THE REYNOLDS COMPANY
ELECTRICAL SUPPLY

TechTalks
Online Seminars

Integration of IIoT with Rockwell Controllers

January 13, 2021

Our presentation will begin at 10:00 am Central

Our Guest Panelists

David Nute
Automation Specialist
The Reynolds Company
Houston

Mike Masterson
Automation Specialist
The Reynolds Company
Houston

2021 Online Events - Register to receive a calendar invite

THE REYNOLDS COMPANY
ELECTRICAL SUPPLY

- **Tech Talks**
- **App Brief – Remote Assistance with RealWear**

  January 27th @ 10 AM
- **MicroLogix to Micro 800 Migration Solutions**

  February 10th @ 10 AM
- **Fiber Optic Cable Selection**

  February 24th @ 10 AM
- **Building Faceplates in View ME/SE**

  March 10th @ 10 AM
- **HART and Highly Integrated HART**

  March 24th @ 10 AM

- **User Groups**
- **Automation Update**

  January 20th @ 10 AM
- **Networking Update with Panduit**

  February 17th @ 10 AM
- **Scalable OEE**

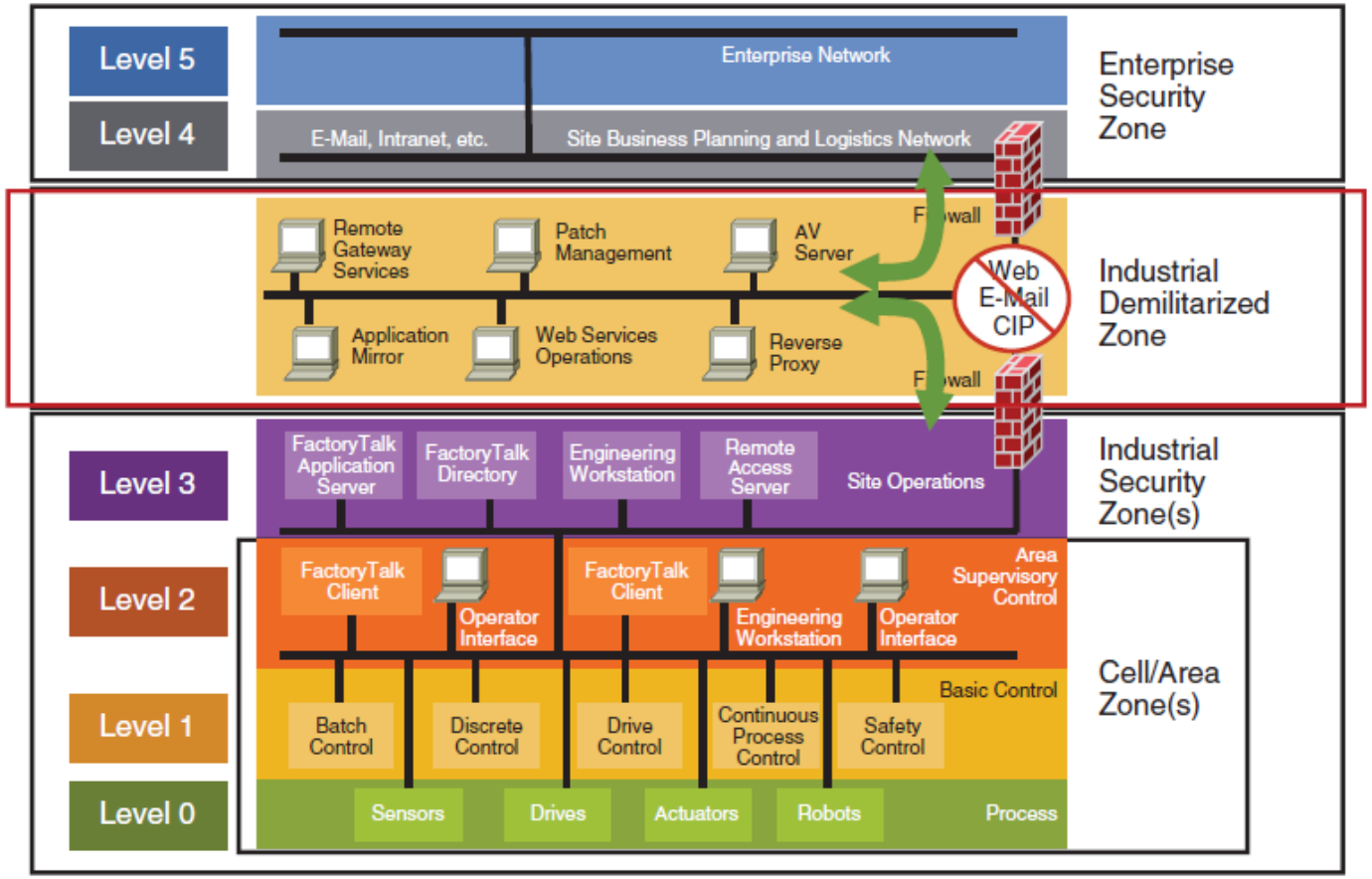
  March 17th @ 10 AM

reynoldsonline.com

IIoT – What Is It?

Industrial Internet of Things

Wiki Definition: Interconnected sensors, instruments, and other devices networked together with computers' industrial applications

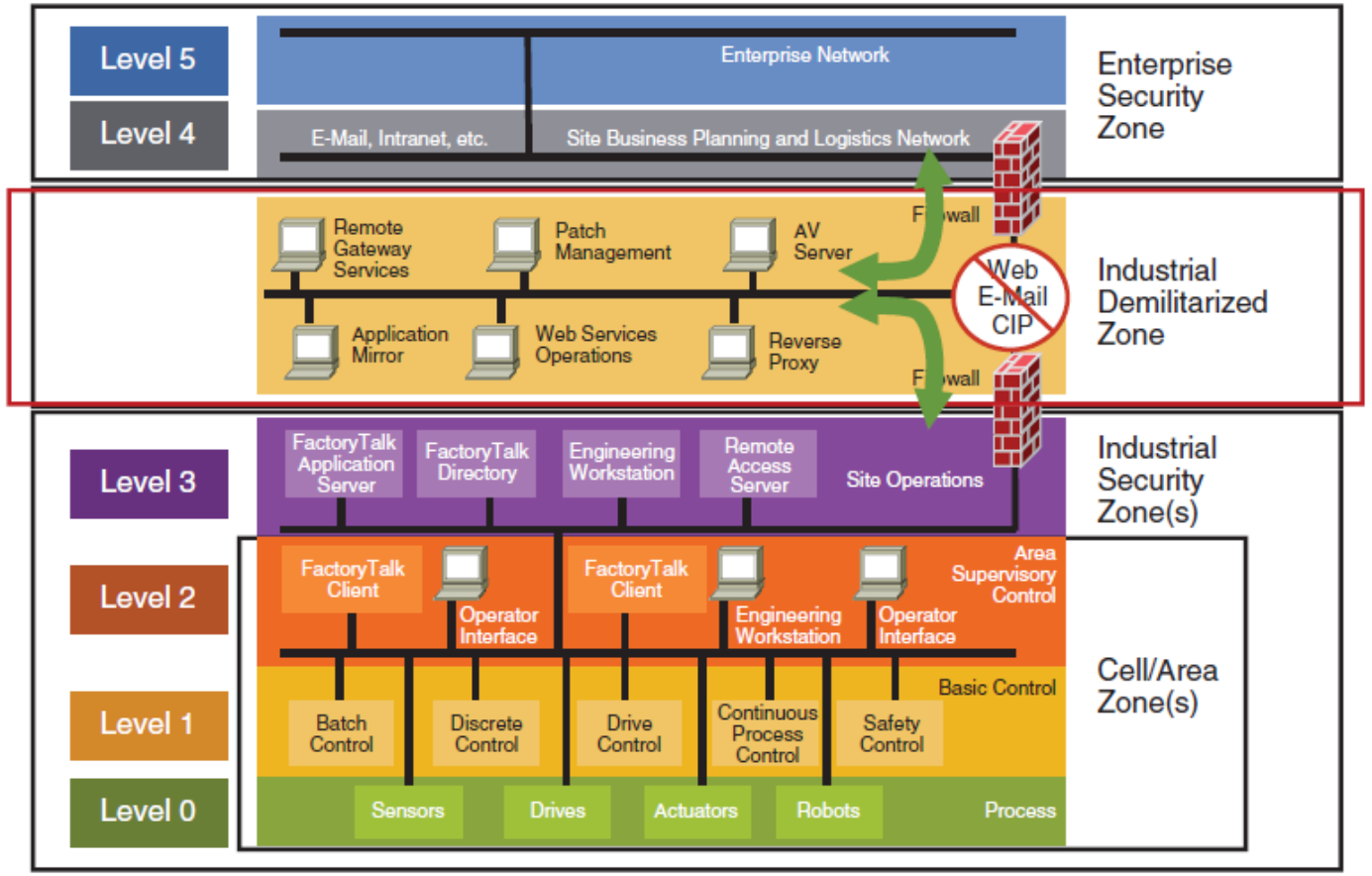


- But wait…I've seen this picture before…
- OK, so what is the rest of the story?
- Is this IIoT?

