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OCTOBER 14-17, 2024

Integrating HMI/SCADA into a Unified Namespace (UNS) architecture

Presented By:

Nathan Slider

Product Manager (HMI / SCADA) - Operations Control

AVEVA

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Integrating HMI / SCADA into a Unified Namespace (UNS) Architecture

Businesses require access to Industrial data sets that both overlap and differ by the use case, as each require very different data structures. AVEVA's HMI / SCADA products can help overcome these challenges by complementing Unified Namespace (UNS) architectures thru enhanced data contextualization, leveraging open standards while providing secure and agnostic integration into a Unified Namespace (UNS).

Nathan Slider
Product Manager – (HMI / SCADA) - Operations Control
AVEVA

Contributing Member - **ISA 111 – Unified Automation for Buildings**

Develop standards, recommended practices, and technical reports to communicate the necessary information to allow Buildings subsystems to be managed.

Contributing Member - **ISA 112 – SCADA Systems**

SCADA standards and technical reports that address system design, implementation, operation, and maintenance of SCADA systems

Agenda

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1. Introduction to a Unified Namespace
   - What is a UNS
   - Why a UNS
   - How a UNS
2. Integrate: AVEVA HMI / SCADA into a Unified Namespace Architecture
3. Roadmap: AVEVA HMI / SCADA for UNS Integration
4. Questions & Answers

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Introduction: *Unified Namespace* (UNS)

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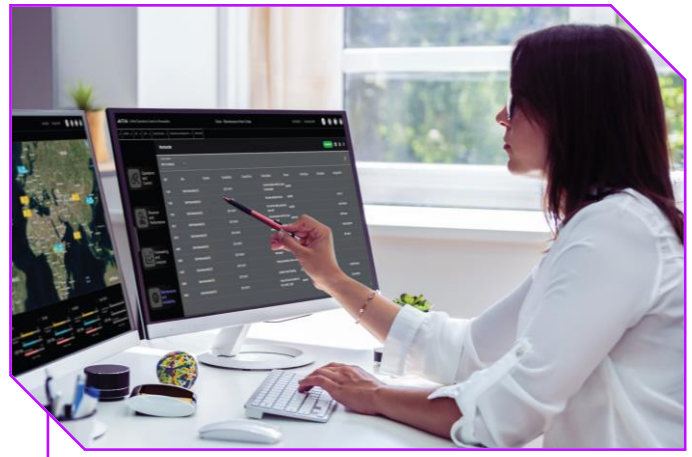
Foundation for Digital Transformation

IT / OT Convergence



Democratize the Information

Industry 4.0	Centralized & Organized Data	Citizen Developers
Powerful concept that helps companies **Digitally Transform** the way they manufacture, improve and distribute their products while elevating their digital footprint towards **Smart Manufacturing** Concepts.	Connects Devices to Applications to provide a **centralized hub** for **data access organized in a Semantic Hierarchy** providing a single source of truth across the business, **unifying the data** needed by the Information Technology **(IT)** and Operations Technology **(OT) Systems**	Easily accessible & **contextualized data** now **becomes information** which **provides** the ability to democratize the information to scale up and out which makes the data grow in value. **Citizen Developers** across the enterprise can use this information **to spark innovation**

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Why: the *Unified Namespace* (UNS) is needed

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ISA 95 / IEC 62264 standards framework

For Integrating Enterprise and Control Systems

Traditional Industrial Automation Integration is aligned around point-to-point connections, passing data thru each level in the Technology Stack.

Point-To-Point Integration

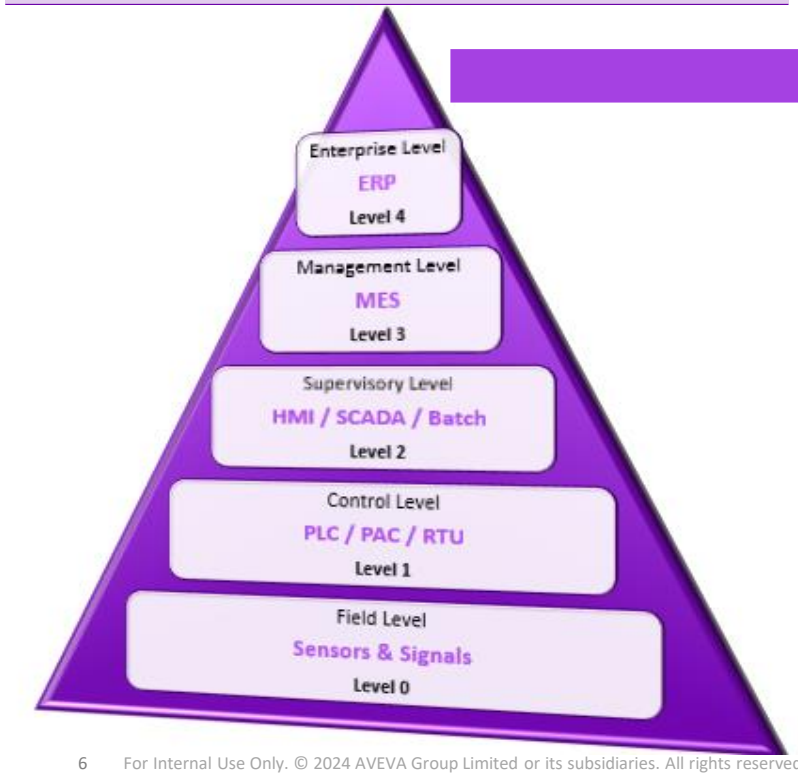
Traditional Industrial Automation Integration

Inconsistent Naming Conventions
Inconsistent Structure and Context
Difficult to maintain & scale
Data Isolation and Silos (Software Sprawl)
Breaks Down IT/OT Convergence

