

Securing SCADA and OT Platforms



**A GE Digital Software Sponsored
Hands-On Product and Technology
Workshop Series**

Find Out What's New in Proficy SCADA 2023

Impacting communities

If you drove to work, used a computer, drank a glass of water or coffee, ate a cranberry, changed a diaper, ate a bowl of ice cream, bought composite wood, used something made of plastic, received a covid 19 vaccine, used perfume, drank cola, applied makeup, seen a solar panel, visited a hospital, flushed a toilet, ate a chocolate bar, turned a light switch on, or used a 5G phone then **you, your families, & communities** have benefitted from an AutomaTech Solution.



Workshop Objectives



- ✓ **Learn – Ask Questions, Interact, have fun!**
- ✓ Security – OT Best Practices
 - Why you should care, what actions can you take
- ✓ Proficy 2023 – What is new
 - Why you should care, what actions can you take
 - Ops Hub & Config Hub
- ✓ Network with peers
- ✓ Learn about architecture references

Workshop Agenda

- Workshop Objectives
- Automation Trends
 - OT Security Trends & Platforms
 - Client Technologies
 - Disaster Recovery & Virtualization Technologies
 - Alarming – ISA 18.2
- Proficy 2023 – What's New
- Hands-on Workshop
- Technical Focus:
 - AI & Analytics
 - Redundancy
 - OT Security

You will see:

- On selective slides:



- **Best Practices** while working with customers over last 25+ years.
- In short, pay attention when you see help-full tips!

About AutomaTech

- [Overview – AutomaTech](#)
- [Technical Support – AutomaTech](#)



OT Automation Trends

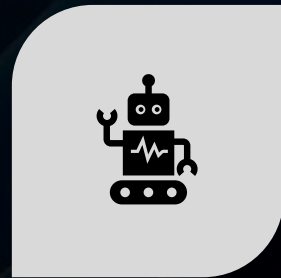
Operational Technology

April 2023

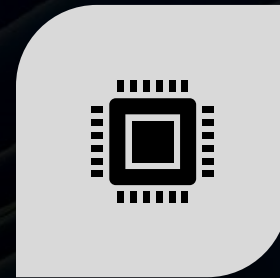
Automation Trends: Top 5



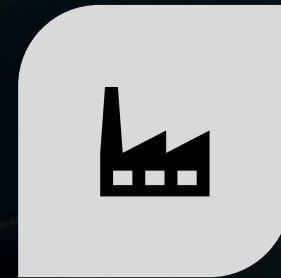
WORKFORCE CHALLENGES -
INVESTING IN SKILLS TO TACKLE
WORKFORCE CHALLENGES



**AI, AUTOMATION, DIGITAL
TWINS, AND THE INTERNET OF
THINGS**



ONGOING **SUPPLY CHAIN
DISRUPTION** (CYBER)



NET ZERO, ESG, AND
SUSTAINABILITY IN
MANUFACTURING

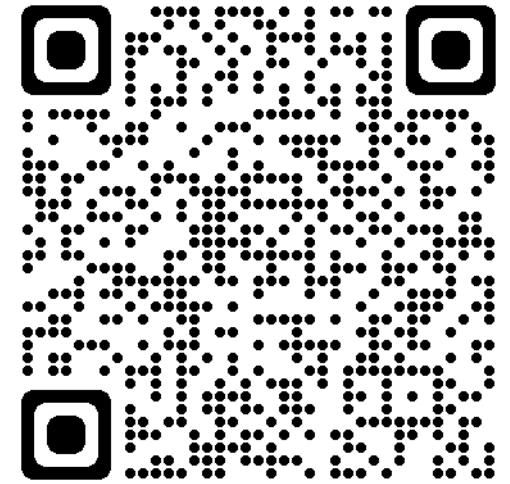


**DECENTRALIZED
MANUFACTURING**

<https://www.forbes.com/sites/bernardmarr/2023/03/29/the-top-5-manufacturing-trends-in-2023/?sh=2e3ad43e5875>

Poll #1 – Which trend are you addressing the most?

1. Workforce Challenges
2. AI, Automation, digital twins, IoT
3. Ongoing supply chain disruption (including Cyber)
4. Net zero, ESG, and Sustainability in manufacturing
5. Decentralized Manufacturing



OT Cyber Security Trends

What and why you should care?.....



CYBERSECURITY STRENGTHENS U.S. MANUFACTURERS

Cybersecurity protects the confidentiality, integrity and availability of your information.
A cybersecurity program provides advantages for small and mid-sized manufacturers:

-  **Improve Recovery Times After Disruptions**
-  **Avoid Potential Losses**
-  **Protect Valuable Data**
-  **Ensure Employee and Customer Privacy**
-  **Mitigate Risks**

Costs of Cybercrime

- Cybercrime up 600% due to COVID-19 Pandemic
- It is estimated that, worldwide, cybercrimes will cost \$10.5 trillion annually by 2025.
- The global annual cost of cybercrime is estimated to be \$6 trillion per year.
- Cybercrime cost makes up a value worth 1% of the Global GDP.
- On average, a malware attack costs a company over \$2.5 million (including the time needed to resolve the attack).
- Ransomware is 57x more destructive in 2021 than it was in 2015. **In 2022 this cost was ~\$4.24M per incident.**
- There are 30 million SMB in the USA and over 66% of all SMB's had at least 1 incident between 2018-2020.
- The average cost of a data breach to small business can range from **\$120,000 to \$1.24 million.**
- The average cost was \$1.07 million higher in breaches where remote work was a factor in causing the breach.
- Security Driven AI had best cost mitigation, **saving up to \$3.81 million (80% cost difference).**











According to Cybersecurity Ventures, global ransomware damages amounted to **\$20 billion in 2021** and are expected to reach **265 billion by 2031**. In 2021 it was predicted that a ransomware attack occurred every 11 seconds and by 2031, ransomware will attack a business, device, or consumer **every 2 seconds!**

are you prepared? it's only going to get worse...faster!

OT Cyber Security Incidents

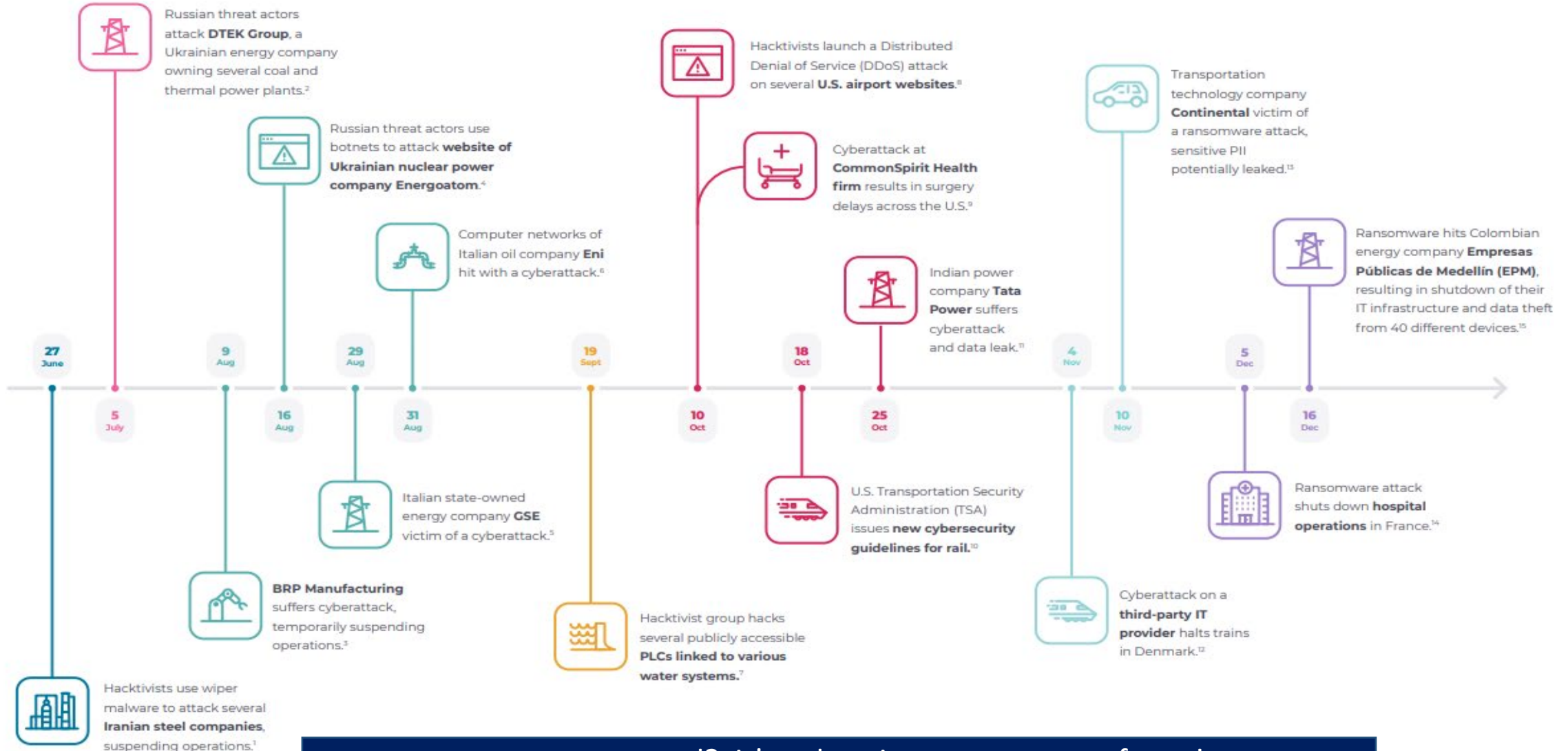


Organization	Attack Type	Incident and Impact	Cost
Energy  COLONIAL PIPELINE CO	Ukrenergo (Ukrainian power company)	OT-Specific Malware: Industroyer/CrashOverride	Disrupted operations resulting in a blackout in the capital city of Kiev. ^{9,10} 225K customers without power
Food & Beverage 		Ransomware: Targeted	Ransomware attack resulting in data loss and operational damage. ¹¹ \$150-\$188M
Manufacturing  		Ransomware	Ransomware attack affecting manufacturing & operations, IT networks, and infrastructure, in multiple markets. ¹² \$117M
Pharmaceutical		Ransomware: NotPetya	Production shutdown, including inability to fulfill vaccine orders, lost sales and technology remediation. ¹³ \$670M
Shipping and Logistics		Ransomware: NotPetya	IT operations disruption, impacted deliveries and sales, loss of revenue, and drop in earnings for one quarter. ¹⁴ \$300M

93.28% of detected ransomware files are **Windows-based** executables. The next most common file type is **Android**, at 2.09%.

Notable Cyber Events:

Jul-Jan (22/23)



are you prepared? it's only going to get worse...faster!

Evolution of Security Disciplines



More Isolation

More Connectivity

Security by Obscurity

OT Network-Centric Security

- Purdue Five-Layer Model
- Firewalls
- DMZs
- Unidirectional Gateways/Data Diodes

CPS Asset-Centric Security

- Discovery, Inventory
- Connectivity/Communications Mapping
- Vulnerability Management
- Dynamic Segmentation
- Remote Access Management
- Dashboards and Compliance Reports

Source: Gartner
743794_C

Gartner.

How it Started!









Action: watch Zero Days movie - Siemens PCS7 PLC system attack

[Zero Days \(2016\) - IMDb](#)

CISA: Take Action



 <p>Protect all devices with Antivirus</p>	 <p>Enable multi-factor authentication</p>	 <p>Choose strong passwords</p>
 <p>Avoid Phishing scams</p>	 <p>Shop at safe websites</p>	 <p>Check website URL</p>
 <p>Check your privacy settings</p>	 <p>Remember to log off</p>	



Shields Up: Guidance for Families

Every individual can take simple steps to improve their cyber hygiene and protect themselves online. Here are 4 things you can do to keep yourself cyber safe.



Shields Up: Guidance for Organizations

CISA recommends all organizations—regardless of size—adopt a heightened posture when it comes to cybersecurity and protecting their most critical assets. Take these recommended actions.



Shields Up: Guidance for Corporate Leaders and CEOs

Corporate leaders have an important role to play in ensuring that their organization adopts a heightened security posture. CISA urges all senior leaders, including CEOs, to take these steps.





Cyber Security Framework



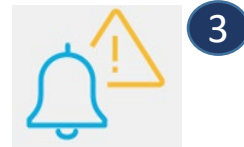
Identify

- Have a cyber plan & roadmap. Use self-assessment tools.
- Have a Network Diagram
- Be organized, know where your devices are located



Protect

- Use contemporary firewalls, managed switches, use Linux based solutions
- Segment your OT from your IT networks.
- Use and adopt MFA on all systems.
- Use virtual machines wherever possible



Detect

- Install an OT Cyber threat detection system
- Your OT Cyber detection systems should work-with your DMZs and firewalls



Respond

- Develop a robust process & response plan
- Have organized plan to shut-down systems
- Twice annually, validate your back/restore (DR) process.
- Have **quick** process to disconnect and isolate OT network & compute platforms.

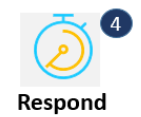
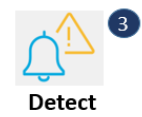


Recover

- Have a plan to restore your OT systems in a defined stat-up sequence
- Validate you are re-loading latest versions of your configurations files for VFDs, PLCs, SCADA & other OT systems.

expert resources

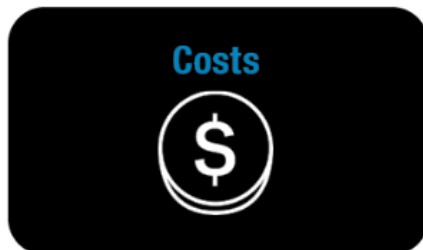




Identify.....roadmap



- **What** are choices and **why** should you care?



Tools to aide you....we can help

Co-Dependency: OT Systems and OT Security



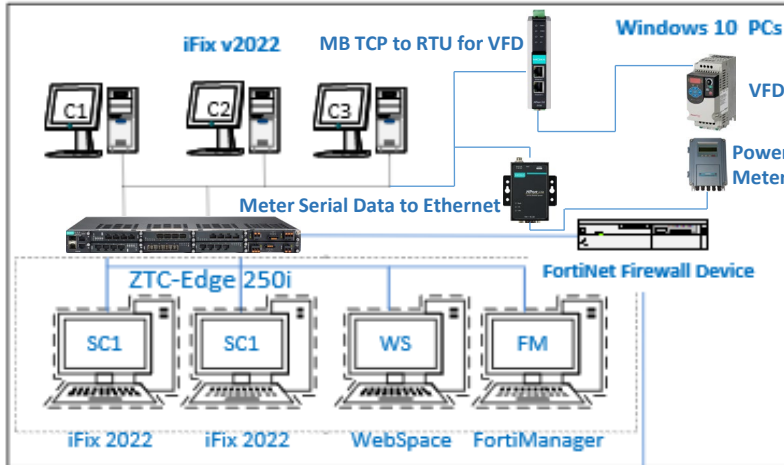
Self Assessment: OT Systems (PLC, SCADA, & Historian)		AutomaTech [®] <small>Optimizing Industrial Operations</small>
		<i>(5 being best)</i>
SCADA SETUP		Rate 1-5
1	Our SCADA is running latest version of OS and GE Proficy Revisions. No known security risks. Our PLCs are running latest firmware.	4
2	Our SCADA system is using ANSI/ISA-18.2 alarming standards.	2
3	Our alarming and data is organized.	3
4	We have a supportable architecture with very little downtime or issues.	3
5	Our SCADA systems use a historian for data archiving.	3
6	We have a current / future state SCADA Network Diagram.	3
SCADA SECURITY		Rate 1-5
7	We have a defined Cyber Security Plan and Roadmap.	4
8	We have a firewall in place between our IT and OT zones. (vs. a firewall only between the network and the internet).	2
9	We do not use USBs drives with our PLC or SCADA system with contractors.	2
10	Our SCADA, PC & Drive systems are backed up regularly.	4
11	Our SDADA system is using standard authentication processes for operators.	1
		31
Score		56%
Key / Score		
	≥85% You're well in control of your process. Let us know if we can help in the future.	
	70%-84.99% You have room for improvement. Call AutomaTech to help!	
	≤69.99% You have a high degree of vulnerability & risk. Call AutomaTech to help!	

Self Assessment: Networking & Cyber		AutomaTech [®] <small>Optimizing Industrial Operations</small>
		<i>(5 being best)</i>
Networking		Rate 1-5
1	Our OT systems are organized: we have a logical network diagram of our OT systems. PLCs, SCADA, Drives, etc.	2
2	Our OT servers have ≥ 99.99% uptime and rarely fail.	3
3	We have a highly available infrastructure hosting virtual servers that support our OT systems.	3
4	We have separate networks for IT and OT which are connected with proper firewall & DMZ controls.	2
5	We have separate VLANs for each network (Management, OT, Production) vs. one subnet spanning our entire facility.	3
Security		Rate 1-5
6	We have a defined Cyber Security Plan and Roadmap.	3
7	We have a firewall in place between our IT and OT zones. (vs. a firewall only between the network and the internet).	2
8	We have designated & properly managed switches for all devices plugged into the OT network.	3
9	We have end point security in our critical OT areas.	2
10	We regularly backup our OT data and servers to ensure quick recovery in the event of a failure or to restore due to an attack.	1
		24
Score		48%
Key / Score		
	≥85% You're well in control of your process. Let us know if we can help in the future.	
	70%-84.99% You have room for improvement. Call AutomaTech to help!	
	≤69.99% You have a high degree of vulnerability & risk. Call AutomaTech to help!	

