



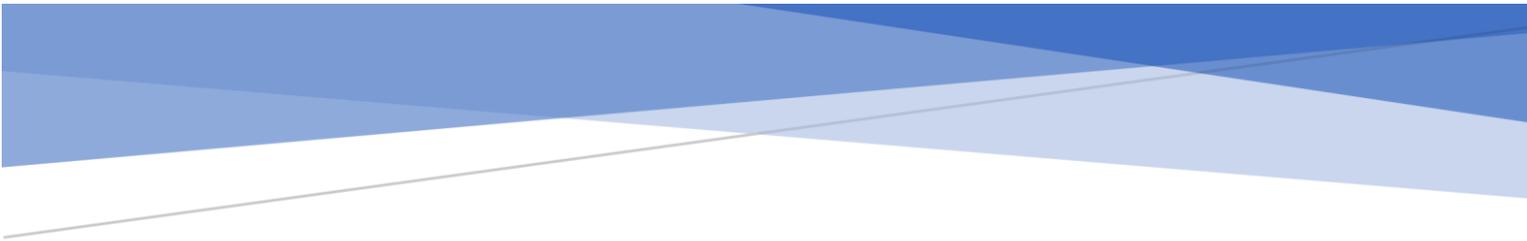
# **Increase Customer Satisfaction & Save Money with a Smart Maintenance System for IT Infrastructure**

White Paper

How Organizations Can Benefit from Deploying a  
Smart Maintenance System for IT Infrastructure



MEIKYO ELECTRIC CO. LTD.



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## Background

It is a common practice, whenever an IP enabled device fails or is “frozen”, the user has to manually power cycle or reboot the device to resume normal operations.

If you could proactively monitor the health of your IT network infrastructure, or do “Life & Death Monitoring”, you could minimize all of the issues caused by downtime, which we will discuss later. IT infrastructure would include infrastructure that supports IT including routers and switches, Wi-Fi access points, surveillance cameras, and digital signage. With the expansion of IT infrastructure, more effective and efficient life and death monitoring will be required.

Life & Death monitoring can be either active monitoring or passive monitoring. Active monitoring is done by the monitoring side, actively. PING monitoring is the most famous type of active monitoring, which is done by periodically sending ICMP packets to the monitored device to check the response. If there is no response for a period of time, it is determined that an abnormality has occurred. Passive monitoring can be done by using a WATCHDOG function. Basically, monitor packets are sent regularly from the monitored device, and if the packets do not arrive in a period of time, the user will be notified.

Now back to power cycling of “frozen” devices. Manual power cycling or rebooting “frozen” devices can be difficult, especially when devices are in remote locations. Remote can be in “hard-to-reach” locations within a facility or in other offices across the country or around the world that an IT technician can’t easily access. Organizations should consider devices which can do BOTH, Life & Death Monitoring and remote power management, ideally automatically.

Automatic power cycling could also be described as a Smart Maintenance System. The importance of such a system is often underestimated. If your IT infrastructure is small, the demand is less. However, as that IT infrastructure grows, your need for an automatic solution increases exponentially.

There are significant impacts to your business that arise when network devices go down. These could include lost business reputation, lost revenue from downtime, increased IT maintenance costs and a decrease in productivity due to an already overstretched IT support resources team.

Users who implement a strategy to deploy a Smart Maintenance System for IT Infrastructure can realize significant benefits. These benefits can include:

- Increased customer satisfaction
- Increased profits from a reduction of downtime
- Decreased expenses from a reduction of IT maintenance costs
- More efficient utilization of limited IT support resources

## The Causes of “Frozen” Devices

When a device freezes, it is usually due to an issue with firmware, software or hardware. These issues can be caused by the following:

- Lightning induced surges: Lightning strikes generate strong noise levels, causing devices to freeze. Surges may also occur from indirect lightning strikes and thunder.
- Network overload: New products and services are introduced everyday that heavily tax network devices.
- Unforeseen Network issues

Regardless of what causes device freezes, it is critical to get devices back online quickly, preferably automatically. It is vital to have a plan to prepare for these events in advance. Investment in a Smart Maintenance System for IT infrastructure will provide significant benefits to any organization.

### **Business Reputation**

If your remote IT devices are unmanned and freeze, you risk impacting your reputation in the eyes of your customers and/or “users”. With social media and the internet, complaints are easy to find and rarely ever go away. Discover and resolve issues before your “users” do by investing in solutions with automatic device recovery capabilities.

### **Lost Revenue from Downtime**

If your remote IT devices are unmanned and freeze, you risk losing revenue during that downtime. Every minute your IT infrastructure (i.e., digital signage or kiosk) isn’t operational, could significantly impact revenue from advertisers and / or “users”. Automatic device recovery will not only minimize downtime, but essentially eliminate it. While there still may be cases of downtime, the frequency and duration will be significantly reduced.

### **High IT Maintenance Costs**

If your remote IT devices are unmanned and freeze, you will most likely have to “roll-a-truck” to send a maintenance crew to troubleshoot and reset any frozen devices. The time to get a crew on-site and to troubleshoot can be expensive. If you design a reliable system with smart devices, you can eliminate these unexpected and unplanned costs.

### **Limited IT Support Resources**

In recent years, most companies and organizations have insufficient IT staff to meet their growing internal and external demands. In many cases, these essential resources to your business or organization are already overworked. It may require significant additional time to deploy IT staff to any remote sites. With the right strategy and investment in smart monitoring and management equipment, you can avoid having to send overworked IT staff to sites after-hours, or on holidays.

### **Why Does Your Organization Need a Smart Maintenance System for Your Critical IT Infrastructure?**

Imagine the following scenario: A managed service provider (MSP) technician named Will, is playing catch with his son in the park on a Saturday afternoon. He gets a call from a client, Dave, whose digital signage system has gone offline. The system is critical to Dave’s business on Saturday evening. Unfortunately, both Will’s colleague and boss are on vacation. It is a two-hour drive to Dave’s site. As Will’s wife is busy, he needs to take his son to a friend, as he can’t bring his son to the customer’s site.

Will is in a difficult situation. Now imagine this occurrence happens every month for Will’s clients, and his boss is always having to send someone to client sites to troubleshoot and restore issues. If these emergency situations are covered by the service level agreement (SLA), then these expenses have to be absorbed by the MSP. If they are not part of the SLA, and the MSP is issuing invoices for these costs to clients like Dave, you are going to have an upset client or clients.

What is the true cost of downtime for an organization? Many organizations over simplify the cost of downtime, however it should include the following:

- Employee productivity cost
- Lost Revenue (or SLA penalties)
- Recovery costs
- Long-term impact

We will expand on this more later, however it should be known that the larger the organization the more dramatic the increase of these downtime costs.

Wouldn't it be great if Will's company had deployed a smart device which did both life & death monitoring, and had the ability to automatically recover the device, with no customer knowledge an event even happened? The WatchBoot Rebooter is such a device.

It is a known and accepted fact in the industry that IT devices freeze. The factors causing frozen devices will always exist and cannot be eliminated.

Thus, one of the key metrics for an organization is to reduce their MTTR. Depending on the organization, there are different definitions of MTTR. Mean-Time-To-Repair is the time required to fix a piece of machinery or device. Mean-Time-To-Restore is a digital equivalent and is the time required to get an application back into production after a performance issue or downtime. Finally, there is Mean-Time-To-Resolution, which focuses on the broader issue. It addresses not only the time to fix a problem, but also the additional proactive steps which are designed to keep the problem from recurring.

Only once the underlying root causes are addressed and proactive steps are put into place, can the issue consider to be resolved. The ultimate goal is to minimize these metrics to as low of value as possible.

### What is the Real Cost of Downtime?

If we assume we are measuring Mean-Time-To-Restore, let us begin to expand the key elements in the downtime cost calculation and use the previous scenario as an example.

#### Employee Productivity Cost

In the scenario, Will was playing catch with his son on a Saturday. Sending him to a client site on a weekend may require overtime pay. While it may be part of his normal compensation, it could impact his overall productivity. If we were to assume the issue happened on a normal work day, Will would be distracted from his normal work and would be unable to complete other projects. Or let's assume because Will did this work on a Saturday, he didn't go to work for the full day the following Monday. Thus, we should estimate the total productivity lost due to downtime. To do this, we should calculate a utilization percentage for Will's role. In this case, Will's utilization percentage is to make sure clients' systems are always up and online, so we would assign it at 100%. If Will's hourly salary is \$50 per hour, then the employee productivity cost for this one employee will be \$50.00 per hour. If it takes Will 2 hours to drive to the site, 2 hours to restore the system, and 2 hours to drive back home, we are looking at 6 hours. The total employee productivity cost \$300.

