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E-book

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# **Realizing the Full Potential of IoT with Device Management**



## Across Industries, Internet of Things (IoT) Device Deployments Allow Organizations to Streamline their Operations.

**By automating key processes organization are able to create more personalized customer experiences. But managing a large fleet of IoT devices comes with its lot of challenges.**

For one, your IoT fleet is likely to comprise different devices, each running its own software with its own hardware specifications. So a 'one size fits all' mindset won't work here, adding to the complexity of management.

Then there are security and compliance issues that can complicate matters further. IoT devices aren't typically built with the highest security standards. By far, IoT's rapid growth has outpaced the growth in device security. And the network environment in which these devices operate will often be hostile and have poor connectivity, compounding the issue further. As more IoT devices access enterprise networks (from potentially insecure networks), businesses find themselves at greater risk of being insecure and non-compliant.

Given the above, there's also a high chance that the devices in your IoT fleet will generate a massive number of alerts - many of which will be false positives.

So it's going to be crucial to properly monitor and analyze the data pouring out of these devices in real-time to distinguish the signal from the noise. From incident response to business intelligence, the faster actionable data gets to stakeholders, the better the outcome.

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# The Benefits of IoT Device Management

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Let's look at some of the benefits an IoT management solution can provide organizations.

## Streamlined Device Onboarding and Configuration

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IoT management has proved a game changer in how organizations manage their devices. And one of the major headaches it can solve is device onboarding and configuration. With a sound IoT management solution, organizations can easily onboard devices, configure them, and ensure they're up-to-date with the latest firmware and software updates without requiring manual configuration. The above not only saves time but is much less error-prone.

## Comprehensive Device Visibility and Control

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Remotely tracking and managing IoT devices are key features of IoT device management platforms, allowing organizations to manage all their connected devices from a single point without needing to physically interact with each device. With IoT device management, you can easily register, manage and monitor all your devices, regardless of the number of devices in your network.

Another crucial benefit of remote device management is the ability to troubleshoot issues without requiring time-consuming phone calls or the help of a technician. That saves both time and money while minimizing the risk of errors or miscommunications within your organization while increasing your IoT fleet's uptime.



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# Automated Device Maintenance & Software Updates

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IoT management enables automating device maintenance and software updates, allowing updates and patches to be applied to multiple devices across various locations simultaneously - again, without physically interacting with each device. It represents a critical advantage for businesses that rely on large-scale IoT deployments to carry out their day-to-day operations.

By automating device maintenance and software updates, businesses can ensure that their devices are always up-to-date and functioning correctly. It helps prevent downtime and other issues impacting productivity (and profitability). Automated device maintenance can also assist IT departments in identifying potential problems before they become major (and expensive) headaches.



## Enabling Real-Time Monitoring and Analysis of Data

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The above highlights the significant benefits IoT management solutions can provide organizations deploying large IoT fleets. But to reap those benefits, the chosen IoT management solution must be capable of performing the following tasks on the data being pushed by an army of connected devices:

- Real-time data ingestion and processing
- Data visualization and reporting
- Issue detection and device performance

## Real-time Data Ingestion & Processing

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IoT management enables businesses to collect vast amounts of real-time data, providing an accurate and comprehensive view of their operations. The data collected comes from various sources, including sensors, devices, and other IoT-enabled systems, and is processed in real time. Businesses can make informed decisions based on accurate and up-to-date information, which was simply not possible before.

Real-time data ingestion and processing also provide businesses with the ability to detect and respond to issues as they occur. For example, if a machine on the assembly line starts to malfunction, the sensors attached can detect the problem and alert the relevant personnel.

# Data Visualization and Reporting Capabilities

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An IoT management solution with advanced data visualization and reporting capabilities enables businesses to present complex data in a simpler and much more visually appealing manner. It helps to identify trends and patterns that might not be visible with raw data. IoT sensors collect data from various devices and machines, and data visualization tools can transform that data into charts, graphs, and other visual representations.

The graphical representation of data makes it much easier for decision-makers to understand the information, define priorities, and make sound decisions about everything from production processes to customer engagement strategies. Reporting is another essential aspect of IoT management for businesses. Having the ability to generate detailed reports and visualizations in real-time is a boon to companies looking to stay ahead of the curve and make data-driven decisions.



## IoT Management Reporting

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IoT management's reporting tools help to generate custom reports that provide insights into the performance of devices and machines. It helps to identify any issues or inefficiencies, enabling businesses to take action proactively. Reports can also help to predict future trends, allowing organizations to adapt quickly to market shifts rather than play catch up.

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# Maintenance & Issue Detection

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With IoT management, businesses can monitor their assets and equipment in real time, giving them an edge in detecting potential issues. By analyzing the data collected from IoT devices, businesses can determine when equipment is likely to fail and perform maintenance before it breaks down. Such an approach not only reduces downtime but also saves money by preventing costly repairs.



## Real-Time IoT Monitoring

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With IoT management, businesses can monitor their assets and equipment in real time, giving them an edge in detecting potential issues. By analyzing the data collected from IoT devices, businesses can determine when equipment is likely to fail and perform maintenance before it breaks down. Such an approach not only reduces downtime but also saves money by preventing costly repairs.

