nordic World Ski Championships 2021 in Oberstdorf. The client commented that EMG's systems ran smoothly and without disruption, delivering the professionalism of production expected whilst facilitating crew safety through distancing, and operating in a challenging environment of the snowy Bavarian Alps.

In addition, the wider strategic pivot has helped EMG to meet its sustainability goals – both through the reduction of transport-associated carbon footprint, but also because when implemented in a modular fashion, the solutions can reduce the overall power consumption of a standard network significantly.

Looking to the future, the modular solution is set to be deployed at an upcoming event that would typically require at least eight OB trucks with all feeds being made available to multiple destinations, as Davidson explains, "…this is something we can do, because in the end, it basically all goes into the same pipeline and the same data center. I don't think anybody else could accomplish that kind of exchange of signals between so many sources, but our platform is designed to do exactly this kind of task."

The relationship between Arista and EMG has been strong and Flagothier heaps praise on the robustness and well-engineered nature of the Arista software, "…but it's also worth mentioning that our SDN provider is capable of getting all the information [from the switch] necessary for them to develop their software further. And a lot of the benefits we've had by choosing Arista is related to the openness of Arista towards our SDN provider. Because of course, that is where most of the software development takes place - not so much in our modular construction - and this openness has been invaluable in making this project such a success," he concludes.

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