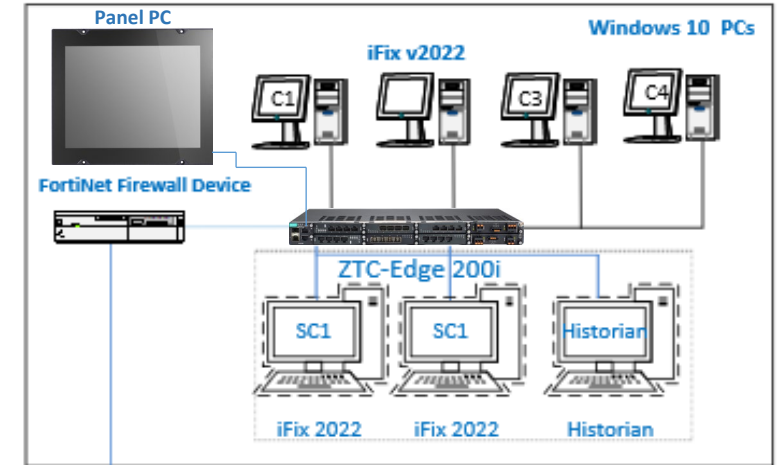
Actions: call AutomaTech to aide in your self-assessment process

Vilas County Water: OT Network Diagram

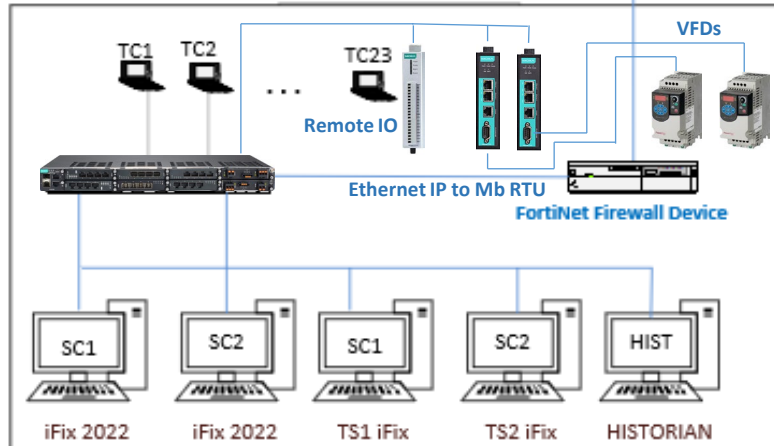
Sams Creek Site



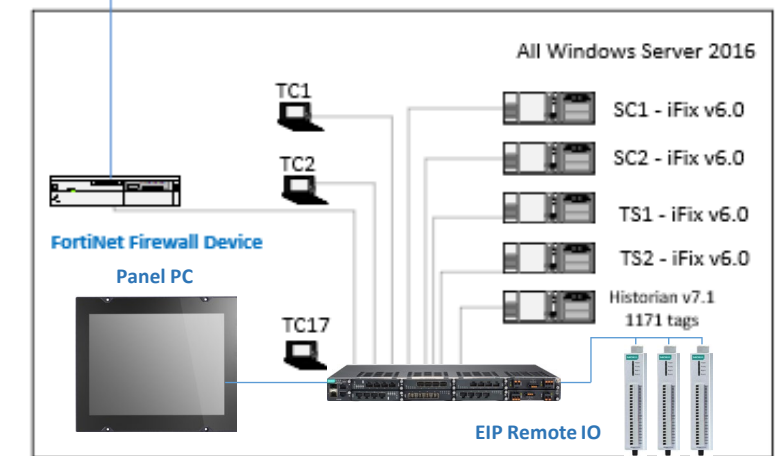
Camp Nine Creek Site



Snake Creek Site



Little Bend Creek Site



DeviceApp Client/Agent



DeviceApp Client/Agent



Operations Hub Central Dashboard



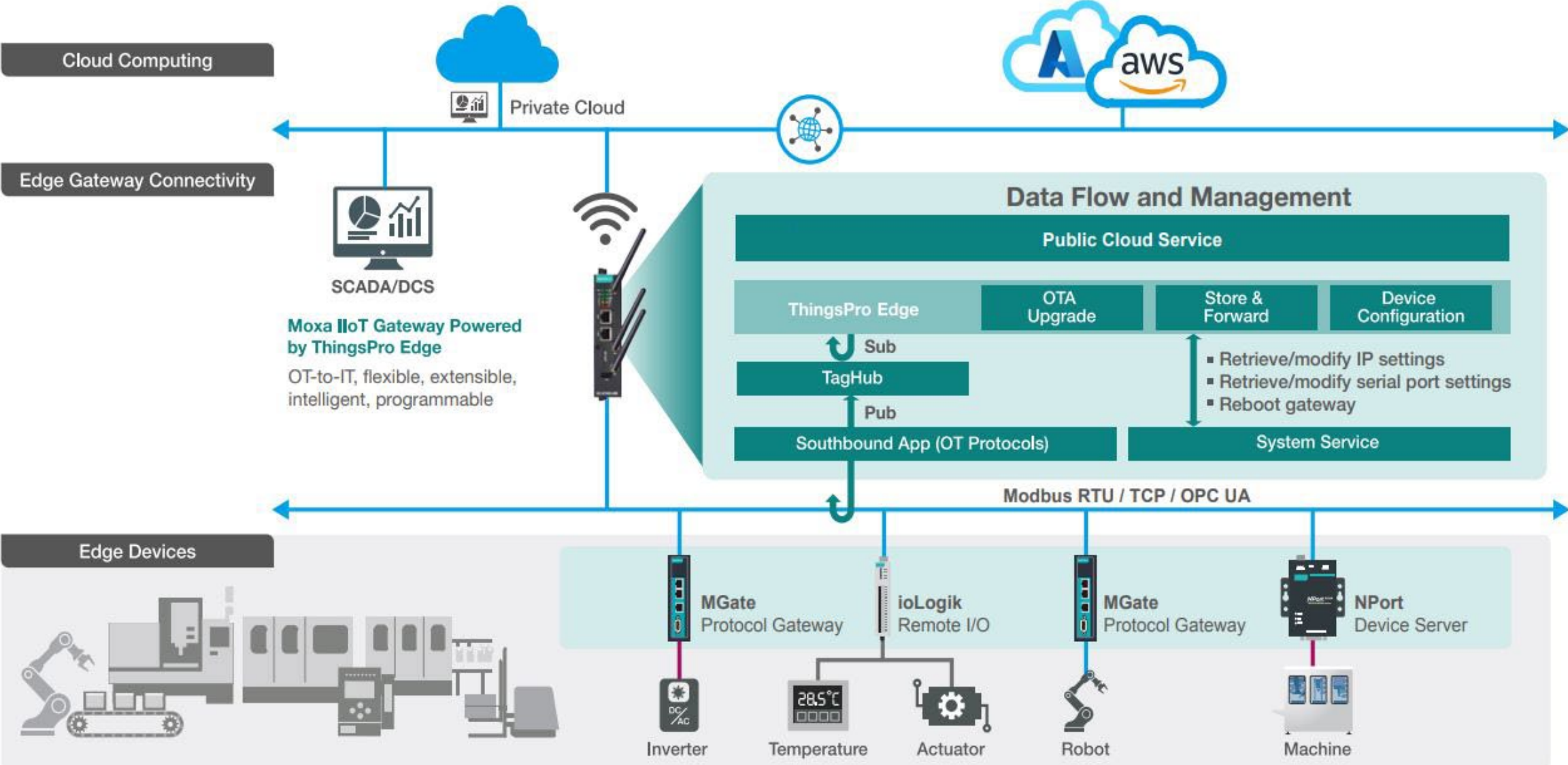
Secure Internet

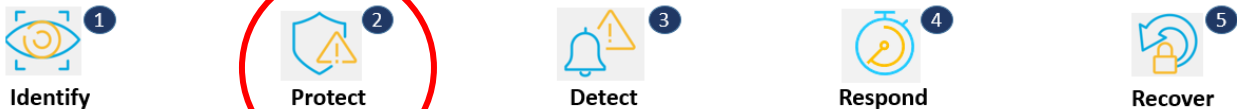
Mission - 58 Lift Stations

Blue Items = Updated or New

Key:
Cx = Client
SCx = SCADA
TCx - ThinClient
TSx = RD Server

Use Cases & Architectures





Device Security.....Protecting SCADA & OT

- **What** are the choices and **why** should you care?



Linux based devices are more secure!

Device / End Point Security

Secure Routers:

- Integrated cybersecurity solutions, combining firewall, VPN, router, and switching functions.
- Provide secure remote access.

Secure Switches:

- Provide complete visibility and control of users and devices on the network.
- Centralized security and access management.



NextGen Firewall Security for OT Networks

What is it?

A next-generation firewall (NGFW) builds upon a traditional firewall to block modern threats such as advanced malware and application-layer attacks.

Why should I care?

- Secures web, content, and devices and protects networks from ransomware and sophisticated cyberattacks.
- Provides full visibility into users, devices, and applications across the attack surface.





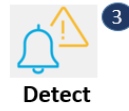
Cyber Security Framework



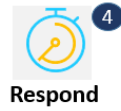
Identify



Protect



Detect



Respond



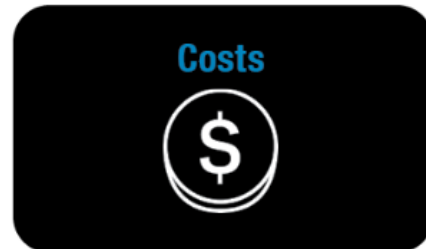
Recover



Client Technologies

• **What** are choices and **why** should you care?

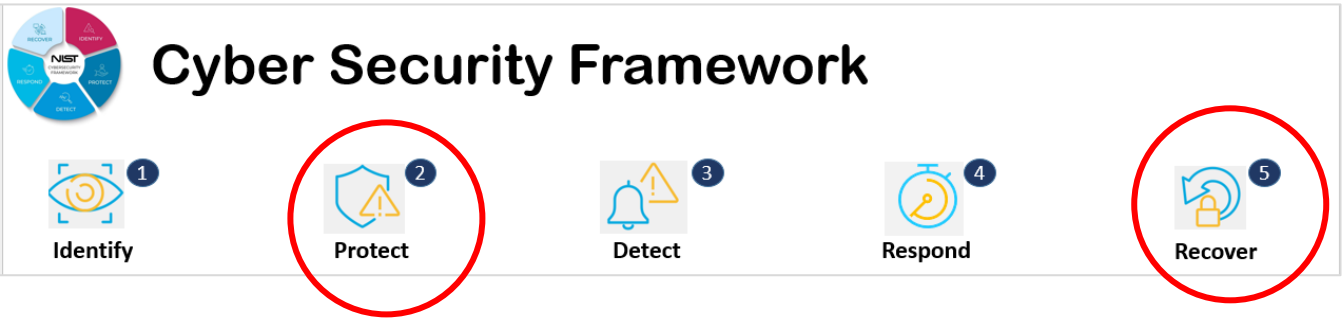
1. Thick
2. Thin
3. Zero



Client Type Comparisons

Client Type	Advantages	Disadvantages	Industry Leaders
Thick	<ul style="list-style-type: none"> • Run in stand-alone environment • Multiple points of failure • Fast • Est. Price: \$1500-\$3000 	<ul style="list-style-type: none"> • For X Number of Clients... <ul style="list-style-type: none"> • Install the OS and Software • Install individual Licenses • Windows updates • Complex Disaster Recovery Plan – hours or days to recover 	<ul style="list-style-type: none"> • GE Rich SCADA Clients • Arista IPCs • Proface / Xycom IPCs • Dell • Lenovo
Thin	<ul style="list-style-type: none"> • Easy to deploy and maintain • Very cost effective for multiple clients • Supports Microsoft and Citrix • Est. Price: \$800-\$2400 	<ul style="list-style-type: none"> • Single point of failure without a backup RDS Server • Requires Microsoft RDS licenses and installation. • Slightly more complex software configuration. • Requires an OS on the client. 	<ul style="list-style-type: none"> • GE – Software (Ops Hub) • Arista • AdvanTech • TenZig • Onlogic
Zero	<ul style="list-style-type: none"> • Easy to deploy and maintain • No Operating system to maintain on the client • Very cost effective for multiple clients • Est. Price: \$400-\$2400 	<ul style="list-style-type: none"> • Single point of failure without a backup RDS Server • Requires Microsoft RDS licenses and installation. • Slightly more complex software configuration. 	<ul style="list-style-type: none"> • Thin Manager • Arista • AdvanTech • TenZig • Onlogic

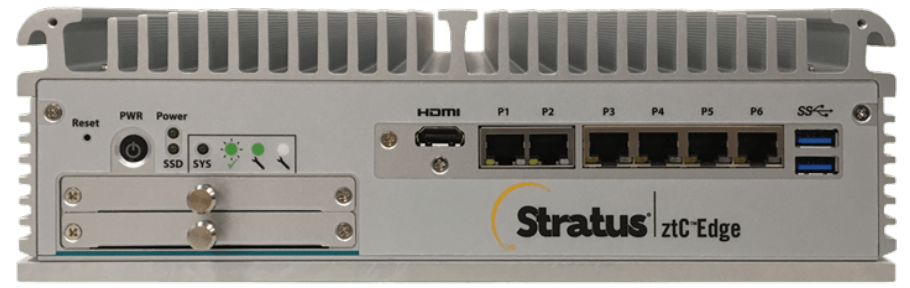
choose client technology based on you environment.....not sure we can help!



High Availability & Fault Tolerant: Compute Platforms



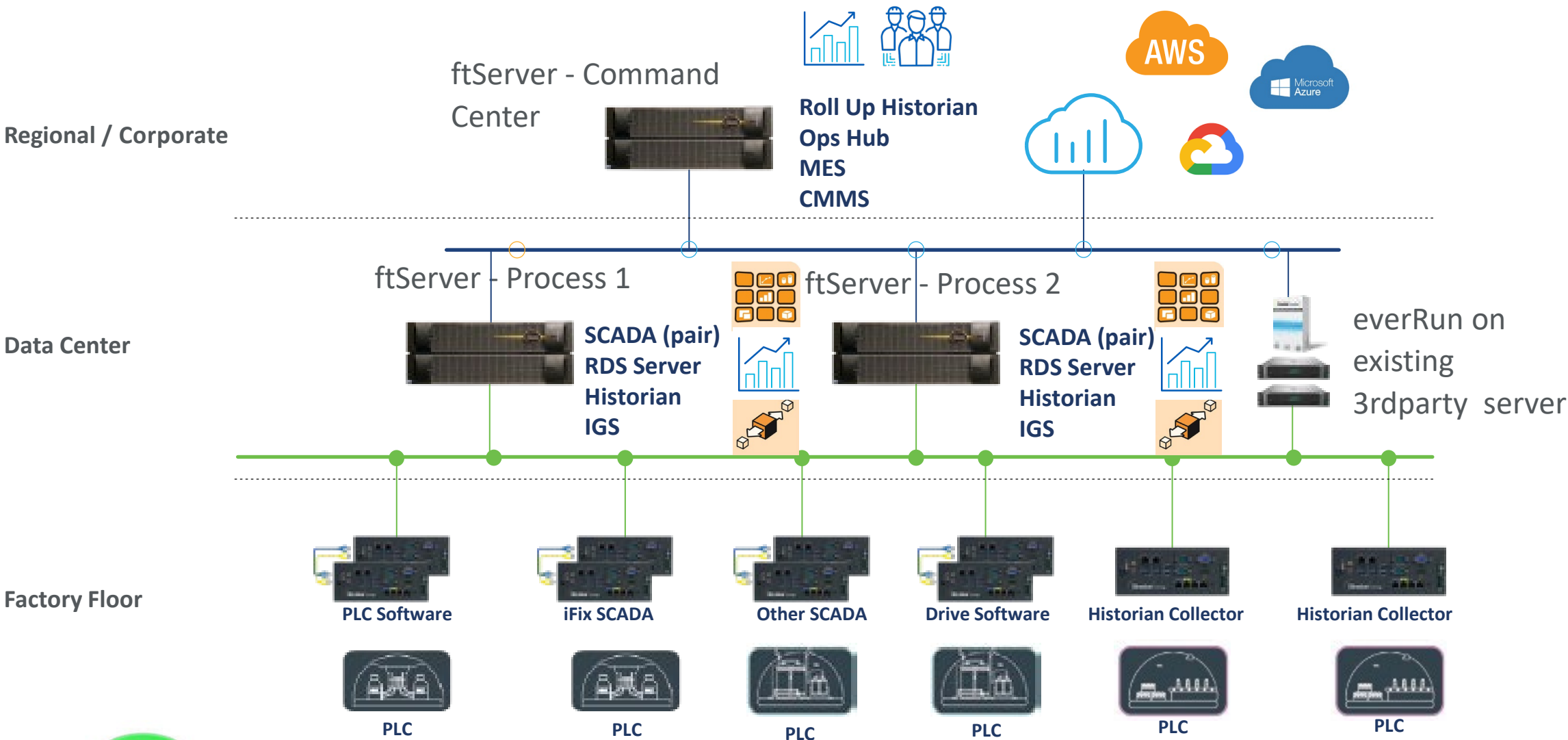
- What and why you should care?



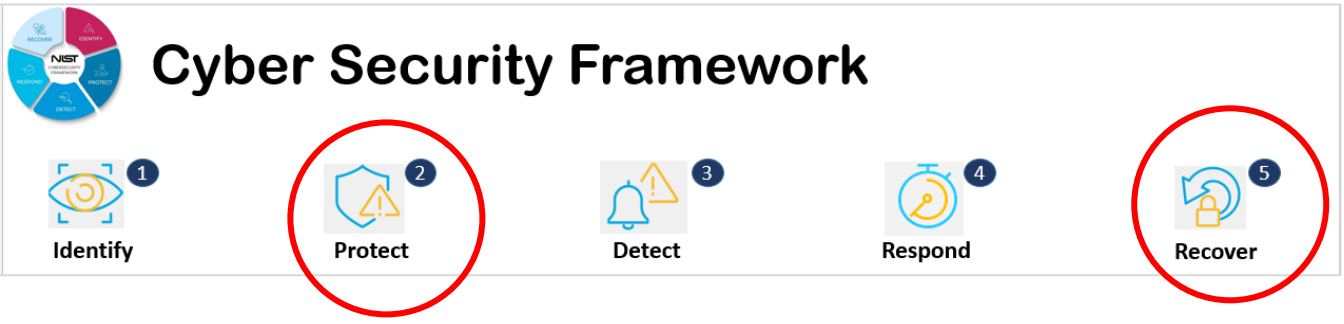
Rugged & reliable, fan-less, IP-40 rated

Why Care: eliminate unplanned downtime from compute platforms

Stratus & Proficy 2023: Edge to Enterprise



Why Care: it's the easy & secure button!



Virtualization & Disaster Recovery

- What and why you should care?



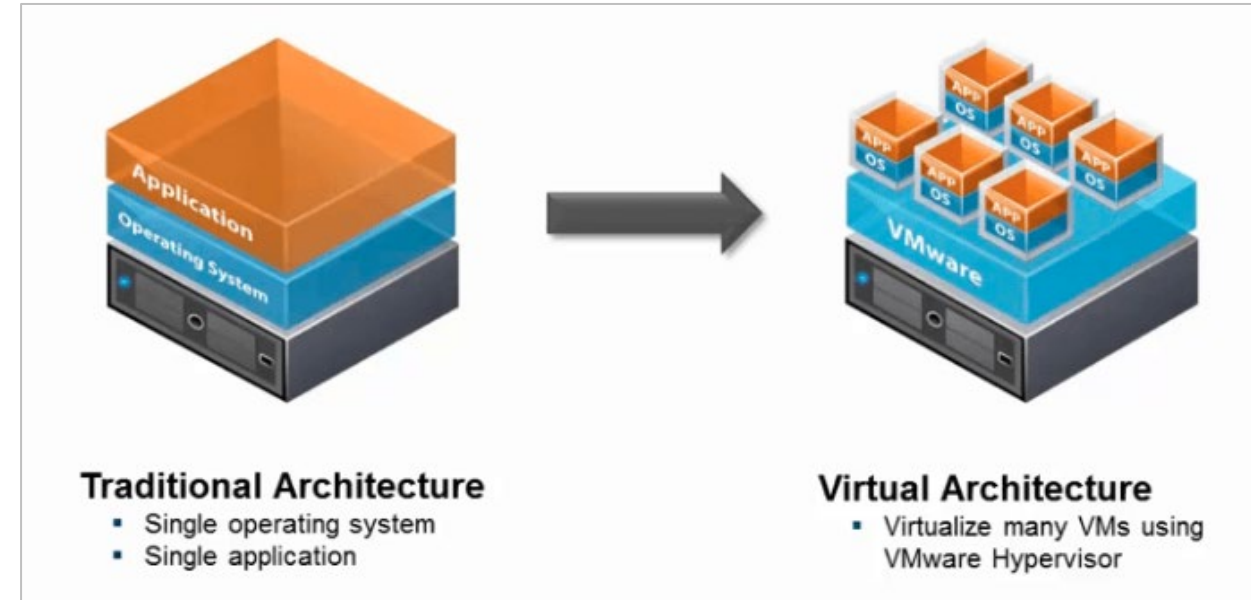
Virtualization 101

Virtualization: reduce costs by running more than one app on a server. Allows you to organize your applications for many people to use / share. Reduces security footprint and allows **faster recovery time.**

Why you should care? If you are attacked and you must restore, if you are running VM's, you can restore quickly.

Best Practices:

- Have a documented plan....it's a journey
- Organize all your files & systems
- Use some type of VM application software like VMware or Hyper V from MS.



