Why Manufacturers Need To Bulletproof Their Virtualized IT Environments

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Today, many popular manufacturing applications are certified for virtualization and with good reason. The benefits of virtualization, including cost control, higher productivity, and better long-term planning, are indisputable. Yet, some manufacturing engineers and plant IT departments are missing out on these benefits because they think virtualization involves too much risk — a point of view that is not entirely without merit.

It's true that virtualization, the practice of using a software layer to let one physical computing server run multiple virtual machines, exposes a greater number of applications to downtime. While virtualization can increase redundancy and availability, it does not guarantee continuous operation. After all, the virtualization server still has the potential to be a single point of failure for all the applications it supports. Therefore, when you consolidate dozens of virtual machines on a single physical server, that system becomes mission critical — even if all the applications it's running are not—making downtime prevention all the more important.

The Staggering Costs of Downtime

Think about all the applications involved in running your manufacturing operations. When even one of them goes down, it can have a ripple effect across the organization, potentially causing business to grind to a halt. What is the financial impact of such a scenario? According to a Computer Associates Technologies report, the average manufacturing revenue loss due to IT downtime is $196,000 per company per year.[1] Given today's tight profit margins, who can afford those kinds of losses?

The true cost of manufacturing downtime is measured by understanding all the variables affected by a downtime incident, including:

Labor: What labor, including overtime hours, will you need to meet production targets and fulfill customer orders after your manufacturing system goes down? Every hour of catch-up uses budget dollars that could have been spent elsewhere. There are indirect labor costs to consider as well. Once the technical problem is fixed, all employees don't become immediately productive. It takes time to get the plant back up to its full operational capacity. In addition, critical projects may need to be put on hold while IT staff deal with system recovery.

Production line scrap, cleanup, and disposal: When unplanned downtime occurs, work in progress may need to be discarded. Why? System interruptions can lead to lost inventory, quality issues, and unsalable product. For food and pharmaceutical manufacturers, even the shortest period of downtime can result in

contamination, making it necessary to scrap an entire run. Cleanup of contaminated materials and equipment can also be expensive.

Production line repair: What are the internal and external maintenance costs required to detect, contain, diagnose, and repair production line systems and equipment? What about IT-related repair costs? In addition to maintenance employee costs, you need to factor in restart costs including unbudgeted labor, testing, and inspection expenses. IT costs such as consulting, service, and emergency replacement parts may also need to be considered.

Protect Your Virtualized Application from Downtime

While downtime and its associated costs may be something to fear, application virtualization is not. Manufacturers should not shy away from realizing all the advantages of virtualization when there are proven ways to protect your virtualized environment against unplanned downtime. By developing and executing an availability strategy that incorporates technology solutions for downtime prevention, your organization can ensure that your virtualized applications stay up and running for continuous processing.

When developing your strategy, it’s important to think about the level of availability required for each type of application. Some manufacturing applications are mission critical, in which case no amount of downtime is acceptable. Others may be highly important, but because they play a less critical role in your operations, may be able to tolerate some threshold of downtime.

Uninterrupted availability is a requirement for manufacturing applications involved in running 24x7 production lines as well as those that process real-time data as opposed to analyzing historical data off line. What’s more, if your manufacturing applications are all integrated and interdependent—as many are in today’s modern production facilities—continuous availability may be the only viable option for avoiding system interruptions that lead to serious business consequences.

Depending on the level of downtime protection you require, there are two primary technology categories from which to choose: high availability (HA) software and fault-tolerant servers.

Advanced High Availability Solutions

Today’s advanced HA software solutions are designed to prevent downtime, data loss, and business interruption with less cost and complexity than traditional approaches such as HA clusters. Predictive features automatically identify, report, and handle faults before they cause bigger problems that can result in downtime. Thanks to this continuous monitoring, advanced HA software prevents downtime from happening in the first place, whereas other HA solutions focus on system recovery. The most effective HA software solutions provide more than 99.99% uptime, making them an ideal choice for protecting applications that may be important to your operations, but not absolutely critical.

Advanced HA software solutions offer other advantages as well:

- Work with standard x86 servers that you may already have on premise
- Provide ease of installation and maintenance so you don't need specialized IT staff
- Offer high availability without the costly storage area networks required for HA clusters

If disaster recovery is a priority, you should be aware that some advanced HA software solutions offer long-distance protection for physical and virtual environments with "near zero" recovery. With this type of solution in place, you can rest assured that your applications always restore correctly with the ability to recover to a specific point in time or a bookmarked event.

Fault-Tolerant Solutions

Fault-tolerant solutions provide the highest availability for manufacturers and are ideally suited for protecting your most mission-critical virtualized applications against unplanned downtime. Fault-tolerant servers provide system component redundancy with no single point of failure. The server's software automatically synchronizes the replicated components — executing all processing in lockstep — so that "in-flight" data is always protected. With the two sets of CPUs, RAM, motherboards, and power supplies processing the same information at the same time, even if one component fails the system keeps on functioning without missing a beat.

When your manufacturing applications are running in virtual machines on a fault-tolerant server, your production lines will never go down due to an interruption in server availability. You can count on 99.999+% uptime for worry-free computing.

Fault-tolerant servers deliver continuous availability with innovative features including:

- Built-in, fail-safe software technology that detects, isolates, and corrects system problems before they cause downtime
- Multi-path I/O ensures that any I/O operation failure will result in a retry using an alternate path that ensures successful completion of the I/O operation.
- Lockstep architecture simultaneously processes work instructions and synchronizes memory in two separate hardware component sets to protect in-memory data from hardware failures

Thanks to these features, fault-tolerant servers provide bulletproof downtime protection for manufacturing applications that need to run 24x7x365 — without even a momentary disruption — to avoid a major hit to the bottom line.

So if you're thinking about virtualizing manufacturing applications to save money

and boost operational efficiency, don't let fear of downtime stand in your way. There are proven availability solutions out there that will allow you to realize all the benefits of virtualization without the associated risks.

Want to know more about virtualization? Sign up for the Free Webinar now! **[1]**

You can also read Hill's Q&A on Virtualization In Manufacturing [2] here*.*

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[1] CA Technologies, *The Avoidable Cost of Downtime* (CA Technologies, 2010), 4.

Links:
[1] http://www.advantagebusinessmedia.com/ims/MBT/MBT326_Stratus_Invite/MBT326_Stratus_Invite.htm
[2] http://www.mbtmag.com/articles/2013/03/virtualization-manufacturing