

Midokura for Industry 4.0

THE NEXT GENERATION NETWORK FOR INDUSTRIAL ENTERPRISES



The Internet of Things is a rapidly growing trend that is transforming the way companies and entire industries compete. From manufacturers using plant-floor robotics to retailers with global warehousing and distribution networks, more and more connected devices are being deployed to collect, store, and communicate data from the environments in which operate. This includes new sensors, as well as gateways that interact with existing equipment such as programmable logic controllers (PLC). At the core of this revolution is the need for reliable and secure connectivity.

“IDC’s research found that, on average, organizations that undertook network virtualization initiatives reduced the impact of unplanned downtime by 84%.”

Industrial enterprises are being challenged to drive value with complex network of systems, devices, teams and processes at an ever-increasing speed and scale. As the pace of business continues to accelerate, for organizations that can execute based on informed decisions, this translates into a distinct competitive advantage. Industrial IOT is expected to drive \$1.9 trillion in productivity improvements by 2020 (as measured by direct increase in output per unit cost enabled by IOT and reinvestment in productive assets), according to AT Kearney.

The primary reason for connected systems, or “things,” comes down to one imperative - use the insights to make data-driven decisions and often, data analysis can help organizations realize new functions leading to new revenue streams.

Use of Cloud Networking to Interconnect Devices

Connected gateways that typically connect sensors, actuators and motors need to be adopted for industrial IOT applications. The myriad of manufacturers and machine types makes adoption cost prohibitive. Any change in the manufacturing process can present unpredictable risk that may affect machine uptime. One alternative is to retrofit the systems with data loggers and I/O modules to provide connectivity and edge processing to simple field devices without any architecture change.

Connected I/O modules can capture the data at the sensor level, aggregate monitoring data from the automation component (such as the cameras, pumps, or robots) and then transfer the data to the IT system without impairing the performance of the control network.

Midokura for Industry 4.0 is a next generation cloud networking solution purpose-built for industrial enterprise applications and designed to connect, secure, and deliver insights from every layer of your business.

Challenges of Securing Connected Devices

Today's industrial enterprise organizations understand the role IoT can play in improving products and services, increasing productivity, and accelerating time to market, while reducing costs. Many have already implemented thousands of connected devices throughout their manufacturing plants, warehousing operations, distributions centers, and supplier networks to take advantage of these opportunities. However, enterprises are becoming aware of the security risks that connected devices can pose, opening their previously locked-down networks to intruders that can potentially disrupt corporate resources. The proliferation of connected devices that control plant processes or machinery, direct connections between control systems and enterprise operations, combined with mobile and wireless connectivity, makes securing these industrial networks ever more challenging.

"Human error accounts for 35% of network downtime, making it the largest cause of outages."

- ZK Research

"An hour of downtime in a factory can cost up to \$300,000."

- CB Insights



Midokura for Industrial Enterprises

The Midokura for Industry 4.0 solution delivers the key capabilities required to easily connect, secure, and manage the growing number of connected devices (sensors, gateways) and technologies.

Using Midokura, Industrial Enterprises can now effectively leverage “Internet Connectivity” in industrial networks for competitive advantage, while achieving operational efficiency.

The solution can help your organization:

Improve security

Midokura implements software-based, network segments that help isolate users and devices from unauthorized access through fine-grain security policies that are applied close to the source of traffic, at the device level and even down to the virtual port level.

Automate the onboarding of new devices

Security attacks in Industrial IOT underline the importance of being able to view, manage and update IoT devices and firmware after the point of manufacture.

Once connected to the Midokura solution, pre-defined security and flow policies can be automatically assigned to the new device, these policies dynamically follow the device wherever it is connected on the network.

Easily manage thousands of devices

One of the greatest challenges to managing the volume of devices on an Industrial network is device mobility. Not only does Midokura provide the location and status of all on-boarded devices in the network, it also ensures that policies remain intact with device migration. For example, if a sensor has been moved to another gateway, Midokura ensures that the same policies, such as QoS, would be applied to the traffic flows.

Ensure QoS guarantees

There are significantly more types of Industrial IoT devices and different types of networks than enterprise IT devices. Midokura can prioritize traffic based on device type and traffic types. It can implement a service-level guarantee like QoS (Quality of Service) originating from specific devices and traffic types.