• What is a Virtual Machine:

- 99 Series: [VM Basics - 3 minutes](#)
- 101 Series: [VM Intermediate - 12 minutes](#)

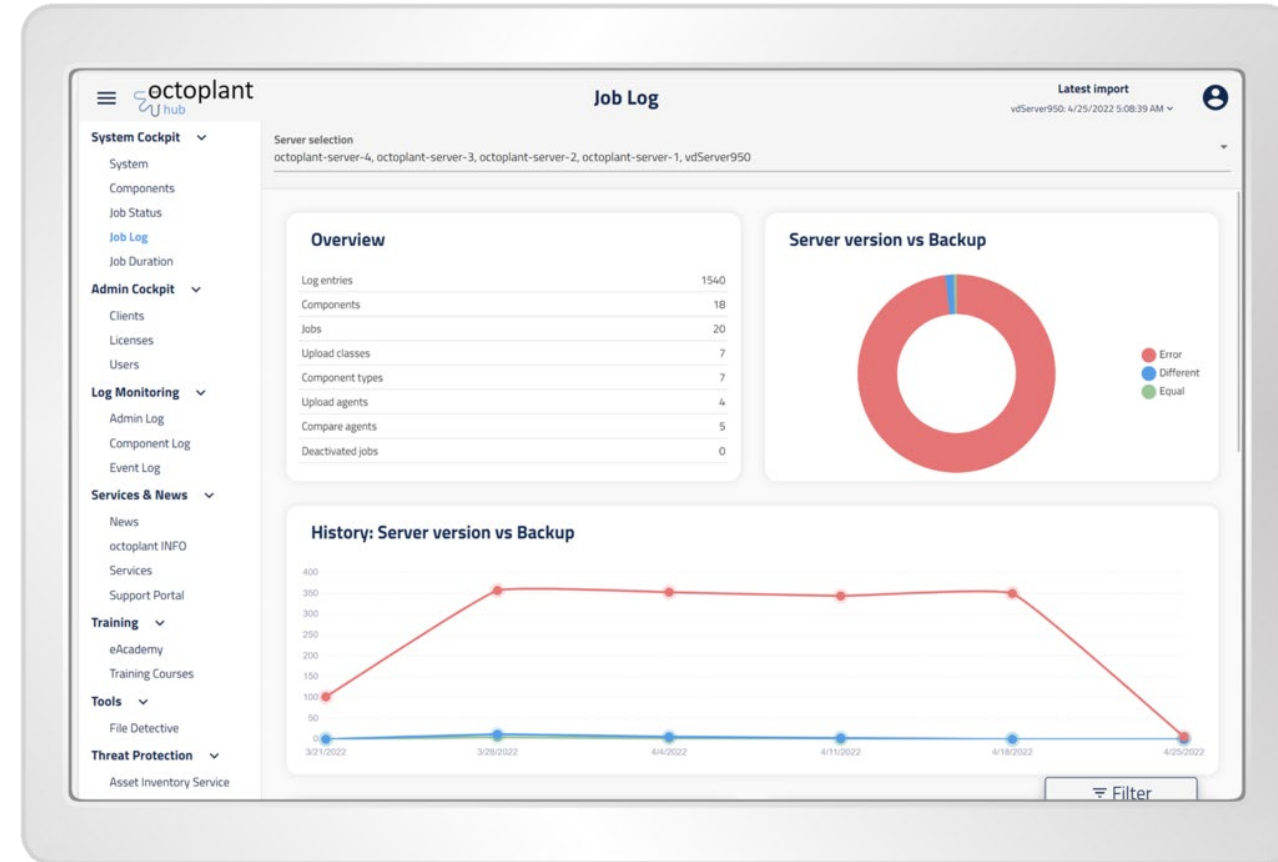
Disaster Recovery

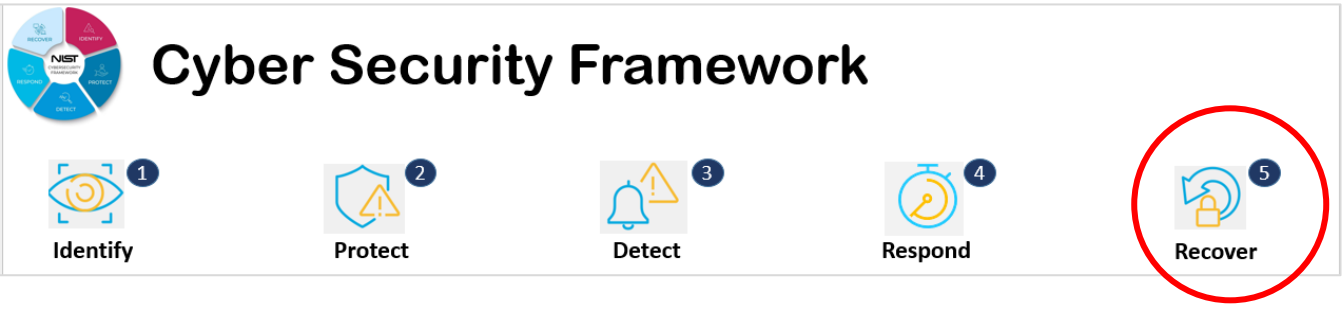
DR Includes: People, Process, & Technologies and it is part of your security process

Why should you care? If you are attacked and you must restore, do you know where your files are? How long will it take to find and restore them? When people retire, are you prepared?

Best Practices:

- Have a documented plan....it's a journey
- Audit Trails, Version Management, Auto Backups, Archiving.
- Organize all your files & systems
- Use systems like Octopant (Auvesy-MDT) to aide in backup / restore processes





Alarming

- What and why you should care?



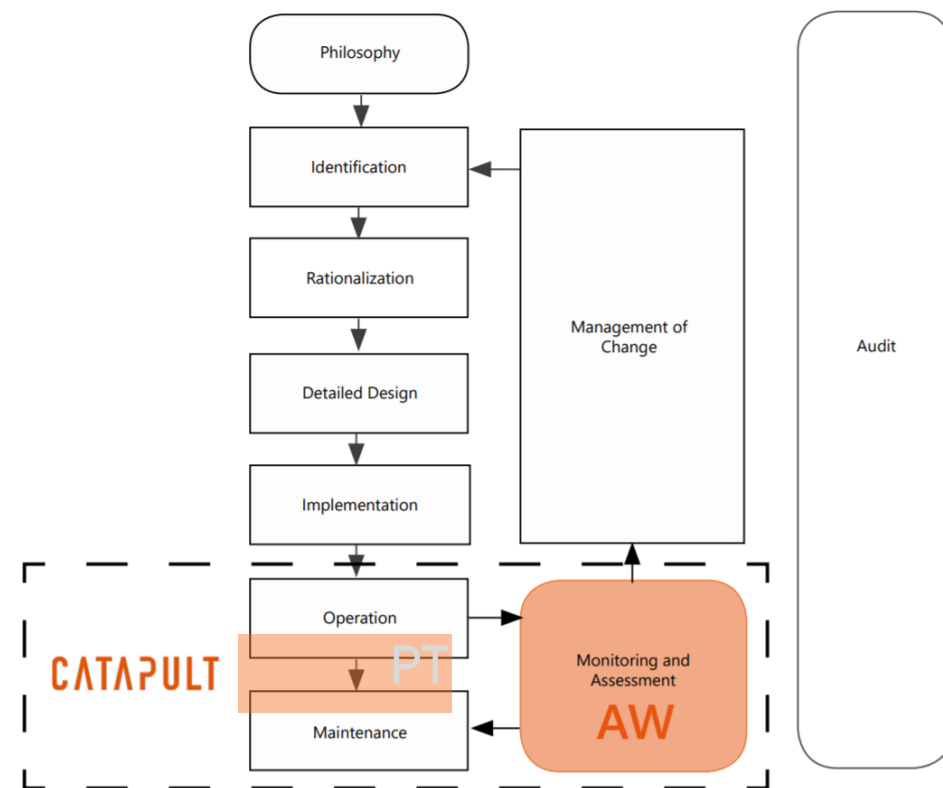
Alarming 101: ISA 18.2 Overview

What is it? The safety standard was released in 2009, and became the industry standard for 'good engineering practice' for alarm management.

AlarmWatch aggregates GE Proficy iFIX and Historian alarm and event data, analyzes the alarm data against ISA 18.2 recommended best practice standards and displays the alarm performance summary.

Why should you care?

- Get's rid of clutter
- Allows you to focus on what's important
- Helps improve process industries safety, quality and productivity



Alarm Management Lifecycle ISA 18.2

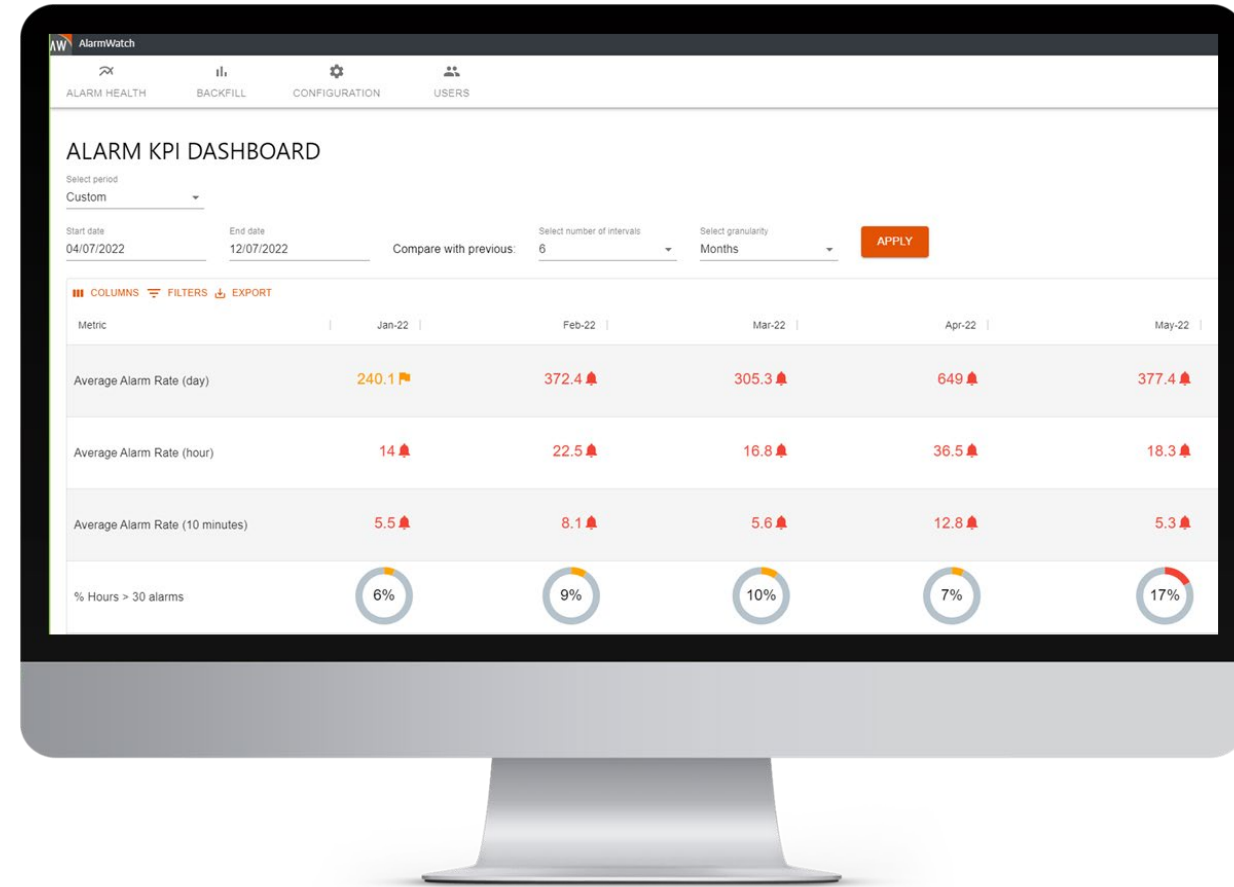
Using AlarmWatch



Before

Mode	Alarm Summary	Location	Device	Priority	Ack		
✓	SAMPLE	2014/12/05	10:26:33.144	HIGH		BLF_CB33_AI_KW3PH	KW 3-PHASE
✓	SAMPLE	2014/12/05	10:41:35.267	MEDIUM		BLF_CB37_AI_AMPSC	CB37 B PHASE CURRENT
✓	SAMPLE	2014/12/05	10:26:33.144	MEDIUM		BLF_CB33_AI_KWB	KW PHASE B
✓	SAMPLE	2014/12/05	10:26:33.144	MEDIUM		BLF_CB33_AI_KWC	KW PHASE C
	SAMPLE	2014/12/05	10:26:33.144	MEDIUM		BLF_CB33_AI_KWA	KW PHASE A
	SAMPLE	2014/12/05	10:41:35.267	LOW		BLF_CB37_AI_AMPSC	CB37 A PHASE CURRENT
	SAMPLE	2014/12/05	10:43:42.271	LOW		BLF_CB37_AI_AMPSC	CB37 C PHASE CURRENT
	SAMPLE	2014/12/05		LOW		BLF_CB37_AI_MVAR	CB37 MVAR
	SAMPLE	2014/12/05		LOW		BLF_CB37_AI_MW	CB37 MW
	SAMPLE	2014/12/05		HIGH		BLF_CB37_AI_VOLTSA	CB37 A PHASE VOLTAGE
	SAMPLE	2014/12/05		HIGH		BLF_CB37_AI_VOLTSC	CB37 C PHASE VOLTAGE
	SAMPLE	2014/12/05		CRITICAL		BLF_CB37_DXC_RCL	CB37 RECLOSE STATUS
	SAMPLE	2014/12/05		LOW		BLF_CB39_AI_AMPSC	CB39 A PHASE CURRENT
	SAMPLE	2014/12/05		MEDIUM		BLF_CB39_AI_AMPSC	CB39 B PHASE CURRENT
	SAMPLE	2014/12/05		LOW		BLF_CB39_AI_AMPSC	CB39 C PHASE CURRENT
	SAMPLE	2014/12/05		LOW		BLF_CB39_AI_MVAR	CB39 MVAR
	SAMPLE	2014/12/05		LOW		BLF_CB39_AI_MW	CB39 MW
	SAMPLE	2014/12/05		HIGH		BLF_CB39_AI_VOLTSA	CB39 A PHASE VOLTAGE
	SAMPLE	2014/12/05		HIGH		BLF_CB39_AI_VOLTSC	CB39 B PHASE VOLTAGE
	SAMPLE	2014/12/05		HIGH		BLF_CB39_AI_VOLTSC	CB39 C PHASE VOLTAGE
	SAMPLE	2014/12/05		CRITICAL		BLF_CB39_DXC_RCL	CB39 RECLOSE STATUS
	SAMPLE	2014/12/05		HIGH		BLF_CB3_AI_AMPSC	AMPS PHASE A
	SAMPLE	2014/12/05		HIGH		BLF_CB3_AI_AMPSC	AMPS PHASE B
	SAMPLE	2014/12/05		HIGH		BLF_CB3_AI_AMPSC	AMPS PHASE C
	SAMPLE	2014/12/05		HIGH		BLF_CB3_AI_KW3PH	KW 3-PHASE
	SAMPLE	2014/12/05	10:26:33.143	MEDIUM		BLF_CB3_AI_KWA	KW PHASE A
	SAMPLE	2014/12/05	10:26:33.143	MEDIUM		BLF_CB3_AI_KWB	KW PHASE B

After



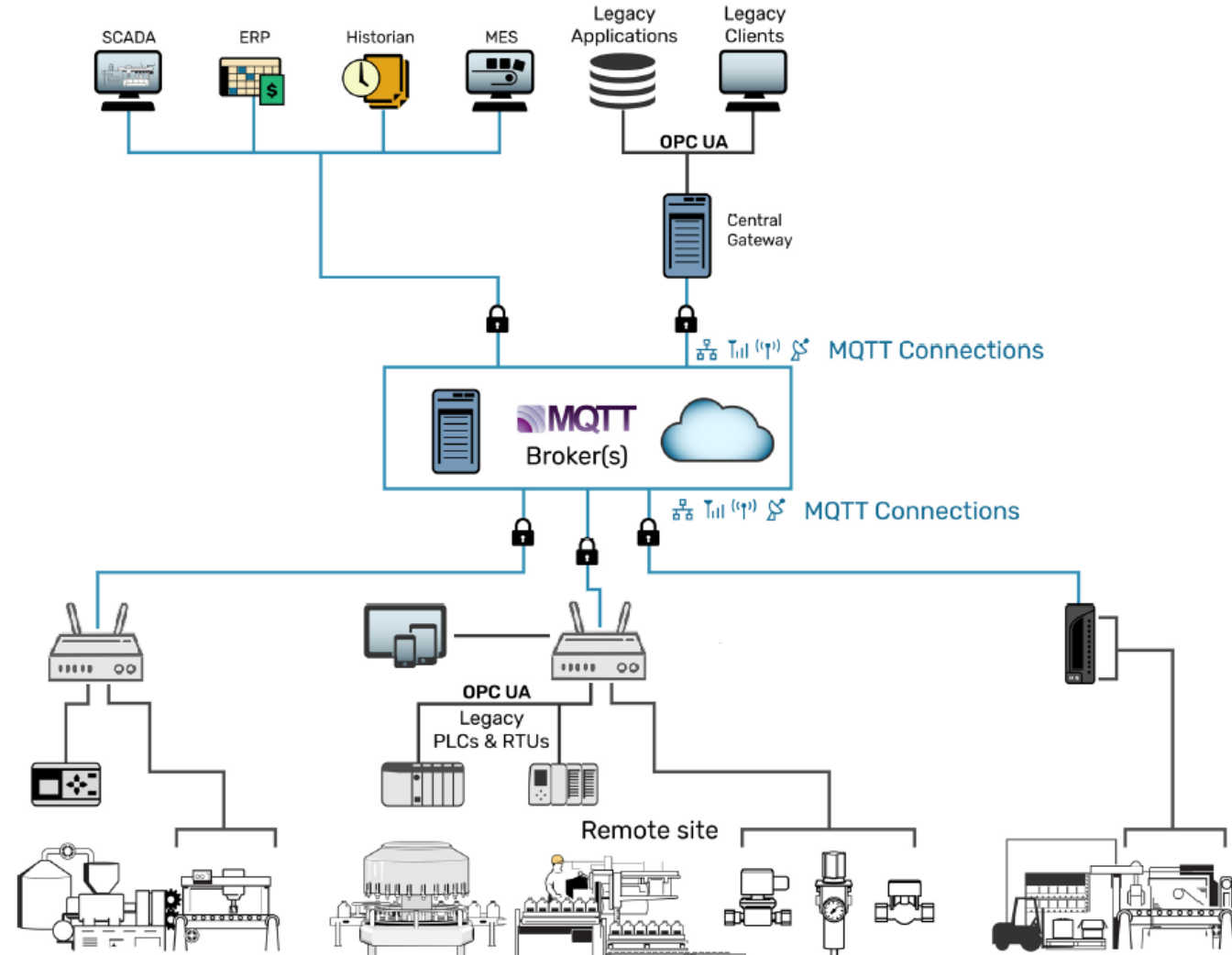
OT Communications Trends



- What are these technologies?
- Why should I care?