IIoT – What Is It?

Industrial Internet of Things

Purdue Enterprise Reference Architecture - Typical Automation Architecture model

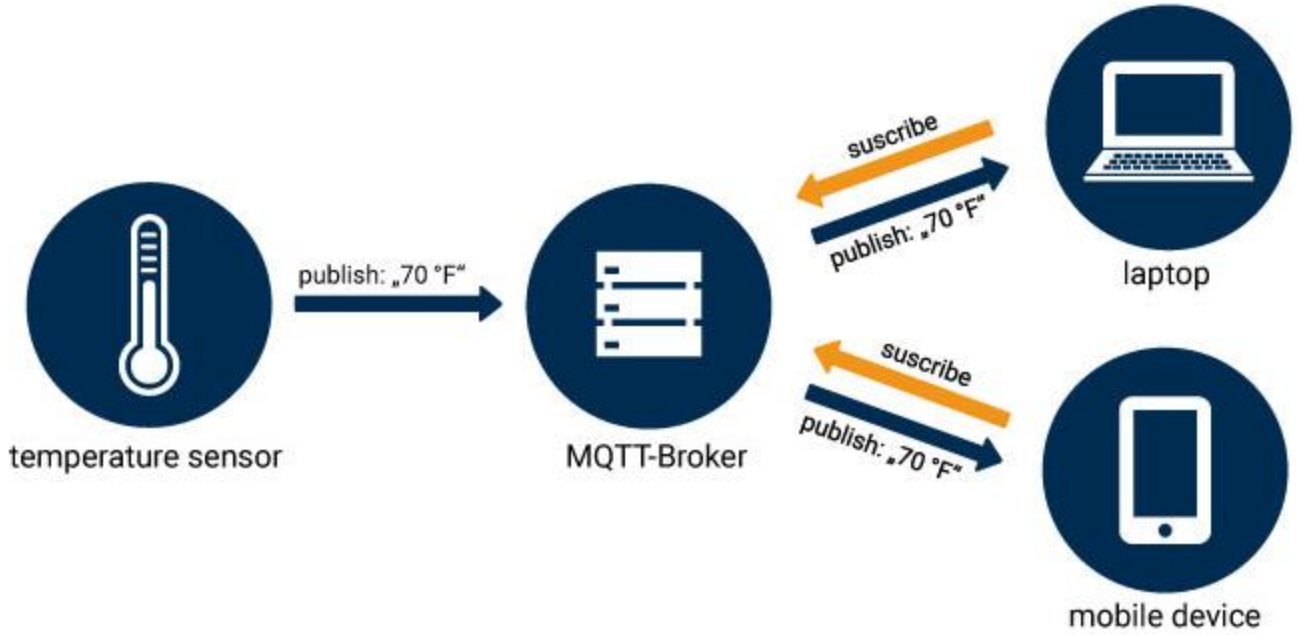


- Communication Protocols:
  - Client/Server Architecture
  - Producer/Consumer Network
- Configuration requirements for moving data from one level to another
- Is there an easier way of moving data from the Control Layer to the Enterprise?

IIoT – What Is It?

Industrial Internet of Things

IoT Architecture – MQTT (Messaging Queuing Telemetry Transport)



- Communication Protocol
  - Publish/Subscribe
- Device publishes data to a Broker, or Namespace
- Consumer of data subscribe to Broker or Namespace
- Lightweight Messaging Protocol
- (Credit OPC-Router.com)

IIOT – Why Do We Need It?

Why Do We Need IIoT Data Infrastructure in the Industrial Automation Space?

- Assist already depleted facility maintenance resources
- Reduce unplanned downtime
- But what about the typical automation data model, doesn't it accomplish the same thing?
  - Yes, but …IIoT solutions often require fewer resources and can be quicker to implement

How Do I Connect My Rockwell Controllers to the IIoT?

