

The background of the slide is a blue-tinted image of a complex, geometric structure, possibly a dome or a large-scale architectural framework, with many intersecting lines and nodes. The text is centered and white, providing a high contrast against the blue background.

# TRIDIUM

## niagara4.14

### FEATURES OVERVIEW

# AGENDA

**01**

Niagara 4.14  
Overview

**02**

New HTML5  
Web Views

**03**

Connectivity  
Upgrades

**04**

Brick  
Schema  
Support

**05**

Compliance  
Upgrades

**06**

Cyber  
Defense  
Upgrades

# niagara

## ALWAYS EVOLVING ACROSS FIVE DIMENSIONS

### DEPLOYMENT



- Provisioning Web Views
- Category Service Views
- GAuth Enrollment Workflow
- Added JACE 9000 features
  - DHCP on secondary port
  - 802.1x Support

### INTEROPERABILITY



- Core Driver Views
- Niagara Network History Views
- Brick Schema Tag Dictionary
- OnCall Service Views

### CONNECTIVITY



- Rdb History Views
- Weather Service Views
- Unit Test Public APIs
- OPC-UA Driver Refresh

### CYBER DEFENSE



- Certificate Signing Service
- Multi-Tiered Security Dashboard
- SAML Authentication
- WindowsAuth for msSQL

### COMPLIANCE

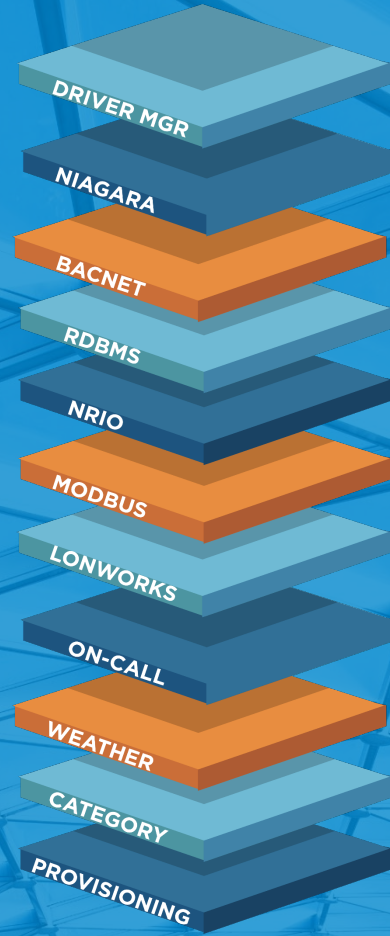


- BACnet Protocol Revision 16 Update
- ISA 62443 Process Certification

# niagara4.14

## New Web Views

# NEW HTML5 WEB VIEWS



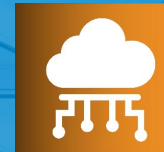
*A Significant Step-Up in*



**DEPLOYMENT  
EASE**



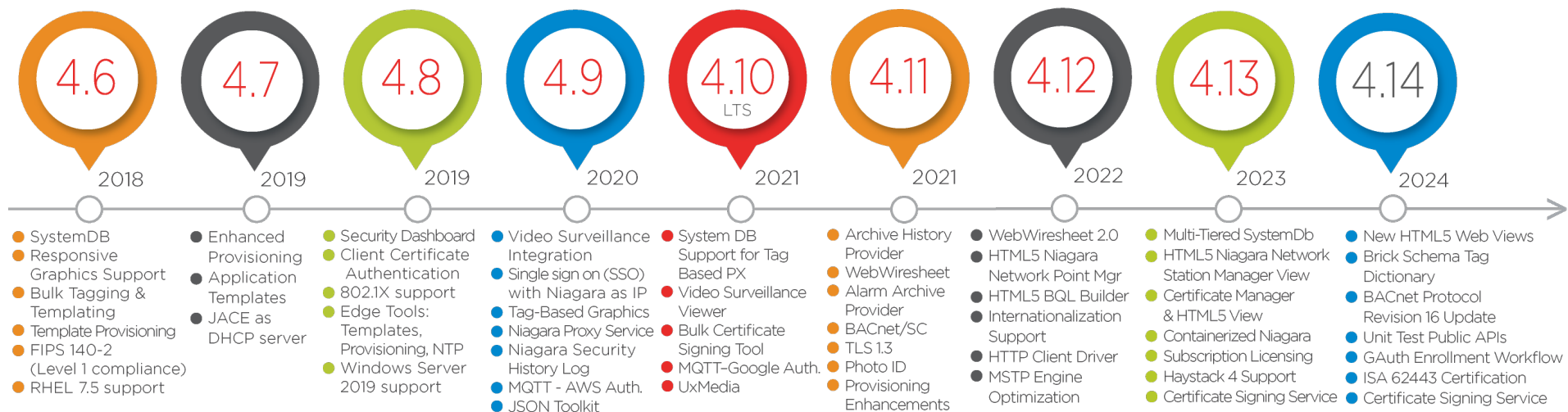
**VISUALIZATION  
CHOICES**



**SECURE  
CONNECTIVITY**

# WORKBENCH INTO CORE

With every version of Niagara Framework®, we are adding more Workbench functionality into the core so you can take advantage of **browser-based remote engineering.**



