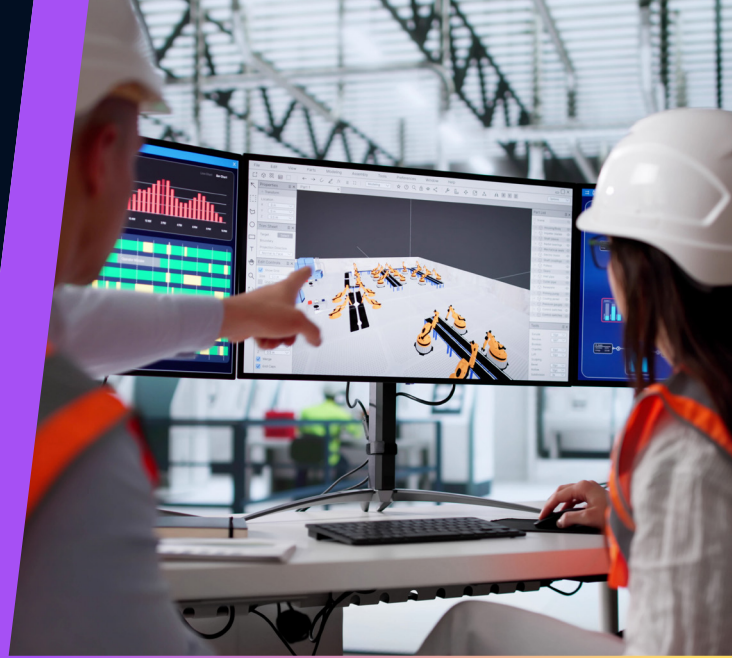


Scalable network infrastructure

Solution Brief



As automation demands accelerate, **OEMs** and **SIs** face a critical challenge: delivering network infrastructure that not only scales seamlessly from pilot projects to enterprise-wide deployments, but also inherently supports future upgrades.

Without meticulous upfront planning, the network embedded in a machine or integrated across diverse vendor technologies can quickly become an outdated bottleneck, turning essential performance or cyber-security enhancements into a daunting challenge for end users and a major impediment for both **OEMs** and **SIs**.



»» Scalable network infrastructure unlocks sustainable automation growth. Using industrial-grade technologies, it connects distributed assets and operations to enable real-time coordination, centralized management and consistent performance as businesses expand.

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Challenges that put network scalability at risk

Poor planning can cause capacity bottlenecks, integration delays and performance degradation that disrupt operations and limit growth potential:

- **Capacity limitations:** Architectures hit bandwidth limits during expansion, requiring complete redesign
- **Integration complexity:** Connecting new facilities or equipment becomes difficult with rigid designs
- **Performance inconsistency:** Maintaining reliable communication is difficult across distributed operations
- **Protocol conflicts:** Different automation systems struggle to coexist on incompatible networks
- **Cybersecurity gaps:** Expanding networks create vulnerabilities without proper security frameworks
- **Use case misalignment:** Discrepancies in use case priorities can lead to missed opportunities or inefficient operations

»» Scalable network infrastructure

Our solutions enable truly scalable network infrastructure designed for continuous growth, adaptability and use case attainment through:

- **Future-proof capacity planning** with modular, expandable architectures
- **Seamless multi-site coordination** via centralized management and monitoring of network systems
- **Consistent performance during expansion** through built-in redundancy and load balancing
- **Simplified integration processes** supporting diverse OT and IT protocols

Belden's complete connection solutions deliver unparalleled performance, security and operational efficiency across your automation offering, encompassing both industrial and enterprise level (graded) solutions.



3 steps to network infrastructure implementation

Our projects follow a clear plan to connect business goals to technical execution. By creating an implementation roadmap together, we guide you through every stage of your project, from mapping operational needs to designing robust infrastructure and sustaining performance over time.

> Align network design with operational KPIs

STEP 1

We translate your customers' productivity metrics, whether it's throughput targets, availability requirements or efficiency goals, into specific network specifications like bandwidth, latency and redundancy levels. Our infrastructure approach enables any current or future use case by unlocking your data's hidden potential before you even identify the perfect warehouse application

For example:

- **Multi-site coordination** → centralized management + monitoring
- **Rapid expansion** → modular architecture + plug-and-play integration
- **High availability** → redundant paths + automatic failover

> Design for success with infrastructure and integration

STEP 2

Taking the KPIs from Step 1, we design a robust and secure network architecture that's built to last. We meticulously plan for capacity, modularity, and security to ensure your infrastructure supports your ambition, both now and in the future.

- **Network capacity assessment:**
For brownfield projects, we analyze existing infrastructure identifying constraints and opportunities. For greenfield deployments, we design modular architecture supporting planned growth.
- **Modular infrastructure design:**
We help you choose topologies, switches and expansion strategies engineered for industrial environments without requiring infrastructure replacement.
- **Secure scalable systems:**
We implement segmentation, access control and cybersecurity frameworks supporting protocols like PROFINET, Ethernet/IP and Modbus TCP alongside IT standards.



We ensure reliable, consistent performance throughout growth by:

- Validating scalable design before and during deployment
- Confirming capacity headroom and expansion readiness
- Training teams on network expansion best practices
- Providing configuration and troubleshooting documentation
- Ensuring performance meets scalability and compliance requirements

>>> Customer success story

A conveyor system manufacturer needed to help its customer expand from one warehouse to five sites. The original network couldn't scale without complete replacement.

Belden conducted a comprehensive [network assessment](#) before implementing a modular, scalable design with built-in expansion capabilities and cybersecurity frameworks.



- Results:**
- Zero network-related delays
 - 40% reduction in integration time and built-in capacity for future expansion without infrastructure changes

>>> Ready to build scalable automation networks?

Request a consultation →



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