



Executive Summary:

Industry

- Hospitality and Public Venues

Environment

- Open-air festival
- 144 hectares (356 acres)
- Over 220,000 total visitors

Technology Needs

- Purposely designed and deployed network solution for temporary event
- Ability to offer connectivity with limited mounting options and lack of fiber
- Reliable Wi-Fi connectivity and improved mobile experience for festival goers
- Support of event management assets and back-of-house staff
- Visibility and understanding of network performance and usage

Extreme Solution Components

- ExtremeWireless[™]
- ExtremeSwitching[™]
- ExtremeGuest[™]
- ExtremeAnalytics[™]

Results

- Over 10,000 unique attendees connected to network
- Over 3,000 concurrent Wi-Fi users
- 6TBs of data transferred from Day 2 at festival main stage
- Support of central festival functions, including ticketing, point of sale, and internal communications.
- Overall quality, consistent wireless experience for guests and festival staff



Delivering a Unique Festival User Experience

Located in Achterhoek, the eastern region of the Netherlands, Zwarte Cross is one of the largest annual outdoor music and sports festivals in Europe. The event has grown immensely, from the 1,000 attendees recorded at the 1997 launch to over 220,000 total attendees at the 2018 festival, which took place from July 12th – 15th. The festival now includes 33 stages, and spans a distance of 160 hectares across three villages. The growth in attendees drove the need for more supporting staff and functions. In total, there are now 32 different caterers and 40,000 jobs (including suppliers) that are responsible for running the festivals operations. As the festival grew and evolved the technology and communication needs did as well.

To support all these entities, continue to run a smooth, safe event, and to appease the mobile expectations of festival-goers, Zwarte Cross teamed up with Extreme Networks to design and deploy a purpose-built network solution for the 2018 festival.

The Need for Connectivity in Any Environment

Even in the most challenging and unique environments, businesses today require network solutions to support their specific organizational needs and meet the expectations of their connected customers. This extends to large, open-air environments with limited deployment options to support temporary scenarios and their users, both back-of-house staff and visitors. This could include outdoor concerts, state fairs, festivals, even disaster relief efforts. Each situation necessitates specific network technologies, creative deployment methodologies, and experienced engineers to ensure the solution is successful.

A Reliable and Tailored Wi-Fi Solution

The biggest challenge in a large, open-air festival like Zwarte Cross is establishing a robust, secure Wi-Fi connection with adequate coverage and capacity for thousands of users. With the volume and density of visitors, the cellular-based telephony network would be debilitated and dysfunctional without strong Wi-Fi. This poses several problems for the festival.

A reliable Wi-Fi connection serves two primary purposes. First, it's a complimentary service for the visitors of the festival who want to access the Internet, upload or download photos and videos, even stream content from their tent at the campsite. Secondly, Wi-Fi is crucial for the end-to-end digitization of festival processes and assets: this includes ticket control, the supply of points of sale, and staff management. Under the umbrella of event management, from a security standpoint lack of sufficient communications would be a disaster for emergency services like police, ambulances, or fire brigades - and thus the safety of the festival. In short, Wi-Fi was needed to offload data from the public 4G and 5G network to enhance user experience for both visitors, staff, and internal business assets.

“Despite the physical challenges an environment may present, businesses today must creatively and effectively leverage networking solutions to support their unique needs and meet customer expectations. Customers today anticipate a quality, reliable mobile experience wherever they go; this includes expansive, open-air venues like music and entertainment festivals. Networking solutions are also central in the support of mission critical operations and back-of-house systems, ensuring a smooth and safely run event for guests and staff. We are proud to team up with the Zwarte Cross Festival to help deliver a successful event in 2018, and are thrilled to collaborate together in greater capacities moving forward.”

Norman Rice – Chief Marketing, Development, and Product Operations Officer

Furthermore, Zwarte Cross' IT team required clear insights into the Wi-Fi network and its usage. For a festival terrain of 160 hectare, it's difficult to calculate and predict the essential capacity needed at certain locations and time. Visitors and staff constantly move throughout the site during the four days of the festival; to ensure visitors are satisfied and staff are supported, detailed network visibility was critical to identify interferences, anticipate interferences, and effectively react to them in a timely and effective manner.

Delivering a Complete Solution With Experienced Providers

After evaluating several solutions, the festival organization partnered with Extreme Networks as Official Technology Partner of Zwarte Cross, and Indicium, integrator of wireless LAN and mobile computing technologies.

