



A Path to Increased Capacity at a New Industrial Supply Center

 CASE STUDY

Background

A Fortune 500 industrial supply company experienced consistent network failures multiple times per day when it opened a new distribution center. This downtime halted automation and forced staff to fulfill orders manually, ultimately slowing deliveries and straining customer and supplier relationships. Revenue fell, and future sales were affected. All this when the new center was operating only at 10-20% capacity.

The supply company, which prides itself on quick delivery of a wide range of products, needed to ramp up capacity to 100%, but had concerns. They onboarded a global leader in material handling systems to fix the problem, who then brought on Belden to uncover any issues or misalignment with the facility's network.

Belden performed an in-depth Network Assessment evaluating the existing network's hardware, configuration, backup systems, scalability, and security posture. Following the assessment, Belden found multiple concerns that could lead to network failures, including lack of device segmentation, slower switches on the network backbone, outdated hardware, lack of authentication for security, lack of visibility for proactive system issue detection, and a lack of consistent and reliable protocols.

Background

Results

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Methodology

Belden Customer Innovation Centers

Belden's Network Assessment Service maps out how a Fortune 500 company can safely ramp up capacity to improve customer confidence

Results

The Belden team found that the site's network infrastructure was creating numerous operational challenges. Its flat design contributed to suboptimal network and component performance, magnification of network-related outages, no backup to keep systems online, a lack of scalability, and a poor security posture.

Belden identified actionable recommendations to address and resolve the primary causes of the new facility's system failures, delays, and poor network performance. When the recommendations are followed, the company can reliably and safely ramp up to 100% capacity without further harming customer confidence and supplier relationships.



Network Assessment Key Findings

Belden's proven and best-in-industry Network Assessment service leverages a series of proprietary tools to gather relevant network data and performance metrics that highlight the most critical areas to address. The assessment focuses on data integrity in the core OT network, its availability in data transmission, confidentiality between OT-IT, and data management and visualization.

Belden's assessment of the new facility uncovered several important findings contributing to its recurring network failures. Key issues included:

- **Excessive network devices on a single network.** With no segmentation between areas, all devices were seeing network traffic that was not intended for them.
- **Slower edge switches placed in the backbone network created bottlenecks.** When switches have different maximum port speeds, they slow all communication to the lowest (slowest) common denominator.
- **Hardware did not meet the performance requirements for the network layout.** For example, CPU levels were very high for the infrastructure switches, pushing them to near functional limits.
- **Some switches did not support authentication encryption.** Belden found a lack of consistency among switch operating systems.
- **Lack of visibility for network monitoring was hindering proactive issue detection.** Without network monitoring in place, teams were unable to quickly detect or solve network or component issues, resulting in lost uptime.
- **Lack of PTP protocol in select switches for reliable support of CIP motion.** Precision Time Protocol (PTP) manages time synchronization across components and is critical to support the effective operation of automated systems using Common Industrial Protocol (CIP) Motion.
- **The site's physical media installation opened the door to future network failure.** Cables were overtightened and coiled, compromising long-term stability. Termination points were strained, cabinet cable management was poor, and data transmission configurations were not optimized.



Top Recommendations

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

- 1. Segment the overall network.** A smartly designed network, segmented into smaller, more manageable subnets by control area, would improve overall network performance, limit unnecessary traffic, improve security posture, and contain outages to single network segments.
- 2. Implement proactive management.** Installing a network management software solution, such as Industrial HiVision, would contribute to effective network administration, operation, security, and maintenance.
- 3. Implement Precision Time Protocol (PTP).** For networks that require precise timing, PTP offers a way to synchronize clocks for systemwide accuracy to optimize network performance between the devices that require real-time motion control.
- 4. Employ cable management best practices.** Proper cable lengths and protection from strain and interference will limit damage to cabling over time and prevent service degradation due to cable failures.
- 5. Prevent unnecessary network traffic.** With a proper network design and consistent configuration settings, the site can eliminate traffic floods to unrelated sections of the network.

Overall, Belden uncovered numerous correctable issues that, when remedied, would mitigate the center's downtime and network failure issues.

Belden's Network Assessment Methodology

The detailed findings and recommendations delivered for this customer were the result of Belden's comprehensive and proven Network Assessment methodology. A team of Belden engineers and solution consultants evaluated the status of 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. We then benchmark the findings against the customer's desired state and conclude with a blueprint for a proven network solution that will make the most of real-time OT data.

Learn more at belden.com/network-assessment.



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.

Visit belden.com/cic to learn more.

About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia. For more information, visit us at belden.com and follow us on Twitter [@BeldenInc](https://twitter.com/BeldenInc).