

Improving Manufacturing Asset Availability through Remote Management

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Keywords

Assets, IT, Service, Security, Manufacturing, Operations, Remote

Manufacturing business performance is heavily dependent on the performance of various assets - traditional and IT. Remote service capabilities is an important factor in asset performance but growing security concerns have forced operations and service providers to search for more secure communications methods and technologies. When developing next generation solutions, suppliers should consider new developments such as the Intel® Active Management Technologies.

Summary

The performance of many manufacturing businesses is defined by how well their assets are utilized. Some businesses are asset limited in general and others need to optimize asset utilization for quality, delivery or other factors. In addition to traditional assets (machines, turbines, etc.), IT assets - including embedded computing - have also become critical to business

performance as well. In fact, traditional asset performance is becoming increasingly dependent on IT asset performance and availability. Consequently, there is a growing interest in ways to improve availability of both, and some suggest that the management of the two should converge. One opportunity for improving availability of all assets is through collaborative service strategies that better utilize the support of experts - wherever they are located - to monitor, diagnose problems, maintain and optimize assets. Collaborative strategies will require a range of innovative remote asset service solutions.

Analysis

It is well known that manufacturing asset failure can be very costly. In addition, failures may impact safety, deliveries, customer service, quality, waste, the environment and others. Many of these losses can not be recovered and can have a lasting business impact. Furthermore, as inventories are minimized and staffing is reduced, asset service programs become even more important.



Complex Manufacturing Assets Have the Highest Need

While operations can be impacted by the failure of even the smallest part, redundancy and spares can often mitigate losses adequately. However, the more complex manufacturing assets require special provisions. Frequently, having all the necessary spares and skills on hand is not an option. Examples of assets that might fall into this category are:

- Specialized machines – as in Semiconductor
- Robots – many discrete industries - as in Automotive
- Precision machining – manufacturing as in Medical Devices
- Complex refining and processing systems - as in Chemicals
- Complex analytic instruments – as in Pharmaceutical
- Sophisticated monitoring systems - as in Utilities

High cost, supplier diversity and the need for highly specialized support skills frequently command special monitoring and maintenance approaches to minimize disruption. These approaches usually involve automatic data collection, networking and remote access to provide rapid notification of support events and immediate access to embedded diagnostic information.

Growing Importance of IT Asset Management

Pervasive use of embedded computing, the demand for real-time visibility into operations, and dramatic increase in integration has made operations dependent on IT assets for normal operations. Furthermore, operations IT

has grown in complexity and budgets for on-site support have not kept pace.

The importance of IT assets is further emphasized by the value they bring to traditional asset service. Most complex manufacturing assets include embedded information and diagnostic capabilities that enable faster problem diagnosis and repair, as well as enabling preventive maintenance and optimization. To be effective, this information must be accessible from remote locations, thereby coupling asset availability with IT system availability.

Opportunity	Example Strategies
Minimize Asset Downtime	Failure alerting, diagnosis and possibly correction Reduce trips to the asset – right parts the first time
Maintain Asset Performance	Monitor performance indicators, alert on deterioration limits Complex analysis of operating data Proactive repairs and tune-ups
Optimize Asset & Process Performance	Specialist look for improvement opportunities Advanced analytics, centralized expert team, etc.

Mature Asset Management Strategies Require Increasing Specialization and Expertise

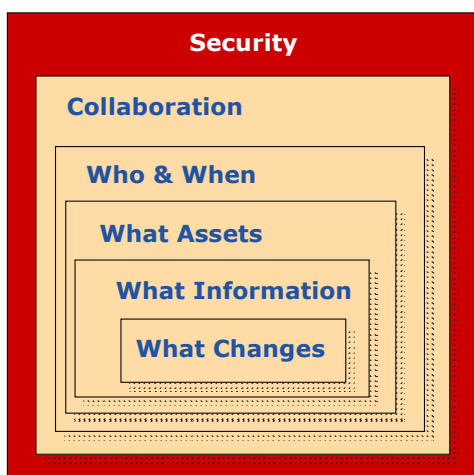
Opportunities for Improving Asset Availability

The increased coupling of traditional and IT assets suggests that the asset management strategies for both should provide consistent levels of service. Increased asset and system complexity, budget limitations and high skill requirements force manufacturers to consider external help such as asset suppliers, external service providers and central corporate functions to increase service levels. Embedded computing and control capabilities are especially dependent on suppliers' knowledge and skills. Accordingly, the utilization of resources from diverse organizations requires innovative asset management and service arrangements based on collaborative service processes.