Unified Namespace (UNS) Integration

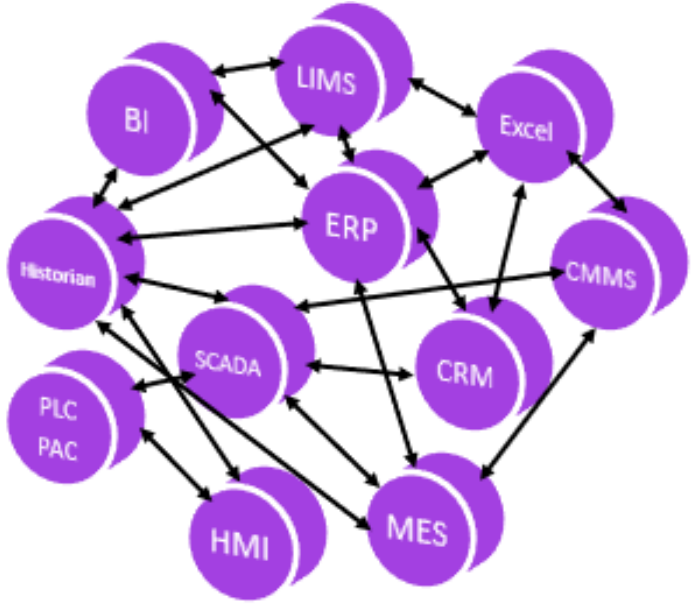
Digital Transformation

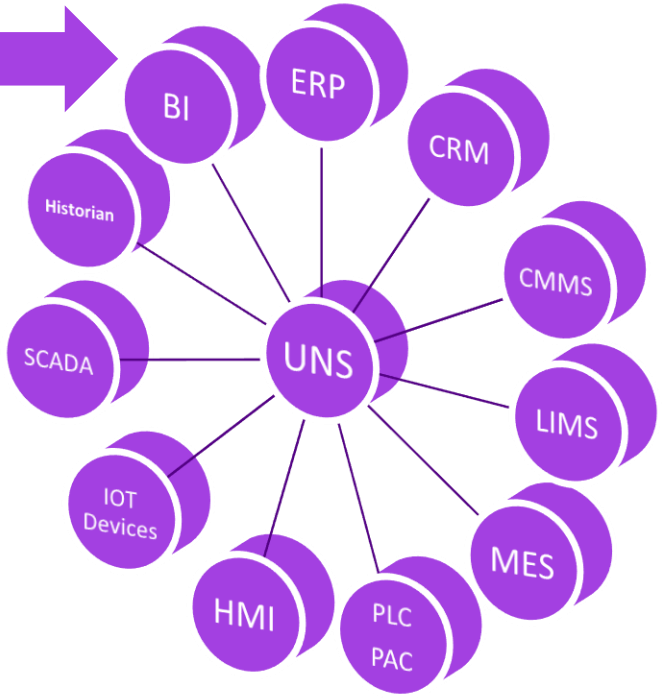
Consistent *(Standard)* Naming Conventions
Hierarchical Structure based upon
(ISA 95 / IEC 62264)
Data in Context (Contextual Metadata)
Democratizes the Data
Faster & Normalized IT / OT Convergence



UNS Semantic Hierarchy

Point-to-Point Data Integration





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Why: the *Unified Namespace* (UNS) is needed

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ISA 95 / IEC 62264
standards framework
For Integrating Enterprise and Control Systems

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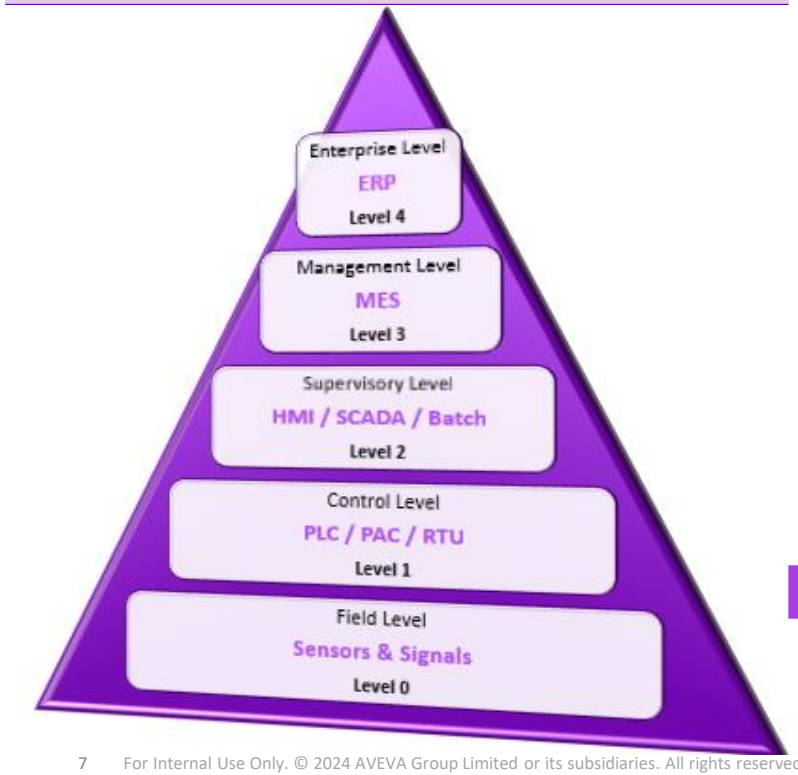

- ENTERPRISE
  - SITE
    - AREA
      - LINE 1
        - CELL 1
        - CELL 2
      - LINE 2
        - CELL 1
        - CELL 2

UNS Semantic Hierarchy

Unified Namespace (UNS)
Integration
Digital Transformation

Consistent Naming Conventions
Hierarchical Structure based upon
(ISA 95 / IEC 62264)
Data in Context (Contextual Metadata)
Democratizes the Data
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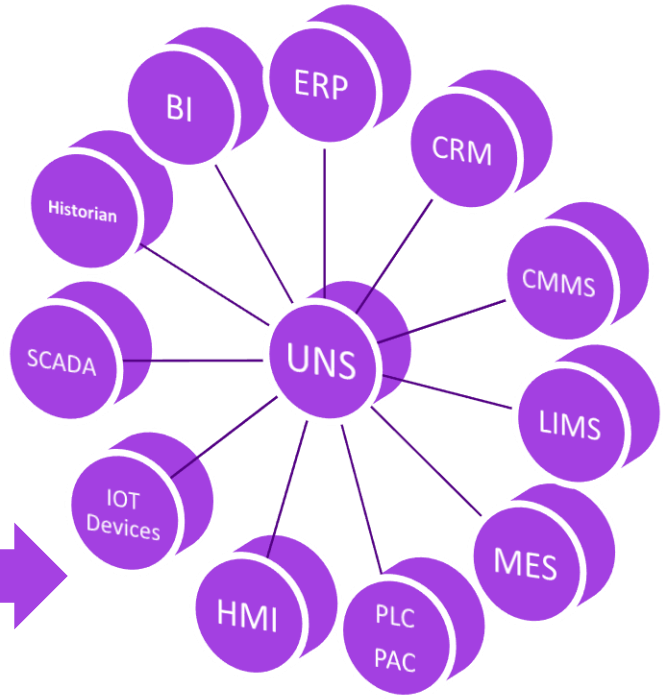