# NEW HTML5 WEB VIEWS

**Save Time** Engineering Niagara Stations through a web browser.



Accessible  
and  
Open

Client Version  
+ Brand  
Agnostic

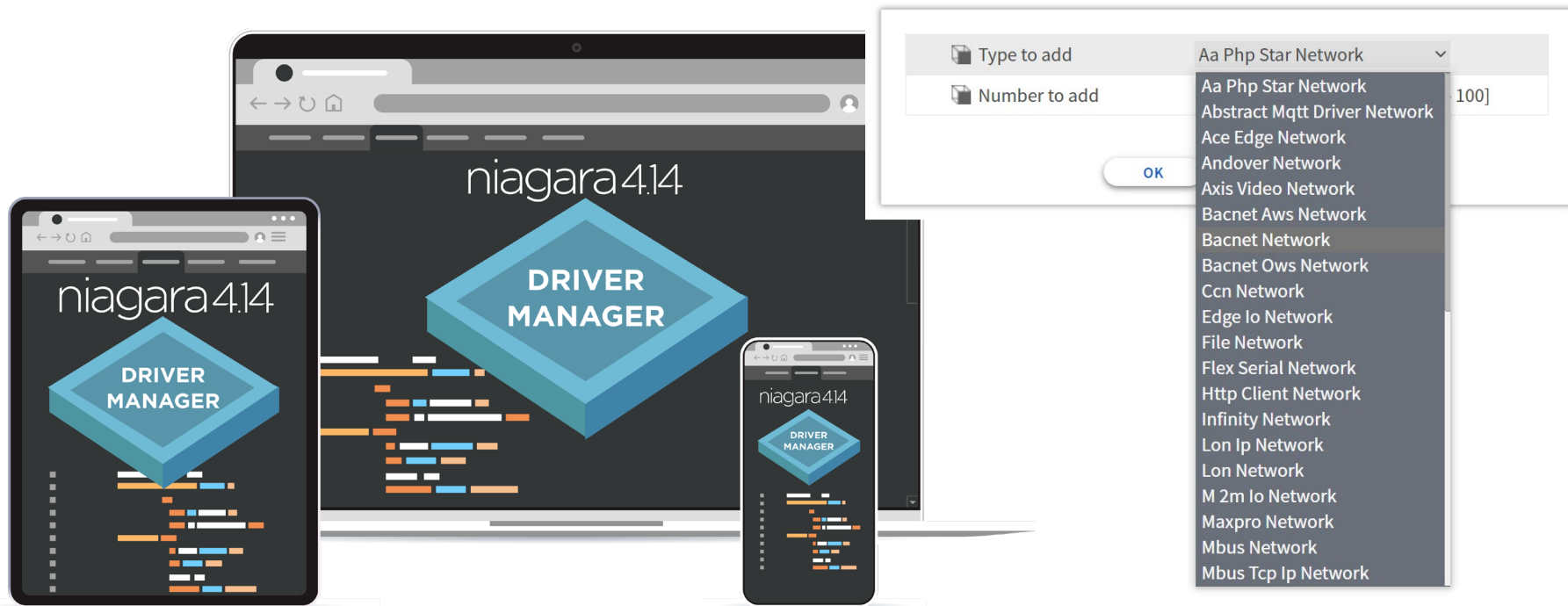
Niagara Cloud  
Suite: Remote  
functionality

Workbench  
Functionality  
via Browser or  
Dedicated App



# DRIVER MANAGER WEB VIEW

Deploy a selection of drivers to create interoperability between communication protocols. Bring devices into a Niagara ecosystem to leverage everything the Framework has to offer.





# NIAGARA NETWORK HISTORY COLLECTION WEB VIEW

Control where your building's data goes from a browser

Name	History Id	Execution Time	Enabled	Capacity	Full Policy	On Demand Poll Enabled	On Demand Poll Frequency	System Tag Patterns
OATmp	^OATmp	2:00 AM {Sun Mon Tue Wed Thu Fri Sat}	true	Unlimited	Roll	true	Normal	

Name

OATmp

History Id

^

OATmp

Execution Time

Daily: 2:00 AM {Sun Mon Tue Wed Thu Fri Sat}

Enabled

true

Capacity

Unlimited

Full Policy

Roll

On Demand Poll Enabled

true

On Demand Poll Frequency

Normal

System Tag Patterns

Cannot Edit

Collect Data From All Stations

Flexible Archive Scheduling

Collect Data From  
All Stations

Flexible Archive  
Scheduling

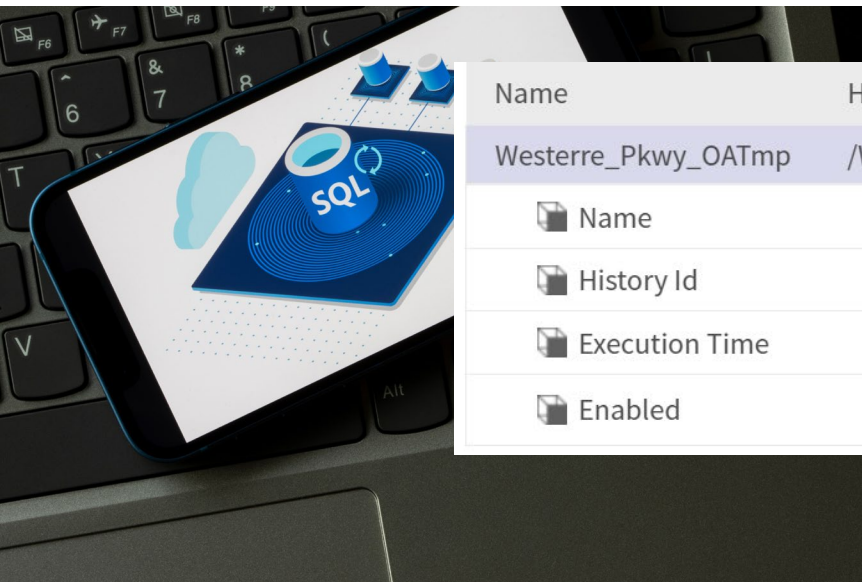
Import and Export  
Managers for Data











# RDBMS NETWORK HISTORY COLLECTION WEB VIEW

Send your building data to **mySQL**, **MSSQL**, or **OracleDb** via browser.

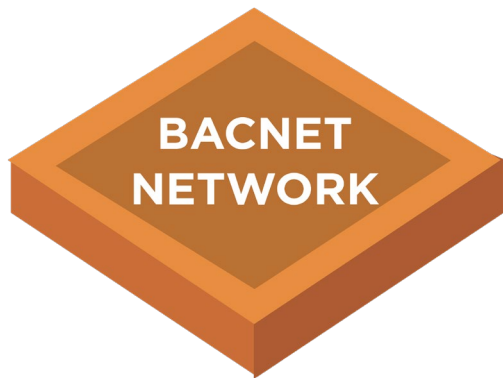


Name	History Id	Execution Time	Enabled
Westerre_Pkwy_OATmp	/Westerre_Pkwy/OATmp	2:00 AM {Sun Mon Tue Wed Thu Fri Sat}	true
 Name	<input type="text" value="Westerre_Pkwy_OATmp"/>		
 History Id	<input type="text" value="/Westerre_Pkwy"/>	<input type="text" value="/OATmp"/>	
 Execution Time	<input type="text" value="Daily: 2:00 AM {Sun Mon Tue Wed Thu Fri Sat}"/>		
 Enabled	<input checked="" type="checkbox"/> true		



# STANDARD BUILDING PROTOCOL WEB VIEWS

Save time, gain flexibility when integrating field devices and energy meters into Niagara.