Controller Data via MQTT

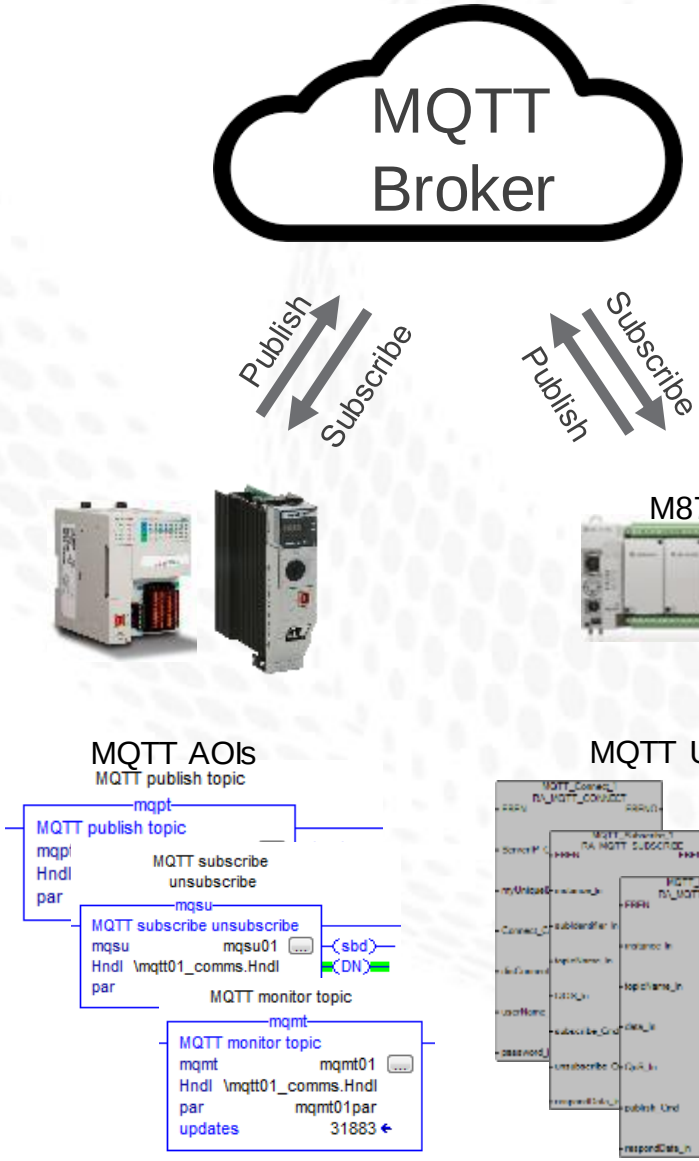
IIoT data delivered directly from a controller

Logix 5000™ MQTT sample code

- Use with ControlLogix® 5580 and CompactLogix™ 5380 controllers or with other Logix controllers and a 1756-EN2T or similar card with socket interface (Logix V24 or newer firmware)
- Connect to MQTT broker or server
- Topics can be subscribed, unsubscribed and published.
- Updates to subscribed-to topics can be monitored for updates.