OPC UA + MQTT: Combined Architecture

- OPC UA – is the next generation standard of OPC. More functionality.
- OPC UA leverages MQTT with PubSub functionalities
 - All major cloud suppliers support PubSub
- You will be using MQTT and OPC in your architectures
- Pubsub architecture is extremely scalable
- MQTT **enabled wireless sensors** enable lower cost, faster implementation with connections to edge devices and the MQTT broker
- New MQTT enabled devices can be leveraged alongside legacy OPC devices



Why Care: OPC UA & MQTT are part of your future architecture

Resource & Links:

- [Today's OT Systems Need IT Security Capabilities \(fortinet.com\)](https://fortinet.com) – ATI Website
- [Cybersecurity Resources for Manufacturers | NIST](#)
- [US Govermet Security: https://www.cisa.gov/shields-up](https://www.cisa.gov/shields-up)
- Gartner Whitepaper on OT Security – ATI Website
- Cyber Roadmap Brochure: ATI Website
 - [Cyber Security for OT - AutomaTech](#)
- **Self Assessment Tools from AutomaTech – *contact AutomaTech***
 - SCADA
 - Cyber and Networking
- **Thick, Thin, & Zero Clients:**
 - [\(90\) TechNet Cyber 2021 ▶ Thick - Thin - Zero Clients – YouTube](#)
 - [10ZiG | About Us | Virtual Desktop Solutions](#)



Proficy 2023 Update

Proficy 2023 – Unified Portfolio Launch (3rd Edition)

Continued significant investment and innovation



- **3rd annual portfolio release**
- Continued alignment of an integrated suite
 - Common **configuration look and feel**
 - Single user management solution
 - Single visualization/interaction platform
- Accelerated move to the cloud

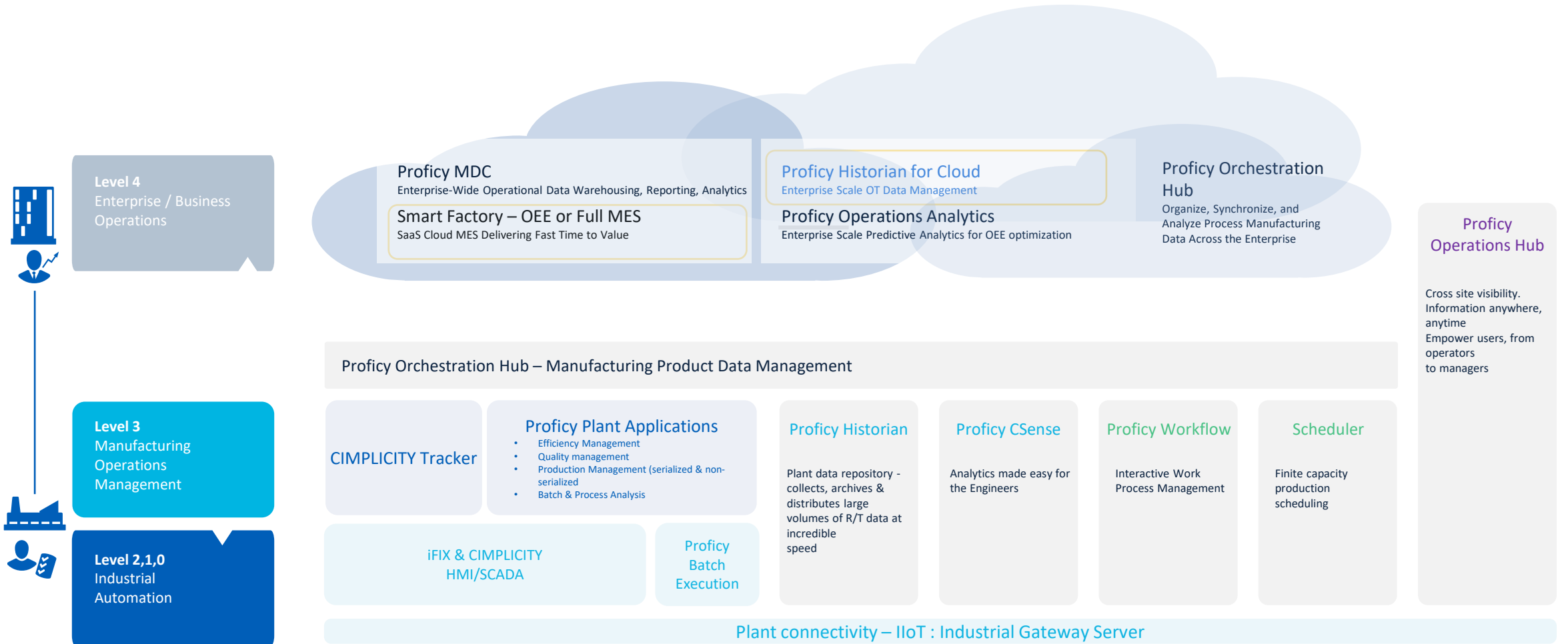
- iFIX 2023
- CIMPLICITY 2023
- Proficy Historian 2023
- Proficy Historian for Cloud 2023
- Proficy Plant Applications 2023
- Proficy Smart Factory – Cloud OEE
- Proficy Operations Hub 2023
- Proficy Orchestration Hub 2023
- Proficy Manufacturing Data Cloud 2023
- Proficy CSense 2023



Combined releases | Validated Interoperability | Major Enhancements to ALL Products

GE Digital's Proficy Portfolio

From Plant floor to ERP



Key Areas of Focus with Automation Solution 2023



Strategic Theme

1

Connected Worker

- Single experience for processing and interacting with Operations
Native HTML5 HMI

2

Centralized Configuration & Management

- Common Model, Common Security – SCADA, Historian, Visualization
- Project Encapsulation and Central Deployment
- Project Component Deployment

3

Flexible Deployment

- Geo separated Failover capability, including Cloud Backup
- MQTT to OPC UA Bridge normalizes OT data connectivity to Level 2, 3, 4 systems



Enabling the Connected Worker & Connected Operations

Single experience of processing and interacting with Operations

Accessing the information I need when I need it



- Common context driven by Model
- Single designer for all Operational applications
- Total Operations view
- Persona based interaction and access



Proficiency Operations Hub



A centralized environment to **rapidly build industrial applications & design operations interfaces** enabling plant operations, analysis, and decision making for plant personnel across the enterprise

- **Accessibility to information** - access your data any time, anywhere
- Enable creation of **high-performance displays**
- **Centrally manage visualization** layer across your enterprise
- **Get additional value** out of existing investment **in GE Proficiency** products
- Proficiency Operations Hub built leveraging domain expertise from Proficiency products



Industrial Applications – Out of the box or build your own!

- Monitor & Control
- Dashboards & KPIs
- Analysis
- Reporting
- Digital Andon



Industrial Automation

iFIX/CIMPLICITY

Manufacturing Operations Management

Proficiency Plant Applications

Proficiency MDC

Proficiency Workflow

Proficiency Batch Execution

Proficiency Tracker

Proficiency Historian

SQL DBs

CMMS, ERP Systems

Other Systems

Single designer for all operational applications





What's new in Proficy 2023 Operations Hub

Enabling Advanced Trend Analysis via Proficiency Operations Hub




Analysis App OpshubAdmin

Demo

Historical ⏏ 🔍 x + - 📄 ☰ 📈 ⋮ ? ➤

Trend Sources Not Selected



Legend

Native HTML5 HMI



SVG* Graphics Editor

Draw custom graphics or bring your SVG and animate

OOTB Graphics

Accelerate screen development with our selection of out of the box graphics, including gauges, pumps, tanks, valves, etc.

Canvas & Flex Layouts

Create screens which scale proportionally, or design more sophisticated responsive behaviors

New Designer Experience

Perform most screen building activities from Configuration Hub

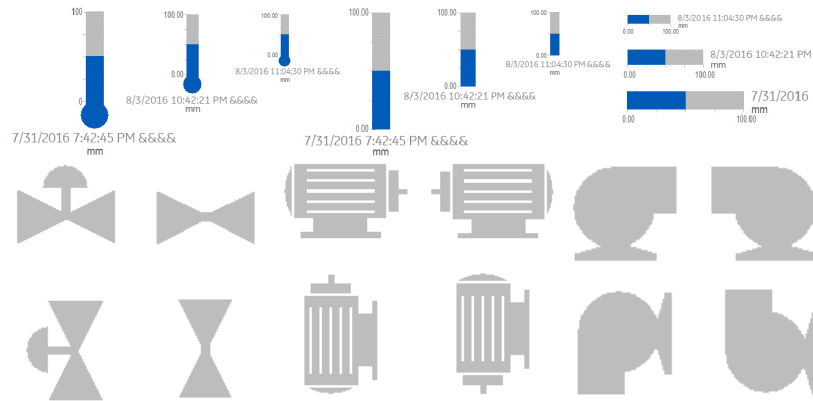
*Scalable Vector Graphic



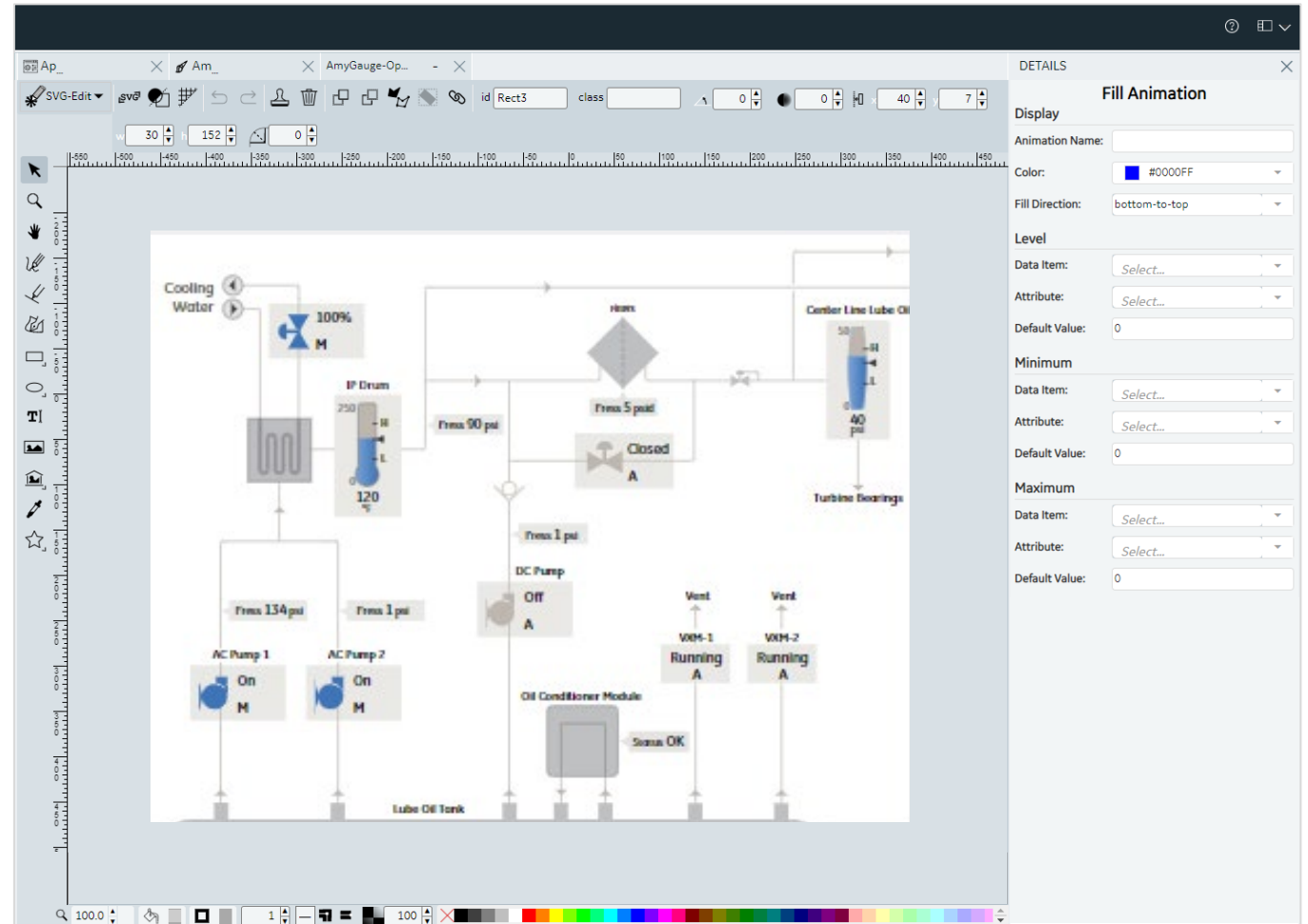
Creating and Animating Custom Graphics



- Scalable Vector Graphic (SVG) based – Resolution independent format, scale up to any size without losing image quality
- Create graphic directly in Operations Hub graphics editor, or import SVG from your favorite graphics editing program
- Add common animations such as fill, color, visibility, etc.



Start from scratch or use one of our out-of-the-box graphics to accelerate development!



Creating Custom Graphics & Defining Animations



A screenshot of a software interface. At the top, there is a dark navigation bar with icons for refresh, home, edit, and save, and a 'Save' button. On the right side of this bar are icons for help, window management, and user profile. Below the navigation bar is a sidebar titled 'NAVIGATION' with a close button. The sidebar contains a tree view with the following items: 'Proficy Authentication' (expanded), 'Security', 'White Labelling', 'Operations Hub' (expanded), 'Applications', 'Plugins', 'fx_nghmi', and 'Operations Hub Dataflow...'. The main area of the interface is a large, empty white space.

Using Custom Graphics in Screen Building



NAVIGATION App List-OperationsHub

	↑	Modification Date	Modification User	Locked	Action
<ul style="list-style-type: none"> ▼ Proficy Authenticati... Security White Labelling ▼ Operations Hub <ul style="list-style-type: none"> Applications <ul style="list-style-type: none"> ▶ Amy App ▶ Analysis App ▶ ClassicApp ▶ DEMO ▶ DemoApp ▼ Refinery1App <ul style="list-style-type: none"> FCC Plant Plugins fx_nghmi ▼ Operations Hub Dat... <ul style="list-style-type: none"> Data Flow Edi... 					

DETAILS

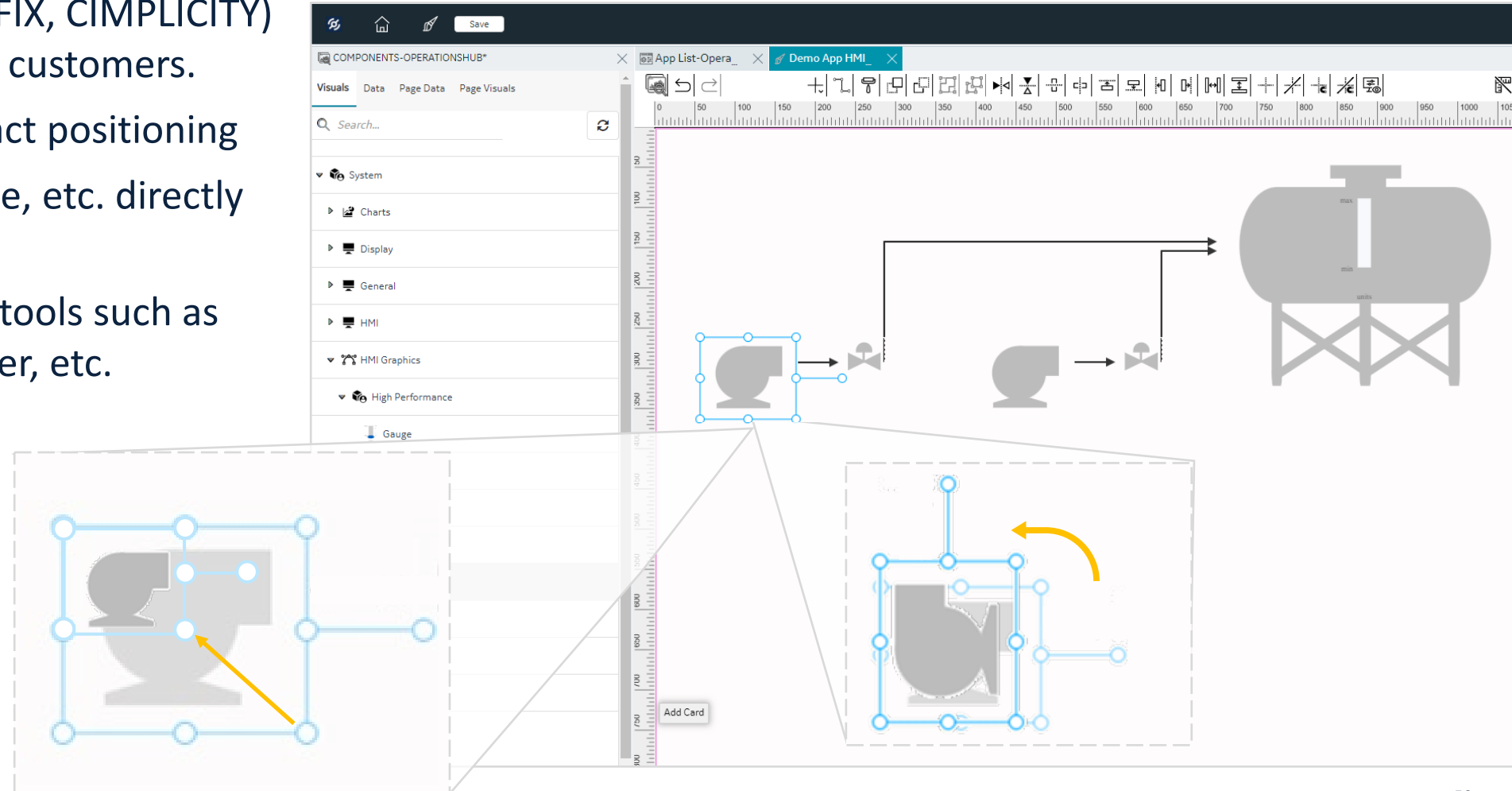
Title	Value
▼ INFO	
Page Name	FCC Plant
Display Name	FCC Plant
Last Updated	Mon Nov 14 14:17:07 ES...
Include in navigation	<input checked="" type="checkbox"/>
Page Icon	
▼ GROUPS	

Coordinate Layout



Freeform layout experience expected by many HMI customers (iFIX, CIMPLICITY) as well as Proficy Portal customers.

- Drag and drop for exact positioning
- Ability to resize, rotate, etc. directly on the page
- Standard positioning tools such as align, distribute, center, etc.