Industrial Networking Architecture for Industry 4.0

Midokura for Industry 4.0 is a distributed intelligence network where network processing and security is performed at the edge, whether it is a sensor, gateway, or switch. Midokura's cloud networking and advanced analytics solution provides full stack management of the IIoT infrastructure and offers the simplicity of remote management from the cloud.

Network processing at the edge gives Midokura the unique capability to continue its critical functions even when a particular node loses network connectivity. This is important for industrial environments where downtime can be cost-prohibitive.

Using Midokura for Industry 4.0 can bring a higher level of resilience to the network control plane and maintain consistent policies and critical functions for the industrial network. Midokura's comprehensive cloud networking solution for Industry 4.0 consists of five components:



Internet-connected Sensors - The Midokura solution can be deployed into internet-connected sensors, providing logical device control and enabling detection of anomalies without affecting the manufacturing process. Midokura can integrate with the devices' processing software to provide meta data (e.g. device id, camera type, location) to other parts of the network.



Industrial IOT Gateways - IOT gateways are used to aggregate sensor data, translate sensor protocols and process sensor data before forwarding onward - and more. The Midokura for Industry 4.0 solution can be used to augment IOT gateways and edge nodes. It can sense the status of the devices connected to the specific gateway, enforce traffic policies and detect malfunctions or anomalies.



Networking Switch Fabric - With broad support for industrial switches, Midokura solution can provide end-to-end network visibility and in-depth traffic analysis across the physical and virtual network.



Remote Management in the Cloud - Remote Management in the Cloud offers sophisticated management capabilities, with the simplicity of a software-as-a-service model. IT and OT professionals have the option of anytime access to examine their network status and analyze traffic flows. There's no cost switching when using Midokura's SaaS solution, because the Midokura network management solution is fully functional, even if the organization decides to unsubscribe from the SaaS analytics solution.



MidoNet Manager - The MidoNet Manager provides graphic management of all devices registered by Midokura. The software can be used to automate provisioning and manage a multiservice network of switches, routers and connected devices. Networking profiles and policies can be propagated throughout the industrial network, providing end-to-end visibility and control. From the intuitive graphical interface, IT and OT professionals can receive insights into live and historical flows for troubleshooting and root-cause analysis.

