

Project Haystack

Project Haystack -
Unlocking the Value of
Equipment System Data

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PROJECT HAYSTACK

 Simplifying Data for the
Internet of Things

March 28, 2018

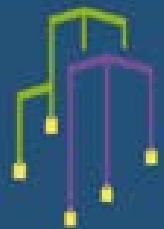
THE DATA CHALLENGE

- **While the amount and type of smart devices explodes,** most device data has poor semantic modeling (information describing the meaning of the data)
- A manual, **labor intensive process is required** to "map" (define/describe/interpret) the data before it can be used in different applications
- This adds cost and slows the use of this valuable data



OUR GOAL – MAKING DATA FROM DIVERSE EQUIPMENT SYSTEMS EASY TO WORK WITH

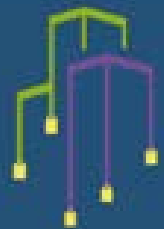
- A **community** of people working to address the data challenge with a standardized approach to defining equipment data meaning
- **Project Haystack vision:** A standardized methodology for modeling data will make it easier and more cost effective to analyze, visualize, and derive value from operational data
- Think of it as a “markup language” for data



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THE CHALLENGE – A USE CASE

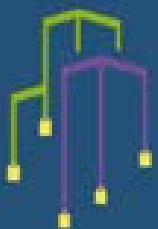
- Analyze this: **zn3-wwfl4 = 76.2**
- Hmmmm... What is it? Deg C, F, KW, kPa, ???
- Need to know units. Lets say it is Deg C
- Hmmmm... Is 76.2 Deg F OK?
- What is it? Zone temp, Return air temp, chilled water temp? Lets say it's a Zone
- What is the schedule? Schedule #1 = 7:30 AM - 6:30 PM
- Is it an exterior zone? Yes
- Is supplied by a VAV box? Yes
- What AHU is it served by? AHU-1
- How can I convey these answers in a standard way that other software can interpret?



USE CASE – HAYSTACK REPRESENTATION OF DATA

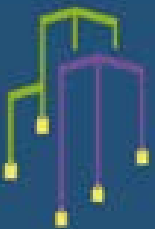
```
id:          150a3c6e-bef0ee0e      (RecId)
clgsp:       74 °F                  (Number)
dis:         zn3-wwfl4              (Str)
equipRef:    Headquarters AHU-1     (RecId)
exterior:    ✓                      (Marker)
floor:       4                      (Number)
point:       ✓                      (Marker)
schedule:    occupied 1             (Str)
south:       ✓                      (Marker)
vav:         ✓                      (Marker)
zone:        3                      (Number)
zoneTemp:    ✓                      (Marker)
mod:         9-Mar-2011 Wed 6:43:21PM UTC (DateTime)
```

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A MARKUP LANGUAGE

- **Why can I point my browser at your website and read what you have published?**
 - **We didn't pre-arrange for me to be able to interpret your website code**
 - **It works because industry agreed on a mark up language (HTML)**
 - **If you use HTML I can read the “data” on your website (text) – if you didn't follow this agreed upon methodology I couldn't**
- e same thing for device data**



HAYSTACK IS MORE THAN ONE THING...

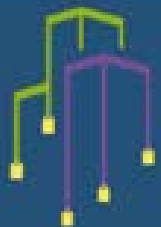
- **First, it's a methodology** for defining the meaning of smart device data
- Also known as semantic tagging, meta data or data modeling
- Open source, highly flexible, applicable to data of all types
- Example of Haystack tags to describe a point in a system:

AHU1-SAT = **sensor, discharge, air, temp, deg F**, ahuRef -> **AHU-1**

Point Name

descriptive tags

association tag



HAYSTACK IS... CONSENSUS DEVELOPED EQUIPMENT MODELS

- **Second, its a set of standard tag sets or equipment models** developed by consensus of the community
- An ongoing effort by to develop tagging models for equipment systems based on the Haystack tagging methodology

The following lists points commonly used with an AHU:

Discharge

- discharge air temp sensor
- discharge air humidity sensor
- discharge air pressure sensor
- discharge air flow sensor
- discharge air fan cmd
- discharge air fan sensor

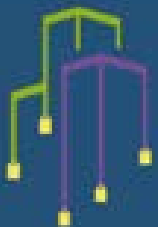
Return

- return air temp sensor
- return air humidity sensor
- return air pressure sensor
- return air flow sensor
- return air co2 sensor
- return air fan cmd
- return air damper cmd

