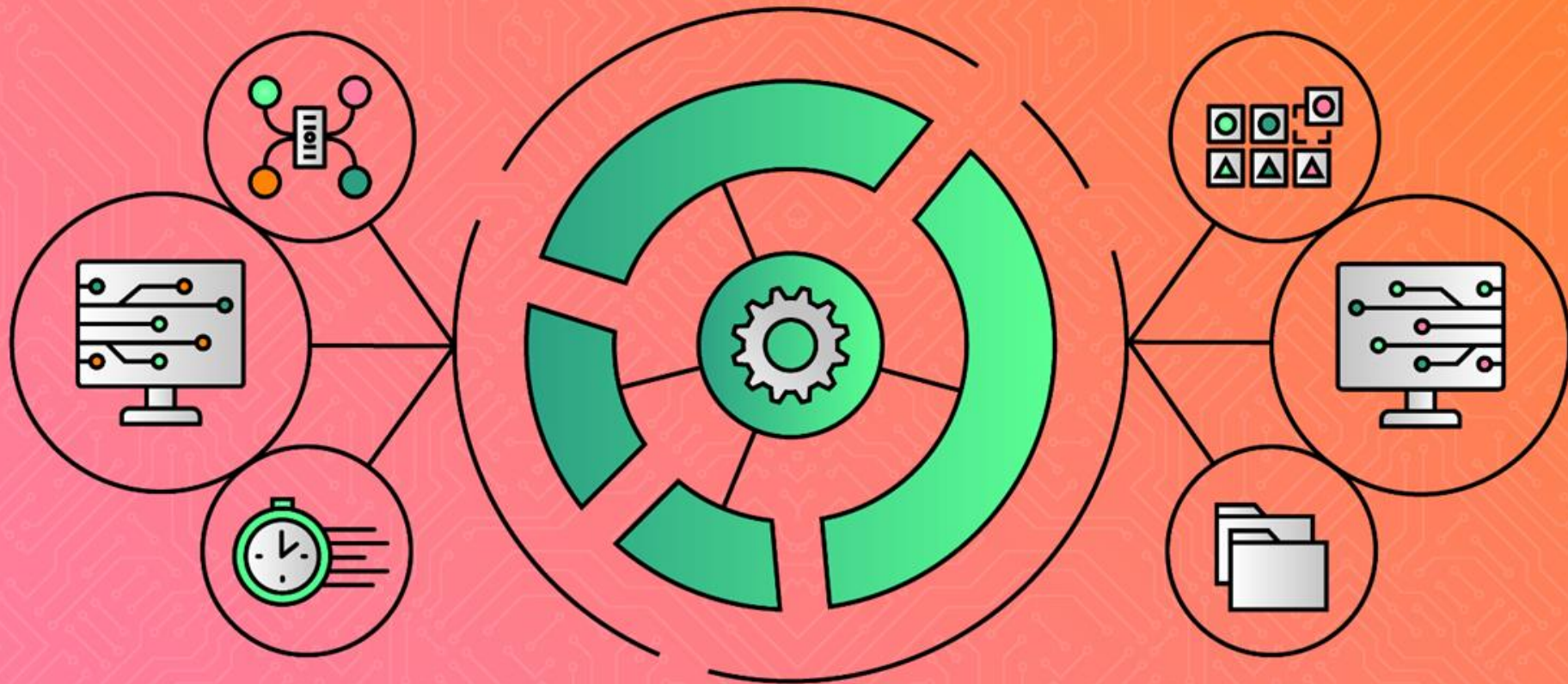


Ditch Data Silos:

Create a Unified Namespace With Ignition UDTs & MQTT



Presenters



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Ignition!

by inductive automation

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Agenda

- Overview of the Unified Namespace (UNS)
- Architecture Tips
- Using Ignition UDTs & MQTT to Build a UNS
- Demo
- Audience Q&A

The Problem

Lack of Data Standardization

- Data silos
- Difficulty sharing data with others

Problematic Data Management

Manual Data Entry

- Time-consuming
- Error-prone

Point-to-Point Data Integration

- Need for specialized engineering
- Namespaces are tightly coupled
- Difficult to scale

Overview of the Unified Namespace

What is a Unified Namespace?

- Standardized way to organize and name data
- Contains an enterprise's structure and events
- One communication interface

Unified Namespace Benefits

- Makes data accessible
- More affordable way to get needed data together
- Better ability to predict when things will go wrong
- Better traceability
- Easier scalability

Unified Namespace Benefits

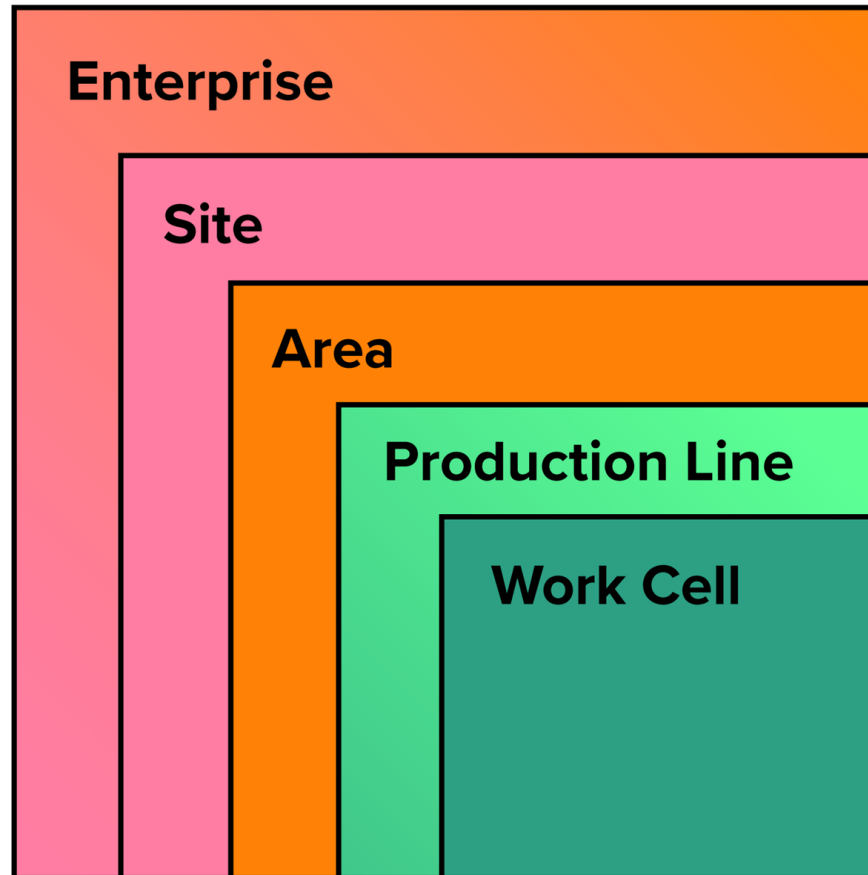
- Single source of truth
- Less manpower/engineering
- Use supply chain better
- Greater efficiency
- Better decision-making

What is Driving the Unified Namespace?

- Artificial Intelligence (AI)
- Machine Learning (ML)
- Predictive Maintenance (PM)
- Leveraging the above in large enterprises
- Maintaining the above in cost-effective ways

Unified Namespace Example Structure

ISA 95 Common Data Model



Unified Namespace Architecture Tips

Tip #1 Model architecture on your environment/facility/processes

Tip #2 Follow what people in operations want to see

Tip #3 Base naming conventions on your hierarchy

Ignition UDTs

- User-Defined Types
- Enable an object-oriented approach
- Create parameterized data templates
- Instances automatically inherit a change to the definition

The Power of UDTs

Tag Browser

edge

Tags	UDT Definitions	
Tag	Value	Data Type
ROC Devices		
ROC EFM Group		
KC ROC Edge		
FB107		
FCal Validation		
Meter Config		
Meter Run 1		FB107 Meter C...
Meter Config Raw		
AGACFG	108	Short
ALPH	0	Short
ARGON	1.2	Float
ATMPRS	45	Float
AVGTYP	2	Short
CALWGT	32.14	Float
CARBDI	2	Float
CARBMO	0	Float
CMTHI	21	Short
CMTHI	12	Short
CONTRC	0	Short
CORFAC	0.07	Float
DESC	FB107 Mtr #1	String
ELEVAT	1,111	Float
ETHANE	0.3	Float
FLWSTD	AGA3-92	String
FUCALC	0	Short
GASHV	3,220.05	Float
GRAVIT	32.1	Float
HELIUM	1	Float
HIDPSP	5	Float
HYDROG	0.9	Float
HYDSUL	1	Float
IBUTAN	1.1	Float
IMP	2.01	Float
IPENTA	0.9	Float
LATUDE	83	Float
LODPSP	1,500	Float
LOFLOW	5.7	Float
METHAN	74.5	Float
NBUTAN	2.1	Float
NDECAN	2.4	Float

Tag Browser

edge

Tags	UDT Definitions	
Tag	Value	Data Type
Diagnostics		
CFX Publisher		
ROC Devices		
ROC EFM Group		
KC ROC Edge		
FB107		
FCal Validation		
Meter Config		
Meter Run 1		FB107 Meter Config V2
Parameters		Document
Advanced		
Atmospheric Calculation	Entered	String
Atmospheric Pressure	45	Float
Base Pressure	33	Float
Base Temperature	81	Float
Elevation	1,111	Float
Gravitational Acceleration	32.1	Float
Gravitational Calculation	Entered	String
Latitude	83	Float
Orifice Material	Stainless Steel	String
Orifice Ref Temperature	72	Float
OrificeMaterialEnum	0	Short
Pipe Material	Stainless Steel	String
Pipe Ref Temperature	68	Float
PipeMaterialEnum	0	Short
Fluid Properties		
General		
Raw		
Averaging Technique	Flow Dependant Formulaic	String
Flow Alarming	Enabled	String
HV Alarm and Sampler Units	Volume	String
Integral Multiplier Period	2.01	Float
Inputs		
Raw		
Active Flow Calculation	AGA3-92	String
Active Properties Calculation	AGA8-92 Detailed	String
Contract Hour	0	Short
Meter Description	FB107 Mtr #1	String
Meter ID	FBORFC001	String
Units	US	String

Using Ignition UDTs for a Unified Namespace

- Ignition's flexibility lets you create a custom data standard
- Bonus functionality for building a UNS
 - Reference tags
 - Derived tags
- Create nested directories for a UNS
- Map nested directories onto MQTT topic structure

MQTT and Sparkplug

MQTT

Publish/subscribe protocol that lets edge-of-network devices publish to a broker

Sparkplug

Open-source software specification that defines how to use MQTT in a mission-critical, real-time environment

Why MQTT & Sparkplug are Ideal for a UNS

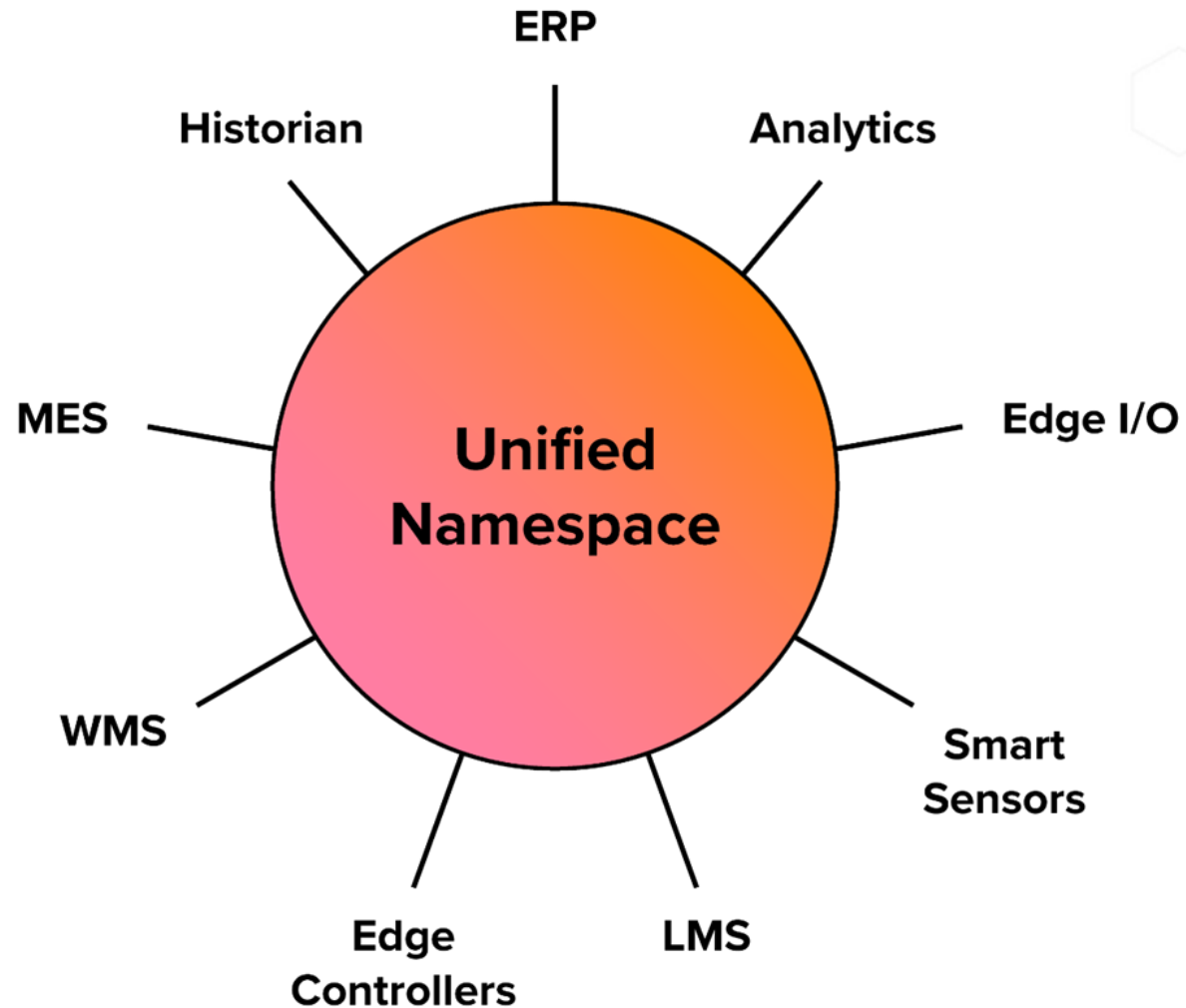
- Lightweight
- Open architecture
- Reports by exception
- Edge-driven

Building on MQTT and Sparkplug is the most common UNS architecture

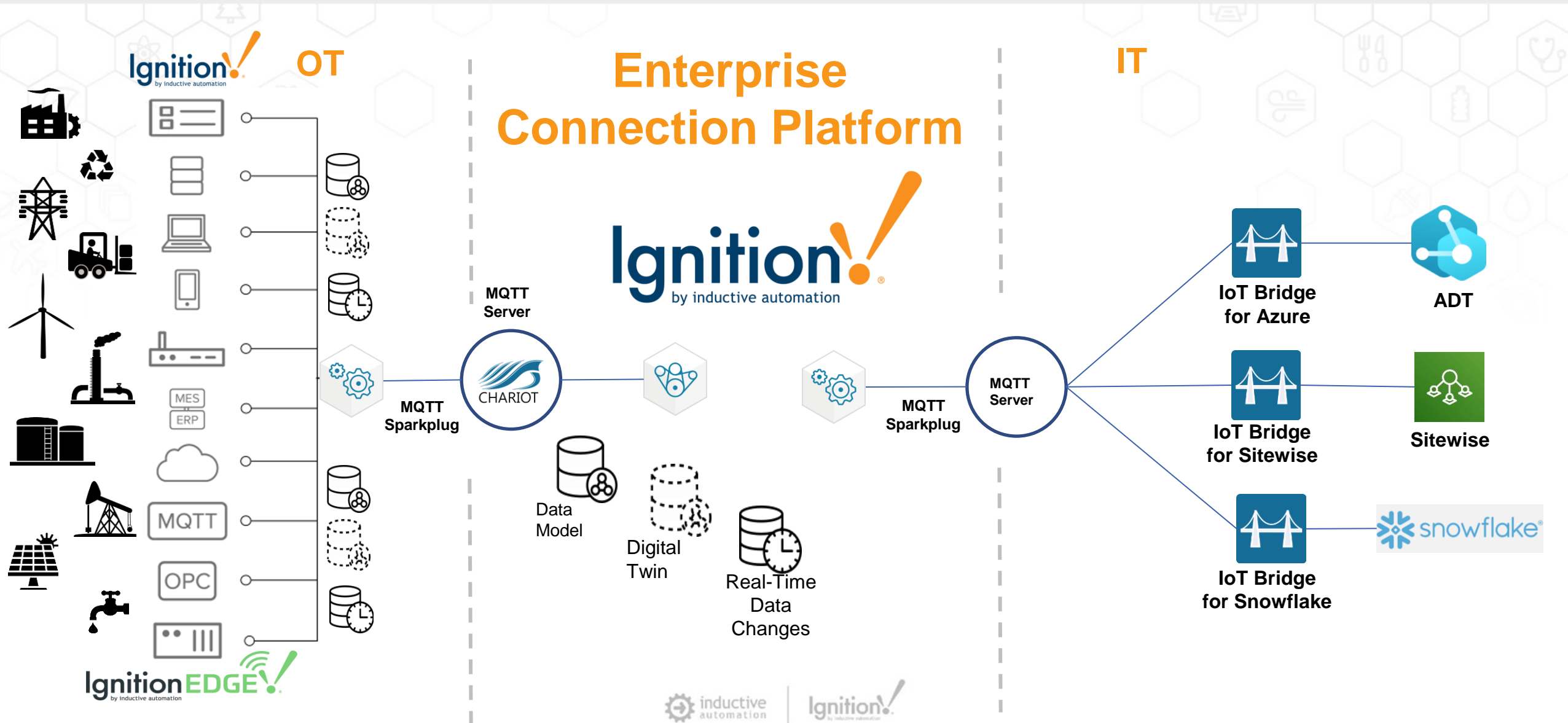
How MQTT & Sparkplug Work to Create a UNS

- Decouples devices from applications
- MQTT helps all components in a system communicate
 - Device/machine/equipment publishes/subscribes to central hub/broker
- Sparkplug provides context & data modeling
 - Map data models into Sparkplug w/ Ignition

Communication in a Unified Namespace



Example: Applying a Unified Namespace



Demo





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