Coordinate Layout – Full Page

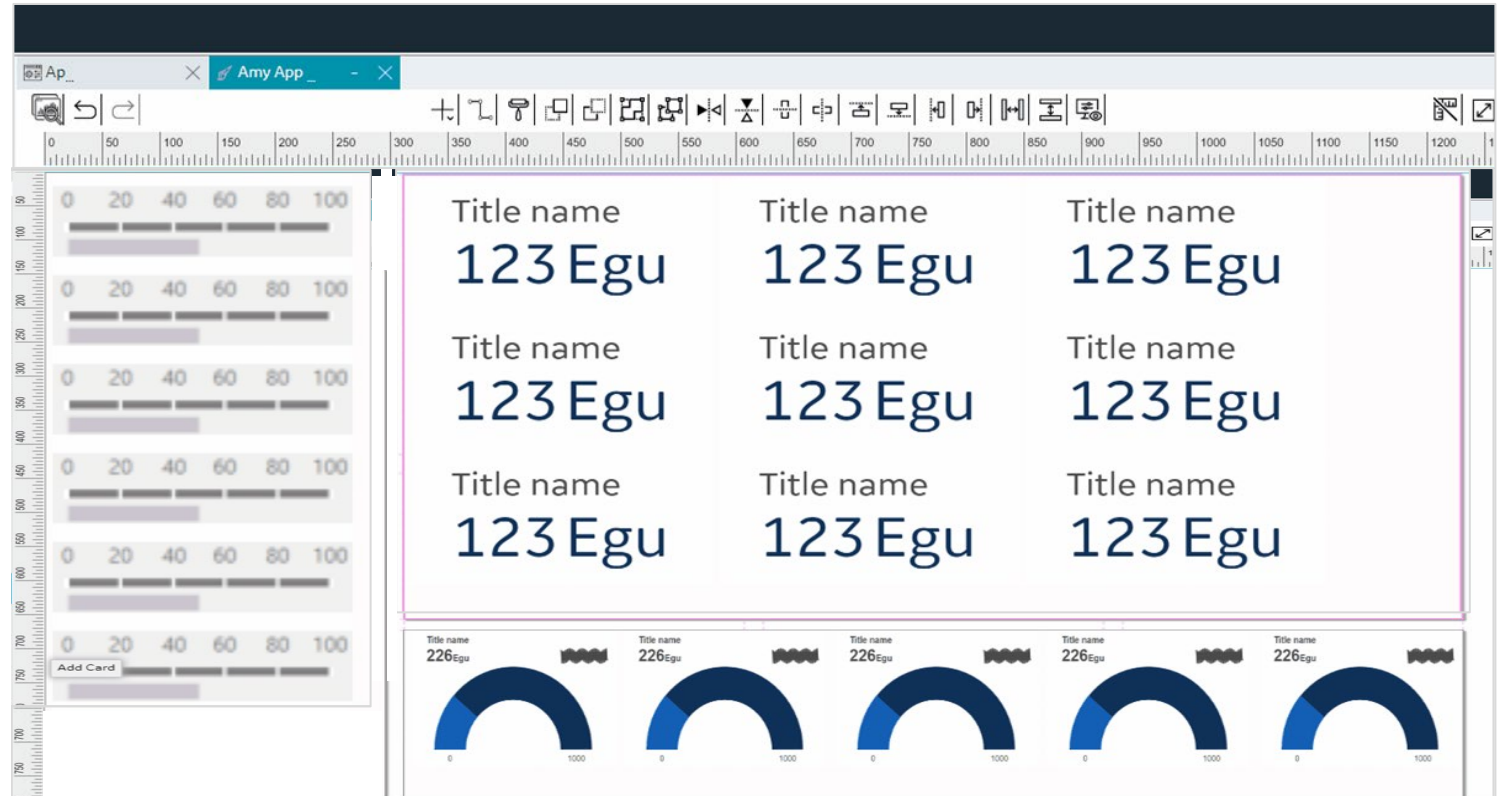


	↑ Modification Date	Modification User	Locked	Action
▼ Applications				
▶ Amy App	11/9/2022, 8:48 PM	ch_admin Confighub		
▶ Analysis App	11/7/2022, 12:39 PM	Operations Hub Admin		
▶ ClassicApp	11/8/2022, 8:26 AM	ch_admin Confighub		
▶ DEMO	11/10/2022, 1:27 PM	Bhat Smita		
▶ DemoApp	11/14/2022, 3:19 PM	ch_admin Confighub		
▶ Refinery1App	11/14/2022, 2:33 PM	ch_admin Confighub		

Flex Layout



Powerful responsive layout which automatically manage spacing of elements based on weight, resize behavior



Flex Layout – Vertical and Horizontal



The screenshot shows a web-based design tool interface for configuring a Flexbox layout. The browser address bar shows the URL `https://nghmi:5000/configurationhub/confighub/designer`. The interface includes a top navigation bar with a 'Save' button, a toolbar with various design tools, and a central canvas area with a ruler. On the left, there is a 'COMPONENTS-OPERATIONS' sidebar with a search bar and a list of components. The 'gaugeLir' component is currently selected. On the right, a 'DETAILS' panel is open for the 'Flexbox Card' component, showing the following settings:

Property	Value
Flex Direction	Row
Flex Wrap	Nowrap
Justify Content	Flex start
Align Items	Stretch
Align Content	Stretch
Layout Type	Flexbox

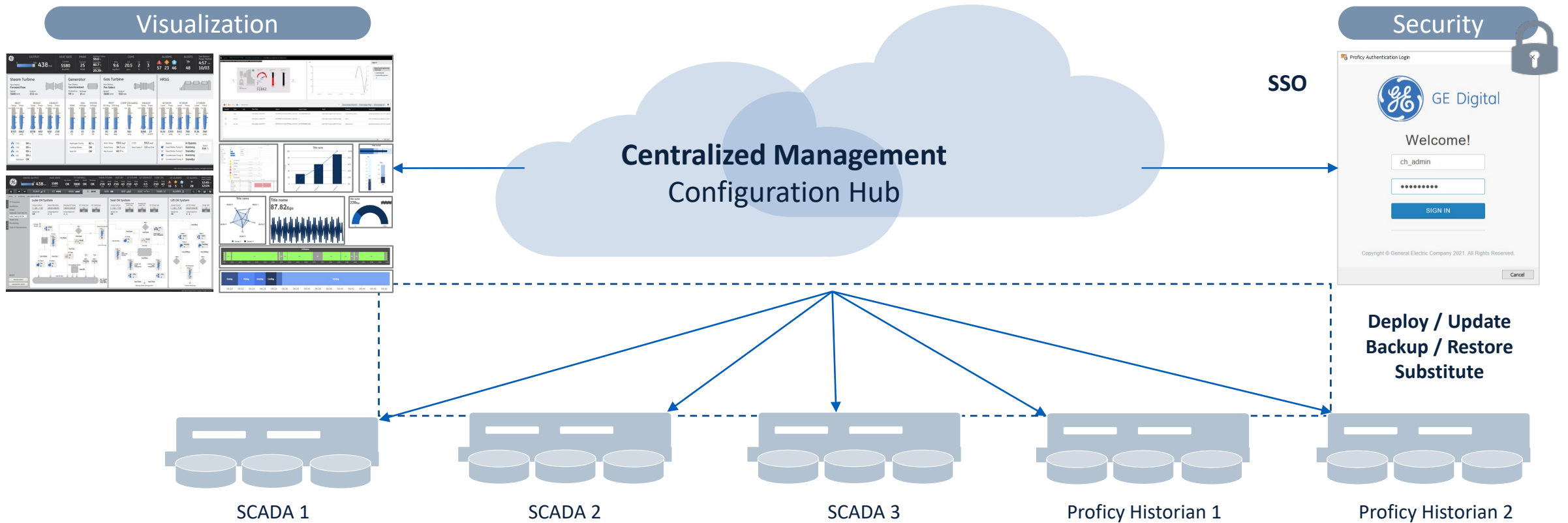


—
Enterprise-wide scale –
Centralized Management &
Flexible Deployment

Do more, do it faster, & do it easier!

Overall Centralized Configuration, Management & Deployment Vision

Project Encapsulation & Component Deployment



Common Model

One place to configure & manage for SCADA, Historian, Visualization



- Graphical Elements
- Tag Structure
- Data Links
- Historian
- Alarming

TAG NAME	STATUS	TYPE	DESCRIPTION	SCAN TIME	I/O DRIVER	ITEM TYPE	I/O ADDRESS
118CHWDP	⊙	AI	B118 CHW Differential P...	2.1	SIM	Tag	0
118CHWF	⊙	AI	B118 CHW Flow	2.1	SIM	Tag	0
118CHWRT	⊙	AI	B118 CHW Return Head...	2.1	SIM	Tag	0
118CHWST	⊙	AI	B118 CHW Supply Temp...	2.2	SIM	Tag	0
118KW	⊙	AI	B118 Kilowatts Usage	2.2	SIM	Tag	0
118STF	⊙	AI	B118 Steam Flow	2.2	SIM	Tag	0
118TNS	⊙	AI	B118 Tons Usage	2.2	SIM	Tag	0
118WCHWDP	⊙	AI	B118W CHW Differential...	2.1	SIM	Tag	0
118WCHWF	⊙	AI	B118W CHW Flow	2.1	SIM	Tag	0
118WCHWRT	⊙	AI	B118W CHW Return He...	2.1	SIM	Tag	0
118WCHWST	⊙	AI	B118W CHW Supply Te...	2.2	SIM	Tag	0
118WKW	⊙	AI	B118W Kilowatts Usage	2.2	SIM	Tag	0
118WSTF	⊙	AI	B118W Steam Flow	2.2	SIM	Tag	0
118WSTF	⊙	AI	B118W Steam Flow	2.2	SIM	Tag	0

Tag Count: 2784/2784

I/O Count: 9500



Faster Deployment

MODEL TEMPLATES Use Templates and Substitutions to automatically and uniquely create Object Instances



Instance

Central Security Configuration & Single Sign On - Configuration Hub

Proficy Authentication (UAA) (iFIX 2022)



Simplify authentication management and improved security

- **SSO*** across **SCADA, Proficy Historian and Proficy Operations Hub**
- Multi-factor Authentication (Enhanced Security)
- Nested AD group support
- Lightweight Directory Access Protocol (LDAP) Support

*SSO: Single-Sign-On

The screenshot displays the Configuration Hub interface for Proficy Authentication (UAA). The main window shows the 'Users' tab under 'Security-UAA'. A table lists users, with 'ch_admin' selected. A 'Proficy Authentication Login' dialog is overlaid on the right, showing the GE Digital logo, a 'Welcome!' message, a username field containing 'ch_admin', a password field with masked characters, and a 'SIGN IN' button. The dialog also includes a 'Cancel' button and a copyright notice for GE Digital 2021.

USER NAME	EMAIL
admin	chadcraigsmith@gmail.com
ch_admin	ch_admin@test.org

FIELD	VALUE
GENERAL	
Name	ch_admin
Email	ch_admin@test.org
Status	true
Origin	uaa
GROUP MEMBERSHIP	
uaa.admin	
approvals.me	
cloud_controlle...	
user_attributes	
cloud_controlle...	

Proficiency Installer



Integrates all the components needed or related to iFIX operations into one installer saving you time not having to download & install multiple installers and reboot multiple times.

**What used to take 1 –3 hours
now takes 15 minutes after downloading!**





What's new in Proficy 2023 for Centralized Management

New Designer Experience

Single place to configure and manage – HMI/SCADA, Proficy Historian



Configure your Proficy products all together in one place, with access from anywhere.

Manage multiple Proficy products centrally from within Configuration Hub:

- Proficy Operations Hub
- SCADA
- Proficy Historian

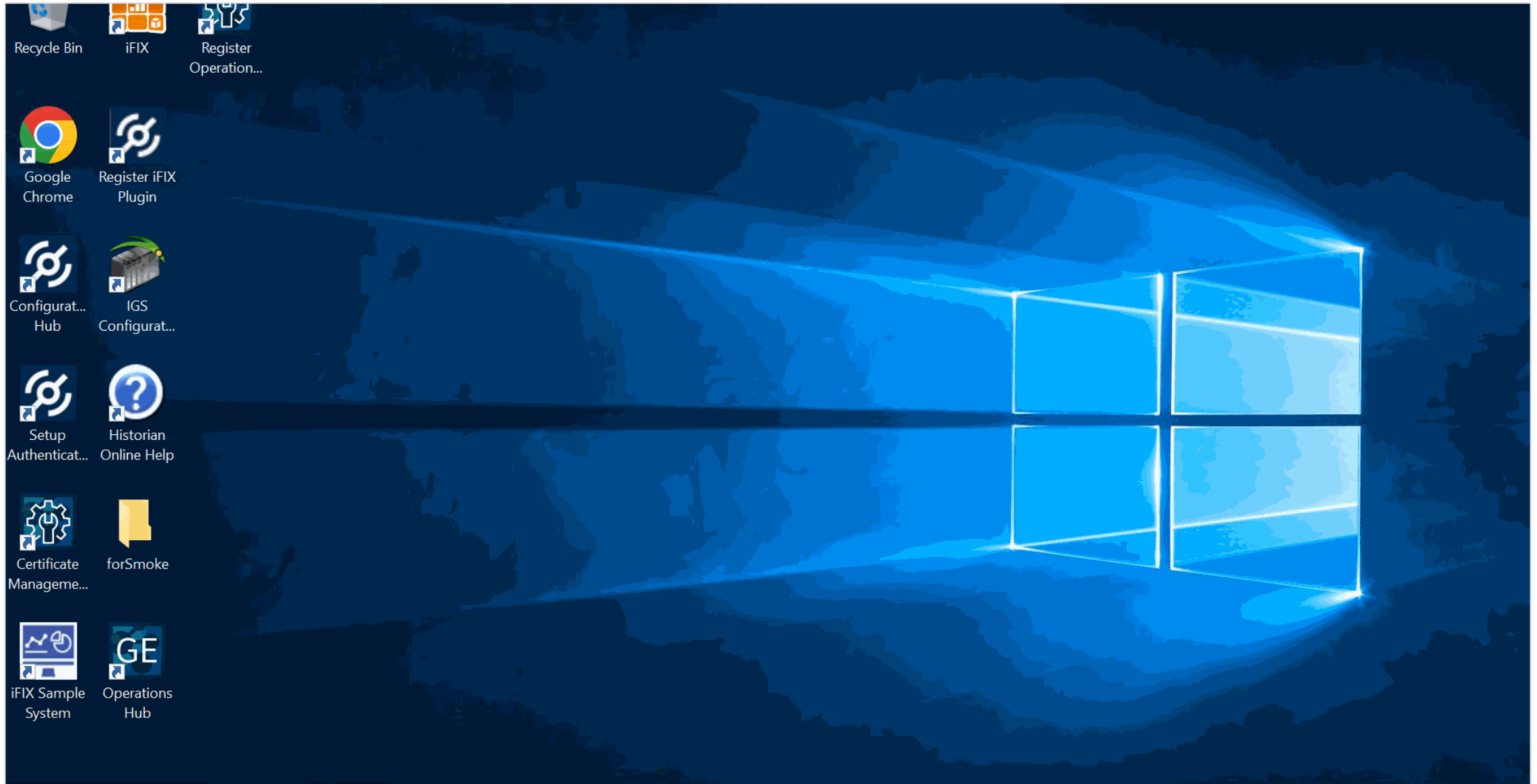
Common authentication across the portfolio – Manage your users and permissions in one place

Create your model in iFIX or Historian, and publish directly to Operations Hub for visualization

The screenshot shows the Proficy Configuration Hub interface. On the left is a navigation sidebar with categories like Proficy Authentication, OperationsHub, Applications, Plugins, fx_nghmi, FX_NGHMI, Connections, Model, Database, HMI, Security, and Alarms. The main area displays a table of model elements under the heading 'Model-fx_nghmi'. The table has columns for 'MODEL ELEMENT', 'STATUS', and an empty column. It lists various types and instances, all with a green checkmark in the status column.

MODEL ELEMENT	STATUS	
Types		
Test	✓	
DisplacementPump	✓	
FWPumpStation	✓	
StorageTank	✓	
SuctionValve	✓	
DemoRoot	✓	
Instances		
FinishedWaterPumpStation	✓	
DisplacementPump1B	✓	
SuctionValveC	✓	
DisplacementPump1C	✓	
SuctionValveD	✓	
SuctionValveA	✓	
DisplacementPump1A	✓	
SuctionValveB	✓	
StorageTank1	✓	

New Designer – Single Place for Configuration



New Designer – Screen Builder



COMONENTS-OPERATIONSHUB

App List_...

No page currently selected

+ ↑ ⚙️ 📄 🔍 Search...

	↑	Modification Date	Modification User	Locked	Action
▼ Applications					
▶ 📄 Amy App		11/9/2022, 8:48 PM	ch_admin Confighub	🔒	🖥️ ⚙️
▶ 📄 Analysis App		11/7/2022, 12:39 PM	Operations Hub Admin	🔒	🖥️ ⚙️
▶ 📄 ClassicApp		11/8/2022, 8:26 AM	ch_admin Confighub	🔒	🖥️ ⚙️
▶ 📄 DEMO		11/10/2022, 1:27 PM	Bhat Smita	🔒	🖥️ ⚙️
▼ 📄 DemoApp		11/14/2022, 1:48 PM	ch_admin Confighub	🔒	🖥️ ⚙️
📄 Page1		11/14/2022, 1:48 PM	ch_admin Confighub	🔒	🖥️ ⚙️
▶ 📄 Refinery1App		11/14/2022, 1:56 PM	ch_admin Confighub	🔒	🖥️ ⚙️

DETAILS

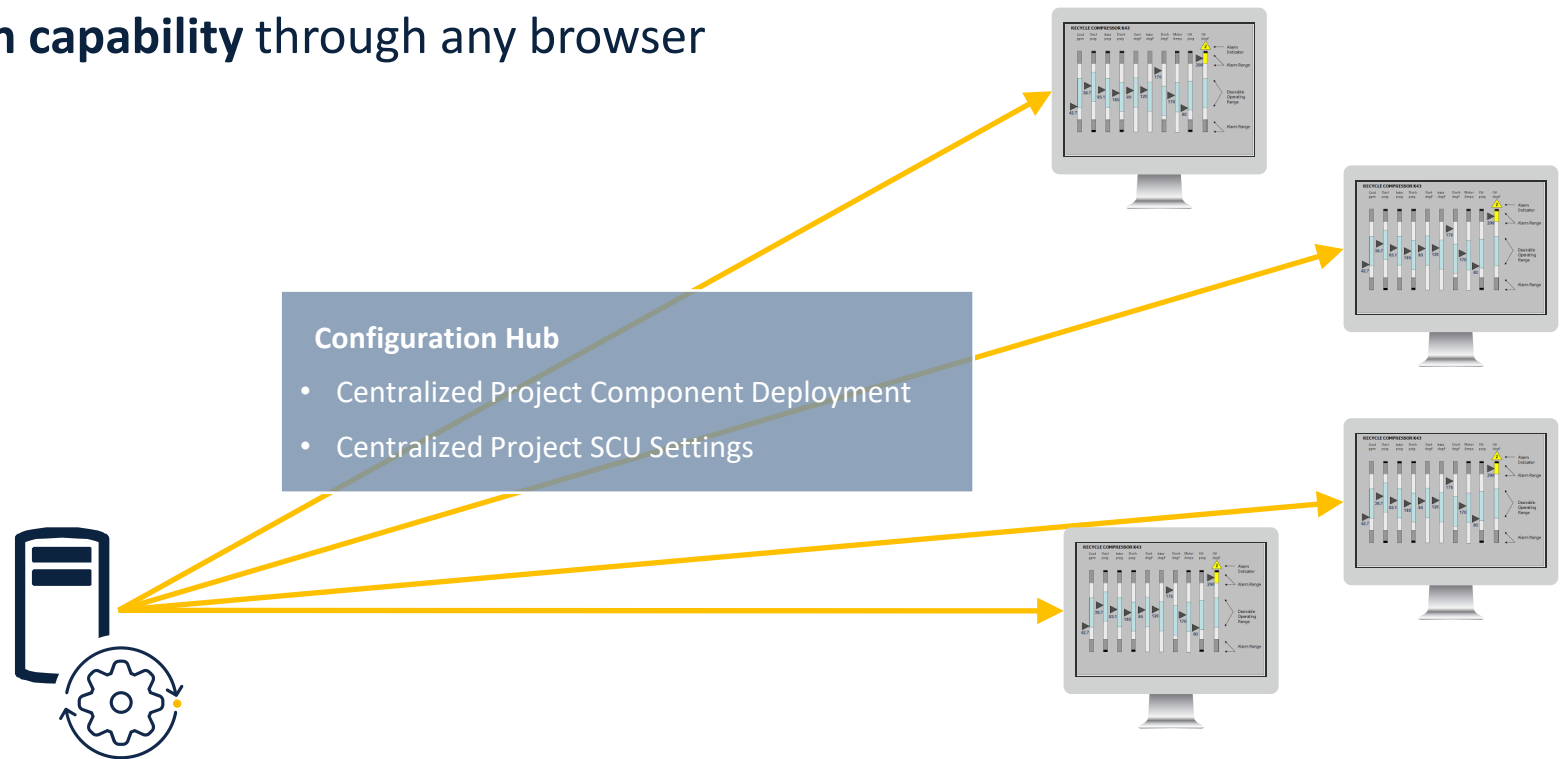
Centralized Project Configuration Overview

Proficy 2023



Configuration Hub gives you:

- The ability to **Centrally manage project Settings**
- Essential **iFIX Project Configuration capability** through any browser



Centralized Project Configuration Overview

iFIX 2023



The screenshot displays the iFIX 2023 configuration hub interface. The browser address bar shows the URL: <https://prrdemos001:5000/configurationhub/confighub/loadplugin>. The interface is divided into several sections:

- NAVIGATION:** A sidebar on the left containing a tree view of project components. The 'SCADA1' component is expanded, showing sub-items like 'Connections', 'Model', 'Database', 'HMI', 'Security', 'Alarms', and 'Node Setti...'. Other components listed include 'Proficy Authentici...', 'Security', 'White Labelling', 'DEMOS001', 'DEMOS002', 'DEMOS003', and 'OperationsHub'.
- Areas:** The main content area is titled 'Areas' and contains a search bar and a table. The table has two columns: 'NAME' and 'STATUS'. It lists areas A through P, each with a checkbox and a green checkmark in the status column.
- DETAILS:** A panel on the right side, currently showing 'No data'.