Mixed

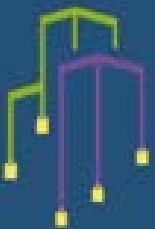
- mixed air temp sensor

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HAYSTACK IS... THIRD - SOFTWARE TOOLS

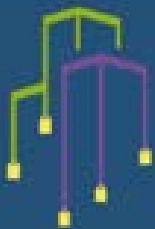
- **A highly efficient REST API** that makes it easy to exchange Haystack tagged data among applications
- **Reference implementations** that can be easily incorporated into applications and products to allow them to exchange Haystack data (Java, node.js, Dart, Python, and C++)
- **Software plug-ins** to enable various systems to “speak” haystack. Example: the NHaystack module for Niagara® systems
- **Software tools** to streamline the tagging process – Example Project Builder Plus – an open source tool



HAYSTACK – WHAT IT ENABLES

- Applications that just work !
- Example: Graphics can auto-generate just by reading the meta data associated with points
- Control logic can "find" all similar devices it should be applied to (think VAV's)
- Easier integration with external software applications – apps can understand and consume data without human interaction to "map" data
- A new generation of engineering tools to streamline project implementation tasks

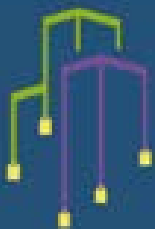
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HAYSTACK – ADOPTION AND SUPPORT

- Used in systems and software deployed in thousands of buildings and devices
- Adoption by equipment manufacturers for next generation product – some on the market today
- Dozens of systems integrators trained and using Haystack in projects every day
- Over 1400 people registered users on Project-Haystack forum
- Intel joins Project-Haystack.org as a Board member (March 2017)
- Multiple community Working Groups focusing on equipment systems and applications segments. Collaboration with ASHRAE BACnet

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HAYSTACK – ADOPTION AND SUPPORT

Thursday, March 8, 2018

 RSS

 Email Ne

ASHRAE's BACnet Committee, Project Haystack and Brick Schema Collaborating to Provide Unified Data Semantic Modeling Solution

The ASHRAE BACnet committee (<http://www.bacnet.org>), Project Haystack (<http://www.project-haystack.org>) and Brick Schema (<https://brickschema.org>) announced they are actively collaborating to integrate Haystack tagging and Brick data modeling concepts into the new proposed ASHRAE Standard 223P for semantic tagging of building data.



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HAYSTACK – OUR MEMBERS

Founders/Board Members:

- Airmaster
- Intel
- J2 Innovations
- Legrand
- Lynxspring
- Siemens
- SkyFoundry

Associate Members:

- Accu-Temp
- Altura
- Arup
- BASSG
- BUENO Systems
- CABA
- Connex Energy
- Controlco
- Grosvenor Engineering Group (Australia)
- Intellastar
- Intelligent Buildings
- IoT Warez
- KMC Controls
- KNX Association
- sensorFact
- Tridium



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HAYSTACK – RESOURCES

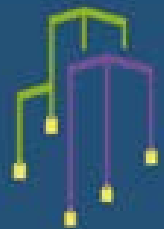
- A Haystack Primer:
<https://newdeal.blog/introduction-to-project-haystack-3dce54f90b1d>
- CABA White Paper March 2016:
<http://project-haystack.org/file/22/CABA-White-Paper-on-Project-Haystack.pdf>
- Haystack Connections Magazine Fall 2017:
<https://project-haystack.org/file/26/Haystack-Connections-Magazine-3-Fall-2017.pdf>
- Guide Specification:
<https://project-haystack.org/file/9/Guide-Spec.docx>
- Software reference implementations in: Java, C++, Niagara, C#, Dart, node.js, Python
- Find Resources and Software downloads here:
<http://project-haystack.org/download>



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WHY HAYSTACK MATTERS

- We want to easily utilize data from various sources for reporting, visualization, analysis, and decision making
- Lack of standardized naming conventions in control and equipment systems makes this a labor intensive effort
- Names on their own can't solve the challenge – too much information to be carried in a name, no standardization, and they already exist the way they are – your not going to change all existing names!
- This is a major barrier to utilizing the rapidly growing amount of data produced by smart systems

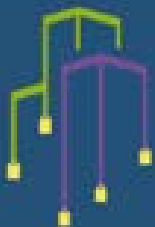


LEARN MORE JOIN THE EFFORT

- www.project-haystack.org
- Learn how to utilize Haystack to streamline your projects
- Contribute your knowledge
- Advance the effort, be a...



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THANK YOU

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