



AHREXPO®

2019 EDUCATION PROGRAM • FREE INDUSTRY SESSION



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Semantic Tagging Passes an Inflection Point – Understanding Project Haystack

Presented by AutomatedBuildings.com

JOIN US! TUESDAY, JAN. 15 • 10:30AM – 11:30AM • LOCATION: B311

Project Haystack

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

PROJECT HAYSTACK IS...

- **A community** of people working to address one of the key challenges in using smart device data...
- **THE CHALLENGE:** Device data has poor “semantic modeling” (information describing the meaning of the data)
- A manual, labor intensive process is required to "map" the data before it can be used in different applications
- This adds cost and slows the use of this valuable data

PROJECT HAYSTACK IS...

- **Project Haystack Solution:** A standardized methodology for describing data that makes it easier and more cost effective to analyze, visualize, and derive value from our operational data
- Think of it as a “**MARKUP LANGUAGE**” for data

THE CHALLENGE – A USE CASE

- Analyze this: zn3-wwfl4 = 24.6
- Hmmmm... What does the number represent? Deg C, F, KW, kPa???
- Need to know units. Lets say it is Deg C
- Hmmmm... Is 24.6 Deg F OK?
- What is it? Zone temp, Return air temp, chilled water temp? Lets say it's a Zone
- What is the schedule for the space? Schedule #1 = 7:30 AM - 6:30 PM
- What AHU is it served by? AHU-1
- What VAV box serves it? VAV-27
- How can I convey these answers in a standard way that other software can interpret?

A USE CASE

- 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
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A MARKUP LANGUAGE - FOR DEVICE DATA

- 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)
- Haystack does the same thing for device data

HAYSTACK IS MORE THAN ONE THING...

- **First** – a standard methodology for defining and representing device meta data (descriptive data)
- **Second** – Standard tag sets or equipment models developed by consensus of the community
- **Third** - Software Tools
 - REST API to easily exchange Haystack tagged data among applications
 - Reference implementations: Java, node.js, Dart, Python, C++ others
 - Plug-ins to enable various systems to “speak” haystack.
 - Tools to streamline the tagging process
- **Fourth** – The ongoing effort by Working Groups to develop tagging models, extend the standard, work with other standards groups, and educate the market

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

HAYSTACK – WHAT IT ENABLES

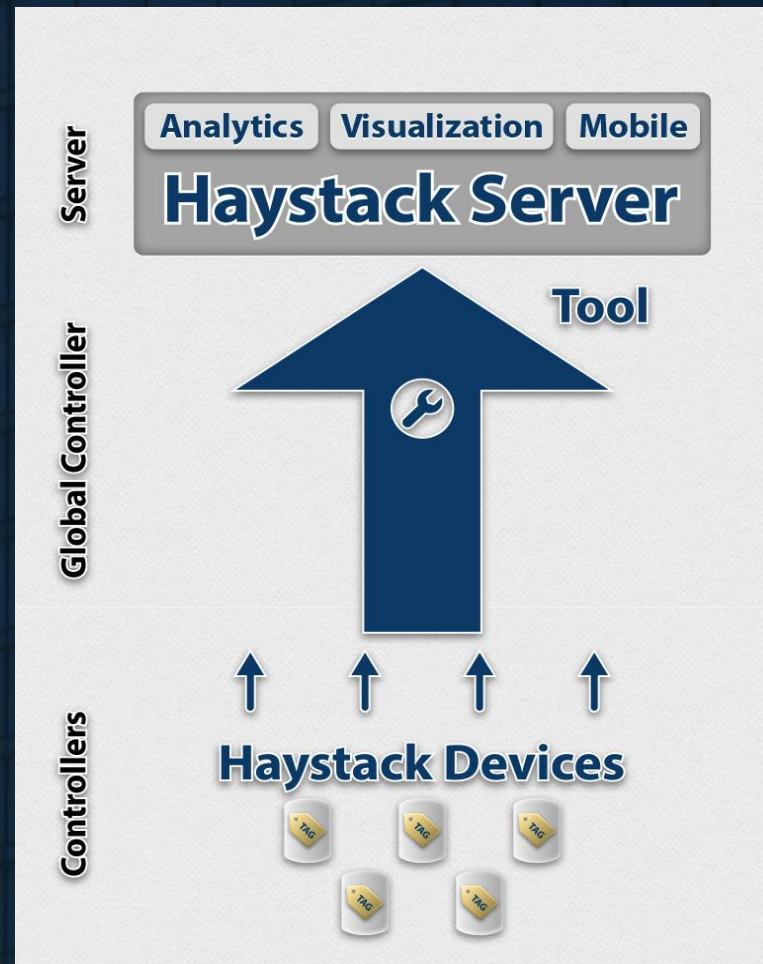


- Applications that just work !
- Example: Equipment Graphics that auto-generate just by reading the meta data associated with points
- Control logic can “find” all similar devices it should be applied to (think of room controls or VAV’s)
- Easier integration among software applications – Apps can understand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