NAME	STATUS
A	✓
B	✓
C	✓
D	✓
E	✓
F	✓
G	✓
H	✓
I	✓
J	✓
K	✓
L	✓
M	✓
N	✓
O	✓
P	✓

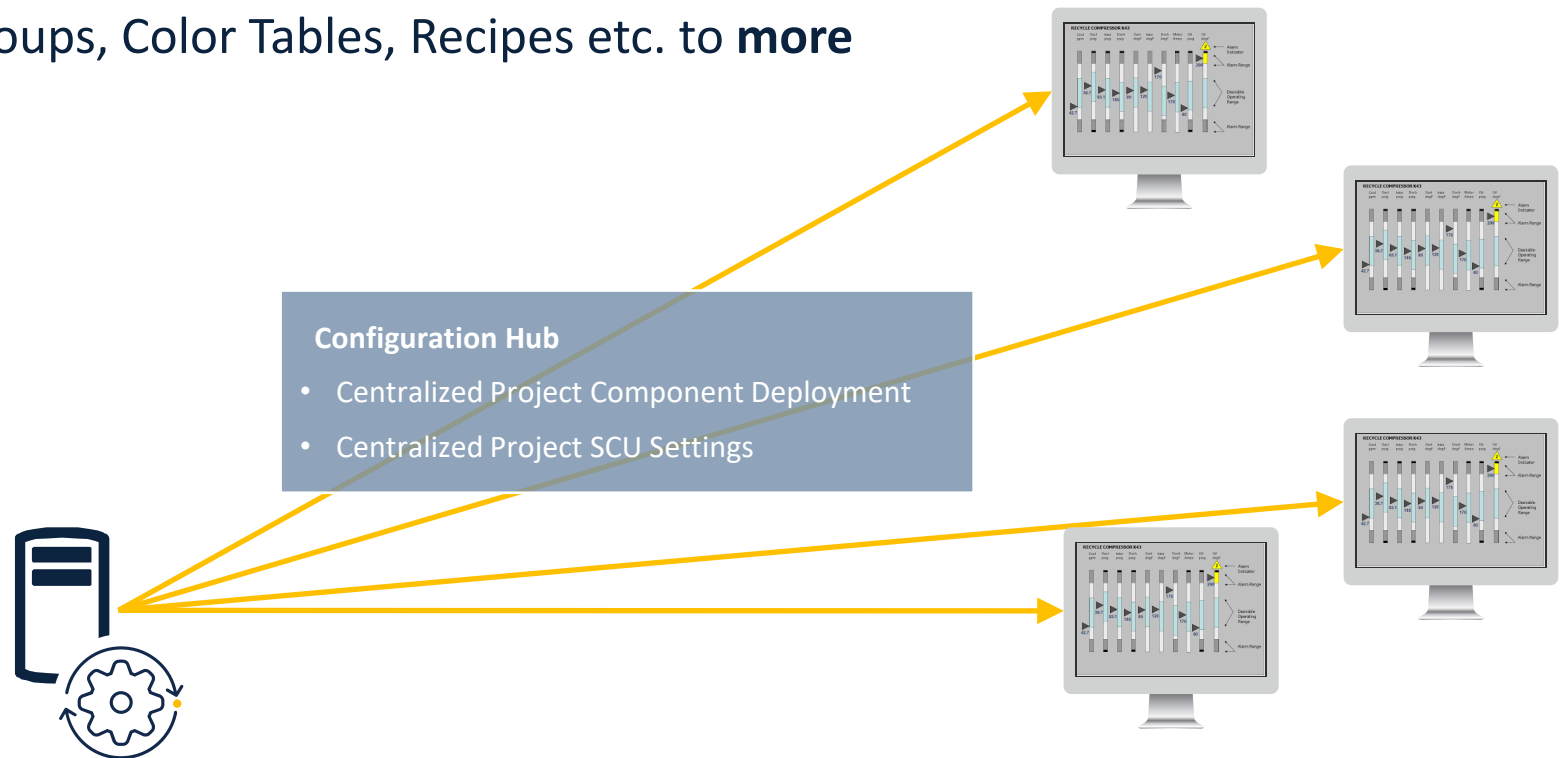
Centralized Project Deployment Overview

iFIX 2023



Configuration Hub gives you:

- The ability to **Centrally manage and Deploy project Screens & Settings**
- The ability to push Screens, Tag Groups, Color Tables, Recipes etc. to **more than one iFIX node**



Centralized Project Configuration & Deployment Overview

iFIX 2023



https://prrdemos001:5000/configurationhub/confighub/loadplugin

Database-DATABASE-DEMO5001

NAVIGATION

- Proficy Authentication
 - Security
 - White Labelling
- DEMO5001
 - SCADA1
 - DEMO5002
 - DEMO5003
 - OperationsHub

Search...

DATABASE

TAG NAME	STATUS	TYPE	DESCRIPTION	I/O DRIVER	I/O ADDRESS
<input type="checkbox"/> LINE01>CLEANWATERFILLER>MOTOR_OIL	✓	AI	Filler 01 Motor Oil Level	IGS	SIM.PLC.Filler02.Motor_Oil
<input type="checkbox"/> LINE01>CLEANWATERFILLER>MOTOR_SPEED	✓	AI	Filler 01 Motor Speed	IGS	SIM.PLC.Filler02.Motor_Speed
<input type="checkbox"/> LINE01>CLEANWATERFILLER>MOTOR_STATE	✓	DI	Filler 01 Motor State	IGS	SIM.PLC.Filler02.Motor_State
<input type="checkbox"/> LINE01>CLEANWATERFILLER>MOTOR_TEMP	✓	AI	Filler 01 Motor Temp	IGS	SIM.PLC.Filler02.Motor_Temp
<input type="checkbox"/> LINE01>CLEANWATERFILLER>NAME	✓	TX	Asset Name	IGS	SIM.PLC.Filler02.Name
<input type="checkbox"/> LINE01>CLEANWATERFILLER>PUMP>RUNTIME	✓	AI	Filler 01 Pump Runtime ...	IGS	SIM.PLC.Filler02.Pump.Runtime
<input type="checkbox"/> LINE01>CLEANWATERFILLER>PUMP>SPEED	✓	AI	Filler 01 Pump Speed	IGS	SIM.PLC.Filler02.Pump.Speed
<input type="checkbox"/> LINE01>CLEANWATERFILLER>PUMP>STATE	✓	DI	Filler 01 Pump State	IGS	SIM.PLC.Filler02.Pump.Vibratio
<input type="checkbox"/> LINE01>CLEANWATERFILLER>PUMP>VIBRATION	✓	AI	Filler 01 Pump Vibration	IGS	SIM.PLC.Filler02.Pump.Vibratio
<input type="checkbox"/> LINE01>CLEANWATERFILLER>TOTAL	✓	AI	Filler 01 Total	IGS	SIM.PLC.Filler02.Total
<input type="checkbox"/> LINE01>CLEANWATERFILLER>VALVEIN_STATE	✓	DI	Filler 01 Valve In State	IGS	SIM.PLC.Filler02.ValveIn_State
<input type="checkbox"/> LINE01>WASTEWATERFILLER>MOTOR_OIL	✓	AI	Filler 01 Motor Oil Level	IGS	SIM.PLC.Filler01.Motor_Oil
<input type="checkbox"/> LINE01>WASTEWATERFILLER>MOTOR_SPEED	✓	AI	Filler 01 Motor Speed	IGS	SIM.PLC.Filler01.Motor_Speed
<input type="checkbox"/> LINE01>WASTEWATERFILLER>MOTOR_STATE	✓	DI	Filler 01 Motor State	IGS	SIM.PLC.Filler01.Motor_State
<input type="checkbox"/> LINE01>WASTEWATERFILLER>MOTOR_TEMP	✓	AI	Filler 01 Motor Temp	IGS	SIM.PLC.Filler01.Motor_Temp
<input type="checkbox"/> LINE01>WASTEWATERFILLER>NAME	✓	TX	Asset Name	IGS	SIM.PLC.Filler01.Name
<input type="checkbox"/> LINE01>WASTEWATERFILLER>PUMP>RUNTIME	✓	AI	Filler 01 Pump Runtime ...	IGS	SIM.PLC.Filler01.Pump.Runtime
<input type="checkbox"/> LINE01>WASTEWATERFILLER>PUMP>SPEED	✓	AI	Filler 01 Pump Speed	IGS	SIM.PLC.Filler01.Pump.Speed
<input type="checkbox"/> LINE01>WASTEWATERFILLER>PUMP>STATE	✓	DI	Filler 01 Pump State	IGS	SIM.PLC.Filler01.Pump.Vibratio
<input type="checkbox"/> LINE01>WASTEWATERFILLER>PUMP>VIBRATION	✓	AI	Filler 01 Pump Vibration	IGS	SIM.PLC.Filler01.Pump.Vibratio
<input type="checkbox"/> LINE01>WASTEWATERFILLER>TOTAL	✓	AI	Filler 01 Total	IGS	SIM.PLC.Filler01.Total
<input type="checkbox"/> LINE01>WASTEWATERFILLER>VALVEIN_STATE	✓	DI	Filler 01 Valve In State	IGS	SIM.PLC.Filler01.ValveIn_State
<input type="checkbox"/> I.INF02>>CLANWATERFILLER>MOTOR_OIL	✓	AI	Filler 01 Motor Oil Level	IGS	SIM.PLC.Filler01.Motor_Oil

Tag Count: 34/34

Published I/O Count: 34

DETAILS

Please select Tag

Type here to search

2:44 PM 10/6/2022

Centralized Project Configuration & Deployment Overview

iFIX 2023

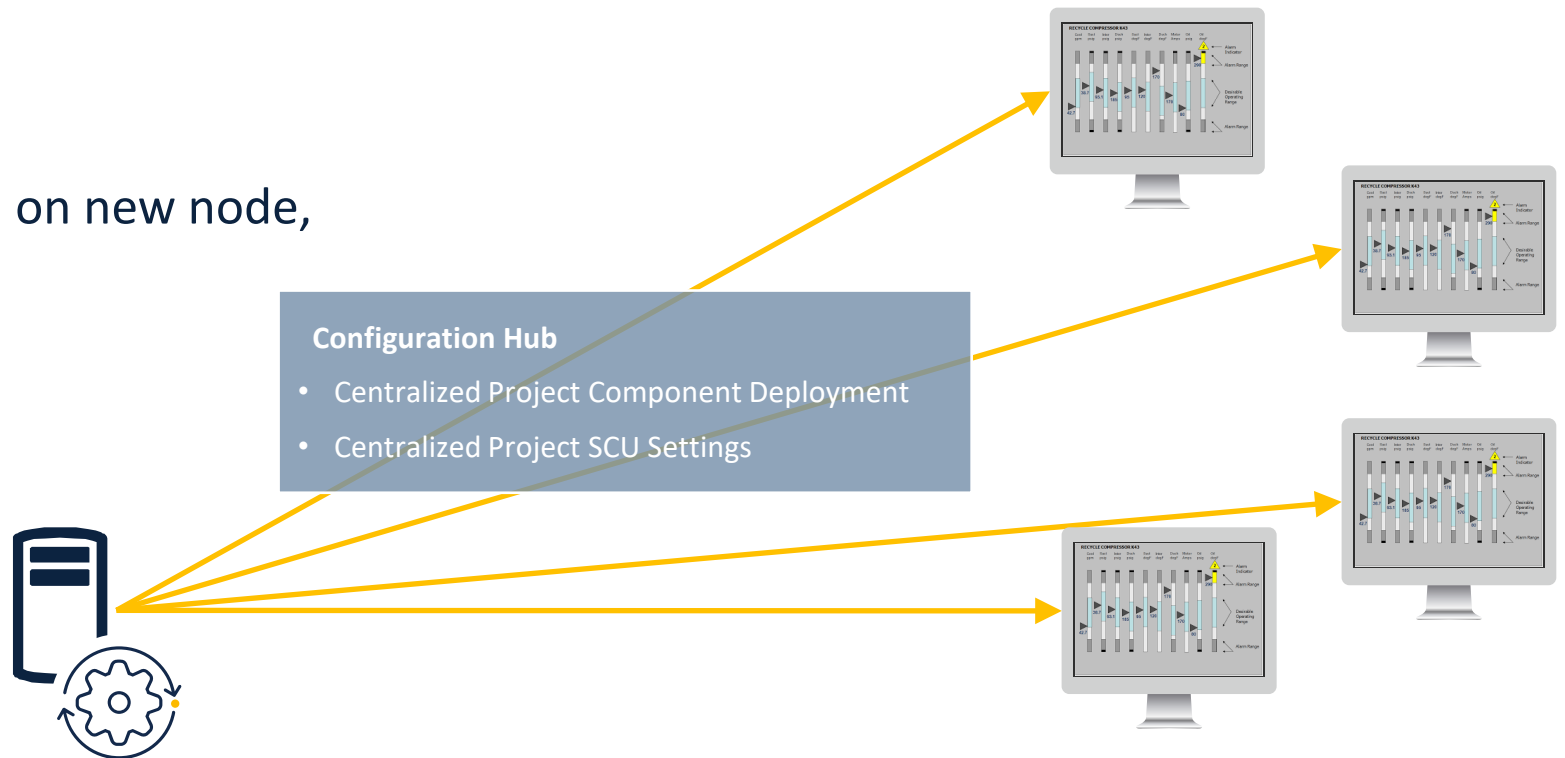


- Ability to **update as many nodes as desired at ONE Time from ONE place**

No more manually transfer of:

- settings to multiple nodes
- screens to multiple nodes

Deploy goes to an unpublished state on new node,
must publish to Runtime manually





Historian Key Update Summary

Historian Administration

Not just modernize, Redesign to simplify administrative task effort



Tag Configuration Example

Tag selection made easy

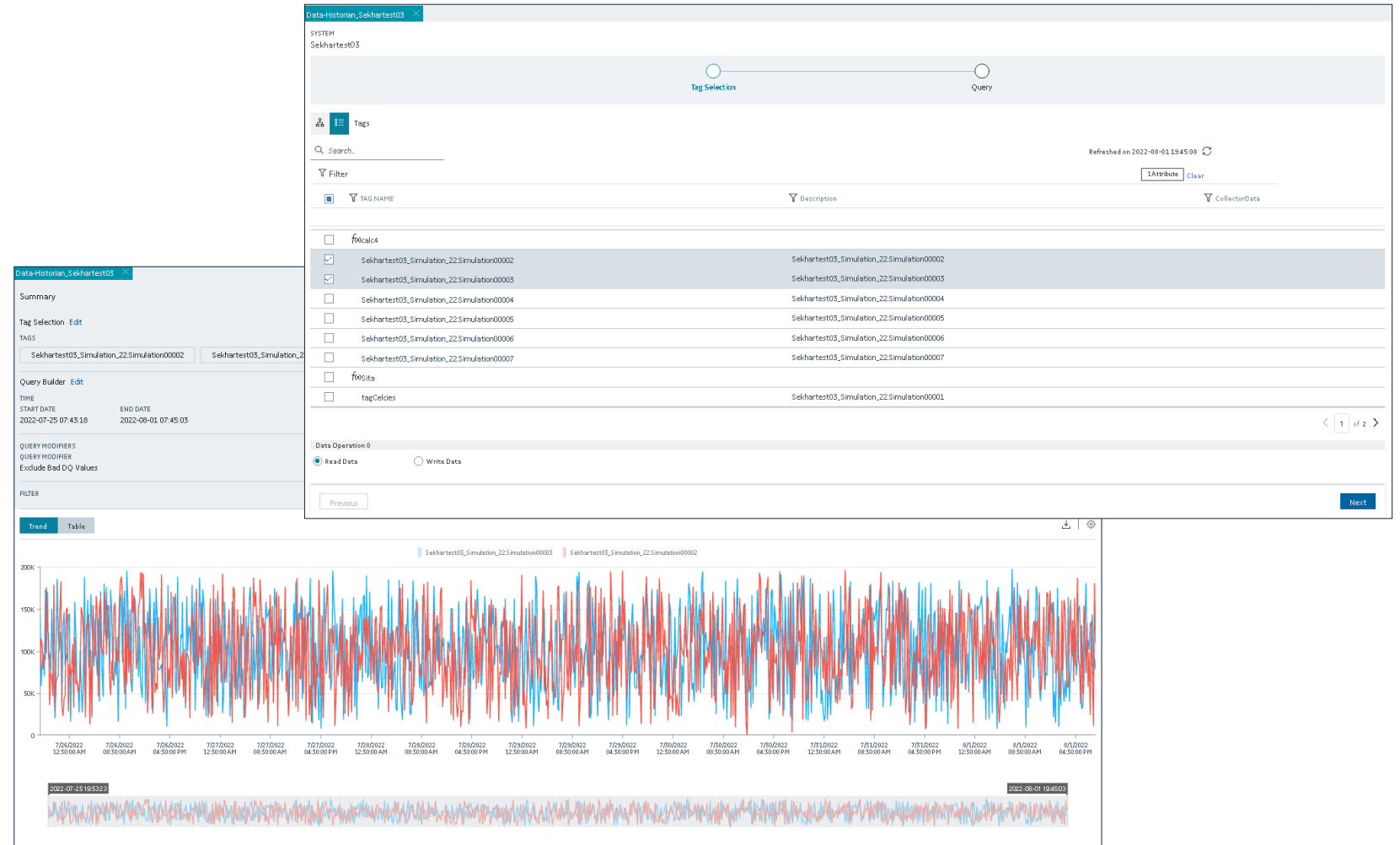
- Perform advance search for tags
- Flat tag view
- Model hierarchical tag view
- Select multiple/all tags at once
- Select read or write operation

Robust query builder

- Select any sample modes & direction
- Select any query modifier
- Add filter conditions

Better visualization

- View the selected tags & query modifiers
- View the results in Trend or Table
- Export the data
- Print the trend
- Easily modify the tag selection or query