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How: the *Unified Namespace* (UNS) is built

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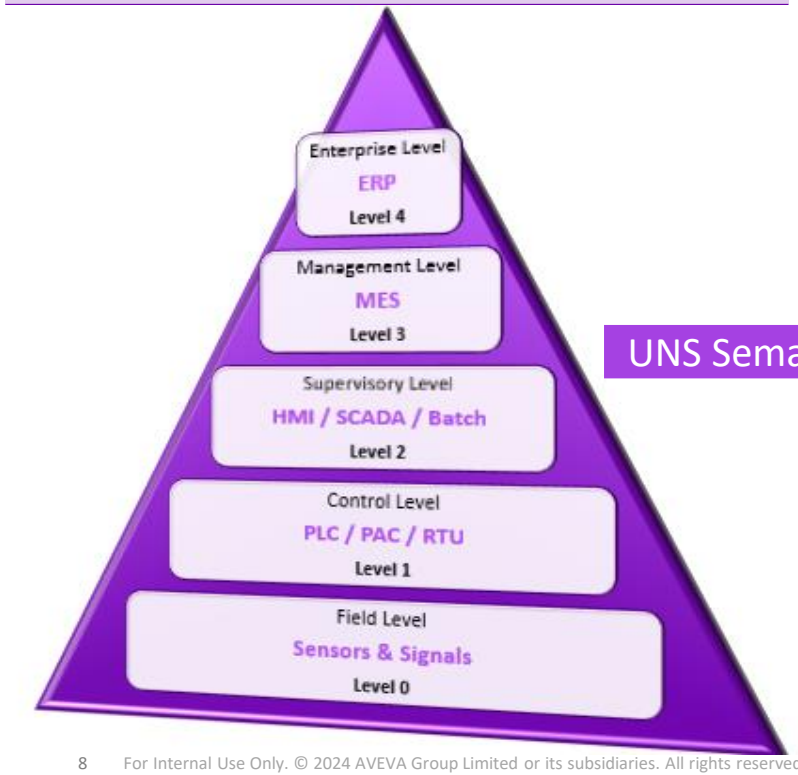
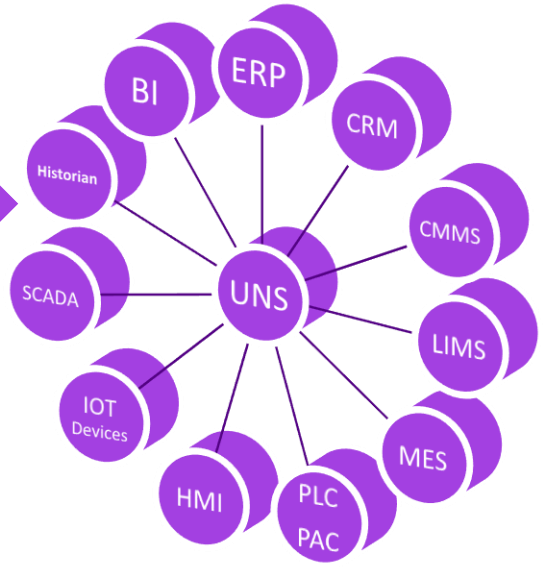
ISA 95 / IEC 62264 standards framework

For Integrating Enterprise and Control Systems

Unified Namespace **(UNS) semantic hierarchy** is usually driven by the **ERP systems** in place as this commonly becomes the **Master Data Model** used within the business.



UNS Semantic Hierarchy



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  - SITE
    - AREA
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        - CELL 1
        - CELL 2
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        - CELL 2

- ENTERPRISE
  - Functional namespace
  - Informational namespace
  - Definitional namespace
  - SITE
    - Functional namespace
    - Informational namespace
    - Definitional namespace
    - AREA
      - Functional namespace
      - Informational namespace
      - Definitional namespace
      - LINE
        - Functional namespace
        - Informational namespace
        - Definitional namespace
        - Ad-Hoc (Edge 1)
        - Ad-Hoc (Edge 2)
        - CELL
          - Functional namespace
          - Informational namespace
          - Definitional namespace