Employee Productivity Cost	6 hours x \$50/hour x 100% utilization	<b>\$300</b>
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#### Lost Revenue

Most MSPs would have a Service Level Agreement with their client. The SLA would include penalties to the MSP which would be inflicted as a result of downtime impacting the revenue of the client. In the scenario, the client's digital signage is a very important part of the revenue generation metric. When the sign is operating, the client generates \$5000.00 per hour of additional revenue. Without the sign, the client is only generating \$1000.00 per hour of revenue. For this scenario, the SLA penalties which must be covered by the MSP is 50% of the lost revenue. They are lucky it isn't 100%. If we assume the system is down for 4 hours, then the SLA penalties will be \$10,000.

Lost Revenue	\$5000 per hour x 4 hours x 50%	<b>\$10,000</b>
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### Recovery Costs

Recovery costs are the most immediate and apparent costs directly related to recovering from the downtime incident. These costs may include additional salary, travel expenses, repair costs, equipment replacement costs, or other costs due to data loss. In our scenario, we are going to only consider the travel expenses for Will. His company has a \$0.50 per mile fuel expense. If we assume the site was 120 miles way, at 240 miles roundtrip, the total expense is \$120.

Recovery Costs (travel expenses)	240 miles x \$0.50 per mile	<b>\$120</b>
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### Long-term Impacts

With the internet and social media, customer expectations are very high. There is a real threat of how negative events associated with downtime can impact a business' reputation long-term. The significance of including the long-term impact into your calculations cannot be understated.

In the scenario we described, the financial impact to the MSP without considering the long-term impact is \$10,420. If an event like this scenario happens monthly, then the MSP is looking at \$125,040 of unnecessary costs per year. More importantly, this will surely impact their reputation in the market.

By deploying a Smart Maintenance System, the MTTR is virtually eliminated, saving the organization's profit annually.

Long-term Impact (annual)	\$10,420 x 12 months	<b>\$125,040</b>
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### How Does a Smart Maintenance System Work?

A smart maintenance system must incorporate intelligent monitoring and automation. The WatchBoot Rebooter includes an automatic power control function with unique freeze detection capabilities. One method for detecting a freeze is to use the Meikyo Heartbeat Application, where you can check the CPU operation status and control the heartbeat. A frozen device can be detected and restarted. A second method is to use PING monitoring, which monitors the health of the device by responding to ICMP packets. If there is no response, the device is determined to be frozen and the power output to the device is rebooted. This method also includes the ability to monitor the normality of the line by monitoring multiple IP addresses as a target of pinging, which can be important, especially in the case of router monitoring. There is an additional option to time the power control of devices by using the weekly schedule function.

In addition to automatic power control by various monitoring functions, there is also the remote power control by various methods such as http, Telnet, text mail, email and direct WEB commands. The device can control from 1 to 4 power supplies. Finally, by writing a script for the WatchBoot Rebooter, you can Telnet to the server and execute the shutdown command.

### Is a Smart Maintenance System worth the Investment?

In the scenario we considered previously, the estimated annual impact to the MSP's profits was \$125,040. This was based on an "event" happening once every month. We could consider this as being either 12 different clients or the same client with repeated "events." If we assume it is one client, and we were to invest in the WatchBoot Rebooter as our solution for a smart maintenance system, we need to consider both the hardware costs and the initial installation costs. Let's assume Will's hourly rate is \$50, however the MSP bills its client based at a rate of \$250 per hour. If we then assume it takes 2 hours to do the installation, and the total hardware cost itself is \$500, then we have an initial investment of \$1,000. If this had been deployed initially at Dave's site, the additional investment would have saved the MSP over \$9,000 and if it was happening monthly, the savings would be over

\$110,000 per year. If we were to assume that each monthly event was an individual client, even the initial investment of \$12,000 significantly offsets the cost of downtime.

Initial Investment per Customer	\$500 (hardware) + \$250 per hour x 2 hours	\$1,000
One-time Savings for one Customer	\$10,000 minus \$1,000	\$9,000
Annual Savings for 12 Customers	\$125,040 minus \$12,000	\$113,040

Most importantly, if your associates are spending time deploying new systems for new clients, rather than solving existing client problems, then you are growing your business and maximizing profits.