Together, a wired and wireless network to meet the unique needs of the festival was realized. The network backbone comprised of a fiber optic cable installed under the festival ground, which included several tapping points; a 10 kilometer temporary fiber glass ring was also installed onsite. At the neighboring campsite, the main connection took place via microwave transmission, which also functioned as backup for the festival environment. Several hotspots - connected via a mesh network - were located onsite. Each hotspot powered seven wireless access points. In total, the festival site was covered by 280 access points, each facilitating 256 users at the same time.

To complement and enhance the Wi-Fi hardware Zwarte Cross also leverage a number of Extreme's network software offerings to analyze and optimize the Wi-Fi solution, including:

- **Extreme Management Center** — a central platform for network management with a 360-degree overview of the wired and wireless network, users, devices and applications.
- **ExtremeAnalytics** — an application-layer network analytics solution to better understand the behavior of visitors and staff on the network, determine mobile engagement patterns, and guarantee an optimal user experience for the Zwarte Cross application.
- **ExtremeGuest** — enables the ability to personalize visitor engagement, by offering tailor-made services and offerings based on behavior and interests.
- **ExtremeLocation** — provides powerful analytics and trends regarding location-based insights, such as data around where visitors and staff are located, how they move across the festival site, and the busiest areas of the environment.

Extreme's network technologies combined with Indiciu's experienced integration capabilities created an enhanced Wi-Fi solution to meet the needs of the festival and offer a quality mobile experience for visiting attendees. To add another layer of service and support, a 'Wireless Helpdesk Booth' was setup and staffed by Extreme's network experts as a central location for any users who had questions or encountered issues.

Deployment Results: Turning Up the (Wi-Fi) Volume

This was Zwarte Cross' first festival where the organizers deployed a purpose-built network solution, and the performance results and usage data already exceeded expectations. Over 10,000 unique users were registered via ExtremeGuest, with a peak of over 3,000 clients connected concurrently, a consistent average throughout the festival. From the main stage on the second day of the concert alone, nearly 6 terabytes of data were transferred across the public network. On average, users spent about 30 minutes on the network - this is mostly attributed to the fluid nature of the festival, where attendees move continuously throughout the festival grounds.

The Zwarte Cross staff validated the reporting data, citing everything went very well technically, according to Maurice Haafs, ICT coordinator at the Zwarte Cross. Not to mention, the organization was able to optimally make use of technology to engage with visitors and communicate with the staff during the festival. The various Extreme Networks solutions played an important role in this.

"Besides the wired and wireless network, we were able to leverage the analytics solutions. For example, we had quick insights into how much bandwidth was being used, how many access points were active, how many clients were connected and how they were using the network. Based on this information we were able to quickly track and solve network issues in the build-up to and during the festival."

Maurice Haafs - ICT Coordinator

Not only the IT team, but also the founder of the Zwarte Cross, Ronnie Degen, discussed the pivotal role technology now plays in successfully running a large event like Zwarte. "Technology is indispensable in managing where people are hanging out, how they register themselves, and keeping an eye on the catering stock levels. If technology fails, we can't really do anything anymore. We are happy that our partner Extreme Networks provided the support they did. That's why we are proud of our collaboration, as it is because of this that we are able to throw such a fantastic party for everyone."

The Second Act: What the Future Holds for Zwarte Cross

Although the network deployment at Zwarte Cross 2018 was considered a great success, the festival and its technology partners have expanded plans for technology's role in the event moving forward.

The network needs and goals for the 2019 are still being finalized, but a first priority would be an expansion and strengthening of the wired and wireless network across the festival grounds. Limited deployments concentrated around the more popular areas of the festival operated efficiently this year, but an expanded deployment would increase the network coverage and enable more festival attendees with Wi-Fi connectivity - in addition to festival staff.

How the festival leverages Extreme's software capabilities are also strong considerations: Zwarte Cross organizers were impressed with Extreme's network analytics capabilities, by increasing the sophistication of the analytics deployment next year will grant the festival with a deeper understanding of their users and their mobile engagements. An investigation around how the festival can creatively use location-based services is also underway, both the location analytics the network can deliver to festival organizers and the increased services they could employ with the solution as well - like location-based service offerings, mobile push notifications, or food and beverage delivery. Whatever the future holds for Zwarte Cross 2019 and festivals to come, it is clear technology and networking solutions will be a key part of the event's success.

Want to learn more about how Zwarte Festival worked with Extreme Networks and Indiciu to provide a quality mobile and wireless experience for its 2018 festival? Check out this [Zwarte Festival 2018 Recap Video!](#)



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