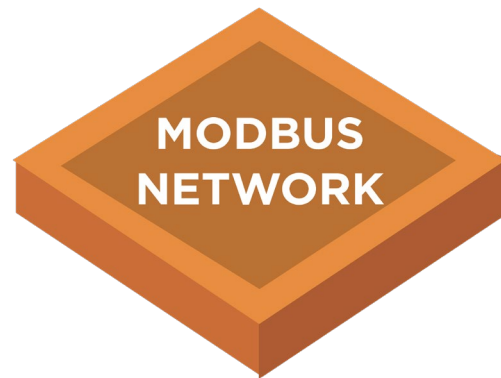
ASHRAE Standard 135 open communication protocol of choice for field devices.

- Export Table
- Schedule Managers
- History Import Manager



Echelon networking platform communicating over FTT-10 twisted pair.

- Device Manager
- Router Manager
- Link Manager
- Utilities Manager
- Point Manager



TCP- and Serial-based communications protocol commonly used with energy metering.

- Device Manager
- Point Manager

# BRING YOUR PREFERRED DEVICES INTO NIAGARA

Nav

Config

Services

Drivers

- NiagaraNetwork
- BacnetNetwork
  - Local Device
  - Bacnet Comm
  - Monitor
  - Tuning Policies
  - BACnet Device
- LonNetwork
  - Local Lon Device
- ModbusAsyncNetwork
  - Modbus Async Device1

Apps

Files

Histories

## BacnetNetwork

Database



Name	Exts	Device ID	Status	Netwk	MAC Addr	Vendor	Model	Firmware Rev
 BACnet Device	   	device:838601	{ok}	14101	1	Functional Devices Inc	RIB[*]W[*]240[*]B-BC	1.03R2

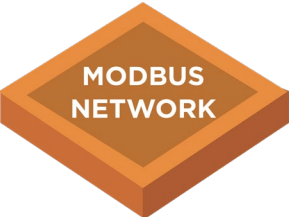
## LonNetwork

Database

Name	Type	Exts	State	Subnet	Node	Fault Cause	Manufacturer	Program Id
 Local Lon Device	Local Lon Device		Config Online	1	127		Tridium	90 00 8e 01 03 80 00 03

## ModbusAsyncNetwork

Name	Exts	Status	Device Address
 Modbus Async Device1		{unackedAlarm}	1



# NRIO NETWORK WEB VIEW

Connect a station operating on a JACE 8000, JACE 9000, or Edge10 to native Niagara Remote-I/O devices and **operate equipment directly through Niagara.**

- NRIO-16
- NRIO-34



Discover,  
Configure, Add  
IO Devices

Discover,  
Configure, Add  
IO Points




# ON-CALL SERVICE WEB VIEW

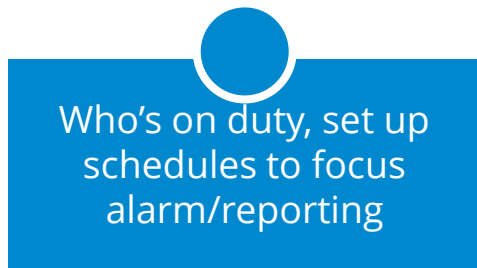


Text or email alarm notifications to the right person at the earliest possible time automatically.

**Set up a flexible user contact list and schedule that list using the standard scheduler interface.**



OnCallList_Weekend						
	Name	Status	Enabled	Priority	User	User Alarm Recipient
	chris_Email	{ok}	true	1	chris	Email
	michael_Sms	{ok}	true	2	michael	Sms
	stephen_Email	{ok}	true	3	stephen	Email



OnCallRecipient

Actions & Topics Slot Details

Time Range

12:00:00 AM 12:00:00 AM

Days Of Week

☒ Sun ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat

Transitions

☒ toOffnormal ☒ toFault ☒ toNormal ☒ toAlert

Route Acks

true

Enabled

true ☒ null true {ok}

On Call List

OnCallList\$2dWeekend

On Call List Schedule

OnCallList\_Weekend {ok}

Escalation Delay

+ 0 h 30 m 0 s

# WEATHER SERVICE WEB VIEW



Maintain awareness of current and forecasted weather conditions in the U.S. via the National Weather Service

WeatherService							Weather Manager	
	Name	Current	Today	Tomorrow	Advisory	Sunrise/Sunset		
	Richmond, VA	51.0 °F, A Few Clouds {ok}	53.0 °F/31.0 °F, Mostly Sunny, 0 percent {ok}	49.0 °F/24.0 °F, Partly Sunny, 7 percent {ok}	none	7:21 AM/5:12 PM		
	Chicago	20.0 °F, Windy {alarm}	26.0 °F/-6.0 °F, Snow, 59 percent {ok}	0.0 °F/-8.0 °F, Unknown, 6 percent {ok}	Winter Weather Advisory {ok}	8:15 AM/5:43 PM		
	New York City	48.0 °F, A Few Clouds {ok}	60.0 °F/33.0 °F, Windy, 10 percent {ok}	40.0 °F/22.0 °F, Snow, 14 percent {ok}	none	7:16 AM/4:51 PM		
	Los Angeles	59.0 °F, Partly Cloudy {ok}	63.0 °F/51.0 °F, Mostly Sunny, 2 percent {ok}	63.0 °F/51.0 °F, Partly Sunny, 0 percent {ok}	none	9:57 AM/8:05 PM		
	Miami	84.0 °F, Mostly Cloudy {ok}	85.0 °F/64.0 °F, Rain, 36 percent {ok}	72.0 °F/69.0 °F, Rain, 31 percent {ok}	none	7:09 AM/5:49 PM		

Adjust  
Operations Per  
Weather  
Conditions

Adjust  
Operations Per  
Outside Air  
Quality

See Current  
and Future  
Forecast Data



# CATEGORY SERVICE WEB VIEW

Configure and manage authorization to station components by category



CategoryService				
Category Browser				
	Inherit	User	Admin	Category 3
▶ Alarm	n/a	●		
▼ Config	n/a	●		
▶ Services	✓	●		
▼ Drivers	✓	●		
▼ NiagaraNetwork	✓	●		
▶ Globals	✓	●		
▶ Westerre_Floor1	✓	●		
▶ ProvisioningNwExt	✓	●		
▶ RdbmsNetwork	✓	●		
▼ Files	n/a		●	
▶ publicCertCopy	✓		●	
▼ px		●	●	
▶ img	✓	●	●	
▶ AHU.px	✓	●	●	
▶ DemoNiagaraSystemDiagram.px	✓	●	●	
▶ Schedule.px	✓	●	●	
▶ VAV.px	✓	●	●	
▶ History	n/a	●		



Categories play an integral role in station security, helping in the practice of *Least Privilege Principle* whereby access to data is only granted to users based on their need for it to serve in their role.