Micro800™ MQTT sample code

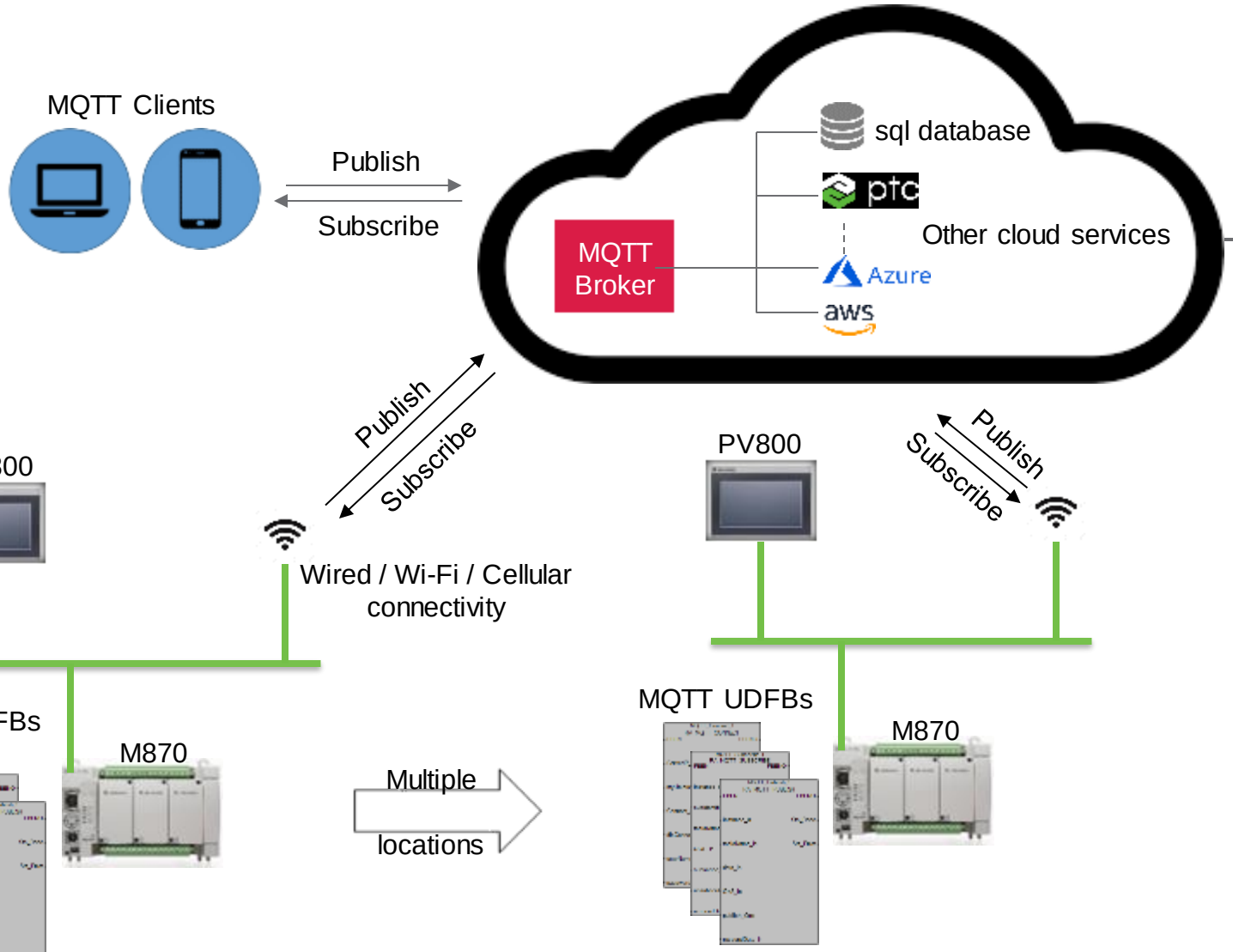
- Use Micro800™ (M800) controllers with built-in Ethernet (e.g. M870) to connect to an MQTT broker or server
- Exchanges data between M800 controllers or M800 controller to other software
- Supports authentication (UID/PW), Last Will and Testament (LWT) and Quality of Service (QoS) levels 0,1,2



https://www.rockwellautomation.com/search/ra-en-US;keyword=MQTT;startIndex=0;activeTab=Sample_Code

Micro800™ to Cloud Architecture

M800 exchanges data via MQTT protocol – Broker on premise or in cloud!



Enterprise Analytics

Web clients

Custom Analytics

Micro800™ to Cloud Implementation

- **Deployment:**
- Simple workflow and easily deployable!
- Readily available sample code with UDFB for exchanging data via MQTT protocol
- Exchanges data between M800 controllers or M800 controller to other software
- MQTT broker can reside either on premise or in cloud
- Supports authentication (username and password), Last Will and Testament (LWT) and Quality of Service (QoS) levels 0,1,2
- **Applications:**
- Remote monitoring, e.g. Unmanned wellheads in O&G industry to improve productivity and asset utilization
- Inventory management, e.g. Warehouse management in Logistics industry to optimize operations
- Monitoring equipment's in larger area, e.g. Water sprinklers in agricultural industry
- Monitor critical parameter in long haul pipeline in Water, O&G distribution networks

Other communication products

Hardware gateways, protocol converters and communications software toolkits

Software
Hardware

Encompass™ product reference guide

http://literature.rockwellautomation.com/idc/groups/literature/documents/qr/encomp-qr004_-en-p.pdf

