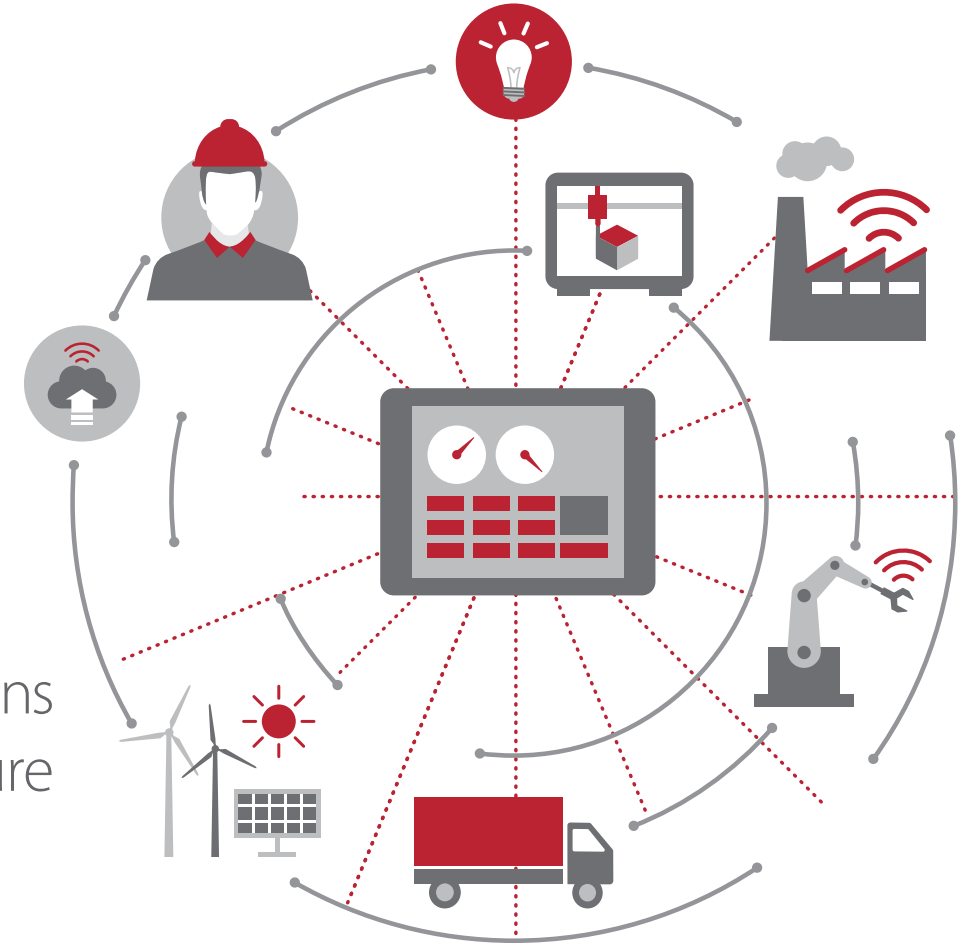
LISTEN.
THINK.
SOLVE.®

Information Infrastructure and Security

The value of smart manufacturing begins with a secure and reliable infrastructure



Allen-Bradley • Rockwell Software

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The Case for Connection

To be competitive, you must be connected. That is why industrial companies around the world are undergoing a digital transformation and moving toward smart manufacturing. By creating a unified network architecture – one based on the use of standard Ethernet and Internet Protocol (IP) technology – that leverages both the information technology (IT) and operational technology (OT) that make up the Industrial Internet of Things (IIoT), companies can:

- **Gain** real-time visibility into operations
- **Optimize** production assets
- **Predict** downtime issues
- **Improve** collaboration and innovation

Building the Infrastructure

The true value of a smart manufacturing can only be realized if a secure and reliable information infrastructure is in place. Unfortunately, the production systems that many companies are using today were not designed for connectivity. This has created islands of data and automation, which makes it more difficult for companies to understand their operational and cyber security risks.

Furthermore, the security-related concerns that are associated with greater connectivity have made some companies hesitant to begin the process of connecting their systems.

The good news: With the right focus and support, you can simultaneously manage risks, and address performance and security needs as you build and manage your information infrastructure.