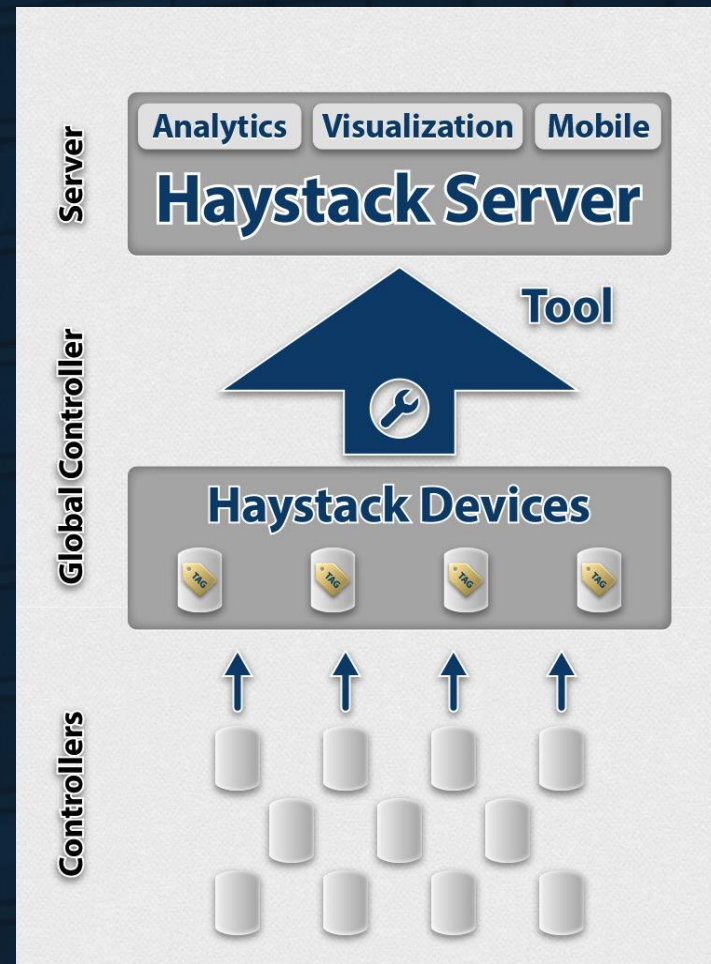
WHY HAYSTACK MATTERS

- We want to easily utilize data from various sources for reporting, visualization, analysis, supervisory control, 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

