SCADA Questions and Answers

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SCADA System Evaluation Questions

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Table of Contents

Architecture

Is this Control and Monitoring system supplied as a single package? Yes

How much does each additional driver cost? Most are included.

Does the Control & Monitoring system use Client/Server distributed processing? Yes

Can the system be expanded, without re-engineering, to handle future requirements? Yes

How do we use the network to maximize the performance of the entire Control and Monitoring system? The server(s) can be redundant & additional performance (proxy) servers are connected via the network. ViewX Clients are connected via the network communicating with up to 64 servers simultaneously. It finds the most efficient server to connect to. The use of managed switches is used to make the network more deterministic and help with security.

How can we add display clients without shutting down the system or changing the software configuration? The system is always online and does not require restarting, rebooting, or reconfiguration for Clients to connect. Each ViewX Client is licensed. WebX Clients (browser based) are licensed by the number of concurrent users, how many users online at any one time, and are "floating" on the server key.

Can I make changes to the system without shutting down? Changes take place immediately as there is no compiling. If there are redundant servers all changes are automatically sent to the Standby servers.

How can we support nodes at remote locations? Remote users are connected via Display (ViewX) or Web Clients (WebX). The system was designed to operate on low band-width Wide Area Networks(WAN). Information is passed to Clients using a publish and subscribe method and is report by exception. This dramatically increases the performance, especially for remote users.
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How can we exchange data with other applications? Exchange of data with other applications and systems is done with OPC, ODBC (SQL), or through an API. The OPC interface supports OPC-DA (Real-time Data Access), OPC-HAD (Historical Data Access), and OPC-AE (Alarms and Events)

Can other automation systems, like a DCS, communicate using industry standard Communication drivers like Modbus or DNP3? The system supports being a Modbus or DNP3 Slave so other systems can connect and access real-time data. This is accomplished by configuring a virtual device which only the points required for the other system are mapped.

What external databases does the Control and Monitoring system support? Any ODBC compliant (SQL) database.

Redundancy

How can we provide for data integrity and system control in the event of hardware failure? Data integrity & system control is maintained through server mirrored redundancy. The system supports triple mirrored server redundancy.

Are multiple copies of the configuration database required to enable redundancy? No, the redundancy is mirrored. Mirrored redundancy means that no programming or extra database configuration is required to make the redundancy work. All functions are available from the standby or redundant server.

What happens if a computer (node or client) fails? If a server fails, the ViewX clients automatically connect to the standby server as soon as the client detects that Main server has failed, transparent to the user.

How can we provide backup for critical tasks such as plant-floor I/O, alarms and trends? All server functions are mirrored to the redundant server. The system provides for Data backups to Local or Storage on a network client with backup device (like large hard drive or tape).

When the primary Server fails, is there any loss of monitoring or control before the redundant I/O Server assumes control? No the transfer is transparent to the users and all functions are as normal.

When the primary and standby Servers are in operation, are they both polling the I/O Devices (PLCs)? No, only the server acting as Main will communicate to the IO.

What happens to alarms monitoring if the primary alarms server fails? The servers are mirrored and all functions are transferred transparently to the users or functions ongoing.

What happens to trend data if the trend server fails? All functions are mirrored.

What happens if the LAN fails? If redundant LANs are installed the transfer is transparent to the system.

Configuration

How many applications do we require to configure a Control and Monitoring system? No other applications are need to configure the system, Any ViewX Client can be used for configuration if that user has permissions for configuration.

How can more than one engineer configure the system at the same time? The system is designed with an Integrated Development Environment interface that provides for collaboration configuration and control. This is not a problem.

Can we configure the system from any node? All ViewX clients have full configuration capacity with security.

Can we create descriptive tag names to incorporate a more meaningful tag naming strategy? Yes

If we need to make a configuration change to one data point, for example, does that changed need to be made on all nodes?
The system has only one configuration database and any change made are automatically propagated to all servers and clients. Nothing else is required.
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Can we build display pages on one node and display them any node in the system? Yes assuming that the users on the other clients have permissions to see the display page.

How do we backup/archive the system configuration information? The system has an Export function which allows saving the database to any media.

How do we restore the system configuration and history in an event of data loss? Import the backup file or database.

How do we set up communication with an I/O Device (PLC)? The system uses a browser design for an object. Define the object (main directory), and define the individual parameters in subfolders. This can be used as a template object so it can be reused in the system.

Can we control how the system polls the I/O Devices (PLCs)? Yes and the polling configuration is easily controlled by adjusting communications parameters of the device.