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# Disney IoT Innovation

Disney's theme parks and their millions of visitors all harbor valuable data that an IoT management solution can harness. In particular, its wearable MagicBand bracelet technology, which includes an RFID chip. The device serves multiple functions. It can be used as a hotel room key, an access pass to the theme parks, and a means to make purchases (payments) within the theme park.

But its most significant feature is that the bracelet continuously sends and receives information to and from sensors dispersed throughout the parks. This generates a large amount of data about the movements of individual customers, which Disney's operational team leverages to enhance the overall customer experience while optimizing park logistics.

## Examples of How Disney Uses Data

By identifying long lines for rides, Disney's team can offer real-time incentives to redirect customers to less crowded areas of the park, resulting in improved customer satisfaction and more efficient use of resources.

The collected data can also lead to innovative park features, such as predicting a child's favorite character based on their behavioral patterns within the park and arranging for a surprise meet-and-greet. That enhances the overall park experience and creates unforgettable memories for

A comprehensive IoT management solution not only provides Disney with insights into their customers they could not otherwise obtain, but it also lowers costs through better use of resources while boosting profitability and customer satisfaction (which tend to go hand-in-hand).



## CPS Energy & Leveraging the Power of IoT Management

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CPS Energy, a San Antonio-based utility company, was able to enhance its many use cases by leveraging the power of IoT management and data analytics. By gathering multiple data points from various sources, such as smart meters that collect and transmit real-time consumer usage patterns, street lights, and event stream data, CPS Energy can provide its customers with a wide range of benefits.

With this approach, CPS Energy uses real-time analytics to detect leaks or outages as they happen and quickly address them. That ensures that customers always receive reliable service and that interruptions are swiftly dealt with. Beyond that, the utility company also uses massive amounts of collected data to help customers save money on their energy bills.

By analyzing usage patterns and identifying areas where energy consumption could be reduced, CPS Energy is able to provide customers with tailored advice and recommendations. And that can include anything from simple tips on reducing energy usage to offering energy-efficient products to help customers save money in the long run.



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CPS Energy's data-driven strategy creates a more efficient, reliable, and cost-effective energy system for customers and is helping to pave the way toward a more sustainable and energy-efficient future.

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# Best Practices for Implementing IoT Device Management

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From device onboarding to configuration and maintenance, all the way to device replacement and data migration, a good IoT management solution streamlines and simplifies those processes, cutting down both costs and hassle. And its data collection and visualization features will turn massive sets of raw data into digestible and actionable information that drive informed business decisions.

But you must choose the right solution for your organization, as not all IoT management solutions are equal. In order to ensure the device management platform meets your needs, it's crucial to ensure its key features align with your requirements concerning deployment, device configuration, edge computing, remote access, and monitoring. It's also important to evaluate the cost and ROI to make sure it's a good fit for you. All these factors come into play when settling on an IoT management strategy.



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# Best Practices for Implementing IoT Device Management Cont.



That being said, below are some key considerations that apply to any organization evaluating IoT management solutions.

- **Installation & authentication** - A full-featured management platform simplifies and expedites the laborious process of enrolling devices and setting up a network. An IoT management platform should have the ability to manage multiple vendors and support everything from batch configuration to device authentication to make the enrollment process as efficient as possible.
- **Configuration & management** - In addition to installation/authentication, an IoT device management platform should support automated configuration management, security monitoring, and be capable of resetting the devices back to a working state with baseline configurations, if misconfigured or tampered with.
- **Security** - Deployed connected device networks should be designed to detect, manage, and recover from security threats and breaches. The IoT device management platform you choose will be crucial to the above.
- **Monitoring** - The ability to monitor your entire IoT fleet will be critical. Monitoring provides valuable insights into any issues or outages that occur throughout the deployment process. Tracking network metrics can also help you identify patterns and trends that may impact performance or raise security concerns. By setting up alerts and generating status reports at regular intervals, administrators can stay on top of any potential issues and keep their platform running smoothly.
- **Full remote access** - Finally, a proper IoT management platform will maintain a connection with every single device in the fleet. In other words, it should be able to perform maintenance and troubleshooting throughout the entire IoT network.

# Security & Compliance

The IoT management platform you choose should ensure security compliance with multiple regulatory bodies, whose guidelines can widely vary from one jurisdiction to another. That tends to revolve around data collection and privacy, securing the collected data (encryption), and setting up access control lists for access to the data.

**Specifically, security compliance of an IoT management solution should align with the following points:**

- **Device discovery and inventory** - Your IoT management solution should include comprehensive device discovery and inventory capabilities. It's critical for organizations to be able to have visibility into the devices connected to the network, with the ability to track them, their activities, and their data. With this level of insight, companies can maintain an up-to-date inventory of all active devices, while also being able to quickly identify any unauthorized or compromised devices. This is crucial for protecting sensitive information and ensuring that your networks remain secure.
- **Deep network visibility** - Another boon to IoT security and compliance is deep network visibility. Your IoT management solution should be able to monitor and analyze your IoT fleet's communication and behavioral patterns. By detecting suspicious patterns, it can help identify potential security breaches and prevent them from occurring (or, at the very least, cut down your response time, which can be critical).