Introduction to FactoryTalk Edge Gateway

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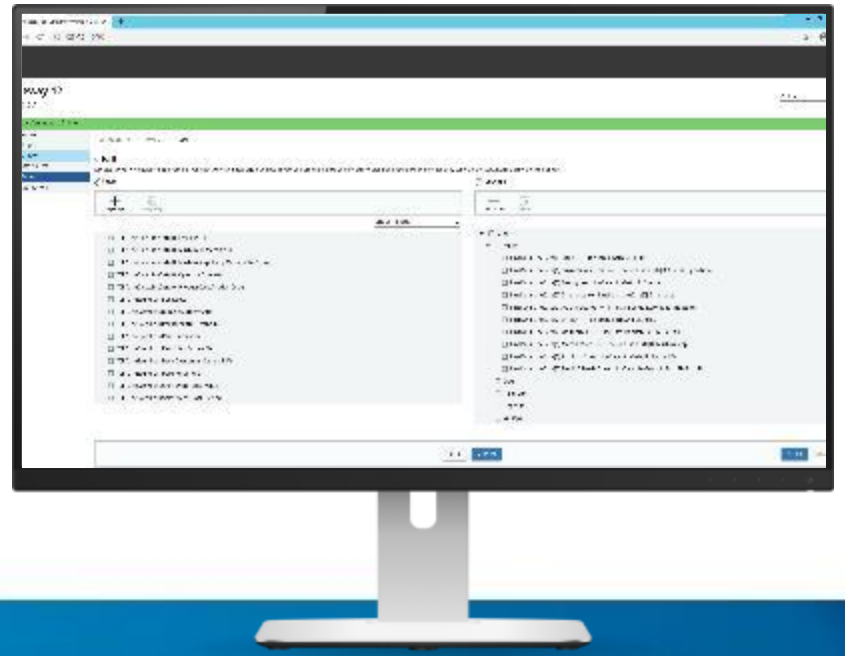
FT Edge Gateway™



Formerly known as FactoryTalk Linx Information Gateway

Intelligent edge solution to connect disparate devices and applications, from industrial control systems to enterprise information systems

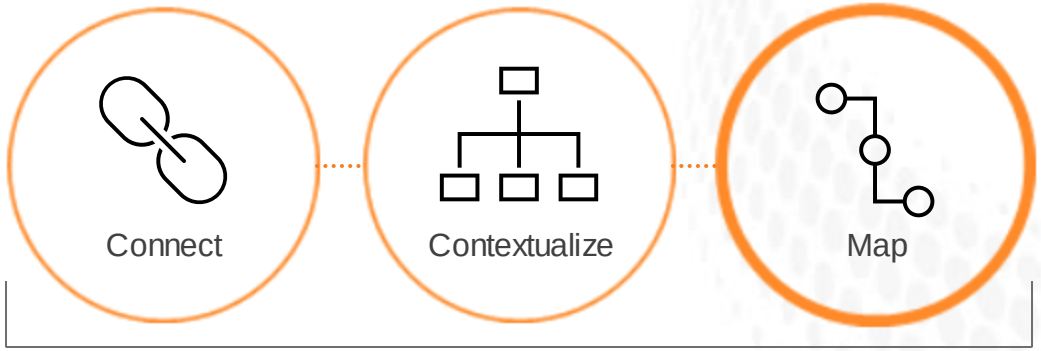
Enables contextual data delivery

FactoryTalk Edge Gateway

Driving industrial connectivity

FT Edge Gateway™

Supports OT / IT collaboration by empowering control engineers to identify the most appropriate data sets and send information directly to the IT layer



EMPOWERS CONTROLS ENGINEERS TO CREATE INFORMATION MODELS WITHOUT TRADITIONAL IT SKILLS

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Connect to data sources (ingress drivers)

EtherNet/IP

- Drive & IMC
- Logix v16+
- FactoryTalk Smart Object Information Models and data

  (Requires Logix v28+)

