



# GET CONNECTED:

6 IoT Pillars to Enhance Your Network



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# OVERVIEW

The Internet of Everything (IoE) brings together people, processes, data and things to make networked connections more relevant and valuable than ever before. It turns information into actions that create new capabilities, richer experiences, and unprecedented economic opportunity for organizations. One of many trends that are combining to make the IoE possible is the Internet of Things (IoT). This technology is coming to life through smarter, safer, and more connected environments, allowing businesses to increase operational efficiency and enable new services.

IoT technology provides real-time connectivity throughout the manufacturing world. While automation products have provided extraordinary improvements in speed, quality, and machine uptime, the IoT has a different focus. It is meant to provide right information at the right time. It works to help businesses make better decisions and improve the use of increasingly scarce human resources like control engineers and technicians.

To continue being successful in today's industrial world, companies should embrace the technologies and software in this era of IoT. Companies across several industries, including manufacturing, utilities, oil and gas, transportation, mining, and public sector, can implement six IoT pillars to effectively manage an operation with increasing network connections.

## 6 IoT Pillars to Enhance Your Network



NETWORK  
CONNECTIVITY



FOG  
COMPUTING



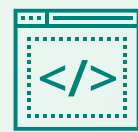
SECURITY  
(CYBER &  
PHYSICAL)



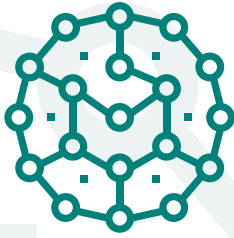
DATA  
ANALYTICS



MANAGEMENT &  
AUTOMATION



APPLICATION  
ENABLEMENT  
PLATFORM



PILLAR 1:

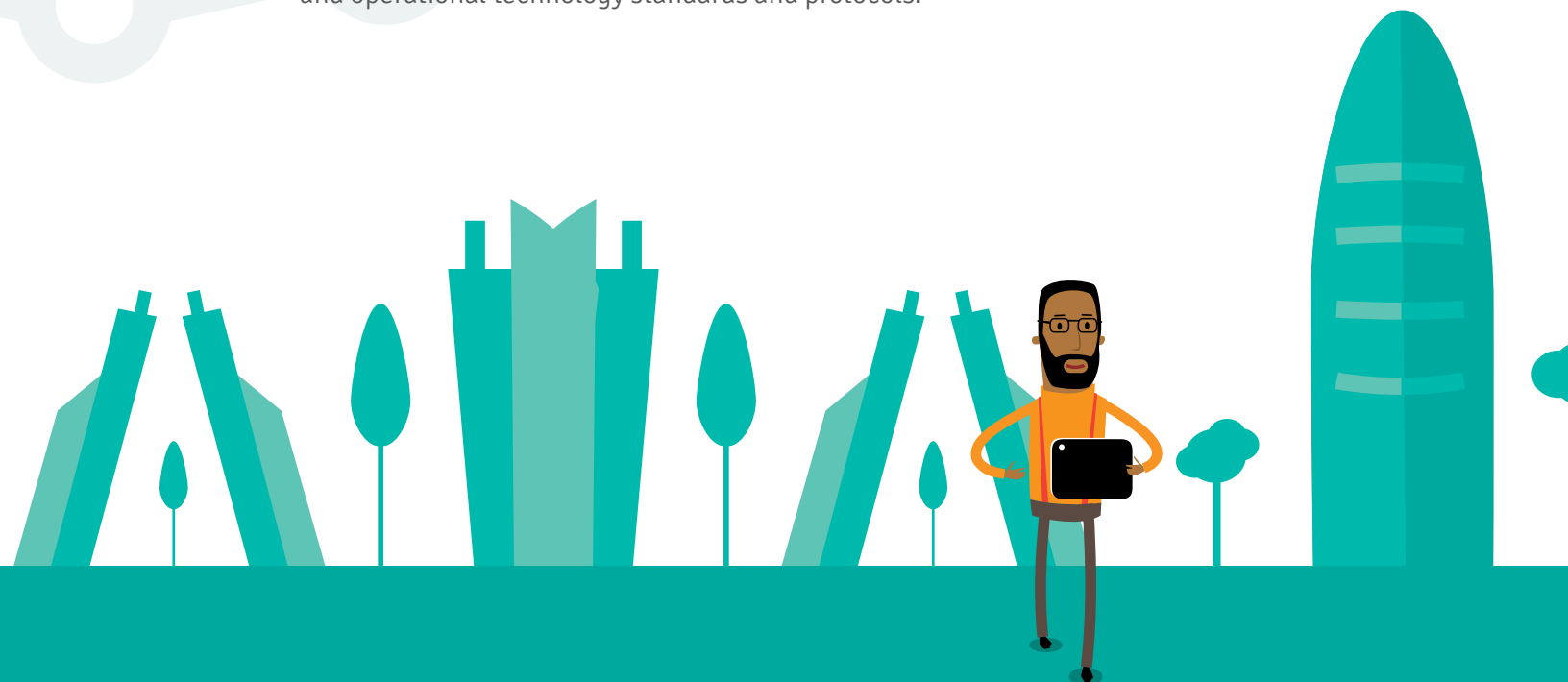
# NETWORK CONNECTIVITY

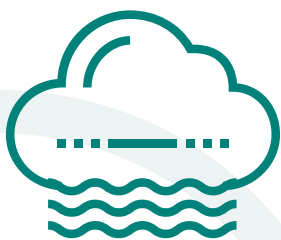
## NEW IoT REQUIREMENTS

Deploying IoT will result in new and more vigorous demands on your network. Applications and services such as high-speed wireless, high-definition IP video services, and others require high-bandwidth connectivity. Extremely low-latency applications, such as high-speed motion controls, also demand high-speed connections. You will need a flexible and scalable network infrastructure to easily deploy your applications from the cloud all the way to the edge with fog computing, and to serve the thousands of devices joining the network. You also must secure and manage your IoT network infrastructure.

## BENEFITS OF NETWORK CONNECTIVITY

- **Resilience at scale:** High availability facilitates network-wide resilience as you scale your networks with millions of new endpoints and applications.
- **Integrated security:** Use a network-as-a-sensor approach to integrate cybersecurity throughout the network, maximizing security visibility and control.
- **Converged networking:** IoT networking solutions support the disparate needs of IT and operational technology standards and protocols.





PILLAR 2:

# FOG COMPUTING

## NEW IoT REQUIREMENTS

Cloud computing helps organizations take advantage of economies of scale to streamline operations, reduce costs, and increase the flexibility of application development and deployment. However, IoT is driving new requirements to control, monitor and analyze billions of smart objects, as well as to process massive amounts of data and transform it into actionable business intelligence in real time. In the IoT era, the cloud model alone cannot meet the new requirements for low latency, reduced bandwidth, high reliability, and efficient and private data processing.

## BENEFITS OF FOG COMPUTING

- **Unified infrastructure purpose-built for IoT:** IoT devices may be distributed over large geographical areas and harsh environments. A network of fog nodes with a unified platform and wide range of form factors can collect, store and analyze data as close to the source as possible.
- **Ability to manage data from the cloud to the fog:** Organizations can efficiently manage the volume, variety and velocity of IoT data. Apply rules to reduce, control and standardize data produced by IoT things. Critical, time-sensitive IoT data is collected, stored and analyzed at the network edge, while less time-sensitive data is sent to the cloud for long-term storage and historical analysis.
- **Redundancy and failover:** Employ high-availability technology, such as switches, routers, and UCS servers, to facilitate network-wide resilience. This will benefit organizations as they scale their networks with millions of new endpoints and applications, as well as the geographically dispersed switches, routers, and wireless access points needed to support them.





PILLAR 3:

# SECURITY (CYBER & PHYSICAL)

## NEW IoT REQUIREMENTS

With converged IT and operational technology networks, the IoT significantly expands the breadth and depth of security challenges. Billions of new connected objects dramatically increase the number of potential attack vectors. The wide variety of objects also increases the diversity of threats facing businesses. More sensitive data flowing through devices with weak or no security, located in insecure places, increases the risk of a security breach. Because IT and operational technology environments are vastly different, the same security policies cannot be applied to both. This makes remediation more complicated and requires a different approach to security. All of these challenges combined have a significant impact on your organization's ability to secure networks and data.

## BENEFITS OF CYBER AND PHYSICAL SECURITY

- **Pervasive security solution:** This can be delivered throughout the extended network. Security products work together to produce robust, actionable security intelligence in real time, increasing your overall security posture with little or no human intervention required.
- **Unique policies for IT and operational technology:** Applying security policies is different for IT and operational-technology environments. That's why security solutions are flexible to deliver differentiated policy enforcement across the extended network for organization-driven security policies and response.
- **Actionable security intelligence:** Use application programming interfaces (APIs) to develop applications that produce comprehensive, actionable security intelligence across the extended network.





PILLAR 4:

# DATA ANALYSIS

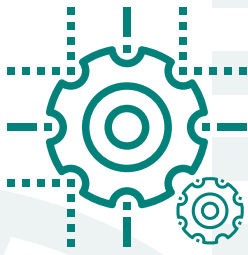
## NEW IoT REQUIREMENTS

IoT comprises billions of connected devices that are creating more than two exabytes of data every day. But to truly provide value, this data must be rapidly processed and transformed into actionable intelligence. Different types of data also need to be handled, stored and processed differently, depending on the specific needs of each. This is putting more pressure on network infrastructure and increasing the need for enhanced hardware and software capabilities to efficiently manage more data.