Can we retain system values on disk at shutdown and restore them on system restart? Yes the system maintains all the last values of every point in the system with a timestamp.

How many separate security areas can we define? As many groups and-or individual as is needed, no limit.

What elements of the system can we associate with security areas? The security level can be defined down to the database point level.

How do we configure a system that only uses an industrial keyboard? The system primary input is through the pointing device. A screen keyboard can be implemented for function not on an external keyboard.

Graphics

First, the system graphic engine is vector graphics, not bitmap. There is a 4 to 1 size difference in favor of smaller vector graphic files. Only vector graphics can use a smooth zoom/pan transition without distortion.

How many colors does the package have for building graphics displays? True Color

How do we draw complex entities such as 3D pipes? The 3D effects are done with shading and sizing techniques like most artists do.

How easily can we construct intelligent objects that will save drawing and configuration time? Objects can be made into templates from which instances are created. Each instance contains all database entries. Typically only addressing and selection of the physical IO device are necessary.

Can we edit library objects and intelligent objects supplied with the package? Yes, but it is recommended to copy/paste the original object into the library and modify it as a new object; thereby, keeping the original library.

If we change a library object or template object, are the changes

reflected throughout the system—or do we have to change every occurrence of the object? The changes will take affect immediately to all other instances of object or template in the system.

Can we use Boolean and other arithmetic expressions when animating data? Yes

Can we apply multiple animations to the same object? Yes

Can we disable (gray-out) command buttons on a graphics page? Yes

Can we create custom sliders? Yes

What graphics file formats can we import into the graphics builder? The AutoCAD, DXF, and all other graphics formats can be imported or copied and pasted into the mimic. They will then allow smooth Zoom with the vector graphic engine.

How do we recover from accidental deletion or moving of objects when editing a complex display page? The use of undo function is used to reestablish deletions. We also support layers so graphics objects can be put on separate layers to prevent accidental changes.

How do we align objects on the page? Use a snap to grid or align the object with the alignment tool.

How can we add special effects to text and other objects? Special effects are done with colors, lines, and shading.

How can we make a global change of one color for another in a object? **Special color tags may be created. When these are referred to for colors, changing the tag color will change all instances that use that color.**

How can we edit a group of objects? **Objects with common attributes can be selected, and the changes will apply to all in the selected group.**.

When we resize an object or group of objects, how can we maintain their aspect ratio? The system uses vector graphics with zoom from 1% to 3,200%.   Maintaining the aspect ratio is a selectable property.

How can we display an animated sequence? Animated sequences and other functions are done without programming, but with IEC61131-3, functional Block diagrams. The system writes the code. Visual Basic Scripts (VBS) can also be used for those understanding VBS.

How far back can we undo an edits to a display page? The undo is user defined.

How can we configure a command that executes continually while a graphics page is displayed? This is done via VBS, Functional Blocks. Or scripts.

Alarms

How are Alarms and hardware communications failures reported by the Control and Monitoring system? Alarms are reported and are always visible on any page through the alarm banner which is normally at the bottom of the page. There is an Alarm Management system within the system that provides for alarm redirection, sorting, filtering, filed editing, etc. Custom alarm lists can be embedded on any page that is filtered for that specific page. For instance, you only what to see the alarms that pertain to a specific substation or breaker.

Do we have to configure alarms for all items of hardware? No

How can we display and process alarms to millisecond precision? Yes

When an alarm is acknowledged at one operator station, is it automatically acknowledged at all nodes (workstations) without having to write programs or scripts? Yes. This is true even on cluster servers.

Can we provide help about specific alarms that the operators can access easily? Yes

Can we disable alarms? Yes

How many logical alarms groups can we create? The system provides for as many alarm groups as desired or individual & group.

How can we prioritize alarms? Alarms can be prioritized by severity, time, device, etc.

Can we send alarms to a printer and file as well as display them on the screen? Yes and alarms can be sent out to groups or individuals via Email, pager, and/or text messages to cell phones.

Trends

What flexibility does the Control and Monitoring system provide for defining trend data? Any database object may be configured to be placed in the Historian and trended. Any point in the system can also be viewed using a feature called Current Trending which allows operators to select a point to view the current trend of a point without it being configured in the Historian.

How can we access trend data from any node in the system? All clients (ViewX & WebX) with security may view Historical data.

What facilities are provided for handling trend data on the screen? All trending is accessed through the Historian using standard menus items. Data can be viewed in a list or graphically without custom configuration. If needed, custom trend pages can be configured in the system.