# NIAGARA PROVISIONING WEB VIEW

Automate Workflows **AT-SCALE!**



Execute the same series of tasks (job steps) on any number of target hosts

Run a provisioning job from anywhere you can open the Supervisor station.

Job Builder

Type	Description
Add Station User	Add a new user to the station.
Backup Stations	Back up each station in the job
Convert To Perpetual License Mode	Converts all the stations' licensing mode from subscription to perpetual
Copy Supervisor File	Copy a file from the supervisor's filesystem to each station in the job
Deploy Template	Deploy a template file to each station in the job
Enable Bootstrap Mode	Enable bootstrap mode for the stations.
Export Application Template Configuration	Exports an application template configuration as an xlsx file
Export Certificate Signing Request	Export a CSR from each device for external signing
Import Signed Certificate	Import a signed certificate for each device from the station's CSR generation
Install a Signed Certificate for an Individual Service (Fox, Web, etc)	Install an Individual Signed Cert Config to onboard/renew a signed certificate for a part
Install a Signed Certificate for Fox/Web/Platform to share	Install a Combined Signed Cert Config to onboard/renew a signed certificate for Fox, Web
Install Application Template	Install an application template file to each station in the job
Install Certificate	Install a certificate to the user trust store of each station
Install Clean Distribution	Install clean distribution file to each system platform in the job
Install Software	Install software to the stations in the job
Reboot	Reboot each station in the job
Remove Platform User	Remove a user from the platform.
Remove Property	Remove a dynamic property
Remove Station User	Remove a user from the station.
Rename Device Station	This step will change the name of the station to match the name that it was given in the N
Run Robot	Run a robot on each station
Security Job Steps	Add all security related job steps
Set Certificate Alias	Set the certificate alias for platform, FoxService, and WebService
Set Platform Credentials	Create a new platform account and remove default platform account
Set Platform User Password	Change password for an existing platform user
Set Property	Set or add a property
Set Station Connection Credentials	Set the station credentials used to connect to the remote station.
Set Station User Password	Set the password of the current station user
Set System Passphrase	Set System Passphrase
Set Time	Set the time for each device
Set TLS Level	Set the minimum TLS level for platform, FoxService, and WebService
Setup Reciprocal Connection	Setup the Niagara Network connection from remote station to supervisor station
Sign Certificate	Sign a certificate on each station
Update Connections Using Niagara Network Discovery	Update station connections using Niagara Network discovery.
Update Connections Using Provisioning Station's DHCP Server	Update station connections using the provisioning station's DHCP server leases.
Update Licenses	Update all of the station(s), importing licenses from the licensing server

# NIAGARA 4.14 CONNECTIVITY UPGRADES

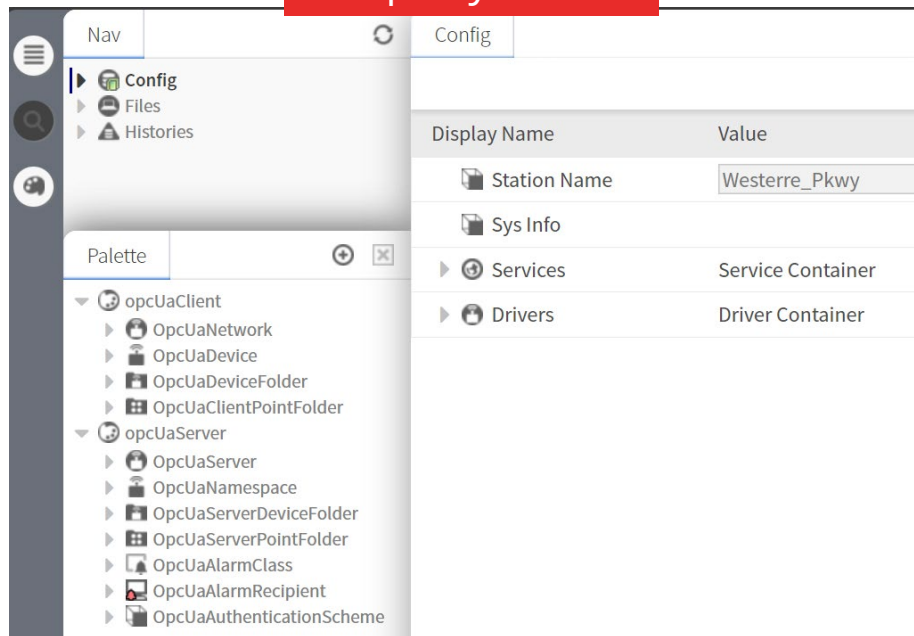




# OPC-UA DRIVER REFRESH

Now you can more easily choose the datatypes of exported OPC UA points

Property Sheet



**Integrate more easily with one of the most basic and familiar protocols used in industrial automation.**



# NIAGARA 4.14 BRICK SCHEMA SUPPORT

INTEROPERABILITY



# BRICK SCHEMA TAG DICTIONARY

- Energy management consultants and others doing sophisticated analytics want the foundation of building data enriched with standardized tagging!
- Brick Schema is an ontology specified for more and more projects due to its knowledge graph methodology and descriptive relation definitions.
- Built-in dictionary support makes tagging an easier lift!
- Add standardized tags as you go about the job of systems integration with Niagara.
- Augments Haystack support.