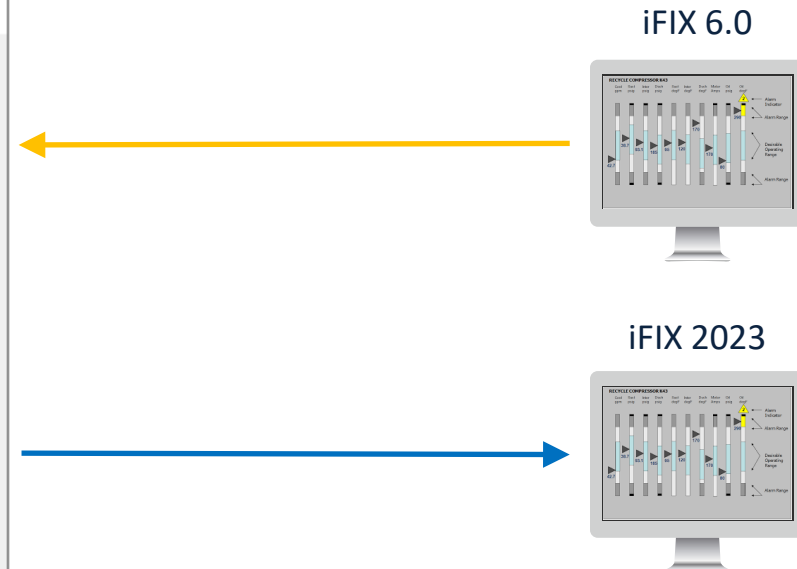
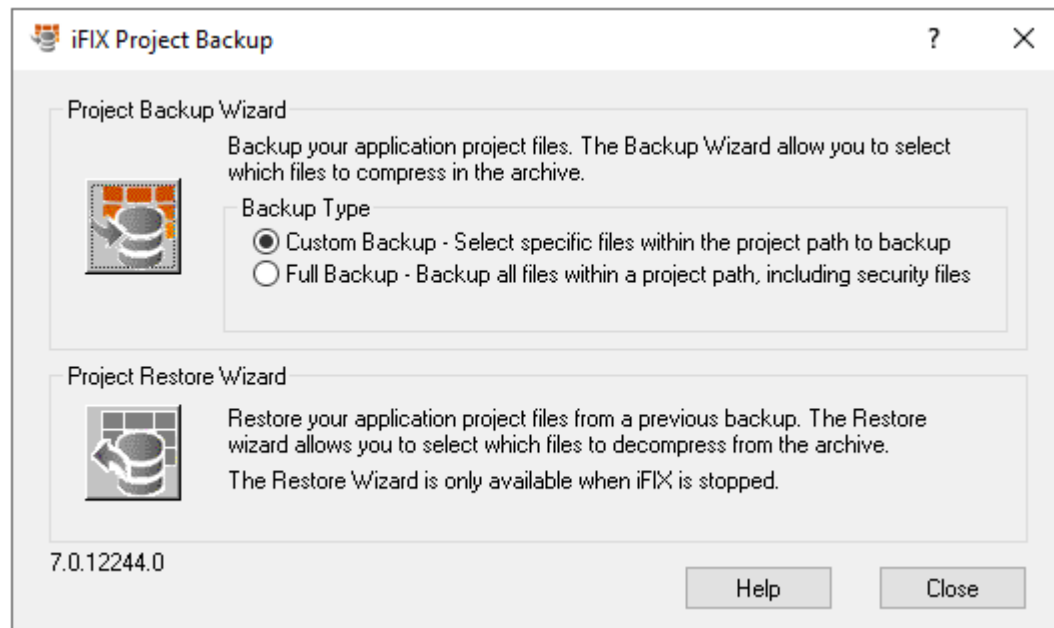
What's new in Proficy 2023 for Flexible deployment

Enhanced Backup & Restore Utility

iFIX 2023



Ability to **create a backup (FBK File) from a node on an older iFIX Version and restore to an updated node on iFIX 2023**



Failover Enhancements for increased Reliability & Compliance

iFIX 2023

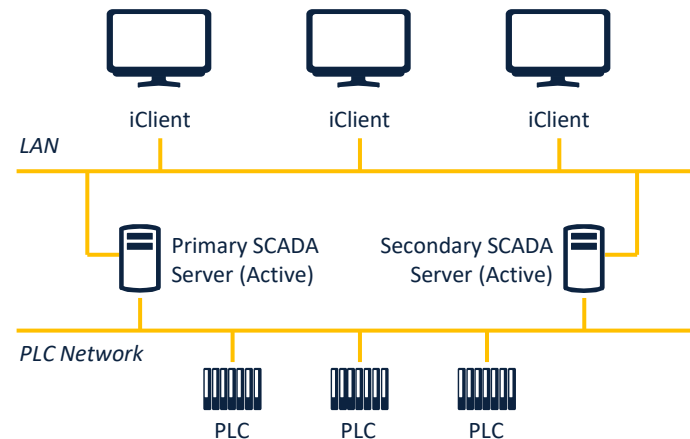


TCP Protocol for enhanced SCADA pair synchronization

- Eliminates need for dedicated cable between SCADA pair
- SCADA pair can be geographically separated
- Step toward cloud readiness for SCADA failover

Improve database synchronization performance

- Packet Compression to decrease time taken to synchronize the database between SCADAs.
- In house tests of 65K tag database sync shows **decrease in time from ~90 seconds to ~3 seconds**



TCP Redundancy with compression results in 90% data sync improvement

Data Sync Protocol

TCP UDP

Important:

Ensure this setting is matched on both Primary and Secondary

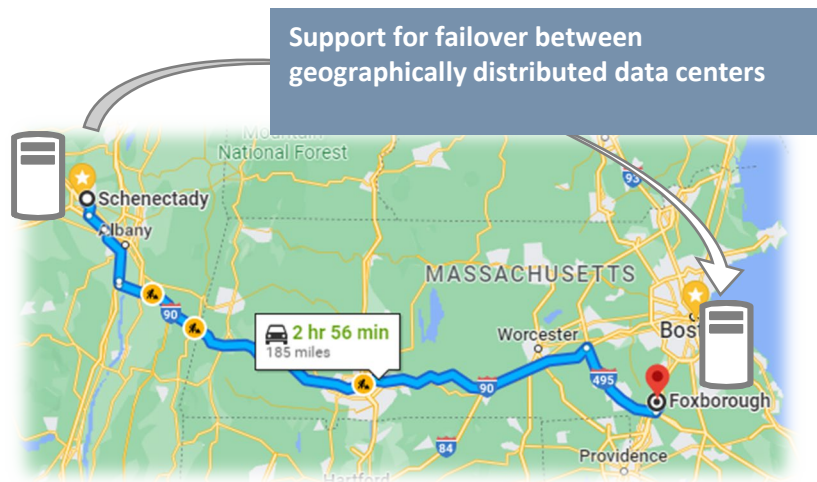
Simplified architecture, increased reliability & reduced maintenance

Enabling Utility Grade Failover Scenarios and Enterprise Scale OT/IT Integration



Multi-Site Failover

Utilities and other critical infrastructure applications require data redundancy across data centers. Historian 2022 simplifies the deployment of these complex systems.



Parquet Export Service

Cloud Based Service extracts data from Historian for Cloud or on-prem Historians

Fully configurable: what data at what frequency

Enables simple:

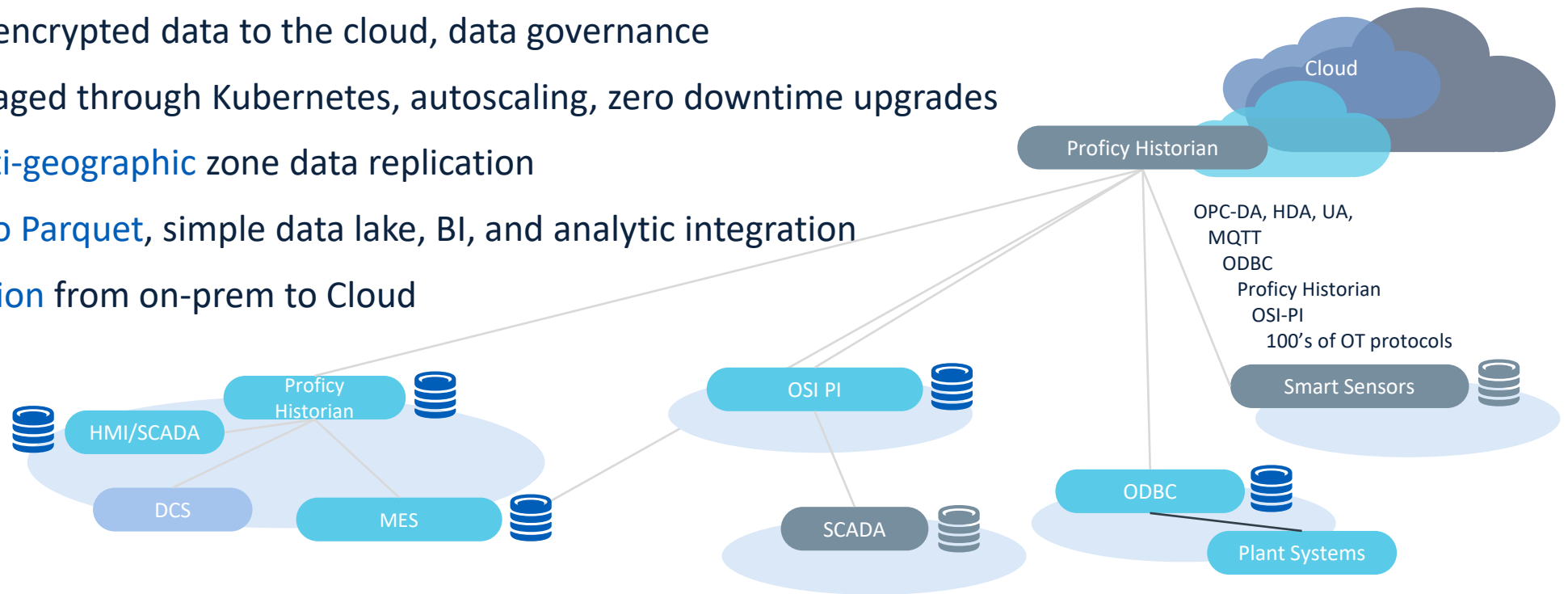
- OT data ingestion into the customer's data lake
- OT data access from BI tools
- Cloud based analytics can directly run against Parquet files without further processing



Proficiency Historian for Cloud

Unique, true operational historian, architected for the cloud, available on *AWS and Azure*

- Cloud native historian providing *same APIs as on-prem* version, zero integration effort
- *Simple to predict consumption pricing & fixed fee term license pricing*
- *100's of protocols*, encrypted data to the cloud, data governance
- Deployed and managed through Kubernetes, autoscaling, zero downtime upgrades
- *Multi-pod and multi-geographic zone data replication*
- Scheduled *export to Parquet*, simple data lake, BI, and analytic integration
- *Legacy Data Migration* from on-prem to Cloud



Proficy MQTT Bridge



What is MQTT?

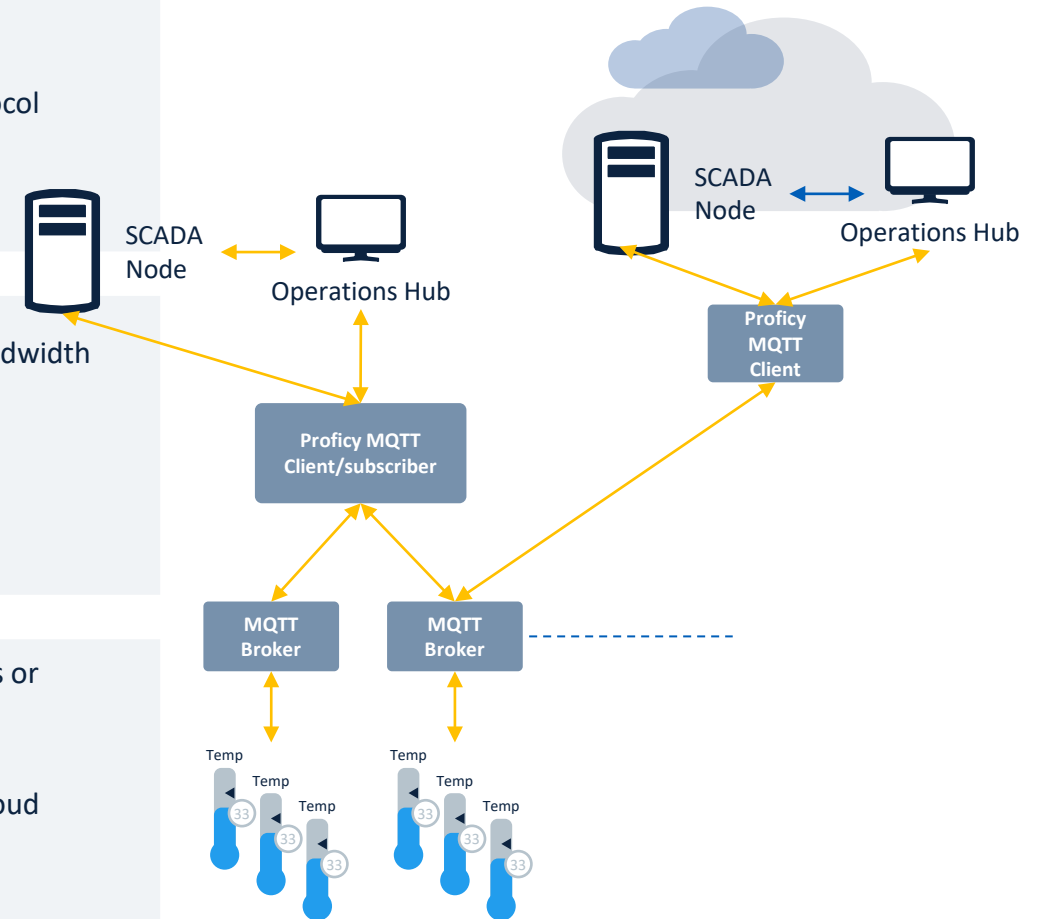
- Message Queuing Telemetry Transport.
- Lightweight, low bandwidth and low overhead open messaging protocol
- Leverages publish/subscribe communications

Benefits of MQTT

- Efficient data transmission with low network usage, low network bandwidth
- Fast, efficient, and reliable message delivery with QoS
- Can transport any type of data in the payload carried by the packet
- TLS/SSL based security
- Ideal for low power devices

When should you use MQTT?

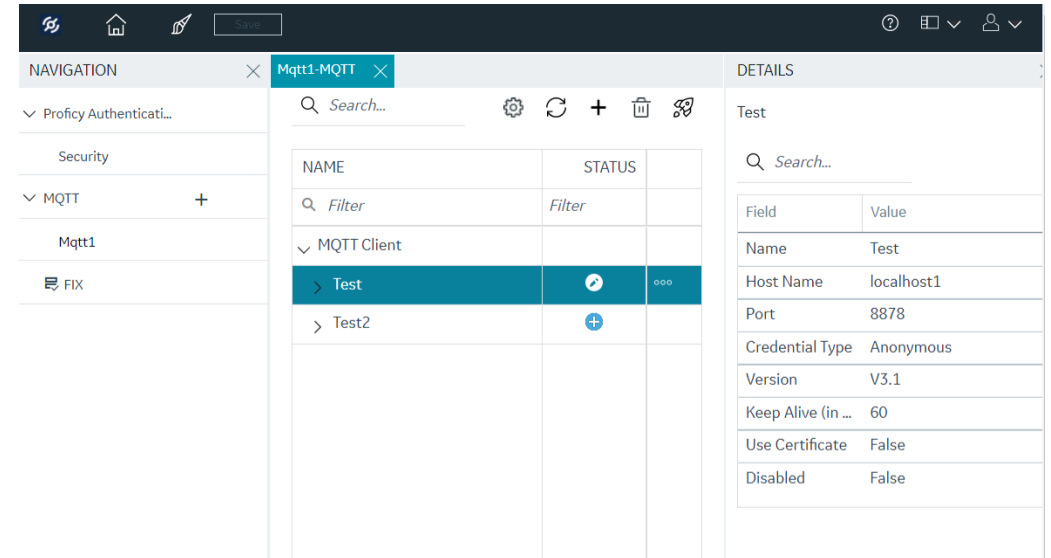
- Cloud based applications receiving data from on premise applications or smart sensors
- Low bandwidth or unpredictable communications
- Normalizing communications from OT to IT, IT to Cloud, and OT to Cloud
- IOT applications – on premise or in the cloud
- Remote Monitoring applications



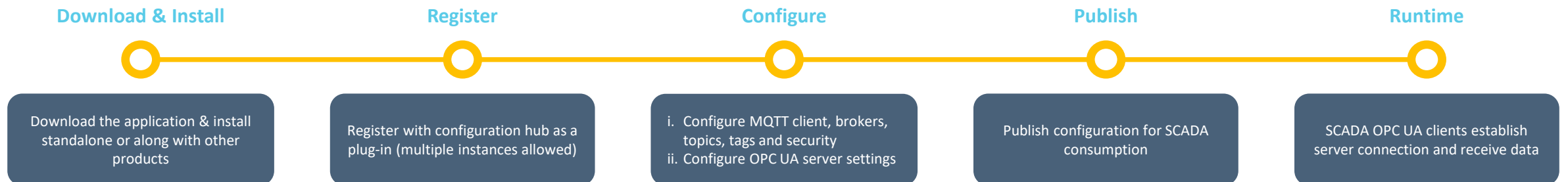
MQTT – OPC UA Translator Overview – Proficy 2023



- Translates MQTT data to OPC UA data
- Common solve across automation product portfolio
- Registration, configuration & runtime as a Configuration Hub plug-in
- MQTT v5, v3.1.1 and v3.1 version support
- Sparkplug-B and normal (JSON) payload support
- Dynamic tags creation support
- Supports connections to multiple brokers in parallel
- Packaged with integrated installer – 2023 Release



HIGH LEVEL USER JOURNEY





iFIX Key Update Summary

iFIX Development Timeline



Key Areas of Focus with iFIX 2023



	Strategic Theme	Features	Benefits
1	Connected Worker	<ul style="list-style-type: none">• Single experience for processing and interacting with Operations Native HTML5 HMI	<ul style="list-style-type: none">• Single context for driving transparency of information driving better decision making, efficient actions and faster on job training
2	Centralized Configuration & Management	<ul style="list-style-type: none">• Common Model, Common Security – SCADA, Historian, Visualization• Project Encapsulation and Central Deployment• Project Component Deployment	<ul style="list-style-type: none">• Ease of configuration, deployment and maintenance
3	Flexible Deployment	<ul style="list-style-type: none">• Geo separated Failover capability, including Cloud Backup• MQTT to OPC UA translator normalize OT data connectivity to Level 3, 4 systems	<ul style="list-style-type: none">• System design best suited for customer's operations

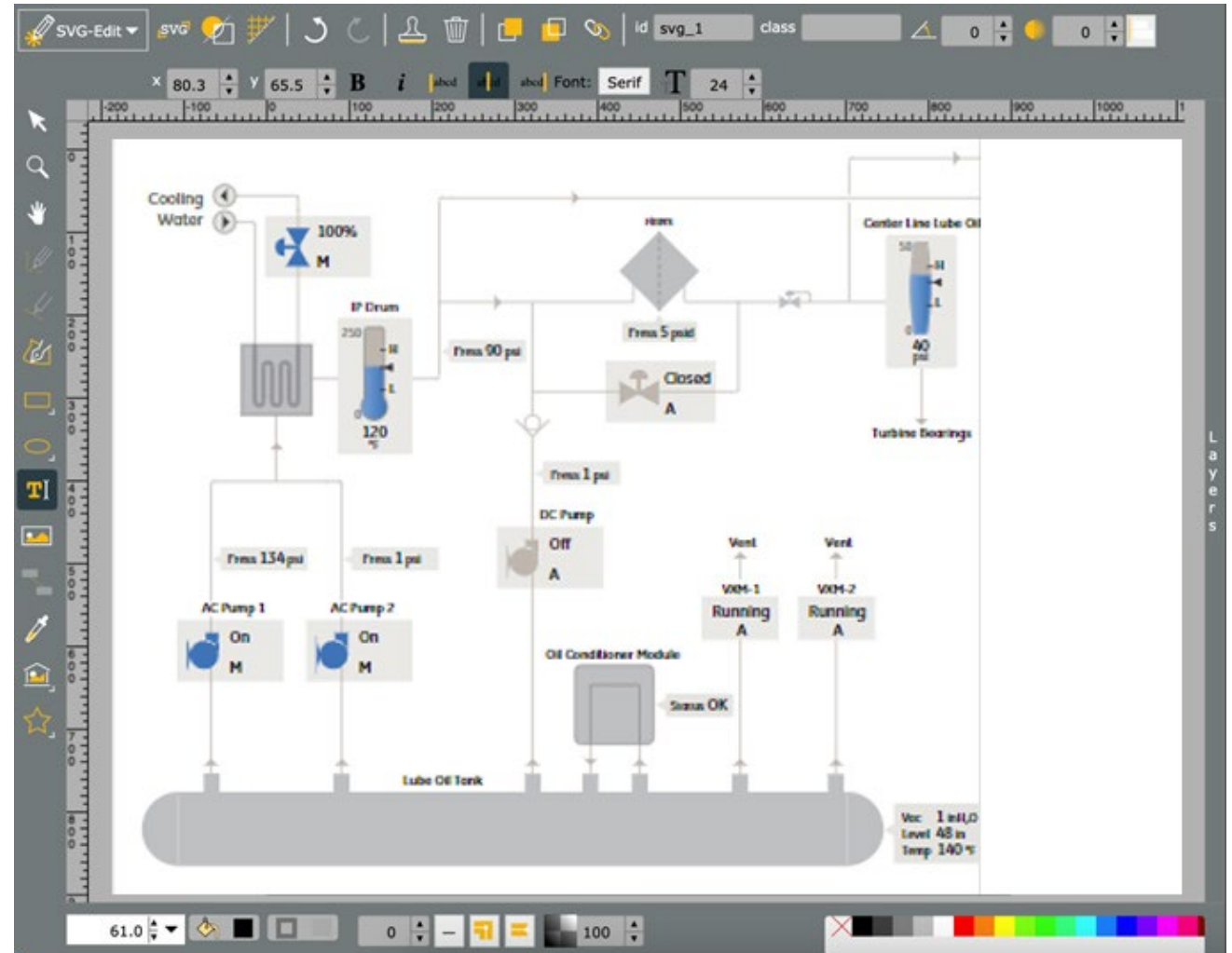
Operations Hub as the native HTML5 HMI for SCADA



Visual Library: What visualizations are available to add to the page?