A modern, secure and reliable information infrastructure connects your assets, people and information. It is central to everything you do. It is the source of endless opportunities for improving your operational performance.

Rockwell Automation and its Strategic Alliance Partners[1] can help wherever you are in the modernization process. We can:

- Provide **guidance** for designing and deploying a modern information infrastructure
- Supply the **network products** that you need to connect and get the most from your infrastructure
- Support you with **network and security services** to fill skills gap and help you design, deploy and manage your network infrastructure

A modernized infrastructure can cut information project timelines in half.

[1] Strategic Alliance Partners are members of the Rockwell Automation® PartnerNetwork™

A Journey Toward Connection

Smart manufacturing delivers value through tighter integration between industrial assets on the production floor and the rest of the enterprise value chain. This tighter integration requires a secure network infrastructure and accessible data that can be managed under a common system. It also contextualizes data from the production environment to turn it into information that can be shared.

There are four stages to deploying this level of connection:

1 **Assess and Plan:** A comprehensive assessment will establish to what extent your infrastructure can be upgraded, or if it needs replacing

2 **Secure and Upgrade:** Securely upgrade your network and controls to facilitate communications between plant-floor and enterprise systems in line with your company's business drivers and risk tolerance

3 **Manage and Analyze:** Define and organize data, and turn it into actionable information that can be more easily viewed and securely shared for continuous operational improvements

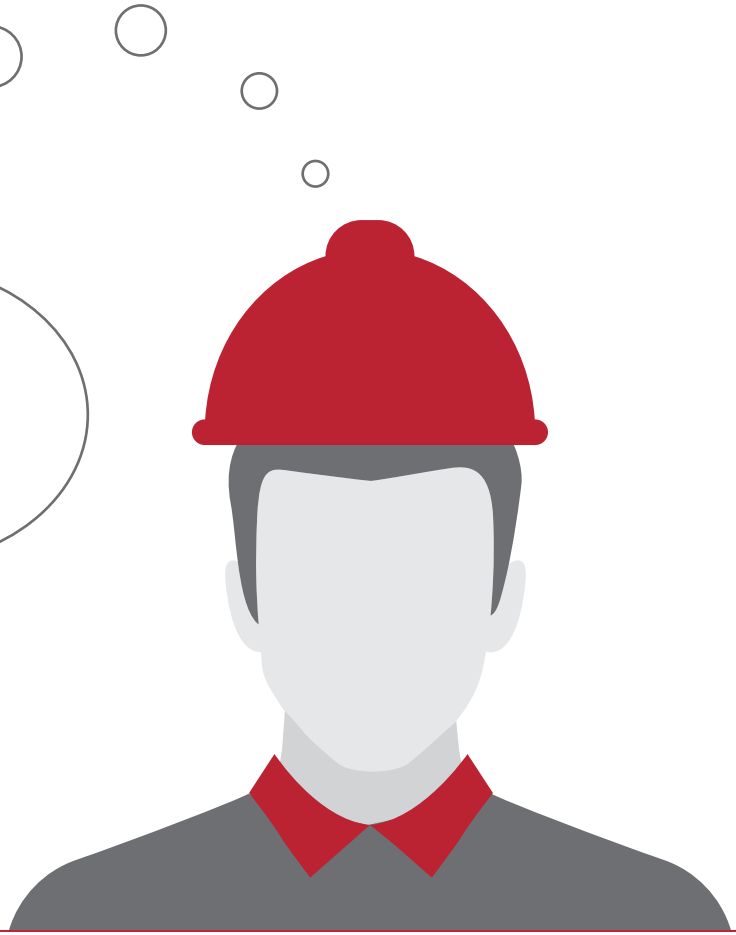
4 **Optimize and Collaborate:** Optimize your operations and drive collaboration across your teams, suppliers and customers

The process of creating a secure information infrastructure that can deliver on your needs is woven into these four stages. Each company's transformation will have its own unique considerations.

Mapping Your Journey

Every path to smart manufacturing will be unique, based on production goals, connectivity and security needs, and the production infrastructure currently in place in your facilities. But there are four key questions to ask as part of any plan:

1. What **performance goals** do I need to achieve?
2. How do I assess, design and implement the **secure infrastructure** that I need to achieve my goals?
3. How will I **protect and maintain** my infrastructure?
4. How can my infrastructure **help improve the performance** of my devices and system in a way that will continue to deliver on my performance goals?