Midokura Industrial Solution

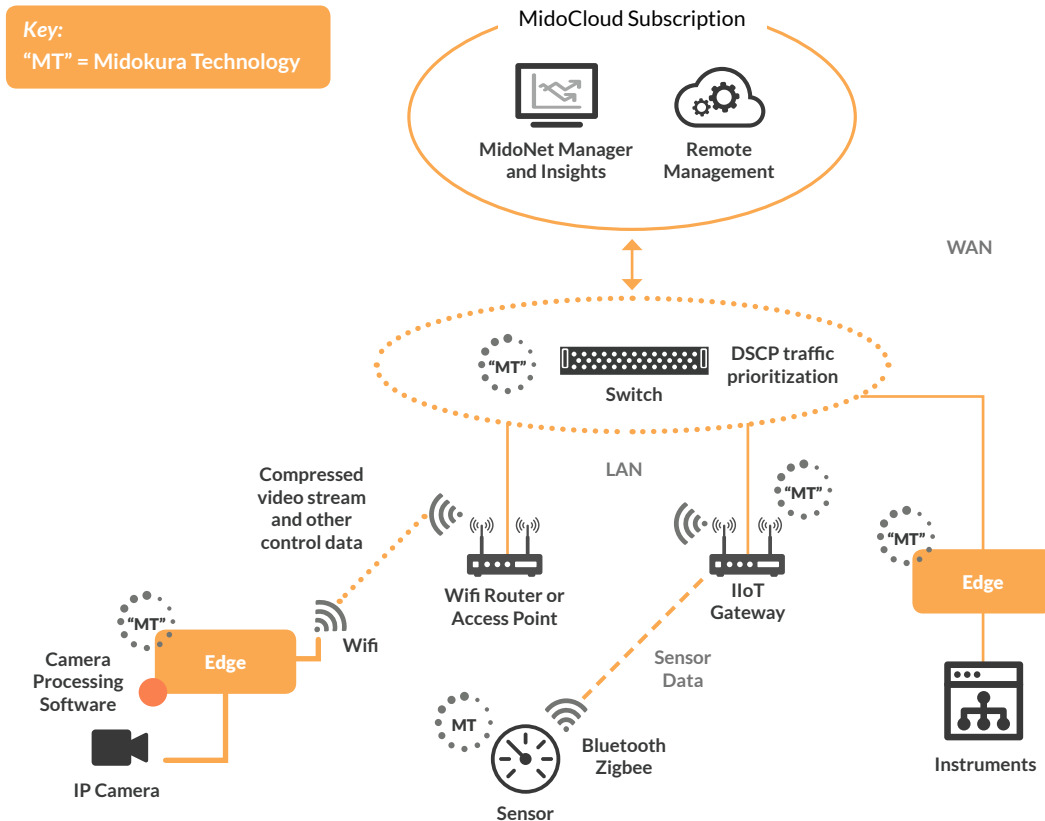


Figure 1: Midokura's Cloud Networking Solution provides end-to-end visibility and network analytics for industrial enterprises

Benefits of Midokura

With the rapid pace of innovation and digital transformation, Midokura is poised to help organizations achieve a significant competitive advantage:

Deliver Innovations Quickly

Deploying thousands of connected devices faster and more securely can be daunting and pose a challenge to existing network designs. Midokura for Industry 4.0 provides the simplicity and flexibility for any organization that needs to connect, secure, and manage the ever-growing number of connected, sensor-enabled devices.

Achieve Greater Efficiency and Lower Costs

The concept of industrial IOT promises greater efficiency, higher productivity and cost reductions, however, inefficient architectures can prevent organizations from embracing these opportunities. Because of its software-based networking architecture, Midokura is adaptable to existing network designs, and can be deployed onto more points on the network with minimal impact.

Better Security

Existing OT equipment, such as PLCs were designed to be deployed on proprietary, locked down networks. Newly deployed devices, such as connected sensors or IoT gateways bring new risks that these networks were not prepared for.

Midokura prevents conventional security breaches with anti-spoofing rules by segmenting the network, thus limiting network access to sensor-enabled devices like (gateways and PLCs). More importantly, Midokura can ensure consistent policies are applied across the network.

Strategic Focus

Bringing in any new technology can introduce operational tasks such as software updates and hardware maintenance and IOT technology is no exception. Many IT and OT organizations typically spend too much time performing manual tasks – known as “just keeping the lights on.” Midokura for Industry 4.0 lets IT and OT professionals cut the time spent on repetitive tasks and maintenance so they can focus on strategic endeavors for the organization.



Why Midokura?

Built for Industry 4.0

Unlike traditional networks that were built for static environments, Midokura was built from the ground up to meet the specific demands of modern industrial IOT environments. Midokura aggregates actual network data from all your connected devices, systems, processes and people, and delivers insights the organization can use to improve operational efficiency.

Tested and Proven

Midokura has been deployed in some of the most demanding business environments around the globe, and the software has been vigorously tested by a large community of open source users.

A Seamless Experience from the Factory to the Cloud

Midokura has designed the experience of bridging the information technology and operations technology perspectives from the ground-up. The seamless experience with Midokura begins with the onboarding application, through to the initial pilot, and to day-to-day product operations, all designed with customer-centricity in mind, with a strong focus on usability, continuous improvement and simplicity.

Midokura is focused on providing end-to-end, data-backed visibility through the industrial network, from the factory to the cloud, delivering insights into every aspect of the business.

About Midokura

Midokura is the leader in Cloud Networking solutions for Industry 4.0 applications. Drawing on our pioneering expertise in open source network virtualization, Midokura has developed the industry's first cloud network, built from the ground up to meet the needs of industrial enterprises that are investing in Industry 4.0 automation as a competitive advantage.

Using Midokura's Cloud Networking solutions, these organizations can now easily connect and secure distributed devices, systems and processes throughout their entire business, and rapidly deploy and scale network resources as physical infrastructure and business needs change.

From the factory floor to the warehouse to the enterprise data center, Midokura's Cloud Networking solutions offer full-stack visibility and actionable insights that reduce costs, increase productivity, and drive intelligent decision making at every layer of your business.

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