

Boosting capacity at a new industrial supply center

Case Study



Background

A Fortune 500 industrial supply company faced frequent network failures at its new distribution center, causing automation to halt and staff to fulfill orders manually. This slowdown strained customer and supplier relationships, reduced revenue and impacted future sales, even though the center was operating at only 10-20% capacity.

The company, known for quick delivery of a wide range of products, needed to ramp up capacity to 100%. They onboarded a global leader in material handling systems, who then brought in Belden to identify and resolve network issues.

Belden conducted a thorough network assessment, evaluating hardware, configuration, backup systems, scalability and security posture. The assessment revealed multiple concerns, including lack of device segmentation, slower switches on the network backbone, outdated hardware, lack of authentication for security, insufficient visibility for proactive issue detection and inconsistent protocols.

Belden's Network Assessment Service enabled a Fortune 500 company to safely ramp up capacity, boosting customer confidence.



Results

The Belden team discovered that the site's network infrastructure was causing numerous operational issues. Its flat design led to suboptimal performance, magnified network outages, lack of backup systems, poor scalability and weak security.

Belden provided actionable recommendations to address and resolve the primary causes of system failures, delays and poor network performance. By following these recommendations, the company can reliably and safely ramp up to 100% capacity, enhancing customer confidence and supplier relationships.

Network Assessment key findings

Proven service

Belden's best-in-industry Network Assessment Service uses proprietary tools to gather relevant network data and performance metrics, highlighting critical areas to address. The assessment focuses on data integrity in the core OT network, data transmission availability, confidentiality between OT-IT, and data management and visualization.

Belden's assessment of the facility uncovered several important findings contributing to recurring network failures:

- **Excessive network devices:** With no segmentation, all devices were seeing network traffic not intended for them.
- **Bottlenecks:** Slower edge switches in the backbone network slowed communication to the lowest common denominator.
- **Hardware limitations:** Infrastructure switches had high CPU levels, pushing them to near functional limits.
- **Inconsistent security:** Some switches lacked authentication encryption, and there was inconsistency among switch operating systems.
- **Lack of visibility:** Without network monitoring, teams couldn't quickly detect or solve issues, resulting in lost uptime.
- **PTP protocol absence:** Select switches lacked Precision Time Protocol (PTP) for reliable Common Industrial Protocol (CIP) motion support.
- **Physical media issues:** Cables were overtightened and coiled, compromising stability and opening the door to future network failure. Termination points were strained, cabinet cable management was poor and data transmission configurations were not optimized.

Top recommendations

Based on its findings, expertise and industry best practices, Belden recommended the following actions:

1. **Network segmentation:** Design the network into smaller, manageable subnets by control area to improve performance, limit unnecessary traffic, enhance security and contain outages to single segments.
2. **Proactive management:** Install network management software, such as Industrial HiVision, to ensure effective administration, operation, security and maintenance.
3. **Precision Time Protocol (PTP):** Implement PTP for precise timing, synchronizing clocks for systemwide accuracy and optimizing performance for devices requiring real-time motion control.
4. **Cable management best practices:** Use proper cable lengths and protect cables from strain and interference to prevent damage and service degradation over time.
5. **Prevent unnecessary traffic:** Design the network properly and maintain consistent configuration settings to eliminate traffic floods to unrelated sections.

Belden uncovered numerous correctable issues that, when addressed via its complete connection solutions, would significantly reduce downtime and network failures, ensuring optimal performance and reliability.

Belden's Network Assessment methodology

Belden's detailed findings and recommendations stem from its comprehensive and proven Network Assessment methodology. A team of Belden engineers and solution consultants evaluated the center's network across five key focus areas:

- Core OT Network (Data Integrity)
- Network Design
- Hardware Installed
- Data Transmission (Data Availability)
- Cable & Infrastructure
- Connectivity & IO Components
- Wireless & Remote Access
- OT-IT Interconnection (Data Confidentiality)
- Network Security
- Data Management & Visualization
- Management Tools

Belden's Network Assessment service empowers customers to boost operational efficiency by gaining insight into their data workflows and digital maturity. The process begins with a comprehensive understanding of the operation's workflow and processes, followed by an in-depth network audit. Findings are then benchmarked against the customer's desired state, concluding with a blueprint for a proven network solution that maximizes real-time OT data.





Belden Customer Innovation Centers: Breaking Down Barriers

to Innovation In today's fast-moving times, data and insights are more essential than ever. And with the convergence of OT and IT, organizations have an unprecedented opportunity to build the backbone required for operational success. As experts, we know getting there isn't easy. This is where the Belden Customer Innovation Centers can help. As connectivity and networking experts, we're dedicated to helping customers accelerate the design and implementation of robust, reliable and secure networks to deliver the data and insights that drive better business performance.



About Belden

Belden Inc. delivers complete connection solutions that unlock untold possibilities for our customers, their customers and the world. We advance ideas and technologies that enable a safer, smarter and more prosperous future. Throughout our 120+ year history we have evolved as a company, but our purpose remains – making connections. By connecting people, information and ideas, we make it possible. We are headquartered in St. Louis and have manufacturing capabilities in North America, Europe, Asia and Africa.

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