How: the *Unified Namespace* (UNS) is built

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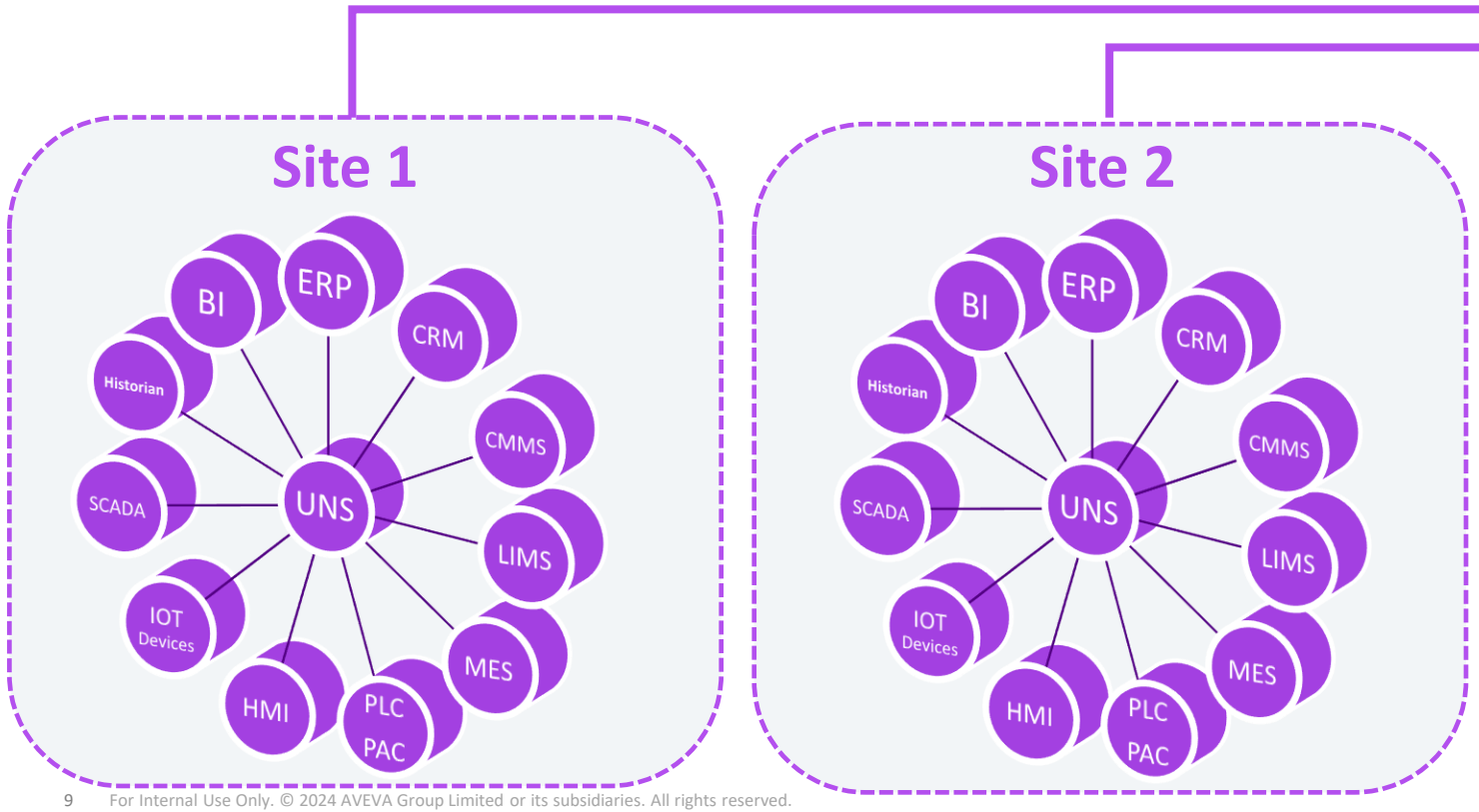

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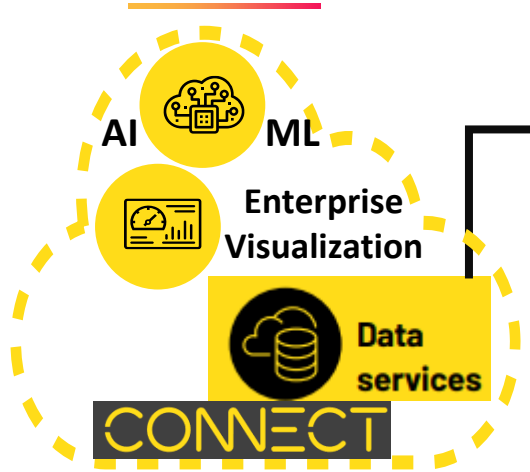

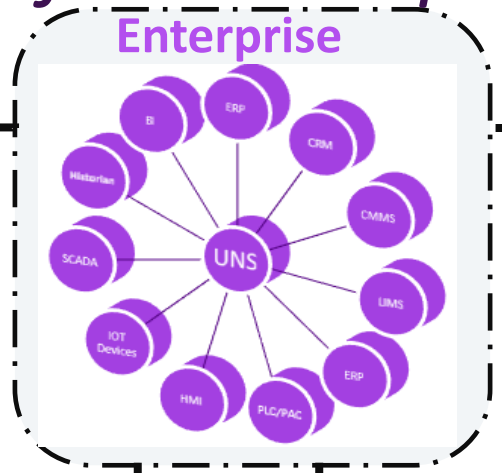

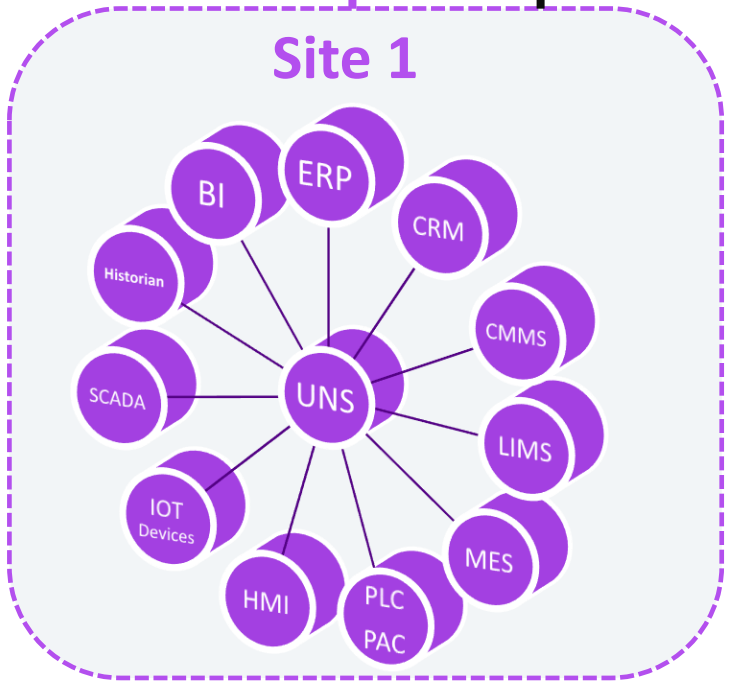

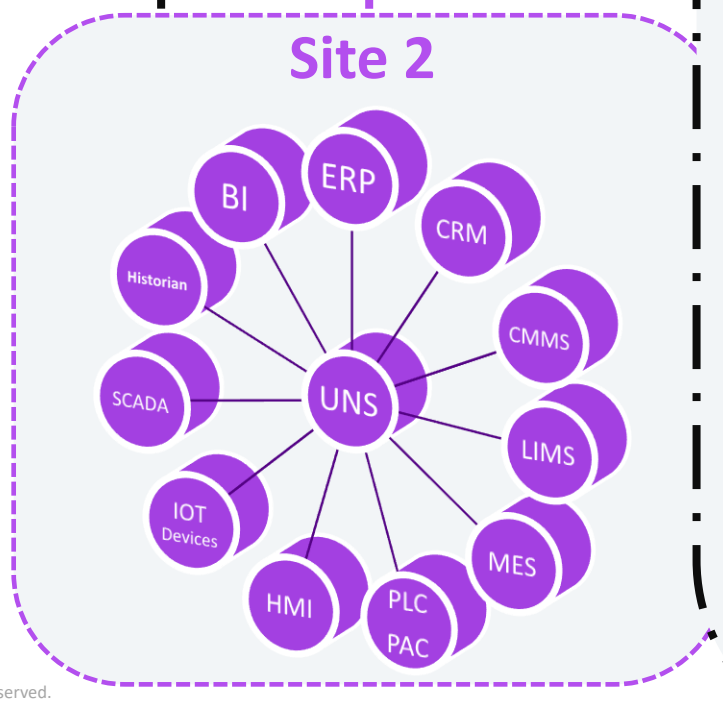

AVEVAWORLD

- ENTERPRISE
  - Functional namespace
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How: does a *Unified Namespace* (UNS) work

