WHITE PAPER

Enabling Mobility in Network Monitoring

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Introduction

Engineers face different challenges during each stage of the industrial network management lifecycle. During the installation stage, manual device configuration and testing is time consuming and prone to human error. During the operation stage, engineers are required to monitor network status in real time and minimize system downtime. During the maintenance stage, engineers often face long labor hours doing firmware upgrades or configuration changes on multiple devices. During the diagnostics stage, being able to quickly identify where critical network issues occur is essential. To help minimize the total cost of ownership, engineers are always on the lookout for new industrial network management tools that can help them overcome all of these challenges.

Industrial network management software is usually installed in the control room, or is sometimes integrated with an existing SCADA system. But when you're out of the control room or on the move, you could miss important messages such as network changes or errors, and fail to respond quickly enough. With the number of devices connected to industrial networks continually increasing, the ability to monitor and maintain your network—anytime, anywhere—is becoming more crucial than ever before to ensure that your operation is reliable and runs smoothly.

Current statistics show that globally, the number of mobile users is now greater than the number of desktop users, and we can expect this global trend to expand into the industrial automation workplace. In fact, since engineers joining the workforce today are accustomed to using mobile devices in their private life, it is only natural that they would want to use the same devices to simplify their work life.

In this white paper, we discuss the challenges in industrial network management and show how a mobile monitoring tool can help keep you informed of network status, even when you're on the move. In addition, we'll share experiences we've had helping customers from the rail industry reduce system downtime by utilizing the right mobile tools to quickly respond to network changes.

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Moxa is a leading manufacturer of industrial networking, computing, and automation solutions. With over 25 years of industry experience, Moxa has connected more than 30 million devices worldwide and has a distribution and service network that reaches customers in more than 70 countries. Moxa delivers lasting business value by empowering industry with reliable networks and sincere service for automation systems. Information about Moxa's solutions is available at www.moxa.com. You may also contact Moxa by email at info@moxa.com.

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Major Challenges in Industrial Network Management

Managing a network can be a complex and often extensive operation, especially for industrial networks, and being able to monitor and manage devices is essential to ensuring that the network is running smoothly. However, with evolving business operations, administrators are often on the move, making it difficult to stay informed of or quickly respond to status changes in the network.

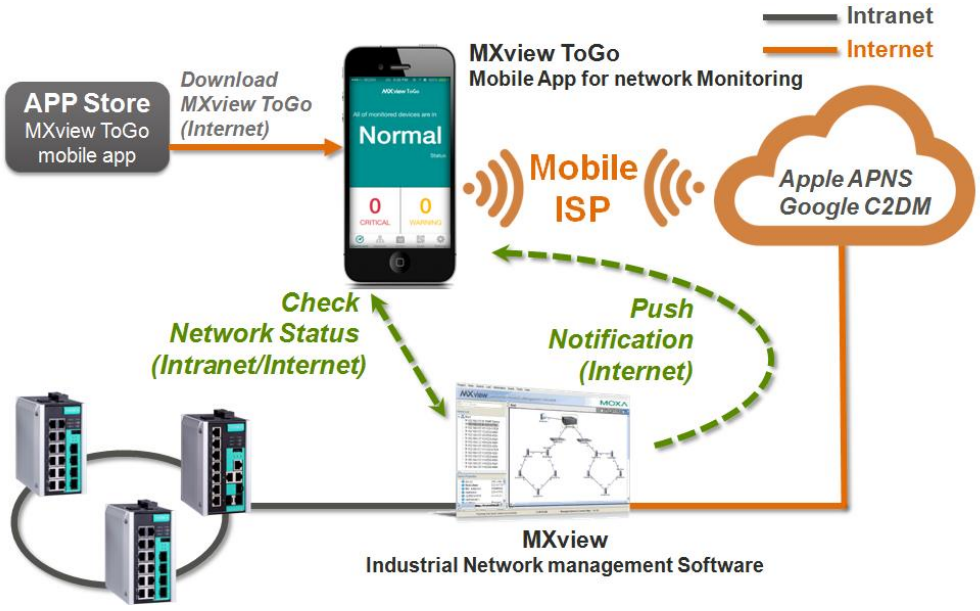
When doing regular maintenance or troubleshooting at a field site where many network devices are deployed, engineers often face the daunting task of identifying specific devices hiding among a multitude of identical devices. Even with proper labeling and hardware placement, it can still take time to obtain the status information of a specific device onsite. As a result, faulty devices cannot be swapped out quickly enough to ensure that your operation runs smoothly.

With the development of mobile networking tools, engineers can now improve operational efficiency and maximize network availability.

Why Mobile Network Monitoring?