Custom Graphics Creation and Editing

- SVG Based
- Create graphic directly in Proficy Operations Hub, or import SVG from your favorite graphics editing program to start
- Add animations, interactivity



Screenshot of SVG Editor for illustrative purposes, not to be taken as final design

Operations Hub as the native HTML5 HMI for SCADA



Visual Library: What visualizations are available to add to the page?



Screenshot of SVG Editor for illustrative purposes, not to be taken as final design



Looking Forward

Key Areas of Focus Beyond iFIX 2023



Strategic Theme

1

Native HTML5 HMI

- Scripting Support
- Responsive HMI

2

Centralized Deployment/License Management

- Server based licensing
- Deployment of iFIX capabilities centrally including license to run
- Project Versioning/Recovery Service

3

Performance / Scalability

- Alarm Generation & Distribution Performance
- Scale number of clients, SCADA database size

4

Recipe Management

- S88 based Recipe configuration
- Recipe Change Management/Versioning

Key Areas of Focus with Proficy Historian 2023 & Historian for Cloud 2023

Reducing time to value for administrators and consumers of historical data



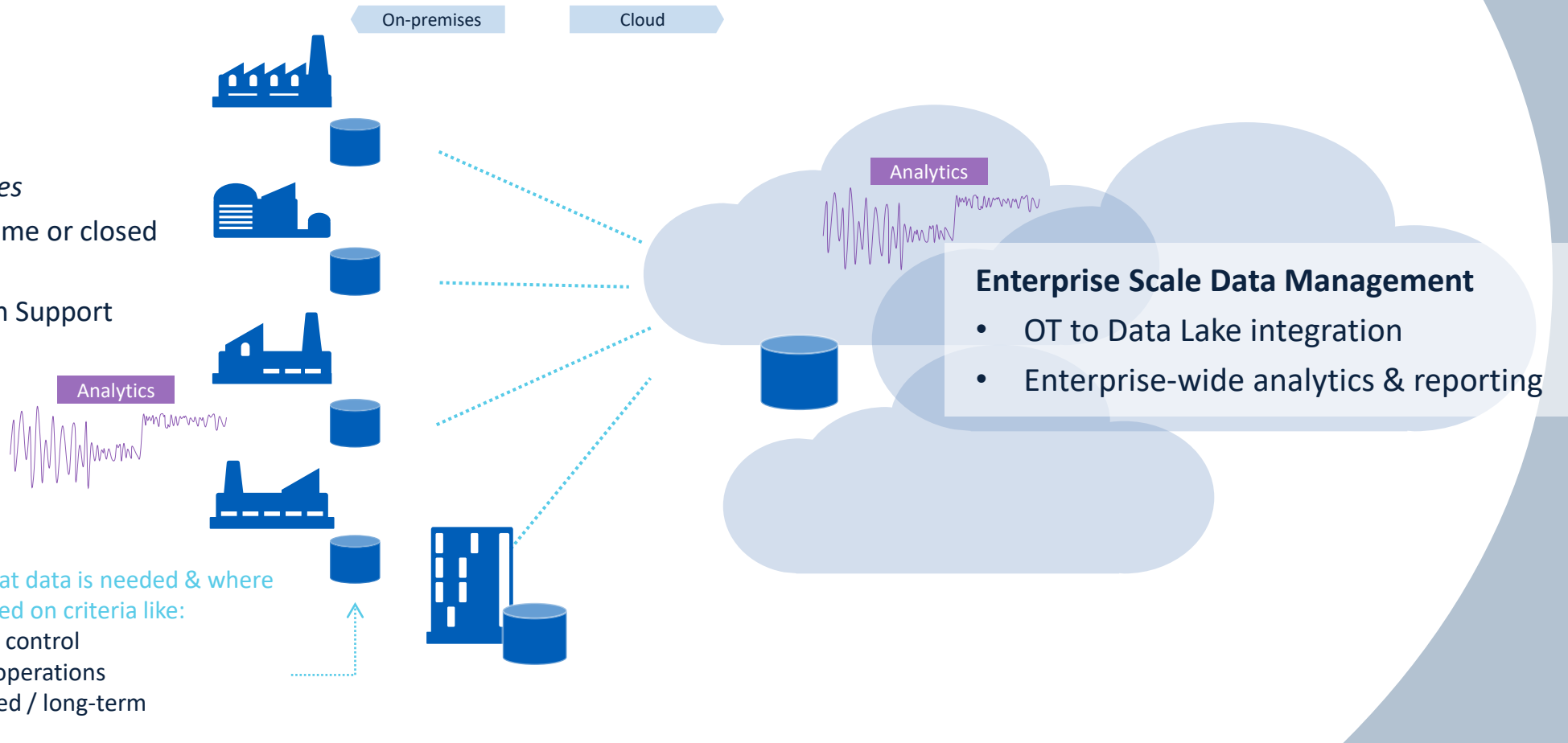
Strategic Theme	
1	Connected Worker Historical Trend Analysis Enhancements (Operations Hub) <ul style="list-style-type: none">Stacked Y Axes, Histogram, Query By Filter...
2	Enterprise Scale Deployments AWS and Azure Cloud Historian options Disaster Recovery Site Data Replication/Failover Grid SCADA Model integration Parquet file export for enterprise analytics and reporting
3	Flexible Deployment & Centralized Management Completely new HTLM5 Administrator <ul style="list-style-type: none">Dramatic re-envisioning of Admin tools Model Integration with Operations Hub & iFIX <ul style="list-style-type: none">Operations Hub Model built from multiple iFIX and Historian Models MQTT V5 Support <ul style="list-style-type: none">Flexible message structure & Sparkplug b support Common Security

GE Digital's Proficiency Historian

The Only On-Prem, Hybrid, and Cloud Native Historian

On premises

- *Critical capabilities*
- Plant level, real-time or closed loop analytics
- Operator Decision Support





Proficiency Operations Hub Key Update Summary

Proficiency Operations Hub – Development Timeline





Proficy Portfolio 2023


Questions?

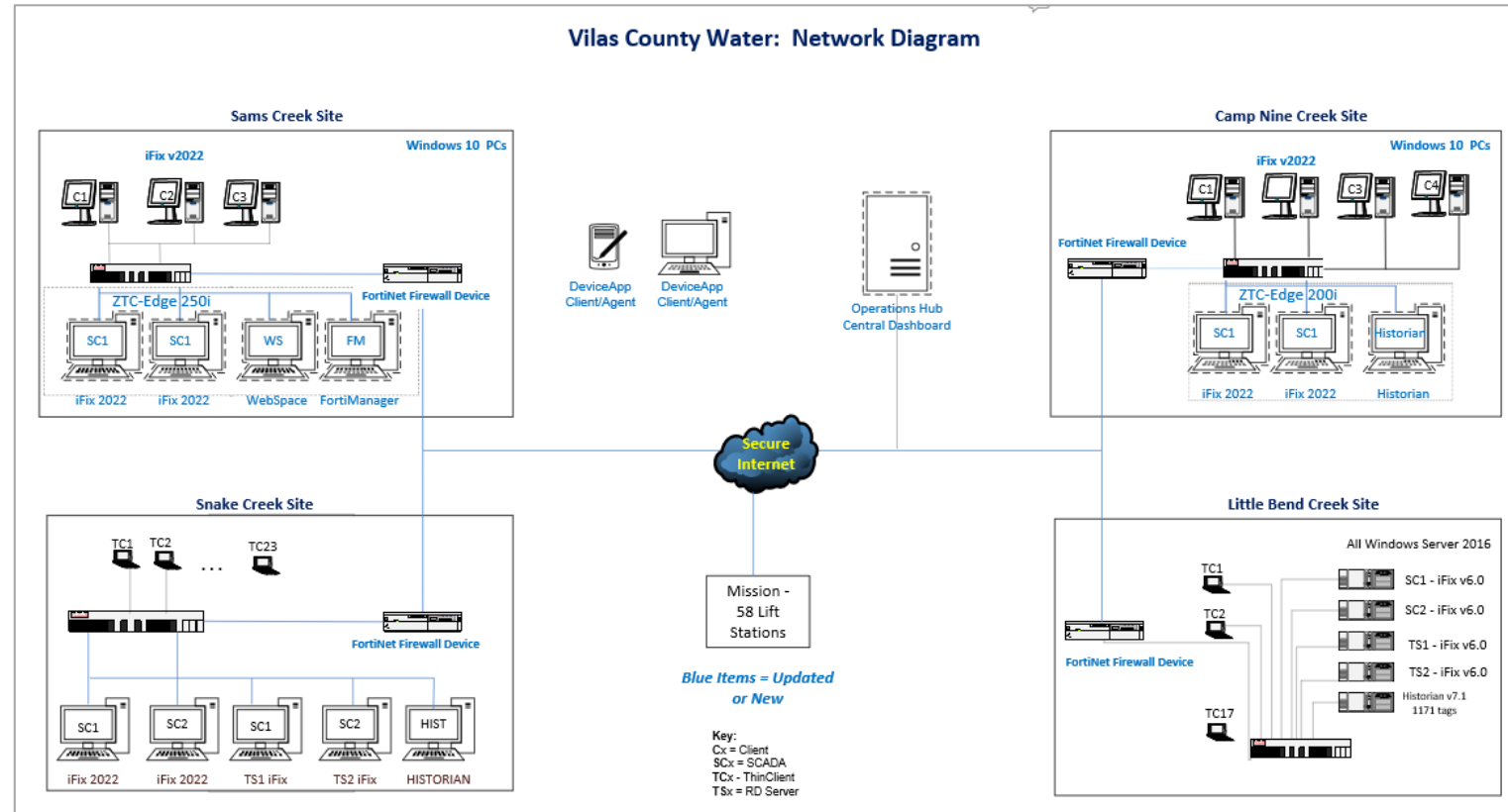


Resource & Links:

- [Today's OT Systems Need IT Security Capabilities \(fortinet.com\)](https://fortinet.com) – ATI Website
- [Cybersecurity Resources for Manufacturers | NIST](#)
- [US Government Security: https://www.cisa.gov/shields-up](https://www.cisa.gov/shields-up)
- Gartner Whitepaper on OT Security – ATI Website
- Cyber Roadmap Brochure: ATI Website
 - [Cyber Security for OT - AutomaTech](#)
- **Self Assessment Tools from AutomaTech – *contact AutomaTech***
 - SCADA
 - Cyber and Networking
- **Thick, Thin, & Zero Clients:**
 - [\(90\) TechNet Cyber 2021 ► Thick - Thin - Zero Clients – YouTube](#)
 - [10ZiG | About Us | Virtual Desktop Solutions](#)

Benefits and Offers (50% Off)

- OT Cyber CTAP or
- GE SCADA & Historian Migration Roadmap
 - We & partners come onsite and build your roadmap:
 - **Deliverable** will be a Logical Network Diagram 
- GE Training Offer
 - Unlimited Online Training Modules



Appendix

Link to this page:
[Workshop Outline Summary](#)

Workshop Outline Summary

Saturday, March 11, 2023 3:44 PM




Link to this page: [Workshop Outline Summary](#)


- 8:30AM arrival : Meet and greet: ATI Introduction using Website: **Outside Sales**
- 9AM: Security Fundamentals & Trends for OT Platforms (30 minutes)
 - Security Trends (20 minutes). **Outside Sales**
 - Architecture best practices review (5 minutes). **Outside Sales**
 - Client technologies (5 minutes). **Outside Sales**
- 9:30AM: Centralized Management (40 minutes): **Outside Sales & GE**
 - Disaster recovery & virtualization (10 minutes). **Outside Sales**
 - Asset management / CSO reporting / LIMS (5 minutes). **Outside Sales**
 - Alarm watch - ISA 18.2 alarming (5 minutes) **Outside Sales**
 - Centralized management update with Config Hub & 2023 focus on security and project deployment/model (20 minutes). **GE**
- 10:10AM: Break
- 10:20AM: Flexible Deployment (40 minutes): **Outside Sales & GE**
 - Communications Trends - OPC/MQTT (5 minutes). **Outside Sales**
 - Flexible Deployment Update with 2023 focus on failover updates, MQTT Bridge (15 minutes). **GE**
 - Operations Hub Update with 2023 focus on HTML5 HMI and how the client technologies support it (20 minutes). **GE**
- 11AM: Hands-On Workshop: (60-75 Minutes): **Tom P or Solution Architects**
 1. Introduction to the Integrated Installer
 - a. Overview of the new integrated installer and its features
 2. Proficiency Authentication Configuration
 - a. Compare Proficiency Authentication with past authentication methods
 - b. Create a user via UAA, add permissions, and explore security within iFIX
 3. Configuration Hub and Centralized Management
 - a. Overview of Configuration Hub and how to configure GE products
 - b. Deploy a project to client nodes
 - c. Review database and driver changes for Config Hub
 - d. Add a tag to the Historian and view historical data on demand
 - e. Explore the migration of System Configuration Utility to Configuration Hub
 4. Operations Hub Visualization
 - a. Review consolidated web-based user interfaces in Operations Hub
 - b. Build a simple Operations Hub interface
- 12:15PM : Lunch
- 1PM: Deeper Dive into Topics: **Tom P, Outside Sales & SAs (maybe virtual)**
 - OT Security (Focus on protecting SCADA Servers)
 - Disaster Recovery
 - Active Directory, Multi-Factor Authentication and ZTNA
 - Octoplant, Fortinet, Nozomi
 - Redundant SCADA Server Configuration: **Tom P or SAs (maybe virtual)**
 - AI & Analytics for OT Platforms: **SAs (maybe virtual)**
 - Artificial Intelligence and Machine Learning
 - Predictive Analytics
 - ~~TrendMiner~~, TwinThread
- 2:30PM : Wrap up & SWAG raffles


OT Security: Global OT Survey of 500 companies

Infographic: Key Findings


People


 **33%** of organizations entrust OT security to the VP/director of network engineering/operations


 **67%** of OT security leaders come from an OT engineering background

 **43%** of respondents have security-incident response time as a top-three success measurement


Security Posture


 **56%** of organizations report being at level 3 or level 4 of OT security maturity

 **50%** say the OT security posture is a significant factor in the overall risk score

 **13%** of organizations have centralized visibility of all OT activities


Security Practices


 **48%** report security compromises to executive management


 **32%** have deployed role-based network access control

 **52%** say all OT activities are monitored and tracked by the SOC

Security Outcomes

 **93%** of organizations had 1+ intrusions in the past year; **78%** had 3+

 **61%** of intrusions impacted OT systems

 **90%** of intrusions required hours or longer to restore service




Best Practices: OT Security

- Have a roadmap!
- Develop a Network Architecture Diagram (current state / future state)
- Have Centralized Visibility
- Be measured by vulnerability response time
- Deploy Network Access Control
- Report Security Compromises
- Reduce OT Device Vendor – choose proven solutions

Creation of OPC UA (Unified Architecture)

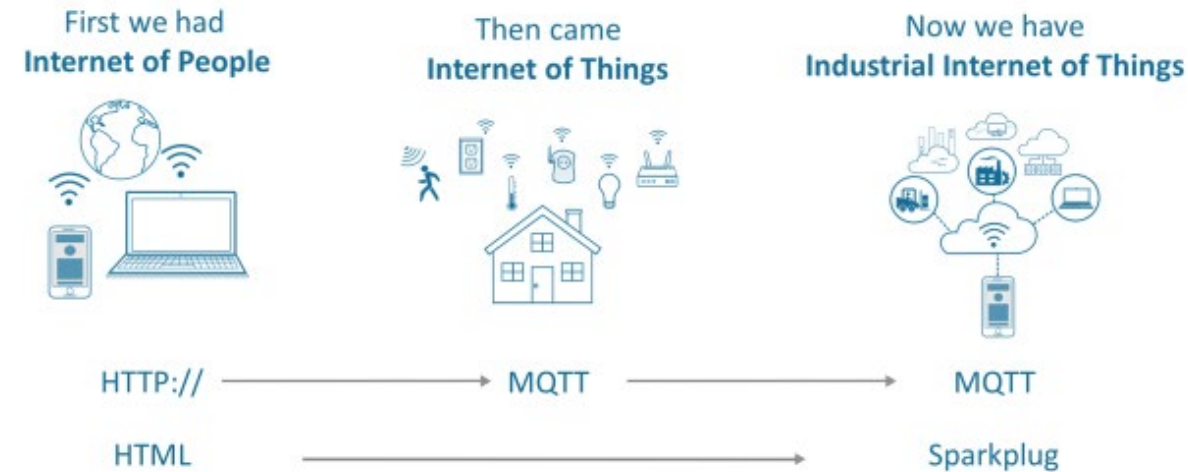
What: Drivers and connectivity to controllers (PLCs), equipment, and field devices (sensors). Think of OPC drivers as “print drivers” in Windows but for SCADA and Data Collection Systems.

OPC UA was created to address the following issues with OPC classic:

- Microsoft moved from COM/DCOM to Service-Oriented Architecture
 - OPC vendors needed to implement OPC on non-Microsoft systems
 - Users required the ability to securely access OPC servers through firewalls
 - OPC vendors wanted a single set of services to expose OPC data models
 - Collaborating organizations needed a reliable, efficient way to transport high-level structured data
-  • TIP: If you are buying new drivers make sure they are UA compliant

Introduction to MQTT

- Lightweight publish/subscribe messaging protocol for bi-directional communication
- Originally built for low-bandwidth, high-latency, and unreliable networks in the oil and gas industry
- Currently utilized in many applications, including smart devices and Facebook Messenger
- Preferred communication protocol to the cloud
 - AWS and Azure IoT solutions leverage MQTT
- Sparkplug specification extends MQTT into the industrial environment
- Enables auto discovery of asset tags, state awareness, and store and forward capabilities



The Journey – Where are you?

The OT/CPS Security Journey



Source: Gartner
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