What Are My Performance Goals?

Your production goals will drive your information infrastructure strategy.

These goals may require specific operational improvements, such as:

- **Gaining** real-time visibility into operations, including KPIs and asset performance
- **Optimizing** asset utilization and worker productivity
- **Improving** collaboration, whether it is between plants or with outside partners
- **Reducing** risks that are related to safety or the industrial skills gap

Your goals will drive your requirements. Some performance benefits producers can expect from an improved information infrastructure include:

- **Multi-discipline** application convergence
- **Improved** asset utilization
- **More** common toolsets, required skills, and training for your workforce
- **Standardized** IT security technology, policies, and procedures
- **Seamless** information sharing

Whatever your goals are, they will rely on a robust and secure Converged Plantwide Ethernet (CPwE) network architecture and should be formalized into a plan with a defined scope, timeline, budget and related security considerations.

> *"A common network architecture enabled us to get this plant operational in a matter of weeks instead of months."*
>
> - Food Manufacturer

> *"Having connected terminals allow us to respond more quickly to changing market conditions without compromising our way of running our terminals."*
>
> - Bulk Liquid Storage Company

> *"Now, we can produce hard data that demonstrates how our pumps and other components last longer. We can use hard data in warranty fulfillment. We can alert our customers when it is time to swap out air filters or come in for an engine rebuild. The possibilities seem endless."*
>
> - Heavy-Equipment and Machinery OEM

How Do I Assess, Design and Implement the Right Infrastructure?

Once you have defined your goals, you must next determine your infrastructure needs in order to reach those goals and maximize ROI. This process has three key phases:

1

Assess

Infrastructure assessments help determine if your networks meet your needs and align with industry best practices. Risk and vulnerability assessments also help uncover security gaps and prioritize necessary updates so you can improve your security posture and reduce risk.

2

Design

Your information infrastructure should be designed to:

- **Drive** optimal network performance
- **Mitigate** security risks
- **Increase** data availability and use
- **Provide** a foundation for future technologies

Pre-engineered solutions can help drastically reduce design time and risk for some aspects of your infrastructure. Infrastructure-as-a-Service (IaaS) can be supplied as a complete and installed system, reducing your capital expenditures.

3

Implement

Your implementation must meet the needs of both your IT technologies and OT environment. It should also aim to simplify and accelerate your infrastructure's deployment.

- Training and certification can help make sure workers have the right expertise for implementing networked industrial control systems
- Vendors can provide documented processes and on-site guidance, or even a turnkey rollout of the updated system

Automation vendors can help in any of these phases if a lack of in-house expertise or a skills shortage is limiting your abilities

Industrial Data Centers (IDCs) are pre-engineered solutions that provide all the hardware you need for a virtualized infrastructure. They can be less costly, less complex and less time-consuming than building a solution from the ground up.

Connected Services from automation vendors can help you:

- Shorten infrastructure project timelines by up to 50 percent
- Reduce future industrial IT CAPEX by up to 67 percent
- Reduce OPEX by up to 33 percent

Food Producer Accelerates Deployment of New Standardized Network Infrastructure

A name-brand food producer was experiencing significant challenges with its existing network infrastructure:

They were using shared networks for both their IT and OT assets, and they were experiencing recurring production issues because the networks were not meeting control-system requirements. Security and safety issues were arising from a lack of network segmentation. Furthermore, the company's IT vendor was unable to support the OT environment.

The food manufacturer turned to an automation support provider to standardize the OT infrastructure and ease these challenges.

The project began with network assessment and design. The vendor captured the control system's requirements, reviewed each site for physical and logical network issues, and created a standard architecture approach - which was based on industry best practices.

The vendor then developed a prioritized remediation roadmap. This involved creating a plan to budget and timeline remediation efforts for the manufacturer's production sites across North America.

Finally, the vendor simultaneously implemented the new infrastructure across multiple production sites to shorten the project's timeline.

The implementation resulted in a network architecture that was standardized and more supportable than its previous iteration. While the manufacturer estimated that conducting the project on its own would take three to five years, the vendor completed the project in just 18 months.

How Will I Protect and Maintain My Infrastructure?

Enlisting a traditional IT company to support your information infrastructure can be risky, as IT vendors typically do not have enough expertise in industrial environments or plant-floor priorities to meet requirements for the quick response times that minimize downtime.

But enlisting the support and counsel of industrial vendors who understand the needs and demands of OT environments is a valuable means of supporting blended IT/OT applications.

Protection That's Right for You

Support is available based on your specific needs.

- **Cyber Security Services:** As the number of industrial security threats continues to rise, you need to take a closer look at risks to your environments. A proactive approach to industrial cyber security spans the entire attack continuum: from identifying critical assets and protecting against potential threats before they happen, to detecting them if and when they occur, and to ultimately having a plan for response and recovery should a threat be realized.
- **Threat Detection and Response:** Beyond monitoring, additional security services can detect and alert operators of irregularities and potential threats in real time. Depending on the criticality, the team can react to the threat based on a response plan to help mitigate the risk that is associated with the anomaly.
- **Remote Support & Monitoring:** A vendor can monitor your infrastructure 24/7. If they detect an issue, they can either notify you and suggest a response, or remotely act to remedy the problem directly. Guaranteed response times can be built into the service to ensure actions are taken within a predefined time frame.

Manufacturer Makes the Switch to OT Support

A major food producer that deployed Ethernet and managed switches on its plant floors struggled with the support provided by its traditional IT vendor. The vendor couldn't respond with the speed required to keep production moving.

As a result, the manufacturer switched to an automation vendor for support. The new vendor set up monitoring of more than 400 switches, which included alarm profiles for eight key parameters in every switch. SLAs established alarm-response times of 10 minutes.

Since making the switch, the manufacturer has seen a significant improvement in uptime and a decrease in downtime events.

How Can My Infrastructure Help Improve Asset and System Performance?

Your goals may also require the implementation of new capabilities that are related to system or asset-performance management.

With a secure and robust information infrastructure, you now have the connectivity that is required to tap into strategies that can boost your bottom line. Large amounts of data lives within your production assets, but it needs to be transformed into useful information to drive performance improvements. Evolving services can help you do just this:

- **Asset reliability:** Services exist today that combine a mix of industry expertise and electrical automation controls knowledge with continuous improvement processes, reliability techniques, and asset intelligence systems to help drive plant productivity, improve asset reliability over your equipment lifecycle, and streamline maintenance activities.
- **Preventive Maintenance:** Service agreements can keep your critical assets running at peak efficiency. From identifying pending system failures to recommending which components should be repaired or replaced, these services can help mitigate the unnecessary repairs and associated costs that occur with most time-based preventive maintenance programs.
- **Remote Monitoring and Analytics:** Monitoring services can reduce Mean Time To Repair (MTTR) by 76 percent and reduce the cost of managing your infrastructure. Analytics services can help you predict machine failures, reduce Mean To Between Failure (MTBF), and automate maintenance activities to reduce downtime by up to 30 percent.

Such services also have value beyond day-to-day process improvements and issue resolutions. You can use access to insights to optimize your larger operations and transform how you do business, reduce downtime recovery, help integrate your supply chain, design material orders to automatically replenish after a certain number is met, or even build customized dashboards to view production data and asset or system health that is most important to your specific needs.

> *"We've seen how the right control and information infrastructure can turn data into information. Contextualized, that information becomes knowledge that improves accountability and collaboration."*
>
> - Equipment Supplier

> *"Our new remote capabilities have significantly reduced troubleshooting time and costs."*
>
> - Supplier of Rail-maintenance Machinery

Security as an Enabler

Build a Secure, Robust, Future-ready Network for Your Connected Enterprise

ASSESS DESIGN IMPLEMENT VALIDATE MONITOR

A holistic approach to help you design, deploy and manage your network infrastructure.

For more information about the Rockwell Automation portfolio of Services, visit **rok.auto/services**

Rockwell Automation, Inc. (NYSE:ROK), the world's largest company dedicated to industrial automation, makes its customers more productive and the world more sustainable. Throughout the world, our flagship Allen-Bradley® and Rockwell Software® product brands are recognized for innovation and excellence.

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Services vary by region.

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