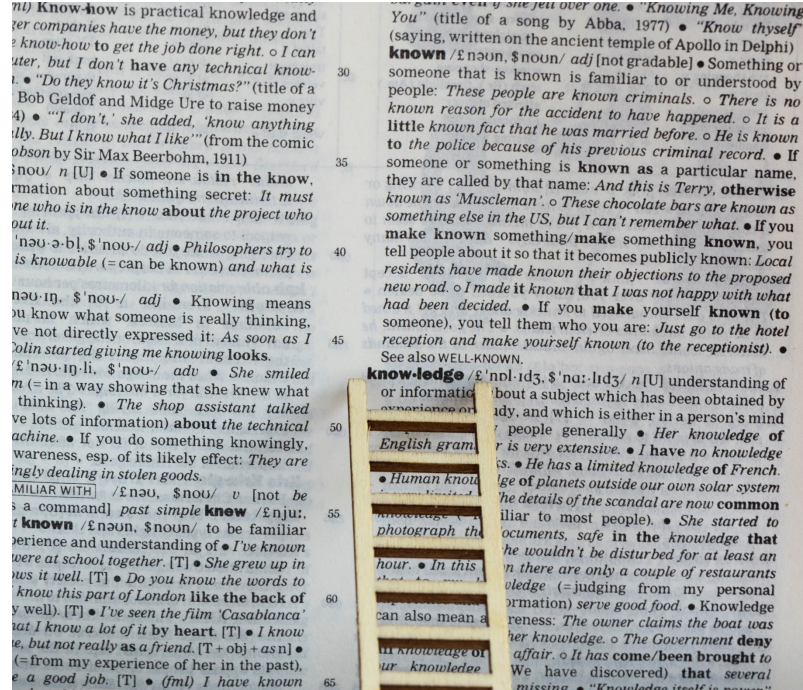
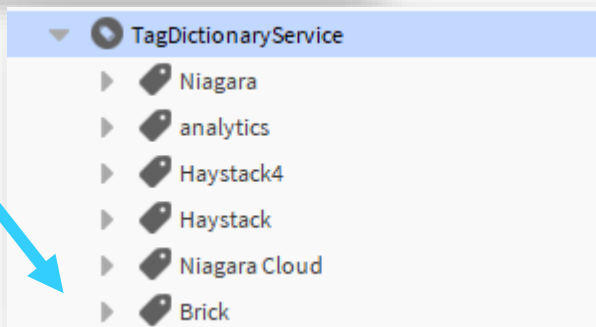
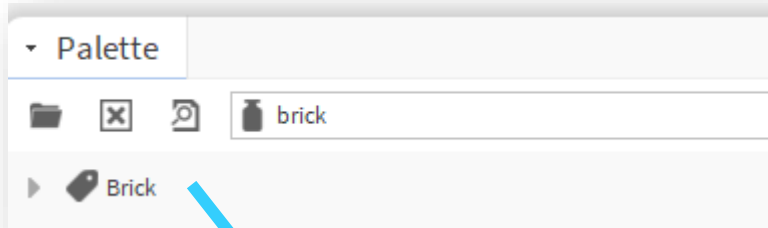
<https://brickschema.org/>





# NIAGARA TAG DICTIONARY SERVICE

- The Tag Dictionary Service was designed to accommodate several ontologies.
- Just Drag and Drop the Brick Dictionary to the service.



# BRICK SCHEMA METHODOLOGY

## ▼ Tag Definitions

- ▶ aed
- ▶ ahu
- ▶ ablutions
- ▶ absorption
- ▶ acceleration
- ▶ access
- ▶ activated
- ▶ activation
- ▶ active
- ▶ adjust
- ▶ aid
- ▶ air
- ▶ alarm

## ▼ Tag Group Definitions

- ▶ ablutionsRoom
- ▶ absorptionChiller
- ▶ accelerationTimeSetpoint
- ▶ accessControlEquipment
- ▶ accessReader
- ▶ activeChilledBeam
- ▶ activePowerSensor
- ▶ adjustSensor
- ▶ airAlarm
- ▶ airDifferentialPressureSens
- ▶ airDifferentialPressureSetp

## ▼ Relation Definitions

- ▶ feeds
- ▶ hasInputSubstance
- ▶ hasLocation
- ▶ hasOutputSubstance
- ▶ hasPart
- ▶ hasPoint
- ▶ hasQuantity
- ▶ hasSubMeter
- ▶ hasSubstance
- ▶ isFedBy
- ▶ isLocationOf
- ▶ isMeteredBy

## ▼ Tag Rules

- ▶ aed
- ▶ ahu
- ▶ air
- ▶ alarm
- ▶ atrium
- ▶ auditorium
- ▶ basement
- ▶ battery
- ▶ blind
- ▶ boiler
- ▶ breakroom
- ▶ building

Tags

Groups

Relations

Rules

# NIAGARA 4.14 COMPLIANCE UPGRADES

## CERTIFICATIONS



# BACNET PROTOCOL REVISION 16 UPDATE

ASHRAE Standard 135 open communication protocol of choice for field devices



Protocol Revision 16  
Certification Testing in Progress!



B-BC Profile for Supervisor, Jace 9000, & Jace 8000  
with BACnet Secure Connect link layer!

- Configuration Support New Protocol Revision 16 Types
  - Examples: Binary Output Lighting Config Type, Access Door, Load Control, Pulse Converter
- Added Interface Value Property
- Added "Change of State Alarm" Offnormal Algorithm for Numeric Points
- Added "Change of Discrete Value" Algorithm
- Exposing "Fault Out of Range" Algorithms
- Enhanced Loop Algorithm
- Can Set "Change of State Count" and "Elapsed Active Time" to Non-Zero Values
- Duplicate Time Values No Longer Allowed

# ISA 62443-4-1-2018 CERTIFICATION

Tridium processes have met all requirements defined by ISA "Security for industrial automation and control systems

Part 4-1: Secure product development lifecycle requirements"

This lifecycle includes:

- Security requirements definition
- Secure design
- Secure implementation (including coding guidelines)
- Verification and validation
- Defect management
- Patch management
- Product end-of-life



