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Case Study

CS00018

Belden and Hirschmann Help Soccer Stadium Enhance Data Speed and Reliability

With an upgraded communications infrastructure, VfB Stuttgart – one of the largest soccer stadiums in Germany – can quickly collect tickets and safely admit thousands of visitors, while also reliably broadcasting its games worldwide.

Project Overview

While they may not be traditional industrial settings, outdoor sporting stadiums face similar challenges to factories. Maximum reliability for mission-critical communications. Large quantities of data transferred quickly. Extreme temperatures in the summer and winter seasons. Safety and security threats.

The VfB Stuttgart sports club – based in Stuttgart, Baden-Württemberg – is the fifth largest sports club in Germany. The stadium has undergone a number of renovations since its initial construction in 1933. Its most recent upgrade in 2011 increased the capacity to more than 60,000 visitors.

To accommodate growing numbers of fans at events held nearly every weekend, the stadium needed to increase the reliability, speed and accuracy of the ticket collection process. This helped avoid long lines and improve visitor safety.

Games are also broadcast to viewers all over the world. The stadium needed fast data, audio and video transmission to enable the local and regional media to broadcast the games and their coverage.

To provide better control of the facility – especially the visitor entrance – and put the needed building automation processes in place, VfB Stuttgart sought to upgrade its networking and communications infrastructure. Given the environmental conditions, the stadium determined it was necessary to switch from office-grade products to industrial-grade solutions.

As a longstanding manufacturer of high-quality industrial cabling, connectivity and networking components, Belden was tapped by VfB Stuttgart to share its expertise and enable a more efficient, reliable and safe operation of the stadium.

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Project Needs and Challenges

- On a typical game day, the stadium operates 400 television monitors, 100 automated turnstiles and 30 mobile ticket readers.

- Speed was critical. More than 60,000 people arrive through the stadium's entrances within a one-hour timeframe.

- The stadium had to scan more tickets faster, especially during peak periods, to make entry as smooth and safe as possible for fans. The turnstiles and mobile readers had to read, process and confirm or reject barcodes and RFID codes within 0.3 seconds.

- Back-up systems with extremely fast reconfiguration times were required to ensure uninterrupted communications.

- When tickets are scanned, all of the associated data – including names and other confidential information – goes into the system. This data needed to be properly secured.

- Networking and communication components were used outdoors and had to withstand temperature variations and other harsh conditions. They also needed to fit into existing cabinets.

- The stadium required a flexible, future-proof solution to accommodate further adaptations or enlargements of the facility, as well meet evolving broadcasting requirements.

The Belden Solution

The stadium's Information and Communications Technology (ICT) department partnered with one of Belden's certified, preferred partners – RW-electronic. Together, they designed and implemented a comprehensive network infrastructure to handle the facility's specific priorities and requirements.

"By working with a trusted and qualified partner, like Belden, we've successfully completed many complex network projects over the years. We appreciate the collaborative and solution-oriented approach the sales and technical support teams take in working to uncover the best option for our end customers. Product quality is also extremely critical, which is why we continue to partner with Belden to source the high-quality network components we need." **– Frank Rappold, Managing Director at RW-electronic**

VfB Stuttgart is the fifth largest sports club in Germany with a capacity for more than 60,000 visitors.

With a focus on high availability, speed and security of the stadium's data, the technical support and installation teams upgraded its cabling, switches and network management software. Belden was identified and selected as a partner given its best-in-class industrial solutions that deliver maximum performance in harsh or extreme environments.

To guarantee trouble-free operations, industrial-grade products were selected and installed, including 250 switches and network management software, 300 kilometers of fiber cable and 100 kilometers of copper cable.

Belden and RW-electronic's recommended approach enabled a flexible infrastructure to support future growth. This set-up ensures the stadium will be able to easily accommodate more or less turnstiles, TVs or mobile readers in the future – something that the previous technology couldn´t do.