Like their enterprise counterparts, automation engineers can now access their operational applications from mobile devices by installing an appropriate network monitoring app. The mobile network monitoring app is usually a client software tool designed to work in tandem with the network management software installed in the control room.

The following diagram illustrates how a typical mobile app for network monitoring works to keep users informed of their network's status. The app connects to the software server over an intranet or the Internet to access network status in real time. In addition, if the network is updated, the network management software server will send a push notification via the Apple cloud or Google cloud to alert the app user.



A mobile phone app for network monitoring usually works as the client of the main network management software. Through the app, engineers can access the network status anytime, anywhere.

How Mobile Networking Empowers Network Operators

A mobile network monitoring app should support the following three features to ensure that monitoring a network from a mobile device is worth the effort.

1. **Sending Real-time Alerts**

   With a mobile network monitoring app, administrators can receive notifications of events pushed to their mobile devices. These real-time alerts allow administrators to take action immediately in response to critical events, even when they are out of the control room. For example, once an alert is received, they can contact maintenance engineers to do onsite troubleshooting and consequently reduce system downtime.

2. **Allowing Instant Network Checks**

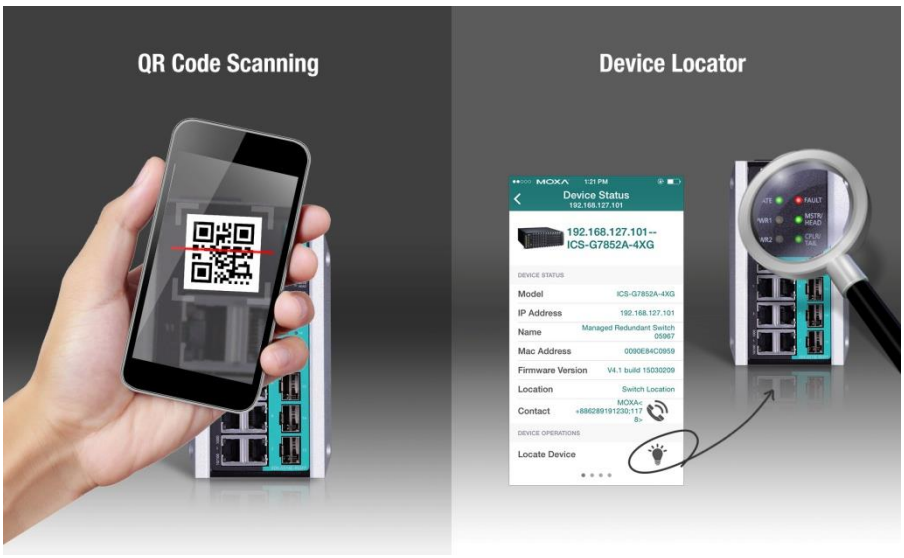
   A mobile network app allows users to check the status of a network in real time. After you log in to the app, it will inform you whether or not the network is operating normally. The app will also display detailed information of a specific network device, keeping network administrators in the know while they are on the move or out of the control room. Information, such as a device's IP address, MAC address, location, and firmware version can be viewed from the app. For example, if an engineer receives an alert for a link-down event, they can readily access the information needed to determine which port is faulty.

3. **Finding Field Devices Quickly**

   In certain scenarios, it could take a long time to manually search for a specific device from racks and racks of similar devices. Moreover, if automation engineers need to access the parameters or settings of a specific device for onsite troubleshooting, they would need to physically connect the device to a laptop computer using a web console or CLI (command line interface), or physically read the MAC address or serial number printed on the device, and then check the information with the computer. Either way, the engineer could end up spending much more time than would be necessary if the same information could be checked using a mobile device.

   To make the task easier and more efficient, mobile network monitoring apps now usually come with a function that allows users to quickly find a particular device, and even view detailed device information.

   For example, each network device could be encoded with a unique QR code based on its MAC address. If the mobile phone app supports a built-in QR code scanner, engineers can scan the device's QR code onsite to pull up information about that device, without needing to boot up a laptop computer or entering a device ID manually.



With Moxa's MXview ToGo app, users can not only scan the device to get detailed information, they can also activate the Device Locator function to find the device—which works by causing the device's LED to blink in a way that is easy to recognize.