FactoryTalk Linx

- RSLinx Enterprise

  (PLC-5, SLC-5, MicroLogix, Logix, etc.)
- OPC UA

- FactoryTalk Live Data

kepware

OPC FOUNDATION

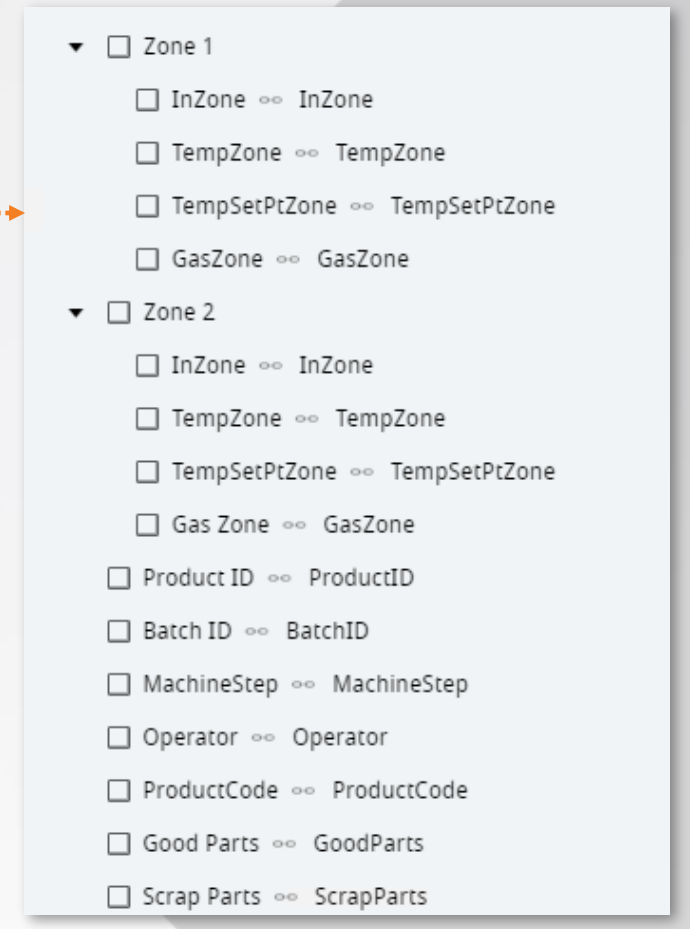
- Kepware for 3rd Party Data
- Generic OPC DA

- OPC DA for 3rd party connectivity to Kepware

Contextualize

CREATING AN INFORMATION MODEL

- Contextualizes data sets for big data analysis projects
- Allows OT engineer to organize data in context as it pertains to the OT assets
- Increases engineering efficiency for project deployment
- Simplifies maintenance and updates



Map data to applications (egress)

Azure IoT Hub

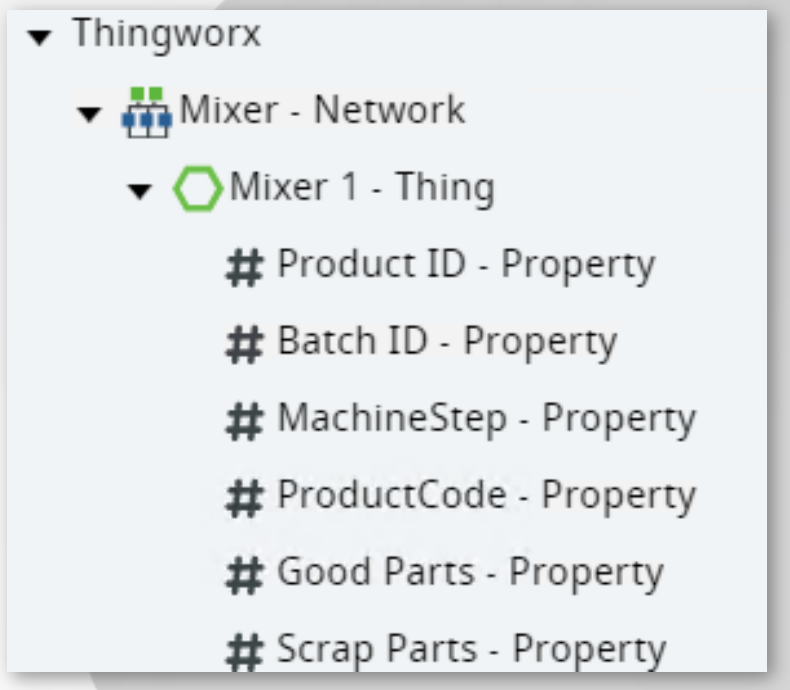
- Supports Azure IoT Hub and Azure IoT Edge
- Streams time-series data along with Information Model context

MSSQL

- Creates SQL table needed to store data
- Streams time-series data into SQL along with Information Model context

thingworx

- Creates objects in ThingWorx to replicate the gateway information model
- Streams data into ThingWorx model
- Available in future release



Suggested installation footprints

- 1756 Scalable Compute Module
- VersaView 5400
- ASEM Hardware with Windows OS Support
- Industrial PCs with Windows OS Support
- Server Class System

Rockwell Automation

expanding **human possibility**™

Thank you

www.rockwellautomation.com