Virtualizing SCADA

Improving control system reliability with proven IT technology

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ABSTRACT

In the aftermath of catastrophic hardware failure & data loss, we explored options for more robust technology to prevent these events from happening again. Our previous system was a typical SCADA architecture utilizing separate physical servers to host our SCADA platform in primary/slave configuration and our database historian. Our investigations showed server virtualization could provide us a high availability solution beyond typical single-application, single-server architectures along with other advanced features, making our system even more flexible and reliable. Through virtualization of our SCADA system, we now create and keep two weeks' worth of daily full backups both on and off-site, and can recover and restore our SCADA and historical data back to any hour of the last day. Our backups are done at the full machine level, and are automatically tested for integrity and functionality as an application group. We now test OS and software patches for compatibility before production deployment without need of additional hardware. We have successfully tested recovering our entire SCADA server and historical database from complete failure to production runtime in less than an hour with minimal to no data loss.

This paper seeks to define key terms and concepts of server virtualization and how it can be adapted to SCADA systems, and show how we've increased our control system reliability, disaster recovery, and patch management methods beyond the previous architecture.

ABOUT THE AUTHORS

Jason Hamlin *loved science fiction as a child, reading and watching people interact with computers and machines to solve problems enthralled his curiosity. As an adult, Jason relives his childhood passion through design and maintenance of the control systems in his care. Jason has 13 years' experience in industrial electrical & instrumentation, and is known to place creative acronyms in his SCADA projects.*

Carter Farley, PE *knows that experience is usually the best teacher, and Carter considers himself lucky to be in a position to learn something every day as he shepherds SCADA projects from concept, to design, construction, startup, and full life cycle service. As Director of Engineering for InstruLogic Corporation,*

Carter sees first hand all the good, bad, and ugly of many SCADA technologies and methodologies. Drawing from his 18 years' experience he is able to guide clients through the SCADA jungle and develop long term strategies for system growth and stability.