Tagging in the Trenches

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Agenda

- Introduction
- Background
- How?
- Data Mining
- Contact Information
Introduction

• This talk is non-technical
  – Easily digested before lunch

• Focus on our experience in associating tags with elements of an HVAC application
  – What was our process

• Data Mining
  – Interesting observations
Background

• Facility Explorer (FX)
  – Based on Tridium Niagara AX originally, now Niagara 4
  – Johnson Controls specific appliance adds functionality to simplify construction of a Niagara station
  – Runs on Tridium JACE
  – Want to exploit Niagara 4 tags to enhance the product
What?

• What were we trying to do?
  – Organize tags and tag groups by HVAC application (Mixed Air Single Duct, Heat Pump, etc.)
  – Tags for Field Controllers (Devices) and Points
  – Focus on Johnson Controls Devices and HVAC applications
Why?

• Why are we doing it?
  – Facilitate automated tagging in the FX appliance
  – Based on Niagara 4 tag dictionary, tag and tag group implementation
  – Our solution involved software development of the “plumbing” and data population
  – This talk will focus on the data population
Who?

• Who was doing it?
  – Two people involved in development
    • One software engineer to do the plumbing (me)
    • One applications expert who knew the data (Robert Harland)
  – Reviews involved two additional people
    • One software engineer testing the plumbing (and indirectly the tags themselves)
    • One software engineer updating FX appliance to utilize tags in various views
Where?

• Where did we start?
  – Began with Haystack Dictionary in Niagara 4
  – Started with Haystack tags and tag groups defined for us by Tridium
How?

• How did we proceed?
  – Communication Mechanism
  – Data Population
  – Review
Communication Mechanism

• We choose Excel to maintain tag information
  – We have a start; already use Excel to organize information on a per HVAC application basis
  – Relatively easy to edit and distribute for review
  – Three types of data need to be maintained
Data to be Maintained

• Workbook containing any new Johnson Controls specific tags
  – Tag name
  – Type
  – Default (if applicable)
  – Definition

• Workbook containing any new Johnson Controls specific tag groups
  – Tag group name
  – Constituent tags (and values if applicable)
Data to be Maintained (continued)

• Associating tags/tag groups to devices and points
  – One worksheet per HVAC application
  – Rows are the points that are expressible in Niagara
  – Already contains a list of all possible points for an HVAC application
    • Name
    • Description
    • BACnet identifier (most of our field controllers are BACnet)
Data Population

• Initially a “heads down” effort by the applications expert
  – Reviewed tag dictionary, implementation descriptions and sample projects available via Project Haystack website
  – Select subset of HVAC applications to begin population
  – Select subset of points for each HVAC application
    • Points that are typically of interest
Data Population (continued)

• Iterate through the points
  – Start with Haystack tags
  – Don’t overload Haystack tags (e.g. don’t reuse stage to represent zoneNum)
  – When defining new tags
    • Always have a definition
    • Use marker tags whenever possible
    • Double check Haystack doesn’t have one that will fit the bill
    • Example: pidReset : Marker tag used to identify JCI PID Reset within an application
Data Population (continued)

– Assigning tag groups
  • Identify points that are common throughout our HVAC applications
    – This should allow for easier editing if add tags in the future

– When defining new tag groups
  • Use Haystack naming convention – camel case, full names of tags with value (if applicable)
  • List tags with value for any value tag
  • Double check that Haystack doesn’t have one that will fit the bill
  • Example: chilledWaterFlowSensor :
    – chilled
    – water
    – flow
    – sensor
Data Population (continued)

• Send the initial population spreadsheets out for review
  – The opinions and questions of non-experts are valuable
  – Check for consistency in naming
  – Valuable review comes from consumers of the tags
  – Helps to be detail oriented

• Expand population to additional HVAC applications
  – Reuse what you can
Data Mining

• We completed tagging for 22 HVAC applications in three broad categories:
  – Air Handling Units
  – Central Plants
  – Terminal Units

• Total New Johnson Controls tags defined: 80
  – 35 not used in these HVAC applications

• Total New Johnson Controls tag groups defined: 201
  – 16 not used in these HVAC applications
Data Mining (continued)

• Most Popular Overall Tag Groups
  – Temperature Setpoint (discharge or zone)

• Most Popular Overall Tag
  – cmd (by far)
Use of Tag Groups vs Tags

Average Percent of Tag Groups vs Tags

- Overall Tag Groups
- Overall Tags
- Haystack Tag Groups
- Haystack Tags
- JCI Tag Groups
- JCI Tags

Legend:
- AHU
- Plant
- Terminal Units
Thank you!

• Contact information
  – Mary Boelk – mary.boelk@jci.com
  – Johnson Controls booth in Haystack Connect 2019 Exhibit Hall – with Robert Harland

• Time for lunch!