International Society of Automation



# NIAGARA 4.14 CYBER DEFENSE FEATURES





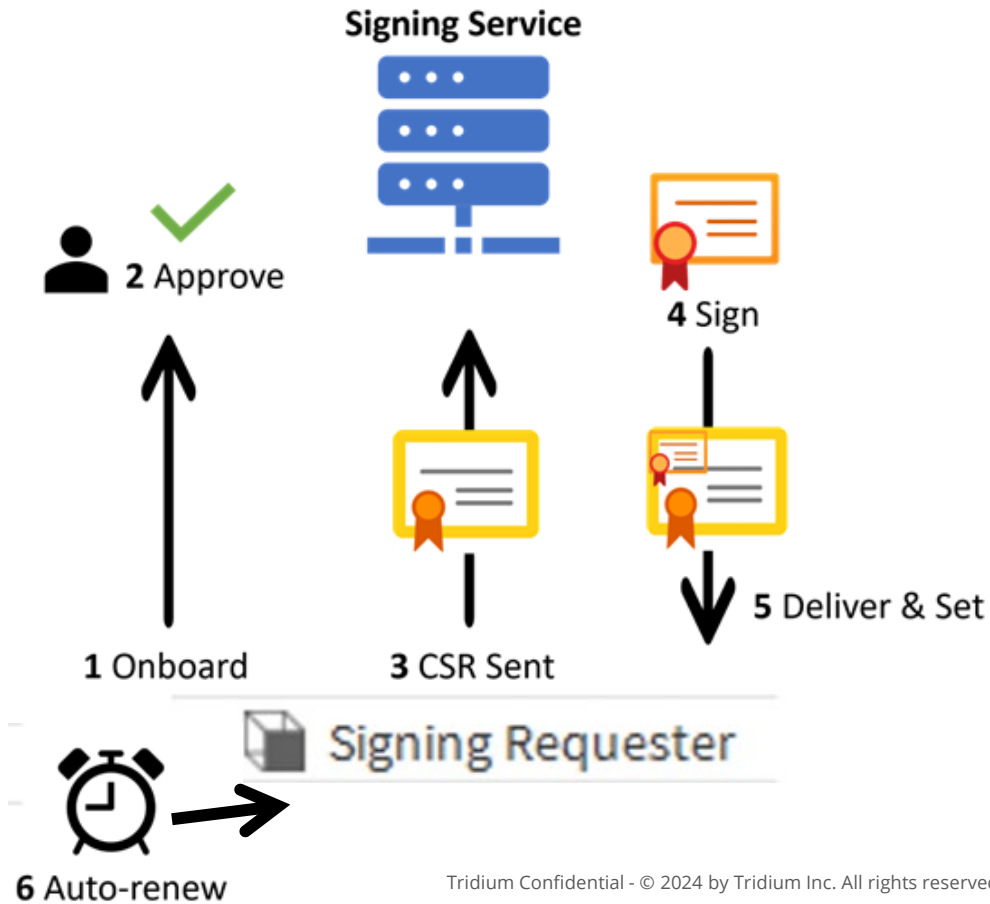
# CERTIFICATE SIGNING SERVICE

Establish, monitor, and renew Niagara installation's PKI **at scale** and **with ease** to enforce secure communication and maintain a strong security posture.

- Individual Signing Requester
- Combined Request:  
Fox Service, Web Service, Platform
- Provisioning Jobs for Deployment



# CERTIFICATE SIGNING PROCESS

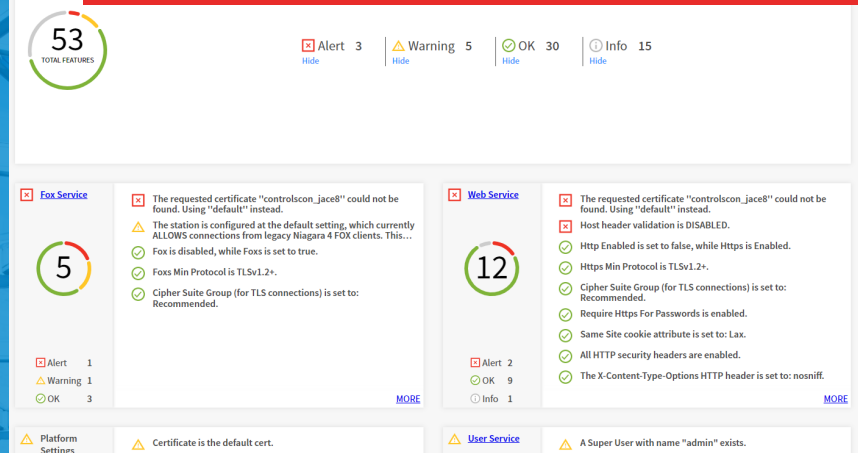


# MULTI-TIERED SECURITY DASHBOARD

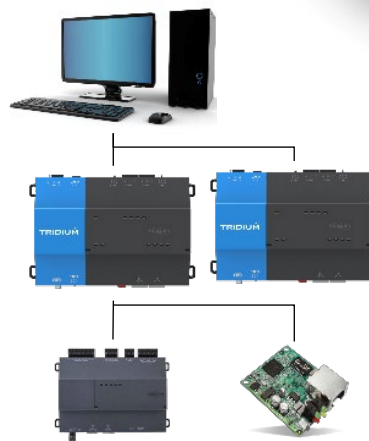
Quickly assess the security posture of a Niagara Network at-scale!

## Niagara Security Dashboard (intro'd 4.6)

Quickly assess the security posture of a Niagara Network of any layout, at scale



## Multi-Tiered Navigation



*Reachable  
Stations  
introduced in  
4.13*



# SAML AUTHENTICATION TYPE CONFIGURATION

Meet stricter single sign-on authentication security requirements with support for specifying the authentication type requirement.

**Provide the required or minimum required type from these options:**



Password,  
PasswordProtectedTransport,  
TimeSyncToken



SSL/TLS Certificate, Kerberos



Smartcard, Smartcard PKI,  
Unspecified



# WINDOWS AUTHENTICATION for MS SQL

Meet strict authentication requirements set by Microsoft database administrators for accessing a Microsoft SQL Rdb Server.



Overcome IT hurdle! Database administrator preferred method of access!



Convenience! Users can be authenticated via standard Windows domain accounts and utilities.