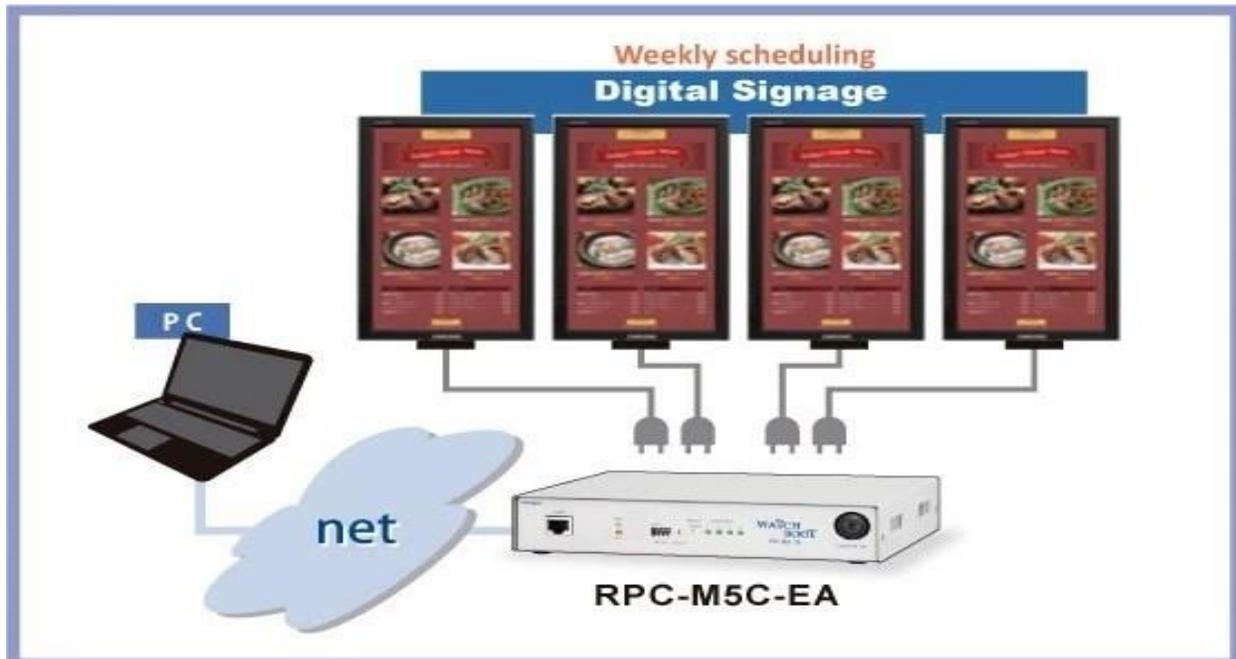
### The Solution

Power management is a crucial factor for consideration when it comes to operating multiple signage across a region. When power and network failures cost businesses precious resources, averting downtime while saving maintenance crew costs becomes of paramount importance to maximize profit and dependability.

Keeping the signage off during off-hours is an effective way to cut expenses. However, manually operating digital signage in a cost-effective manner can be a tedious affair. Dealing with complicated power schedules is a cause for confusion and costly mistakes. Network-enabled signage add to this complexity with controller-PCs that need to be turned on and off according to their schedule.

The WatchBoot Rebooter enables flexible per-outlet power scheduling for individual days of the week. Users can integrate Magic Packet (WOL) on-commands and shutdown scripts to control remote controller-PCs with ease. PING monitoring ensures system integrity and connectivity by rebooting frozen or unresponsive hardware.

Not only that, users can sync outlets to turn signage off when the media player freezes. This way users can hide potentially embarrassing blue screens as well as loading screens.



## **About Meikyo Electric**

Since the dawn of the network in the 1990's, Meikyo Electric has been involved in the development of power control devices using communication technologies. The company has been developing and providing high-quality, high-stability solutions which are necessary for stable operation of IT infrastructure. With proven functionality, there have been more than 100,000 units sold in the Japan market.

Some of the key features of Meikyo Electric's products are:

- High reliability & high-performance by utilizing rich hardware technologies
- Built-for-purpose OS and Protocol Stack Software technology
- PING Monitoring / Weekly Scheduling / Script Shutdown Functions

The WatchBoot Rebooter is able to automatically power cycle IT equipment that freezes by the life-and-death monitoring of the network via PING. The most common usage of this product is for the customer who needs the automatic reboot of shared wireless routers, especially if located in remote locations. Meikyo's products can also be used to schedule the start-up and shut-down of other IT equipment including personal computers and digital signage.

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