The knowledgeable and certified consultants and integrators who handled the network design, product selection and installation ensured seamless support throughout the project and continued to provide continuous, post-installation support.
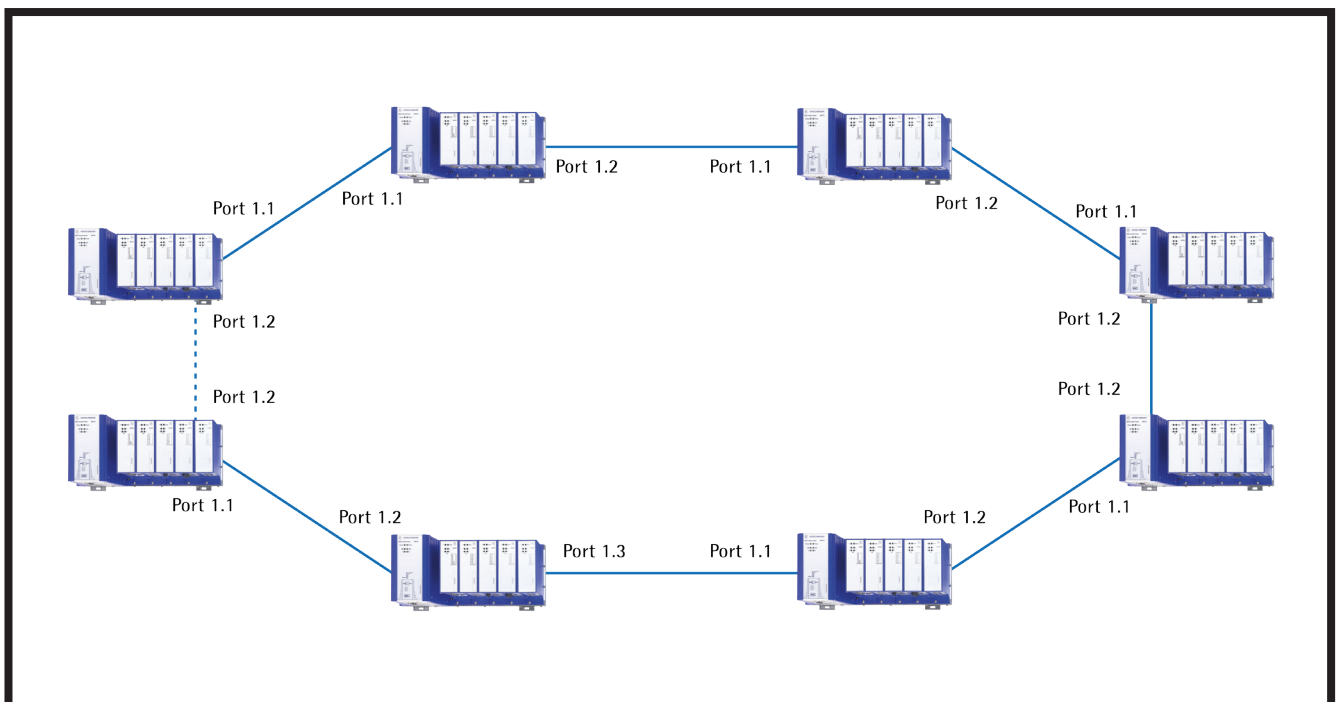
When visitors arrive to the stadium, the traffic flow and control of access have been greatly improved, particularly during peak times right before events or games start. Tickets are accurately scanned at 100 different turnstiles in less than 0.3 milliseconds per ticket.

"Thousands of visitors arrive to the stadium in a very short amount of time. It isn't an option to have systems go down or to transmit data slowly. Our visitors expect to have their tickets scanned quickly. We choose Belden for the reliability of their solutions. By properly segmenting our network traffic, we can identify unimportant traffic and critical traffic, to ensure the network knows how to prioritize our communications during these critical times, and guarantee messages arrive within specified amounts of time." **– Bernd Burger, Director ICT & Payment at VfB Stuttgart Arena Betriebs GmbH**

To protect the sensitive information collected during the ticketing process, Belden helped the stadium properly segment their network into virtual local area networks (VLANs). With VLANs, the network administrators and control engineers can easily define separate virtual networks within the existing infrastructure. This enables the overall system to smartly prioritize data traffic, such as security measures and ticket information, over other less-critical processes.

With overall network management in place, the stadium operators have full visibility of the network and can identify errors or issues immediately and ensure data is transmitted in proper priority order during peak times.

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Product Details

To achieve secure, flexible and uninterrupted communication, the following Belden and Hirschmann products were chosen for the VfB Stuttgart stadium.

MSP30 Managed Ethernet Switches

Hirschmann's MSP30 switches are managed Layer 3 switches designed for use in harsh, mission-critical applications to achieve fast, reliable and secure data transfers. The MSP30 switch sets the standard for network availability, while its modular design allows for flexible and cost-effective solutions.

This switch:

MSP30 - Managed Modular Layer 3 Switch with unique Security Functions

- Enables communication between physically separated networks through extensive routing functions.
- Provides reconfiguration times within milliseconds for high network availability. The Media Redundancy Protocol (MRP) and secure virtual local area network (VLAN) implementations enable network segmentation into sub-rings without additional hardware or cabling costs.
- Adapts to meet changing needs through a flexible, modular structure. Also, withstands harsh conditions through its ruggedized design and features.
- Guarantees all-around network protection through a range of unique security functions.

Industrial HiVision Network Management Software

Used in thousands of facilities around the world, Hirschmann's Industrial HiVision is a proven network management solution to configure and monitor industrial Ethernet networks.

This software:

HiVision - Network Management Software with Security Capabilities

- Provides at-a-glance visibility of key network performance and security indicators with a visual network dashboard.
- Configures hundreds of SNMP-enabled devices from any manufacturer simultaneously, saving time and reducing errors.
- Recognizes and accurately visualizes network topology automatically.
- Generates alerts when unauthorized changes are made, rogue devices are added or MAC/IP address pairs change.

Why Belden

With its best-in-class industrial products, Belden and Hirschmann helped enhance the data speed and reliability for this outdoor stadium. Now, the stadium quickly and safely admits more than 60,000 visitors at events each weekend. With a priority on safety, security and performance, the stadium can better manage its visitor entrances, even during peak times. The new communication system is also flexible to accommodate future growth or changes at the stadium's needs evolve.

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RW Electronics located in Neu-Ulm Germany is a long-term Hirschmann certified Preferred Solutions Partner that offers well-founded trainings, pre- and after-sales support to customers.

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