(intel)

Reduce cost, complexity, and footprint by consolidating industrial systems

Intel demonstrates how to combine multiple industrial workloads on one system—including deterministic real-time functions[1]

Virtualized Industrial Workloads in Harmony
A custom-built robot "musician" carefully manipulates the strings of a zither, while the single computing platform that powers the robot manages motion control, HMI, and vibration analysis in a real-time, deterministic manner.

Challenges

- Find new ways to lower operating expenses, a large part of which are the purchase and support of industrial systems, such as spares, maintenance and repairs.

- Prevent system proliferation from consuming precious space and straining IT resources.

- Minimize downtime and respond to unique support requirements for configuration, backups, spares, and software patching that result from dealing with numerous systems.

- Oversee a large number and variety of systems, which means more devices to install, provision, manage, secure, and fail, and more integration tasks to manage, such as networking, cabling, mounting, and shielding, and their attendant costs.

- Provide the housing and integration of numerous systems, and respond to the resulting increase in overall power consumption and cost, without compromising performance.

Solution

- Efficiency can be improved when multiple factory functions are consolidated onto a single hardware platform.

- Consolidated equipment can decrease operating expense, factory footprint, energy consumption, and integration and support effort as the combined system often takes up less factory floor space than the multiple systems it replaces.

- Multicore architectures and hardware-based virtualization accelerators provide the computing power needed to consolidate multiple operating systems (OSs) and their applications on a single physical board, and deliver real-time, deterministic performance in a virtualized environment

Factory changes drive opportunity

Today's fiercely competitive manufacturing environment is driving companies to constantly sharpen their operational efficiencies and lower costs, without compromising quality, employee safety, or performance. Manufacturers are seeking new strategies that address a range of critical areas, including simplifying the purchase and support of industrial systems, reducing the numbers and varieties of systems in the factory, and optimizing the use of floor space.

Benefits of industrial system consolidation

In recent years, industrial automation efforts have increasingly turned to virtualization as a solution. Virtualization allows traditionally separate subsystems—such as motion control, programmable logic control (PLC), human machine interface (HMI), and machine vision—to be combined into a single multicore platform. This platform can host real-time and general-purpose applications together as if each was running on its own dedicated computer.

With fewer subsystems to house and integrate, costly factory floor space may be conserved, saving what can be a sizable expense. Fewer devices can also mean fewer devices to install, provision, manage, and secure, each of which brings its own cost, risk of failure, and so on.

Intel demonstrates deterministic, real-time performance

In an effort to help industrial organizations reap the benefits of industrial system consolidation, Intel has developed a proof-of-concept demonstration that illustrates how multiple industrial workloads—including motion control, HMIs, and vibration analysis—can be combined on a single system while achieving real-time performance in a virtualized environment.[1]

Using an Intel® Core™ i7 processor-based computing platform, the "Virtual Industrial Workloads in Harmony" demonstration integrates a virtualization software stack using a hypervisor with preconfigured virtual machines (VMs) running a combination of real-time and general-purpose OSs. It includes Wind River VxWorks* RTOS to run applications with real-time performance requirements, while simultaneously running applications on Wind River Linux* 5.0 and Windows* 7 Professional 64 bit. McAfee Embedded Control* security software ensures only trusted software runs on the Windows partition. Watch the video to see the demo in action.

Start consolidating today

Virtualization technology running on multicore Intel Core processors helps you reduce the cost and complexity of designing and building industrial machines. By safely partitioning workloads so that they can perform in a deterministic fashion[2] you can bring together previously discrete industrial workloads such as motion control, HMIs, PLCs, data acquisition, and more.

Learn more about using system consolidation and Intel® multicore and virtualization technology to help meet your customers' needs for greater efficiency and reduced complexity in the factory environment: **http://www.intel.com/industrial**.

Industrial system consolidation: Requirements

Three things are required for industrial system consolidation:

- Embedded virtualization with a real-time hypervisor and real-time operating system (RTOS)
- Intel® multicore technology
- Intel's hardware acceleration for virtualization known as Intel® Virtualization Technology (Intel® VT)

Virtualization enables multiple OSs and their applications to run on the same physical board, while high-performing Intel multicore processors and Intel VT provide the computing power needed to support those multiple functions in a real-time, deterministic manner.[1] Learn more at **www.intel.com/virtualization**.

"Intel is helping developers realize the trend of system consolidation by demonstrating an integrated approach to virtualized real-time systems."

– *Tim Appleton,*
Business Development Manager,
Energy and Industrial Segment,
Intel Corporation

Solution Provided By: