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A Systems Integration Company, Providing Automation and SCADA Solutions.

Allowing You To ... Create. Control.
… a Full-Service, Turn Key Solution:

• An integrated team of engineers & designers
• 300 + years combined experience in providing innovative automation solutions!
• C Corporation founded in 1999
• Celebrating our 20th Anniversary this year
• [4] Project Managers
• [12] Engineers/Designers/Programmers
• [7] Technicians
• UL Panel Shop
Industries

Municipal:
  - Water
  - Wastewater
  - Telemetry
  - Pump Controls
Industries

Industrial:
- Process Control
- Continuous Processing
- Batch Processing
- Vision Inspection
- Motion Control
- Instrumentation & Calibration Services
Panel Building

- UL 508A | UL 698A
- NEMA Design
- PLC applications
- VFD applications
- Environmental | HVAC
SCADA

Topics & Concepts

• Legacy Systems
• Some reasons why systems don’t get upgraded
• Assessment & planning a System upgrade
• Top 5 SCADA Companies
• HMI development standards
Why Systems Don’t Get Upgraded

• Time & money
• Not budgeted – it never is!!!
• “If it ain’t broke, don’t fix it”
• Owners are unaware of the risk of legacy systems
• Owners are unsure how to upgrade
Identifying a Legacy System

- Was your SCADA system installed more than 10 years ago (2008)?
- Has your SCADA software been upgraded in the last 5 years?
- Is your SCADA computer more than 10 years old?
- Is the operating system (OS) still supported (Win7 or older)?
Our Role!

• The “If it ain’t broke, don’t fix it” ….
  ➢ This mentality must be changed
  ➢ SCADA upgrades are no different than any other piece of equipment

• All equipment requires maintenance
• Without proper attention – IT WILL FAIL!!!
• Emergency Recovery is EXPENSIVE
Upgraded Guidelines

- Identify the steps required for the upgrade
- Identify the time required for the upgrade
- Associated costs
- Potential process impacts
- **You MUST Conduct a complete system assessment**
Hardware Assessment

• Hardware Considerations:
  – Architecture: number of computers affected
  – Process hardware: instrumentation, brands, models, communication methods, remote PLCs & telemetry systems, etc.
  – PC hardware: RAM, HD space
  – Communications methods
  – Operating System (OS)
Software Assessment

• SCADA Software:
  – version, database tag count, drivers, tag groups, scripts and custom code, security
  – Historical Data: points collected, storage method, amount of existing data
  – Reporting: alarming, reporting, and external applications (ie: report generation, alarm dialers & paging systems)
Software Upgrade Considerations

- Annual support agreement compliance.
- Can the system run in parallel with the older version for a phased approach?
- Conversion tools: screen resolution and conversion utilities (will the screens look the same?)
- Will the system upgrade require an OS upgrade (version of Windows, 32 or 64 bit)?
Top 5 SCADA packages in the Municipal (in no particular order)

- Wonderware by Schneider Electric
- VTScada by Trihedral Engineering
- Ignition by Inductive Automation
- iFix by General Electric
- FactoryTalk View by Rockwell Automation
• Tag-based licensing (tag count)
• Client-based licensing (how many users)
• InTouch 2017
  – Stand-alone or Client|Server
  – Windows only: Minimum OS (Windows 8.1 Pro or Windows 10 Pro)
• System Platform 2017
  – Application server that deploys screens out to the clients.
  – Can use virtualization technologies for high availability and disaster recovery.
  – Expanded connectivity using native i/o drivers, MQTT, OPC UA.
  – Operating System (OS): Windows only
• Tag-based licensing
• Client-based licensing
• VTScada Version 11.xx
  – Stand-alone or Client|Server
  – Server Web Clients: web-browser based (HTML5) Visualization
  – Can use virtualization technologies for high availability and disaster recovery.
  – Expanded connectivity using native i/o drivers developed in-house (100s of drivers).
  – Operating System (OS): Windows only
• Server-based licensing
• Unlimited tags | Unlimited Clients
• Ignition Version 7.9.x
  – Stand-alone or Client|Server
  – Server driving Web Clients: web-browser based (Java & HTML5) Visualization
  – Can use virtualization technologies for high availability and disaster recovery.
  – Expanded connectivity using native i/o drivers, MQTT, IIoT, OPC UA.
  – Operating Systems: Cross platform for Windows, Linux, or Mac OSX
• Tag-based licensing
• Client-based licensing
• iFIX Version 5.9
  – Stand-alone or Client|Server
  – Server Web Clients: web-browser based (HTML5) Visualization
  – Can use virtualization technologies for high availability and disaster recovery.
  – Expanded connectivity using native i/o drivers, IIoT, OPC UA.
  – Operating System (OS): Windows only
- Display-based licensing (number of screens)
- Client-based licensing
- FTView Version 10.xx
  - Stand-alone (ME) or Client|Server (SE)
  - Server Web Clients: web-browser based Visualization w/FactoryTalk® ViewPoint
  - Expanded connectivity using native i/o drivers for AB and KEPServer for other devices.
  - Operating System (OS): Windows only
Operating Systems (OS)

Are Microsoft technologies still best OS for process control systems? - Control Engineering 2014

Use of Microsoft technologies is creating growing concerns among senior designers and senior architects in control system suppliers. Microsoft technology is widely used as the underlying basis for process control systems, such as supervisory control and data acquisition (SCADA), human machine interface (HMI), distributed control system (DCS) displays, historians, manufacturing execution systems (MES), and batch execution systems. Since 1998, when Microsoft Windows 98 was released, the Microsoft Windows platform has been the de facto standard for most control system suppliers. Below, see six critical requirements for process control systems.

While the hard real-time control systems, such as PLCs and embedded DCS controllers, have not moved to a Microsoft environment, almost all other parts of process control systems have moved to Microsoft Windows servers, MS-SQL databases, and Windows desktop operating systems. Most suppliers have followed the "every other release" strategy, skipping Microsoft Windows ME (2000), using Windows XP (2001), skipping Windows Vista (2007), using Windows 7 (2009), and many are now looking at skipping Windows 8.
Are Microsoft technologies still best OS for process control systems?

For the past two decades consumer software has been the driving force in operating system and user interface in manufacturing systems. Control system suppliers have applied consumer technologies as they have become reliable enough for industrial applications. However, today is a different situation. This is a period of intense change in consumer products with tablets and smartphones replacing laptops, laptops replacing desktop systems, and new user interface models and services under continual change. Continual change is not what control systems need.

Consumer oriented operating systems also always want to call home to the vendor and perform an auto update. This can occur even if auto update is turned off, because we all know consumers won't update critical patches if left on their own. However, this behavior is the opposite for manufacturing, which requires stability, safety, and validation of patches. There are too many examples of patches causing operational problems, or just being wrong, to allow systems to patch themselves without human intervention.

These issues are causing architects and designers to question the 15-year wisdom that you cannot go wrong by picking the Microsoft environment for your process control system.
Are Microsoft technologies still best OS for process control systems?

Process control vendors require:
1. A system with a minimal attack surface, so that biweekly or monthly patches are not required
2. A consistent programming interface that will not change every four to five years, requiring a complete rewrite of their software
3. An environment that can be quickly and safely "locked down" to reduce the risk from hacking
4. A system with limited network access, only through specific ports to reduce the risk of network based attacks
5. Support for priority-based multi-tasking (RTOS) that supports hard real-time requirements
6. A robust ecosystem of utilities and tools to make development as easy as it is on consumer systems.

The process automation market is estimated at about $130 billion, more than large enough to support a dedicated software infrastructure market. Maybe, if the grumbling by architects and designers reaches a tipping point, the process control market can force current suppliers, like Microsoft, Apple, and Google, to develop systems designed for process control, or the process control vendors may collectively move to Linux derived systems. Only time will tell, but watch for movement away from rapidly changing consumer technologies to more stable solutions that will still be valid 5, 10, 15, or even 20 years from today.