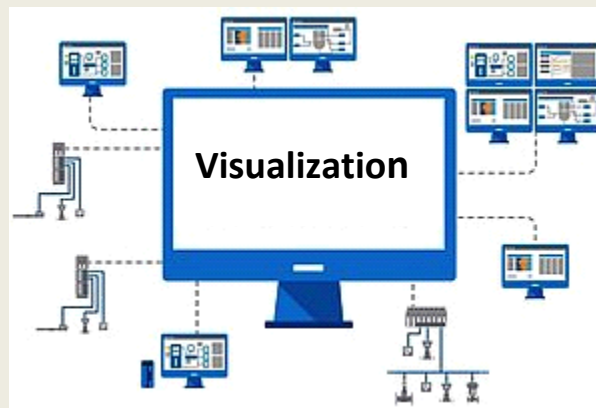


Four virtualization technology myths that hold organizations back

Virtualization technology beliefs are debunked, proving to be very beneficial for critical, industrial applications and optimizing operations.



Virtualization of computer hardware is here to stay, and it proves its value in industrial applications. The automation and operational hardware and software that industrial organizations depend on are more reliable, cost-effective, and efficient when they're run in a virtual environment.

However, some organizations have yet to embrace virtualization. Many of the ideas that keep organizations from embracing virtualization technology are either out-of-date, or were never true. Resistance to the opportunities of virtualization often stems from four common myths. Organizations that have ignored these myths have gone on to implement state-of-the-art virtualization applications that have decreased outages and hours spent on system maintenance.

Myth #1: Complex systems will increase dependence on contractors and automation vendors

In the earliest days of virtualization technology, virtualization systems were complex and difficult to manage. Configuring a new virtual architecture was a specialization requiring engineering and information technology (IT) expertise and significant resources. As a result, many organizations have come to believe that these systems were simply too much for in-house automation engineers to handle and resisted engaging IT.

In recent years, however, new virtualization software packages have been built around the control systems that industrial organizations use, with the purpose of making virtualization more user-friendly. These new virtualized infrastructures are designed to naturally extend automation personnel's expertise.

Virtualized control system applications are designed to mimic the look and feel of the control system software, simplifying the transition from traditional installation to virtual. Best-in-class virtual control system packages include a visualizer that lets technicians see how the virtual networks are laid out, removing the abstraction of how they are configured, simplifying management.

In addition, to ease the strain of choosing a hardware backbone, suppliers offer a variety of recommended hardware configurations to support virtualized control system software packages. Hardware can include preconfigured virtual machine templates, with the control system installed and configured with the proper operating system settings to support operation. Using these templates, automation personnel can quickly and intuitively deliver best-practice installation and configuration of the control system.



A best practice is also to develop control system packages with comprehensive manuals, videos, training, and other online features to guide users through control system configuration. With available resources for installation, configuration, and troubleshooting of these packages, automation technicians can manage control system deployments.

Implementing a virtual solution for automation software also can simplify support, freeing organizations from relying on costly contractors when problems arise. Because virtualized control systems are available as consumer-off-the-shelf products, the plant's virtualized control system is no longer a custom deployment with an unlimited number of variables, thus, global technical support often is available for the product. The standard configurations of virtualized packages allow automation teams to rely on standard support, 24/7, 365 days a year.

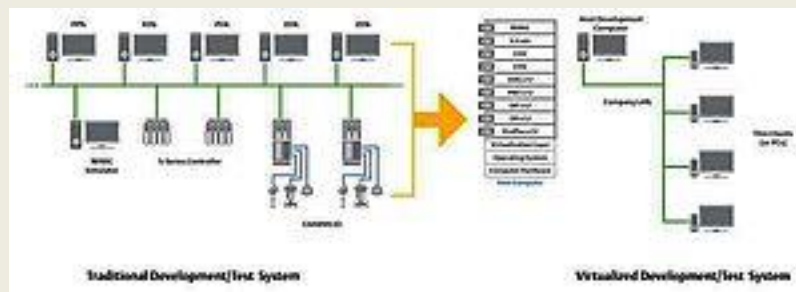
Rather than requiring new personnel with new expertise, virtualized automation system software allows current automation personnel to confidently control the backbone of the control system.