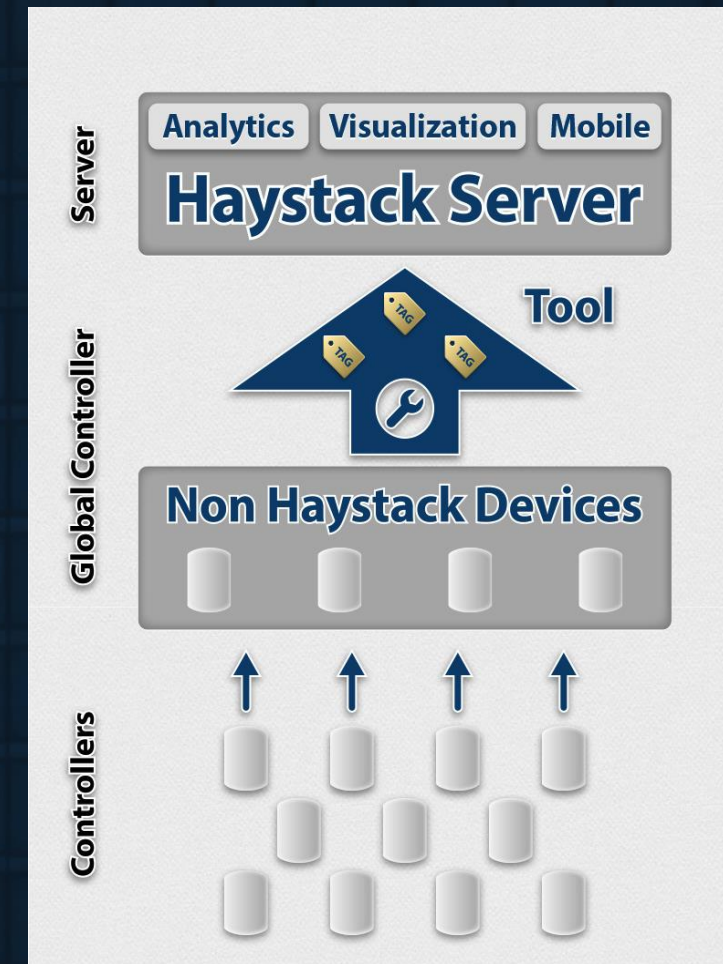
ARCHITECTURES USING HAYSTACK



Tags exist in end devices



Tags exist in network controllers



Tags applied in server level application

HAYSTACK – ADOPTION AND SUPPORT

- Winner of 2013 Digie Award for Best Intelligent Building Technology Innovation
<http://project-haystack.org/forum/topic/100>
- Biennial Community-Produced Haystack Connect Conferences: 2013, 2015, 2017, 2019
<http://haystackconnect.org/>
- Press Announcement Showing Support from over 20 Companies
<http://www.prnewswire.com/news-releases/project-haystack-212890711.html>
- Project-Haystack 501C Corp formed June 2014
<http://www.ireachcontent.com/news-releases/project-haystack-announces-formation-of-non-profit-corporation-263428181.html>

BACNET COLLABORATION WITH HAYSTACK

RICHMOND, VA. (PRWEB) MARCH 02, 2018



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

- Formal collaboration to integrate Haystack tagging and Brick data modeling concepts into the proposed ASHRAE Standard 223P for semantic tagging of building data.

ASHRAE Standard 223P: "Designation and Classification of Semantic Tags for Building Data" provides a dictionary of semantic tags for descriptive tagging of building data including building automation and control data along with associated systems.

By integrating Haystack tagging and Brick data modeling concepts with the upcoming ASHRAE Standard 223P, the result is intended to enable interoperability on semantic information across the building industry, particularly in building automation.

- <http://www.prweb.com/releases/2018/03/prweb15264563.htm>

HAYSTACK – ADOPTION AND SUPPORT

- Used in systems and software deployed in THOUSANDS of buildings to model 100's of thousands of devices
- Adoption by equipment manufacturers for next generation product – some on the market today
- **Intel** joins Project Haystack as a Board Member (March 2017)
- Dozens of systems integrators trained and using Haystack in projects every day
- Over 1200 registered users on **Project Haystack Forum**
- CABA White Paper March 2016

PROJECT HAYSTACK – OUR MEMBERS

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Buildings®



KMCM
CONTROLS

KNX®

KODARO

sensorFact®

TRIDIUM

VRT
SYSTEMS

Yorkland
Controls
+
ENVIRONMENTAL
SOLUTIONS

HAYSTACK – RESOURCES

- Haystack Connections Magazine
 - The latest issue:
<https://project-haystack.org/file/29/Haystack-Connections-Magazine-Issue-4-June-2018.pdf>
- CABA White Paper March 2016:
<http://project-haystack.org/file/22/CABA-White-Paper-on-Project-Haystack.pdf>
- Guide Specification:
<http://project-haystack.org/file/9/Guide-Spec.docx>
- Detailed Reference Implementation:
<https://project-haystack.org/file/28/Reference-Implementation-Applying-Haystack-Tagging-for-a-Sample-Building.pdf>
- Find Resources and Software downloads here:
<http://project-haystack.org/download>



HAYSTACK –KEY TAKEAWAYS

- Deployed, working, proven in THOUSANDS of applications
- Open source, community-driven, ZERO cost to access documentation and use
- Extensible beyond community agreed equipment models – you can use Haystack methodology with your own tags/descriptors outside of standard group work on models
- Lightweight – can be implemented in the smallest devices, network level controllers, standard databases – all the way to text files, & Excel worksheets
- Human readable and machine readable
- Accessible/understandable by real users – technicians and engineers that do systems integration

THANK YOU!

John Petze

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