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Bruce Claremont, November 2006

- Preserving Good Software - ITT Goulds Pumps Replaces VAX Hardware without Impacting Software

[ITT Goulds Pumps](#) operates a substantial manufacturing facility in beautiful Seneca Falls, New York. There they manufacture industrial and consumer mechanical pumps, everything from common sump pumps for your basement to massive high volume coolant pumps for power stations. The facility is comprehensive, complete with a smelter for creating castings through specialized tooling to precisely fabricate shafts, bearings and other critical assemblies.



Much of the machine-driven tooling is supported via Computer Aided Manufacturing (CAM) programs. Over the years, Goulds has progressed from a PDP-11/60 through a VAX 11/785 to a MicroVAX 3100-96 to support these programs along with an application called UNIAPT. Newer tooling now uses Windows-based CAD/CAM control systems, but much of the older tooling still relies on the VAX system running UNIAPT under OpenVMS 6.2.

As a rule, the machine tooling equipment is massive, expensive, and long-lived. Thus, computer system longevity becomes a key component in maintaining manufacturing capacity. The VAX and OpenVMS were an excellent choice in this regard, as they are a stable, reliable, long-lasting combination. The MicroVAX was installed in 1994 and had provided 12 years of steadfast service.

Unfortunately, even VAX's eventually wear out. ITT Business Analyst Ray Schussler recognized the increasing risk represented by the VAX system and began to investigate replacement options. Coincidentally, IT Infrastructure Supervisor Steve Savage was working towards a corporate mandated server consolidation goal centered on Windows Server 2003 and rack mounted Intel-based Dell servers.

The two men put their heads together and researched the problem. There was no need to update or replace the UNIAPT software supported by the VAX system; it was still working just fine. At the same time, migrating to an HP Alpha or Integrity system that supported the current version of OpenVMS was off the table for two reasons: 1) doing so did not meet the corporate mandate for server consolidation; 2) UNIAPT was not available on either platform.

Their research lead to the [Migration Specialties](#) web site. There they learned of the CHARON-VAX hardware emulator, a software application that emulates VAX hardware under Windows Server 2003. They contacted Migration Specialties and got me involved in the project.

Upon reviewing the Goulds' requirements and limitations for VAX replacement, I concurred that CHARON-VAX would be a good solution. Steve then sent me a set of image backups of the

MicroVAX system so I could configure and test the emulated replacement system. Testing was successful and we scheduled a two-day onsite visit for installation and acceptance testing. We put the time prior to my visit to good use preparing an installation and acceptance test plan.

Arriving on site, I set up my laptop for a quick demonstration of the ported system. Ray brought in senior programmer John McCormick, who quickly put the demonstration system through its paces, validating its functionality and performance.

With our first acceptance hurdle cleared, Steve and I proceeded to install the VAX emulation software on the replacement Dell server. We loaded the system I had test ported and adjusted the configuration to reflect the physical hardware it was now installed upon. We confirmed a working system, then pulled all modifications since the ported image backup off the MicroVAX and installed them on the emulated VAX. With this task completed, we wrapped up the first day.

Day two started with the MicroVAX disconnected from the network and John assessing the up-to-date emulated VAX. Things looked good, so we moved forward with testing the network interfaces, program changes, and down line loading programs to the machine tools. Each test passed successfully.

Our last test proved the most daunting. We wanted to ensure a DECserver 200 connected to a critical piece of tooling would reboot properly after a power outage. To simulate the outage, we needed to unplug the DECserver, then plug it back in. The problem was the server was lashed to an overhead beam 20 feet above the tooling station. Facilities people were called, a lift was trundled into place, and the test was successfully conducted.

We wrapped things up mid-afternoon on the second day. Careful planning and preparation paid off handsomely. Ray is happy about the reduced risk of an OpenVMS server failure. Steve is pleased with consolidation of the OpenVMS applications onto a Windows server. John, the other programmers, and the users are thrilled that no application changes or training were required to implement the replacement system.

The OpenVMS software in use at ITT Goulds Pumps didn't need to change. The underlying VAX hardware did. Hardware emulation provided a quick, economical solution to the problem.



Comments and feedback on this article are welcome. Send them to Info@MigrationSpecialties.com. Migration Specialties provides OpenVMS porting, migration, and support services along with hardware emulation solutions. We will be happy to assist you with your OpenVMS and hardware replacement needs.