Case Study

With the right software platform, one multi-core PC in a fueling center can perform the functions that would have required multiple computers in the past.

IT/OT Converge at the Gas Pump with INtime®

Fueling centers get smarter while decreasing software complexity.

What happens when cloud services, payment processing, and fraud management converge at the pump? For Allied Electronics*, the result was a more capable system with lower TCO. But first, the company needed a way to bring all of these enterprise capabilities together on a platform that could also handle real-time computing. That's why Allied turned to TenAsys®, whose INtime® platform bridges both worlds to enable digital transformation.

tenAsys®

Hidden Complexities of Fuel Centers

There's a wide spectrum of processing applications that are required to operate at fueling centers. There's the point of sale (POS) system, credit card processor and fraud management software, possibly a separate database processor that links purchases with the fueling company's customer loyalty points program. Then there are one or more computers that run the pumps and the system that updates the gas prices, and controllers that interrogate tank gauges and truck RFID transponders. When a new service is added, or a new feature is added to the mix, often a separate computer would be networked in to implement it.

The result can be an eclectic assembly of computing power that is hard to integrate and expensive and difficult to maintain because of hardware/software incompatibilities and turf battles between the various suppliers.

A better solution would be to integrate all the various software environments onto a single platform. The integration of heterogeneous processing workloads brings with it some difficult software challenges, however. For example, by itself, Windows* isn't designed to support real-time processing.

Digital Modernization

Allied Electronics* developed their AEGIS solution to address these issues. The company's goal was to streamline and consolidate the many applications these centers require, to provide a path to digital transformation, and to address the diversity of use cases—which range from large fueling centers with attached convenience stores to unattended commercial fleet card-lock fueling centers.

The AEGIS platform runs all the functions of the center, including back-office computing functions. The system incorporates a PC-compatible single-board computer (SBC) and an I/O interface module that supports a wide range of electrical protocols. The system boots Windows on one processor core and the Intime® RTOS on the other (see Figure 1).

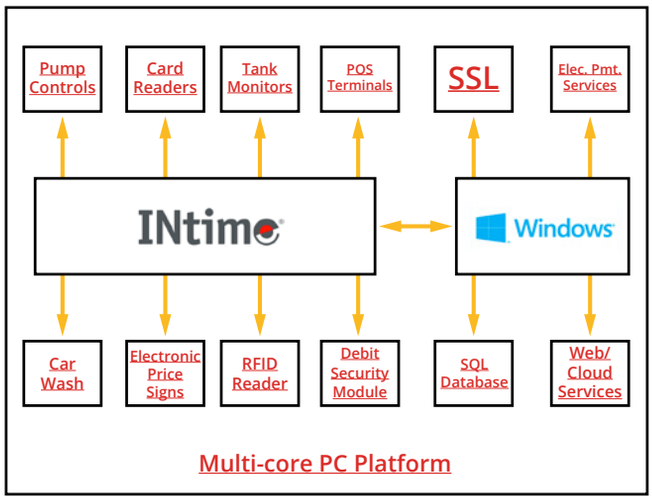

Figure 1. The Allied Electronics AEGIS system runs INtime® alongside Windows* to combine the functionality that used to require many different computers in a fueling center. INtime ensures that the fueling center's I/O interfaces are accessed in a deterministic manner.*

Overcoming Real-Time Requirements for Digital Transformation

Why is there a real-time computing requirement at fueling centers? "The real-time nature of many of the applications we run stems not from the fact that there are so many transactions being handled, but because the typical method that systems use to interface to the devices," said Lou Seitchik, Allied's Lead Architect. Many of the devices must be polled, meaning a central control system must repeatedly ask them if there is an action required by the system.

For example, credit/debit card readers must be periodically asked if a card has been read since the last poll was done. The longer that it takes between polling contacts, the longer that a customer must wait for his or her fueling transaction to be acted upon, which at busy stations can create a customer service problem. "At a truck stop there may be 48 locations to poll," said Seitchik.

In Allied's AEGIS system, applications running INtime handle all the I/O monitoring and control functions in the fueling center, including polling all of the appropriate hardware devices, while seamlessly integrating with Windows applications that handle the database processing and Web-enabled functions.

"INtime enabled Allied to fuse deterministic performance and real-time networking with full-featured enterprise functionality," said Kim Hartman, Vice President of Marketing for TenAsys®. "Our IT-friendly platform mades it easy to connects fuel center operations to business intelligence systems."

A Path to the Future

TenAsys' technique for integrating the Windows platform with the real-time control system (which the company calls embedded virtualization) allows off-the-shelf Windows software to be run on the system without modification. "In the past, when our platform didn't support Windows, we had to say 'no' to being able to run standard software such as SSL (Secure Socket Layer) or Web Services," said Seitchik.

Using a standard platform makes it easier for Allied to partner with other software vendors to offer a more complete solution. "For example, we have partners that do electronic payment software that we want to host on the Windows system. There's also fraud management software," said Seitchik. "Running these applications via AEGIS will eliminate an additional PC at the station for each application, reducing cost and complexity."

"The INtime Software operating environment allows us to offer the best of all worlds: stability, reliability and performance from the real-time environment, but also access to the Windows applications and Web services that our customers will want both now and in the future," continued Seitchik. "And the quality of integrated services including technology, documentation and support available from TenAsys made INtime the best solution for our diverse needs."

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