## BENEFITS OF DATA ANALYSIS

- **Infrastructure for real-time analytics:** Integrating network, storage and compute capabilities enables analytics to run directly on the fog nodes for real-time collection, storage and analysis at the network edge.
- **Cloud to fog:** Data analysis provides a pervasive analytics infrastructure that powers IoT and business analytics capabilities from the cloud to the fog. A robust set of APIs and advanced algorithms allows you to apply business rules to automatically determine which data remains in the fog for real-time analytics and which is sent to the cloud for long-term storage and historical analysis.
- **Comprehensive analytics:** You can integrate IoT analytics with analytics for the IoE. You can even apply your own analytics for a comprehensive view of your organization.





PILLAR 5:

# MANAGEMENT & AUTOMATION

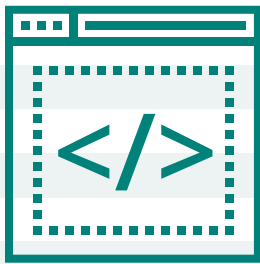
## NEW IoT REQUIREMENTS

IoT greatly expands the size and diversity of the network to encompass the billions of smart objects that sense, monitor, control and react. Networking these previously unconnected devices can deliver unparalleled levels of business and operational intelligence, but operational environments also comprise multiple disparate functional areas. Each of these areas has distinctive requirements, including the need to track specific metrics. Operational technology systems can vary widely by industry, as well as by function in a given industry.

## BENEFITS OF MANAGEMENT AND AUTOMATION

- **Customizable management platforms:** Choose from a wide range of specialized management platforms, each built to cater to specific functional needs.
- **Network elasticity:** Scale up or down as required by organizational needs and functional requirements.
- **Policy automation and compliance:** Maintain regulatory compliance by automating existing policies across the IoT environment.
- **Integrated security:** Provide your company with a new level of secure manageability and control of IoT devices and applications. Implement solutions that automate and enforce secure access to network resources throughout the extended network and ensure that sensitive data is accessible only to authorized personnel.





PILLAR 6:

# APPLICATION ENABLEMENT PLATFORM

## NEW IoT REQUIREMENTS

Digitization of objects and edge infrastructure is enabling organizations to control, monitor, analyze and service smart objects through software and applications. Creating and deploying applications that run on mobile devices is quickly becoming the standard for interacting with smart objects. Organizations are also creating more innovative product offerings for connected industrial objects. Machine-as-a-service and product-as-a-service are new offerings that are changing the business models of both the makers of smart industrial products and the industries that use them. These applications are offered as software-as-a-service (SaaS). They follow the cloud models of SaaS running on platform-as-a-service (PaaS) over infrastructure-as-a-service (IaaS).

## Benefits of Application Enablement Platforms

- **Ability to run applications in the fog:** Using APIs allows fog nodes to host applications. This ensures that applications can be close to the objects they need to monitor, control, analyze and optimize.
- **Elasticity with resilience:** UCS servers offer elastic computing, networking and storage resources for applications to have a flexible and elastic footprint. These can be deployed in all industries to rapidly meet their custom requirements.
- **PaaS offerings:** The fog PaaS and IoT PaaS are planned to extend the cloud development model to the fog. The traditional cloud SaaS, PaaS and IaaS models are now possible on fog nodes. You can take advantage of pay-as-you-go consumption models for objects, machines or products just as you can for software products.
- **Simplified management:** Manage multiple instances of applications, update applications remotely, and allow applications from different development environments and in different languages to run on the same fog node.





# NEW INNOVATIONS THROUGH THE IoT

The IoT is introducing businesses to a bright future of countless opportunities. But the benefits are also met with challenges related to complexity, vast amounts of data, and more details to manage. These six pillars will help you overcome these roadblocks and enable you to:

- Bridge IT and operational technology to give your organization a scalable network infrastructure
- Understand, act on, and protect the data you collect
- Secure your entire technology ecosystem—from cloud and fog networks, to the data being shared between servers and devices

## HOW YOU BENEFIT

- Improve product quality and operational effectiveness by easily connecting IT and operational technology. Use analytics and open APIs to control, monitor, analyze and optimize performance.
- Enhance physical security and cybersecurity with real-time intelligence from network-wide devices, video surveillance, and access control systems.
- Create new revenue streams by using pervasive IoT analytics to accelerate new service delivery and enhance product quality with data privacy.
- Lower operating expenses by using a common network to increase uptime, react quickly to changing market conditions, and reduce energy consumption.

The IoT enables industry-specific solutions for various markets, including **manufacturing, oil and gas, utilities, transportation, public safety, and smart cities.**

**Contact your WESCO rep today** to discuss how your business can take advantage of this pertinent technology.



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