Myth #2: Critical applications shouldn't be virtualized

Virtualization technology has been available for many years, but the perceived complexity and related lack of understanding contribute to the myth that virtualization only is useful for non-critical plant applications. Because industrial environments rely on many critical applications for safety, production, and auditing, virtualization products support these applications.

The most critical applications in an environment often are the best candidates for virtualization. Applications running in a virtual environment are more dependable than those running on traditional physical hardware. Relying on virtualization to support these applications in an industrial environment means an increase in production and reliability.

When a control system runs on traditional hardware and that hardware fails, the results can include an emergency for operations or an unplanned process outage. If the organization does not have spare hardware to resolve the failure, the outage can last hours or even days as technicians wait for replacement parts to be delivered or seek refurbished parts online. The company would lose revenue, risk its reputation, and potentially face fines.



In contrast, a control system running on a virtual platform with high-availability features is at an extremely minimal risk of shutdown. Even in the most extreme hardware failures, high-availability features automatically will move and reboot a virtual machine in minutes, resulting in a running replacement long before most operations personnel are aware there is a problem. Critical applications running in a virtual environment have a much higher uptime. For that reason, the most critical applications in a facility are the ones that should be virtualized first.

Myth #3: A virtual environment is too costly

Virtualized control systems often are similar in cost to equivalent traditional hardware. For this reason, many making this decision find themselves wondering why they would change. In the short-term, traditional hardware may be comparable in cost to a virtual platform, however, the total cost of ownership (TCO) of a virtual system is significantly lower than that of traditional hardware infrastructure for many reasons:

- **Easy upgrades:** Eventually, even the best control system needs upgrades. With a traditional infrastructure, this usually will mean purchasing new hardware for the upgrade. It also will mean technicians need to manually perform upgrades. A virtual platform removes these hassles. Virtual technology decouples software and hardware, allowing the software upgrades to be completed separately from hardware upgrades. In addition, best-in-class virtualized control system packages offer one-click upgrading, allowing technicians to start the upgrade process from the machine, and let the software handle the rest, saving non-value-added work.
- **High availability:** When machine hardware fails, someone needs to fix it. For traditional architecture, this often means a costly process interruption or a degraded mode of operation until the problem is resolved. With a virtualized platform, high availability features automatically move a machine off of the failed hardware and get it to run on functioning equipment. Replacing or repairing the failed hardware can be completed when it is convenient, taking those tasks off the critical path.
- **Decreased footprint:** A virtual platform uses less hardware. This means less weight and space used by equipment overall, as well as utility savings as HVAC costs to cool the server room drop. Moreover, these HVAC savings, coupled with the energy savings of less hardware, translate to a reduced carbon footprint.



While savings may not be apparent immediately, the cost benefits over 5 to 7 years of ownership and operation of a virtualized control system can save thousands, if not millions of dollars.

Myth #4: Virtualization puts too much reliability and risk on one point of failure

Every organization finds value in redundancy for its critical equipment, and the hardware backbone of the control system is no exception. For this reason, many organizations fear that implementing a virtual platform will put all their eggs in one virtual basket, making it possible for a catastrophic event to wipe out all systems.

Virtual control systems are designed to manage disaster recovery. These software packages feature virtual machine (VM) replication and cluster management. When properly implemented, these features ensure that regular machine snapshots are

transferred to another cluster in a different location. In the case of a disaster, these replicas—generally a maximum of no more than five minutes old—can quickly be started, avoiding the need to perform a full restore from backup as is necessary with traditional hardware. Any organization using best practices in separating VM replicas will experience significantly faster disaster recovery than an operation relying on traditional hardware.

Virtualization can be a lever for operational excellence

New virtualized control system packages make it easy for organizations to create and maintain systems for development, training, and on-line production. With less hardware to buy and increased flexibility, virtualization lowers TCO and increases engineer productivity. With virtualization packages built around control systems, automation teams gain the familiarity needed to take control of automation system infrastructure, resulting in less reliance on IT staff and faster turnaround for disaster recovery, changes, and expansions.

Modern industrial organizations provide perfect environments for a virtual infrastructure, and virtualization can remove some of the space, hardware, and obsolescence constraints that impact operational availability, cost, and efficiency.