Collaborative Asset Service Requires Security

Collaborative asset service strategies can provide a framework for innovation in asset management where suppliers and service specialists can become more involved, offloading the onsite staff. The nature of collaborative arrangements is that process participants are distributed and require remote access to the asset - traditional, IT or embedded. This typically includes:

- Status of the asset
- Information about its performance
- Notification of events
- Making changes remotely
- Activity tracking , and others



Secure, Granular Control over Service Access Is Required

In manufacturing and similar industries, remote access methods for traditional and IT assets must provide local control of service processes at a granular level. However, because of continued increases in security threats, manufacturers have shut down traditional modem-based remote communications methods, and suppliers are now developing next generation solutions that recognize their customers' ongoing security concerns as well as new requirements such as security patch management. These require innovation in collaborative processes, architecture, service agreements and fundamental technologies.

Intel's Contributes Fundamental Technologies for Remote Management

Intel has recently been addressing IT systems management related issues with specific capabilities at the chip level, in support of asset suppliers and other service providers. For example, Intel® Virtualization Technology is helping provide the next generation virtualization software that enables real-time and general purpose operating systems to coexist. Intel has also

addressed important aspects of IT asset management with Intel® Active Management Technology (Intel® AMT).

Intel® AMT Feature	Benefit
Remote Access when Not Running	Enables systems inventory and status as long as there is power to the device.
Non-volatile Storage	Information available as long as there is power to the device
Alerting in Firmware	Secure alerting as long as there is power to the device
Remote Initiation of Boot Sequence	Enables remote management processes
Packet Filtering in Firmware	Threat protection at the device

Intel Chip Level Enhancements Address Important Systems Management Issues

Remote management of IT assets has evolved considerably but has required that the computing asset be running for alerting, diagnosis and control. Intel AMT eliminates this restriction by providing communications and alerting capabilities that are available as long as there the device has power. This enables better systems inventories - a requirement for security patch management - as well as diagnosis of problems even when the processor has halted.

Non-volatile memory is available for the operating system and systems management tools to store information to support remote diagnostics in the case of failures and others such as security patch status.

On-chip packet filtering is provided for use by virus protection or other security software. Security software can configure on-chip filtering to recognize known threats. The result is that they are eliminated before they enter the computing environment.

And finally AMT includes an alerting capability that works as long as the device has power. Alerting is configurable and has a watch-dog timer capability which can work in conjunction with security agents or other software to provide a notification that an agent has been disabled by a successful intrusion.

Intel AMT provides a Software Development Kit for OEMs, security software providers, IT management software providers and others to utilize its capabilities.

Conclusions

Operations IT and traditional assets will continue to grow in complexity and it will be increasingly difficult for multiple manufacturing sites to maintain the expertise needed to achieve required levels of availability for IT systems and therefore traditional assets that depend on them.

Traditional manufacturing asset management includes different functionality, domain knowledge and service expertise than IT asset management but both can benefit from collaborative strategies. Collaborative strategies require secure remote access for asset management and service.

Security threats and concerns have changed the requirements for remote access to manufacturing assets and the next generation service capabilities are still evolving.

The AMT capabilities enable innovation in IT asset management and availability which is required for remote management of traditional assets.

Recommendations

- Manufacturers should consider collaborative asset management strategies as a means to improve asset availability and performance.
- Asset suppliers that embed computing into their devices should examine Intel AMT as a means to provide more reliable remote service.
- IT and security management software providers should examine Intel AMT to provide their customers lower support costs. In manufacturing this will be driven by better security management and faster response to problems that impact asset availability.

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