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- **Threat detection and intrusion prevention** - Device security is a multi-pronged effort. Along with the above, having the ability to analyze network traffic and traffic patterns is key in detecting network anomalies that could be potential threats, while discarding the false positives. Some IoT management solutions can also integrate with IPS (intrusion protection system), such as Snort or Suricata to block suspicious traffic/patterns before they can do damage.

- **Authentication and encryption** - Encrypted device communication is one of the centerpieces of IoT device security and compliance (in transit and at rest). Additionally, implementing robust authentication methods is essential in ensuring that devices are communicating with only trusted entities and that unauthorized access is prevented. By following the principle of least privileges, only authorized devices can access the network and its resources, ensuring that all communication is secure and protected.

- **Firmware and patch management** - Having the ability to push critical security updates and bug fixes to the entire fleet is critical in maintaining your network and your fleet's security and integrity. By automating the process of updating and patching devices, you can simplify this task and ensure that all of your devices are operating with current software and the latest security patches.

- **Centralized management** - When you have a centralized Internet of Things (IoT) management interface, it makes managing and controlling your devices much easier. This is because it simplifies the process of device provisioning, configuration management, and enforcing security policies. Not only does this make things much simpler for you, but it also helps to reduce the administrative burden and improve your overall security posture.



## In a Nutshell your IoT Management Solution should:

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- Provide encrypted communication streams for confidentiality and encrypted data storage.
- Implement authentication methods to ensure devices are communicating with trusted entities with access permissions following the principle of least privileges.
- Push security updates in the form of patches and bug fixes from a centralized interface.
- Integrate with an IPS to assess and block threats as they occur.

**The above steps will go a long way in keeping user data safe and secure.**

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Regarding compliance, specifically, IoT applications need to consider, among other regulations, the EU's General Data Protection Regulation (GDPR). GDPR legally compels data controllers to report personal data breaches to their supervisory authorities within 72 hours and, in some cases, to the affected individuals themselves. Organizations should choose an IoT management platform that enables them to identify and react to security breaches in a manner that's consistent with GDPR and other requirements.



## Wrapping Up

**As the number of IoT devices continues to grow, it becomes increasingly important to manage them effectively to realize the full potential of IoT.**

It involves monitoring, configuring, and updating devices to ensure they're secured and functioning correctly. It allows organizations to optimize performance and make data-driven decisions to improve efficiency, productivity, and their bottom line. Plus, without a proper IoT management strategy, devices in your fleet can become vulnerable to cyber-attacks and malfunction, disrupting operations and potentially compromising sensitive data.

The power of real-time monitoring and analysis of IoT data should not be underestimated, as it provides a host of benefits to businesses. With access to real-time data, companies are able to quickly identify issues and make the necessary adjustments. And beyond security and compliance, real-time monitoring helps companies to identify trends and patterns, allowing them to stay ahead of the competition and innovate more quickly.

Real-time monitoring and analysis of IoT data can potentially revolutionize the way businesses operate and interact with customers. Businesses just need to harness that potential.

**Before signing off, here are a few key points organizations should focus on to implement a sound IoT device management strategy:**

- Have a clear understanding of your organization's needs and goals. It will help you determine which devices are necessary and which are not and identify any potential security risks.
- Choose a centralized management system. This will allow you to keep track of all devices and ensure they are properly configured and updated. It will also make it easier to troubleshoot any issues that arise. Have policies and procedures in place for device usage. This includes guidelines for employee-owned devices and rules around accessing company data and networks. These policies should be regularly reviewed and updated to ensure they remain relevant and practical.
- Finally, ongoing training and education are going to be essential in ensuring that employees are aware of the importance of IoT device management and the role it plays in keeping proprietary data secure. This includes regular training on safe browsing practices, identifying and reporting security threats, and the importance of keeping devices updated and secure.



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your IoT fleet to  
its full potential?**

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## Ready to level up?

If you need help with taking your IoT network management and monitoring to the next level, please contact FirstWave and we will be more than happy to help assess your current situation and recommend a solution to help your business.

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FirstWave is a publicly-listed, global technology company formed in 2004 in Sydney, Australia. FirstWave's globally unique CyberCision™ platform provides best-in-class cybersecurity technologies, enabling FirstWave's Partners, including some of the world's largest telcos and managed service providers (MSPs), to protect their customers from cyber-attacks, while rapidly growing cybersecurity services revenues at scale.

In January 2022, FirstWave acquired Opmantek Limited (Opmantek), a leading provider of enterprise-grade network management, automation and IT audit software, with 150,000 organisations using their software across 178 countries and enterprise clients including Microsoft, Telmex, Claro, NextLink and NASA.

Integrating CyberCision™ with Opmantek's flagship Network Management Information System (NMIS) and Open-Audit product enables FirstWave to provide a comprehensive end-to-end solution for network discovery, management and cybersecurity for its Partners globally.

With over 150,000 organisations now using FirstWave technology, we are well positioned to be a leader of transformational change in the IT Operations and Cybersecurity world.