Success Story

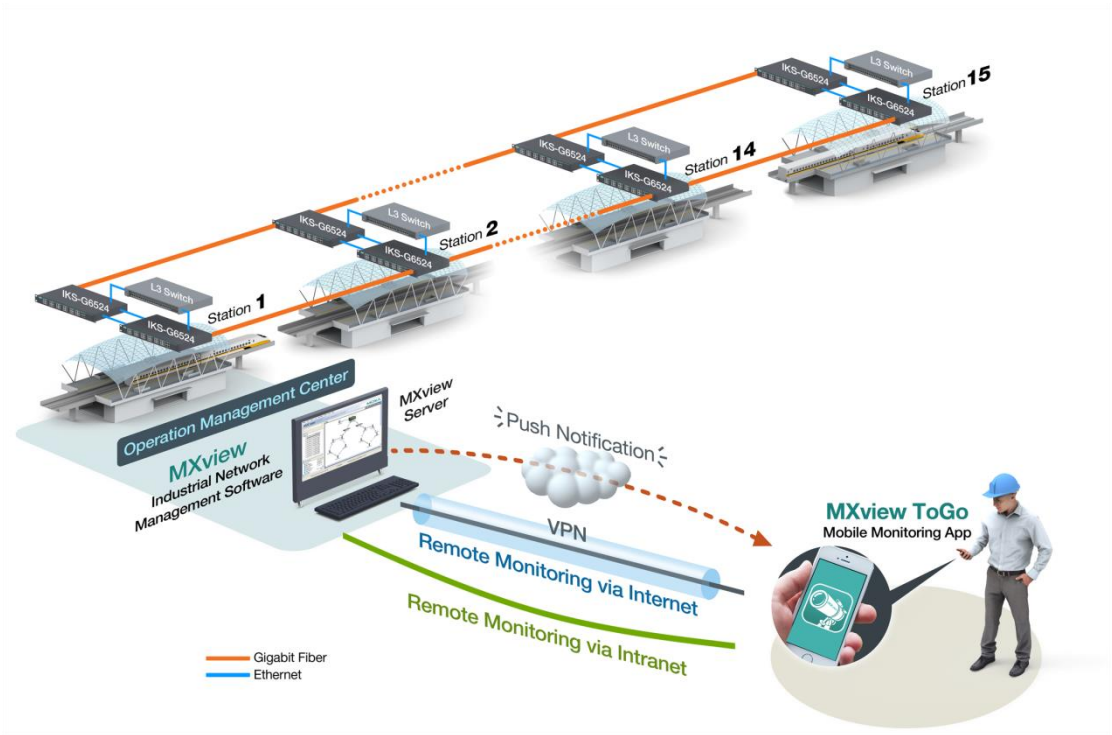
Deploying a Server/Client Solution for Industrial Network Monitoring

To ensure that a network operates reliably, industrial network management software is usually installed in large-scale networks in mission-critical industries, such as transportation, mining, and oil & gas. In this section, we share a success story from a railway application that uses a fiber Ethernet backbone built for data transmission between several stations located across a wide area. Since the application involves multiple control rooms spread over a wide area, the industrial network management software and the mobile phone app can help engineers access network status in real time and then respond quickly, thereby greatly reducing system downtime.

This high-speed railway operator built a fiber Ethernet backbone for data transmission between its Operation Management Center and other railway stations to ensure high network availability. The customer used about 30 Moxa industrial rackmount switches (IKS-G6524) to connect to the pre-existing Layer 3 networks, and used the MXstudio industrial network management suite across the network management lifecycle, including for installation, operation, maintenance, and diagnostics. The MXstudio suite includes the MXview industrial network management software, MXconfig industrial network configuration tool, and N-Snap network snapshot tool.

The railway operator's network administrators recounted that they sometimes needed to leave the control room for patrol inspections within and around the station. Since MXview was already installed in the control room, they could install Moxa's MXview ToGo mobile app, which works as a client of MXview, and then easily check the latest network status from their mobile phones. The dashboard design of the app makes it easy for engineers to tell whether the network is operating under Normal, Warning, or Critical conditions. In one notable incident, an IT engineer received a push notification about a downed link, used the app to determine where

the broken link was located, and also connected to the MXview server to determine the cause. After determining the cause, the engineer contacted onsite staff immediately, allowing them to get the network link back up and running in no time.



The diagram shows that engineers on the move can still get real-time network status with the mobile app.

Conclusion

The use of effective network management applications can help network administrators accomplish tasks efficiently during different stages of the network management lifecycle. With the changing business environment and improvements in mobile device technology, a mobile app for network monitoring allows administrators to be efficient, effective, and responsive when monitoring and maintaining an industrial network.

Using a mobile app for network monitoring, administrators can view device and network status and receive real-time alerts from their mobile devices while on the move. In the field, administrators can quickly search for any device and view that device's detailed configuration parameters with the click of a button.

- Learn more about Moxa's MXview ToGo mobile app here: www.moxa.com/MXview_ToGo
- Scan the following QR code to download the MXview ToGo app:

iPhone OS

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