*New Microsoft Authentication Mode!*



# NIAGARA 4.14 DEPLOYMENT FEATURES

**DEPLOYMENT  
EASE**





# G AUTH ENROLLMENT

Setup Google Multi-Factor Authentication (MFA) token upon the next login  
Enhanced Security by reinforcing MFA for Niagara users

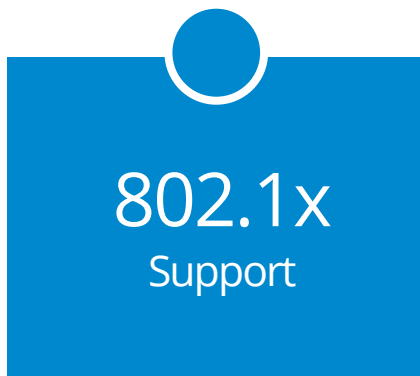
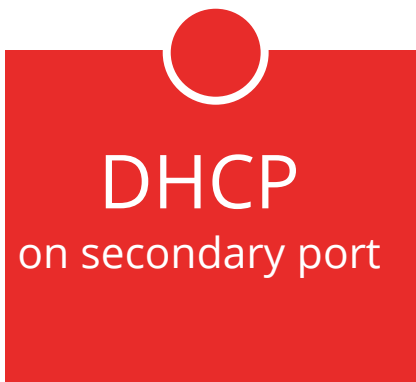


This new workflow will allow the admin to configure the authentication scheme to allow users to login with just their password if they do not have a private key set up yet, but force them to create a private key at next login



# NEW JACE 9000 FEATURES

Powerhouse controller and server platform for connecting multiple and diverse devices and sub-systems via Niagara Framework just got better!

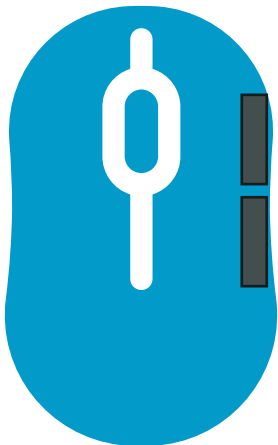


# HIDDEN-GEM FEATURES

## DEPLOYMENT EASE



# WORKBENCH NOW SUPPORTS MOUSE BUTTONS



Forward navigation



Backward navigation



Maps to buttons 4 and 5

# STRONGER PASSWORD PROTECTION

Updating a non-admin user password now requires old password

▼ UserService			●
▶ User Prototypes	✓		●
▶ admin	✓		●
▶ kevin	✓		●
▶ BACnet	✓		●
▶ M2M	✓		●
▶ Bluejay		●	

Before you could  
overwrite the password.

Property Sheet

Bluejay (User)

Email

Authenticator

Password

Confirm

Facets

Time Format

Unit Conversion

Cell Phone Number

# NEW PASSWORD UPDATE PROCESS

▼ UserService			●
▶ User Prototypes	✓		●
▶ admin	✓		●
▶ kevin	✓		●
▶ BACnet	✓		●
▶ M2M	✓		●
▶ Bluejay		●	

Right-click on Authenticator  
Use Action: Update password

Property Sheet

Bluejay (User)

Email

Authenticator Password

Facets

Cell Phone Number

version None

Views

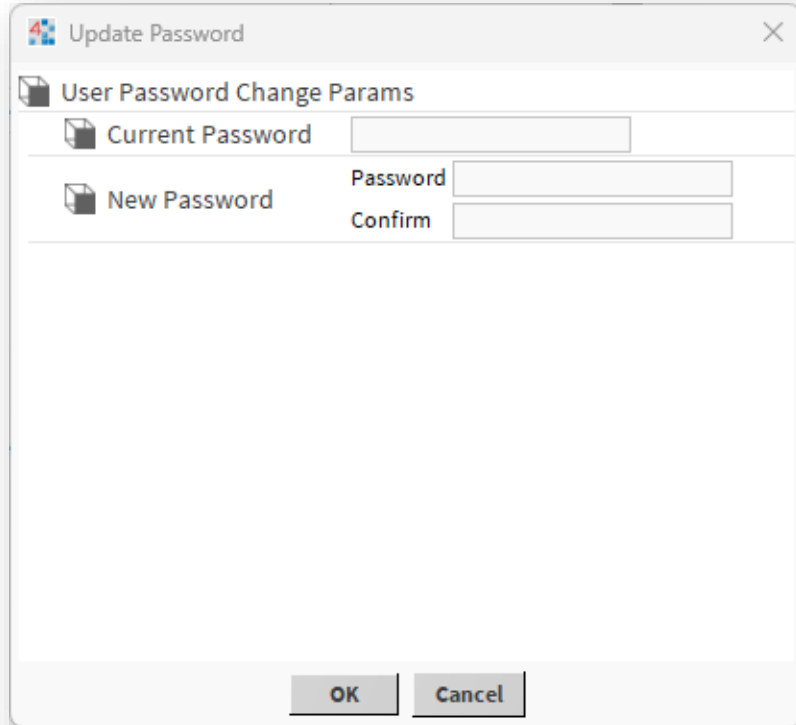
Actions

Copy Ctrl+C

Update Password

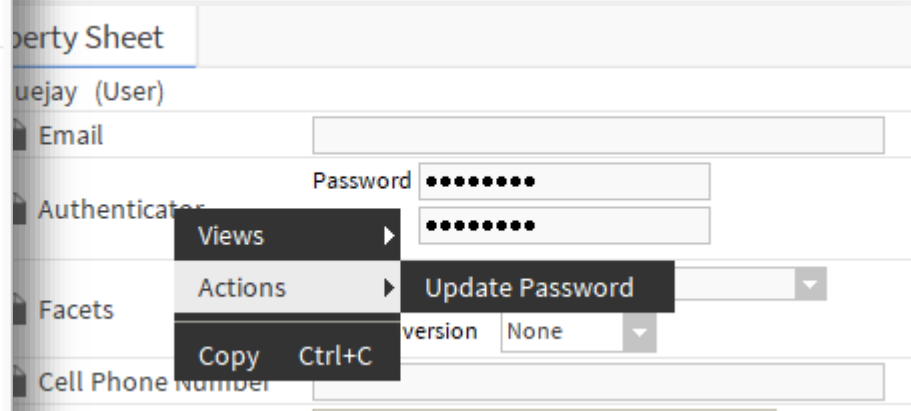


# NEW PASSWORD UPDATE PROCESS



The 'Update Password' dialog box is shown. It has a title bar with a close button. Below the title bar is a section titled 'User Password Change Params'. This section contains three input fields: 'Current Password', 'New Password', and 'Confirm'. The 'New Password' and 'Confirm' fields are grouped together. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

Current password is required before new password is accepted.



