Centralized Accelerated Testing Monitor

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Category:
Prototype/Test

Products Used:
LabVIEW 8.2.1

The Challenge:
Develop a tool to replace physical strip charts. The software needed to talk to multiple machines on the network, polling for status information, while proving viewing and logging capability. The system needed to be easy to setup and use while being flexible enough to talk to multiple types of machines.

The Solution:
Using a well architected application, Data Science Automation was able to develop a product that could be configured to talk to 50 individual units. The system supports all of the customer product lines making it easy to market.

Abstract:
A manufacturer of accelerated testing equipment wanted to develop a low cost, easy to use replacement to physical strip chart recorders for its customers. The strip chart recorders required an investment in each machine and produced a stack of paper that had to be stored and made available for third party auditors. Using National Instruments LabVIEW, Data Science Automation developed a system that collected the readings for any number of testers on a single PC and presented the 'virtual' strip chart data for review.

Manufacturer Need
A manufacturer of accelerated testing equipment wanted to replace the physical strip chart option on their machines. The strip chart recorder only collected data for a single machine, they were an expensive option that produced a pile of paper that had to be stored for future review, and were difficult to support. Replacing them would require talking to the unit over TCP using the propriety protocol designed into the machine.

Talking the Language
The first hurdle on the solution was to talk to the different machines. While there were some common aspects to the communication, each version of each machine communicates different information that must be properly interpreted. Using LabVIEW's TCP/IP communication tools DSA was able to quickly establish communication and develop a set of dynamic VIs that would interpret each machine's responses properly.

Performance

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Once the system collected data, it accumulated a lot of data quickly. At one reading per second, with a dozen critical values in each reading, the system had to manage millions of data points for each unit's monthly data display. Reviewing a paper chart, despite the above mentioned drawbacks, took a matter of seconds as the auditor could 'flip' through the history quickly. To create a comparable experience, the customer requested that the system process a month's data in just a few seconds. With a user base across the world, the performance specifications of the host PC could not be guaranteed. Any PC capable of running Windows XP had to respond in a set amount of time. To improve performance, the data file was preprocessed as it was collected, indexed to provide random access, and an parallel processing engine was developed to speed loading.

A True Windows application
To make the application look and feel like a native Windows program, ActiveX controls were used to provide calendar controls.