How do we display and extract historical data? The Historical database or Historian is a SQL accessible database. This allows SQL queries to access the data and display it on screens. There are also standard tools to extract the data so no SQL knowledge is required to extract data. For instance, display the Maximum and Average can be internal to a mimic or external to a mimic (a trend page to itself).

How do we archive and retrieve historical data? Historical data is stored in weekly files on all the servers. The files can be archived or restored at anytime without shutting down the system.

How long and what is keep in the Historian? All data, reports, configuration, and events etc. are stored in the one Historical database. The data is actually stored in weekly files and the system is configurable as to how many weeks are keep online. The default is 52 weeks but it is only limited to disk size. The Historian compresses the data; hence, 10 years of most system are kept in 100 GB or less. This is system dependent.

Reports

What flexibility does the Control and Monitoring system provide for defining reports? The system has a Crystal Reports Runtime engine embedded that provides for reports from any historian parameter. Crystal Reports Developer is required to generate a new report design then move the report template into the Historian for general reporting; display, print, email, etc any report.

How can I include plant-floor data in a report? Pull up a report
template and select the parameters to report, click generate report,
and the report data appears. For a large water system or electrical
system the full report is generated for distribution in less than 2
minutes./

Performance

How does the Control and Monitoring system communicate with the
plant floor? Communication with devices, plant floor, and other
devices is done by the selected fieldbus: RS-485 to devices converted to
Ethernet, direct Ethernet, cable, fiber, radio, or any usable media.

What is the fastest method of communicating with the plant floor?
Currently the fastest method of communication to devices and the
plant floor is via some media using Ethernet.

How do we ensure that data exchange with the plant-floor is
maximized? The system provides a data quality parameter with most
protocols and devices.

Will the performance be maintained as the application grows? Using
managed switches and proper cabling performance is keep with
growth. For example, limiting the RS-485 devices to 5 or 6 units per
485 LAN connected to the Ethernet.

How many Serial Ports can I have connected to one PC? The system is
designed around Ethernet as the input; therefore, serial data is
converted to Ethernet via serial to Ethernet converter.

Language

What is the built in language (scripting engine) provide standard
programming facilities? The system uses the IEC61131-3 (logic
engine) programming. Most customers use the "function block
programming" to write the functions desired that are not already in
the system or they use Visual Basic Script (VBS), but VBS requires
programming code knowledge.

Does the language provide total access to the system? Yes, all data is
accessible in the database.

Can we write our own functions? Yes

Can we use the same function in more than one place in the system? Yes

Can we create tasks that are triggered by system events or run at certain times? Yes the system is event driven.

Can we activate other Windows applications Yes, in fact, we launch other manufacturer's software to do many device specific functions like waveform capture and harmonics.

Can we print a window dynamically? Yes

Can we access the user(s) who are logged on to the system? Yes

Can we use mail facilities? Yes

Can we access the serial ports on the PC?. Yes.

How do I configure data entry facilities? By using a form or input mimic.

Feature Questions

Can the SCADA system import AutoCAD drawings and maps? **Yes as DXF file.**

Does the system declutter when zooming in on a screen? **Yes. AutoCAD and screens that have layers can make layers visable the deeper the zoom.**

Can the SCADA system do multiple applications and use the same Historian? **Yes, the SCADA system can do Automatic Meter Reading (AMR) for electric, water, and Gas, Power Management (PMS), Substation Automation (SA), water facilities, waste water facilities, industrial complexes, selected process control, and many other detailed applications. The system is very flexible and scalable from very small to huge.**

On an SCADA/AMR system, can the system do the customer billing? **Yes and No. The system, by itself, would not have a customer linked database; therefore, billing is not possible. With expansion of the system with a MS-SQL server that holds the customer database, customer information is related to the SCADA system Historian database via the meter ID, location, and phone number, the system could do billing and provide**

outage management with customer information. This would have to be built for each application.

Can the system show a unit's communication status? **Yes. The communication status is show via color and a device communication page or screen with more data quality information.**

Some additional important questions about protocols & vendors are as follows:

Is IEC61850 & most company's hardware & software interoperable with other vendor's devices?   **Yes, the 61850 protocol requires this when the devices are certified compliant.**

Where has IEC61850 been proven and with what vendor's devices? **Not in many places, TVA, 1 in Mexico and some others. Most are working on the minor problem that happen in the beginning shages of a new protocol.**

Is IEC61850 being put into industrial sales instead of Modbus TCP/IP, serial, and DNP 3.0?   **Yes, it will be a universal protocol when the acceptance is present like DNP 3.0. The UCA will monitor it like www.dnp.org is controlled.**

IEC 61850 is designed for substations only and is Peer-to-Peer, what security is present? **Data encryption.**