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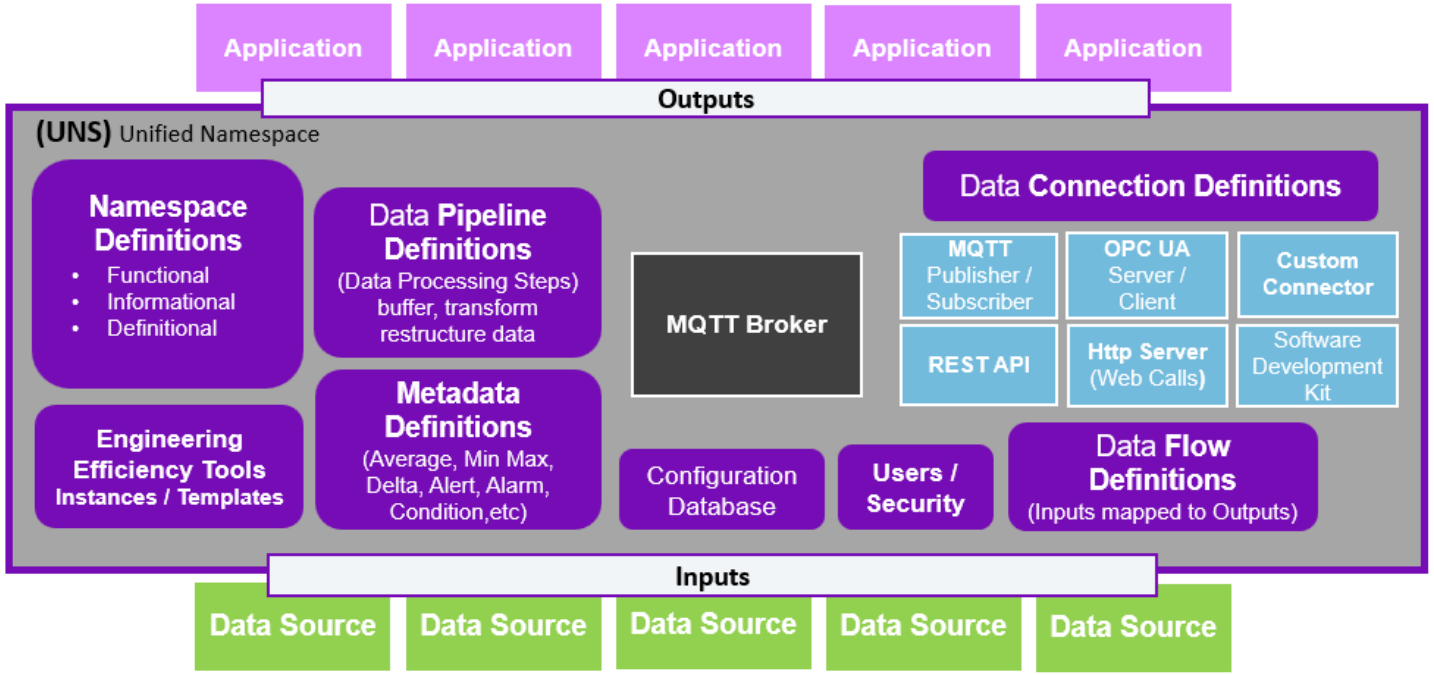
A Unified Namespace (UNS) can mean different things to different people as it is commonly referenced as:

Technology Stack ("UNS Architecture")

OR

Software Offer used to build a "UNS" / Data Ops software



Source: Crosser Technologies

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How: does a *Unified Namespace* (UNS) work

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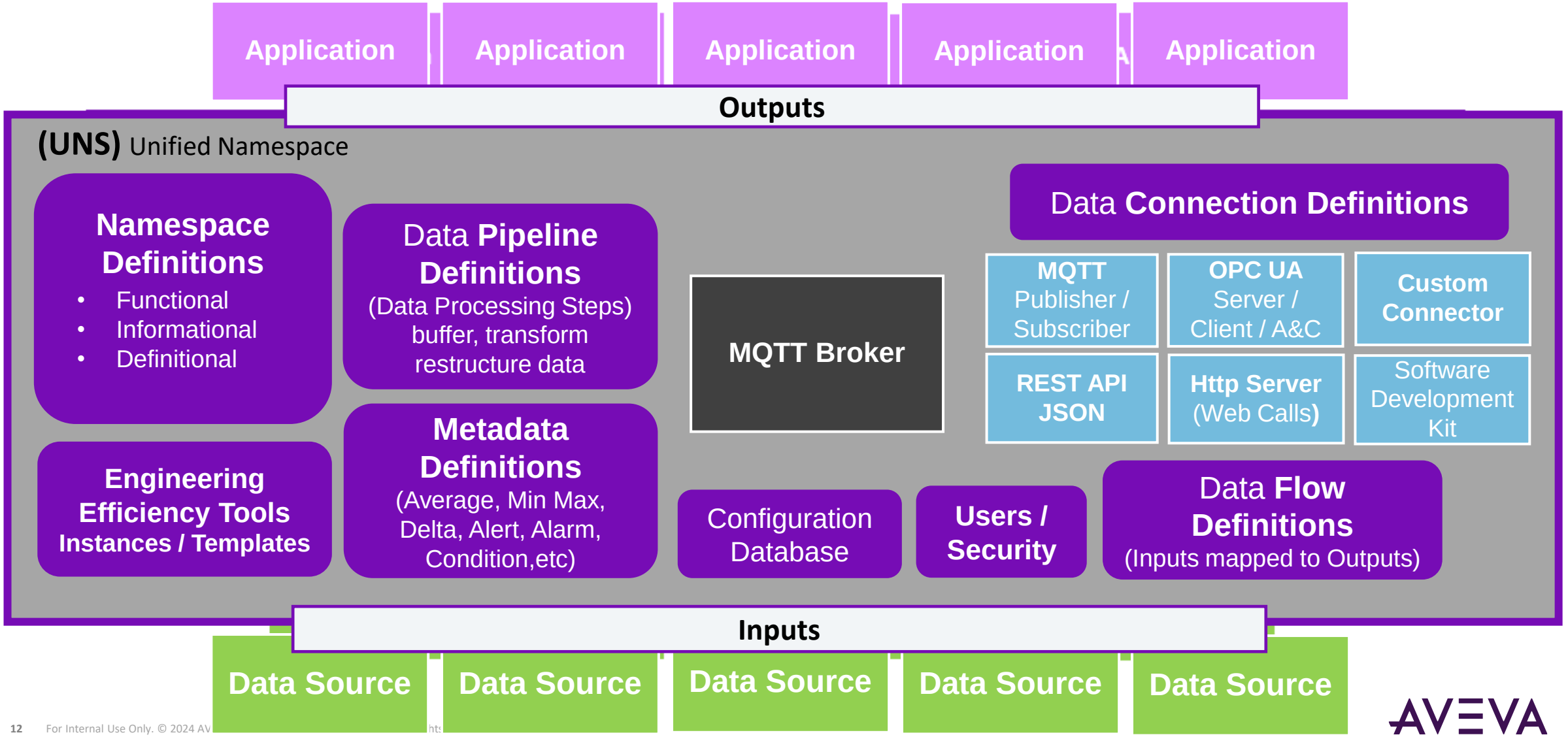
Both references are correct *as both are intended to address the same* ***Digital Transformation*** *needs* :



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Integrate: HMI / SCADA into a *Unified Namespace* (UNS)

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AVEVA™ System Platform

AVEVA™ Communication Drivers

MQTT.ORG

OPC UA™

A-B QUALITY

Schneider Electric

SIMATIC S7 SIEMENS

OMRON

EMERSON

ASHRAE BACnet™

RESTful API

Modbus

OPC

Data Pipeline Definitions
(Data Processing Steps)
buffer, transform
restructure data

Data Connection Definitions

MQTT Publisher / Subscriber	**OPC UA** Server / Client / A&C	**Custom Connector**
REST API JSON	**Http Server** (Web Calls)	Software Development Kit

Data Flow Definitions
(Inputs mapped to Outputs)

Configuration Database

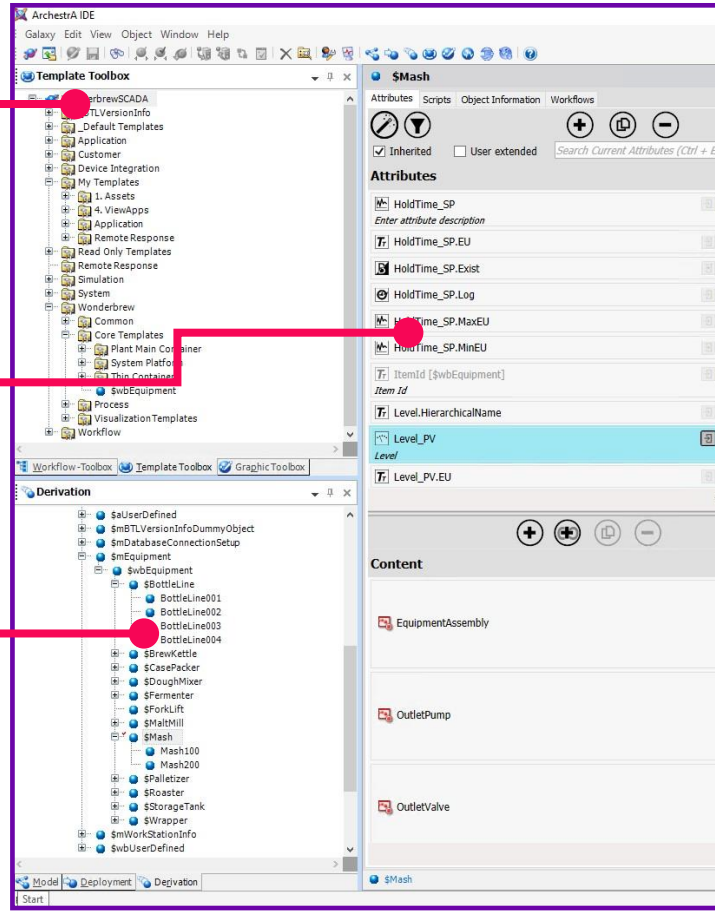
Users / Security

Engineering Efficiency Tools
Instances / Templates

Metadata Definitions
(Average, Min Max, Delta, Alert, Alarm, Condition,etc)

Namespace Definitions

- Functional
- Informational
- Definitional



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Integrate: Publish HMI / SCADA into a *Unified Namespace* (UNS)

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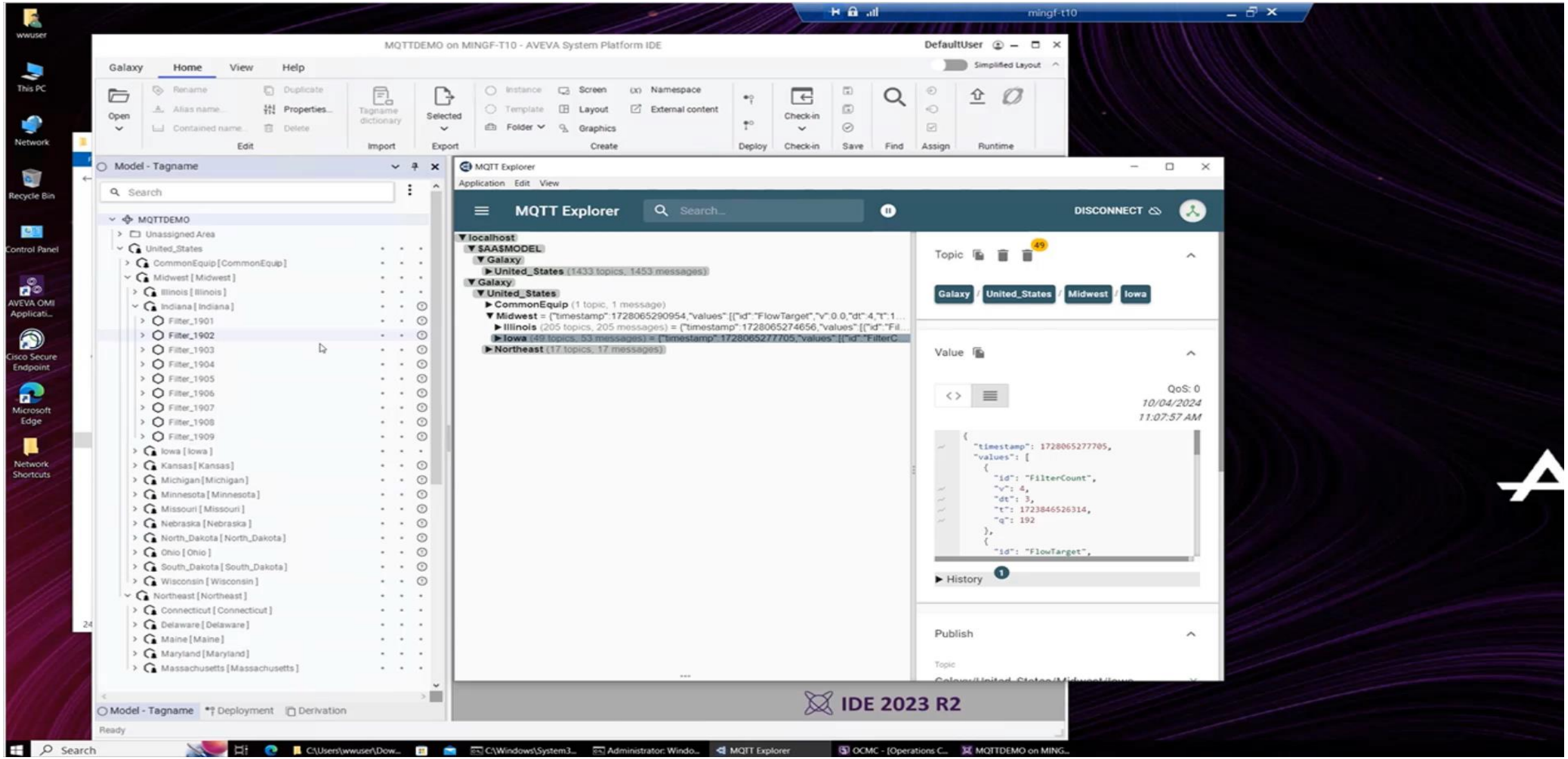
AVEVA System Platform's MQTT Publisher → MQTT Broker → MQTT Client

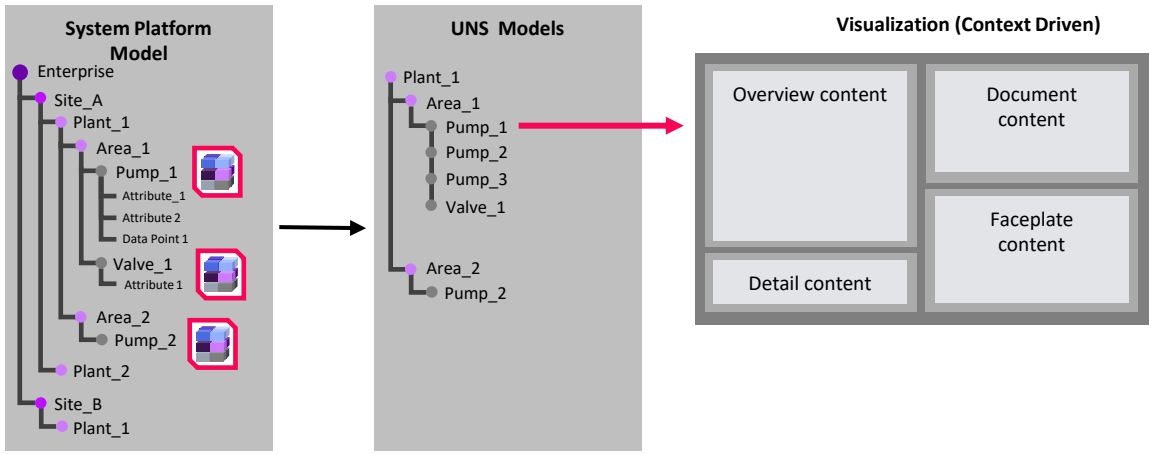


Integrate: HMI / SCADA into a *Unified Namespace* (UNS)