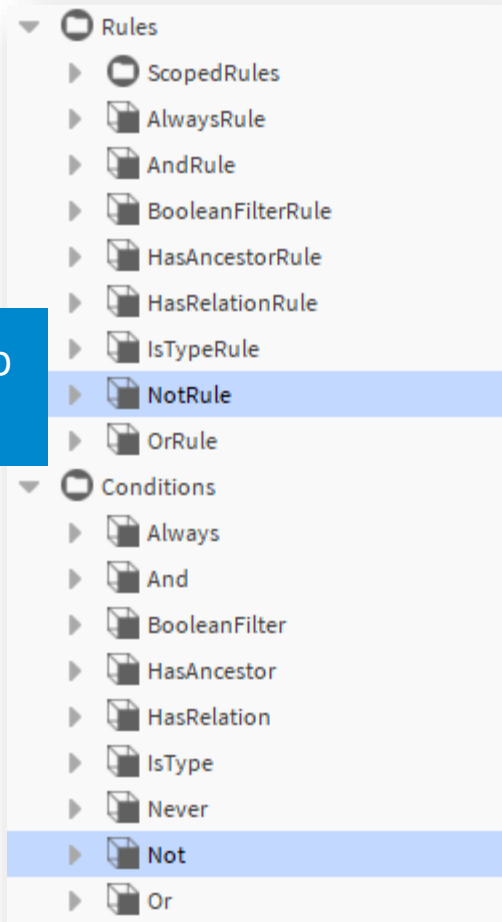
The background shows a user profile form. The 'Email' field is visible. Below it, the 'Password' field is shown with two rows of masked characters (dots). To the right of the password fields is a dropdown menu that is open, showing the 'Update Password' option. Other visible fields include 'Authenticator', 'Facets', 'Cell Phone Number', and a 'version' dropdown set to 'None'.

# TAGGING EDITOR ENHANCEMENT

Additional flexibility to create rules with new  
tagDictionary Service: **NotRule**

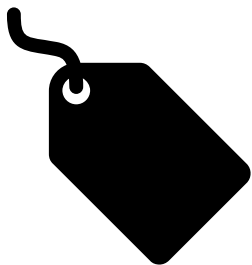


Examples: NOT hs:equip  
NOT hs:vav



# TAGGING EDITOR ENHANCEMENT

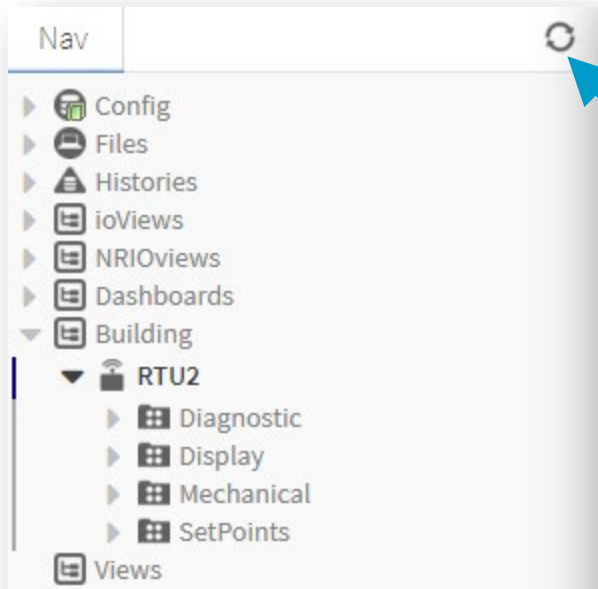
A new implied tag rule will imply a tag to indicate when a control point has an alarm extension.



Implied tag rule: n:alarmablePoint

# HTML5 EDITOR ENHANCEMENT

Added the ability to Sync your navTree to the currently displayed page

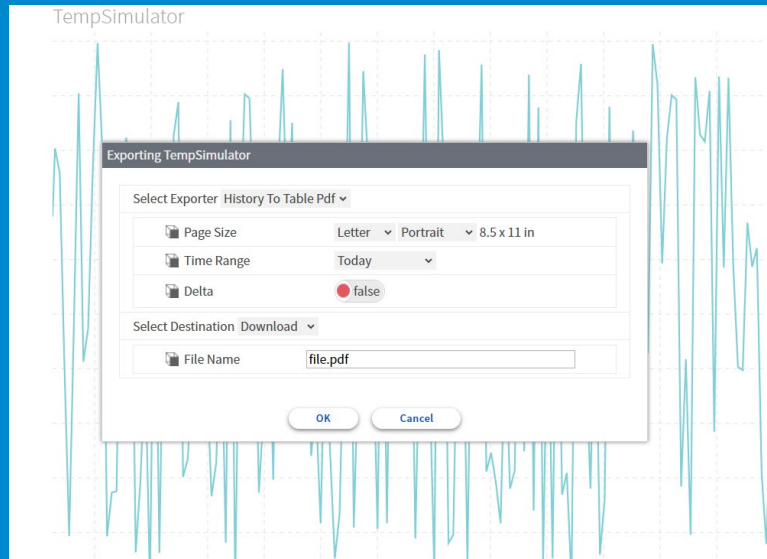


# ENHANCED SETTINGS FOR EXPORTING HISTORIES

Select the time range and delta mode\* to use for the exported history data with the following types:

- History To Table Pdf
- History To Chart Pdf
- History To CSV
- History To Html
- History To Text

*\*delta only applies to numeric histories*





# UNIT TEST PUBLIC APIs

New public APIs available to the developer community to assist in writing unit testing, particularly for testing within a running Niagara station



## UNIT TEST API: BTestNgStation (4.14)

```
@NiagaraType
@Test
public class BMyComponentTest extends BTestNgStation
{
    public void myComponentDoesXInARunningStation()
    {
        BMyComponent myComponent = new BMyComponent();
        stationHandler.getStation().add("MyComponent", myComponent);
        ...
    }
}
```

The background is a solid blue color with a white geometric pattern of interconnected triangles, creating a mesh or lattice effect.

# THANK YOU