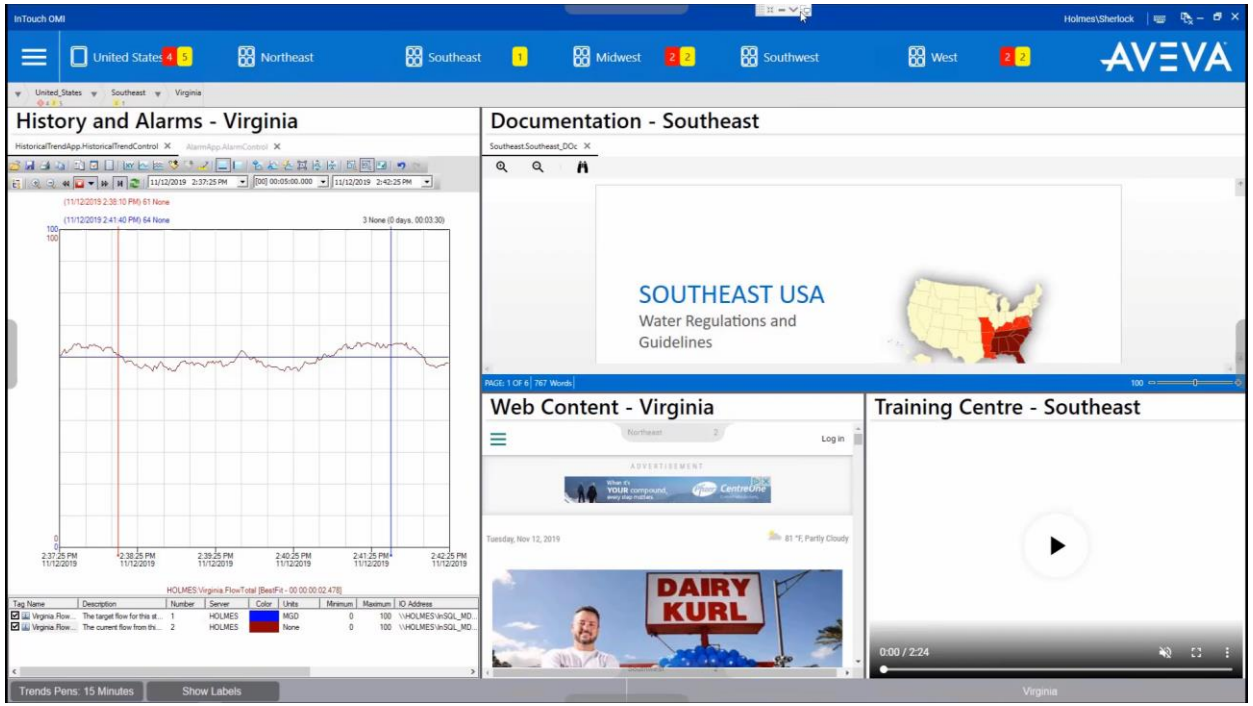
AVEVA™ System Platform

Leverage the AVEVA™ System Platform Semantic Hierarchy - to provide Context Driven Visualization

Publish to UNS



AVEVA OMI
Operations Management Interface



- Publish System Platform Model to the Unified Namespace (Functional, Descriptive , Informational)
- Leverage the UNS Models to drive Visualization (Content Driven)
- **AVEVA Operations Management Interface (OMI) is and advanced contextualized visualization tool that can be used on top of a UNS**

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Roadmap: Publish HMI / SCADA into a *Unified Namespace* (UNS)

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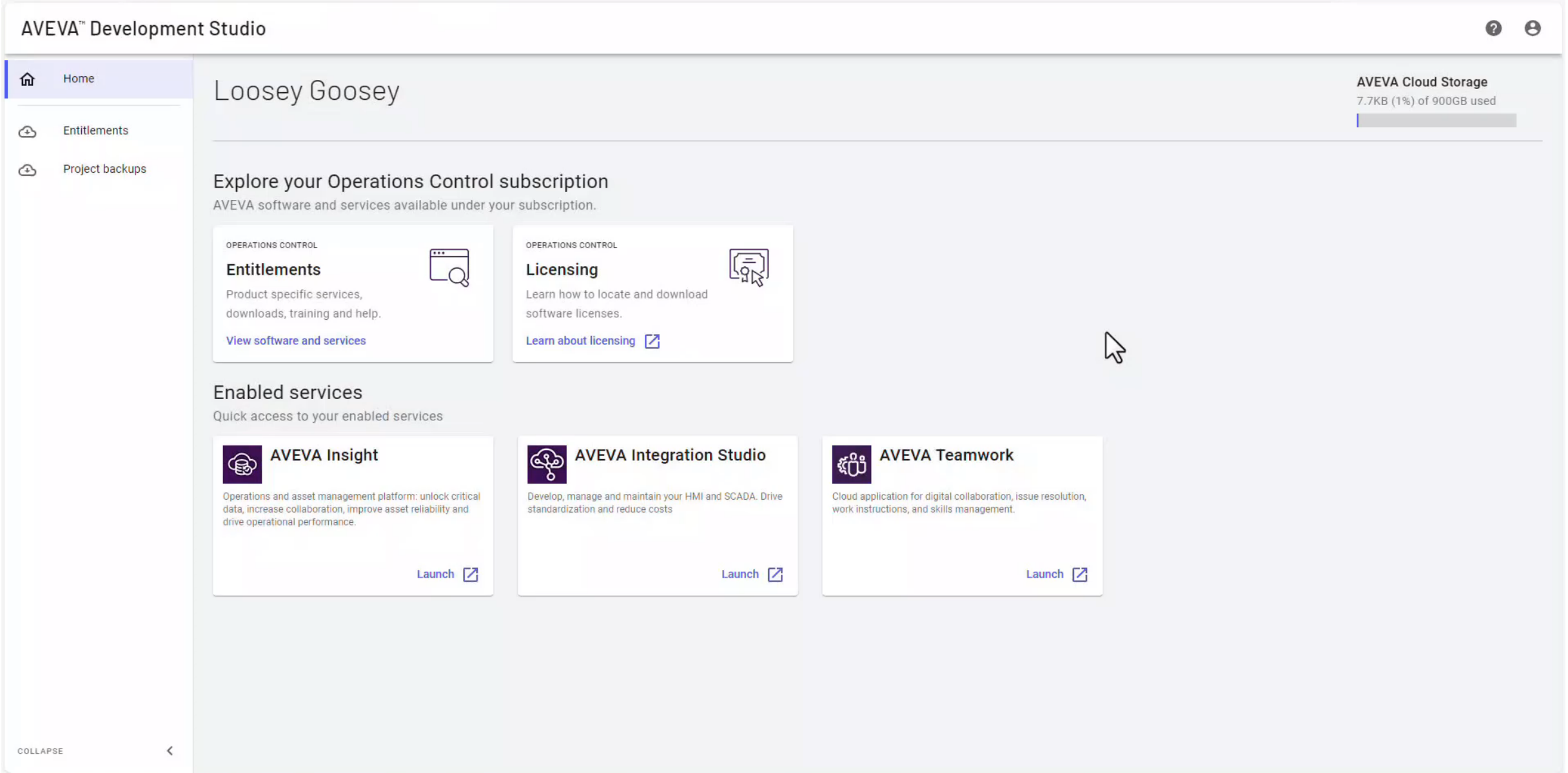
AVEVA Development Studio



Questions?

THANK YOU

Nathan.Slider@AVEVA.com

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ABOUT AVEVA

AVEVA is a world leader in industrial software, providing engineering and operational solutions across multiple industries, including oil and gas, chemical, pharmaceutical, power and utilities, marine, renewables, and food and beverage. Our agnostic and open architecture helps organizations design, build, operate, maintain and optimize the complete lifecycle of complex industrial assets, from production plants and offshore platforms to manufactured consumer goods.

Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

Learn more at www.aveva.com