

Welcome to Our Webinar



Ian Skerrett
Head of Marketing of HiveMQ



Marc Taccolini
Founder and CTO of Tatsoft

Designing an Edge to Cloud Architecture for IIoT

HOSTED BY



HIVEMQ

IN COLLABORATION WITH



TATSOFT
Advancing Elements for Industry™

We will start this session shortly



Welcome to Our Webinar

Designing an Edge to Cloud Architecture for IIoT



Speakers



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1 *About Tatsoft FrameworkX*

2 *Managing real-time data, evolution and current requirements*

3 *About HiveMQ*

4 *Demo: Edge to Cloud*

5 *Q&A*

Powerful Industrial Software for SCADA, HMI, Edge, IIoT and MES



Experience

- ✓ Founded 10 Years Ago, with 35+ years industrial DNA
- ✓ Based in Houston, TX with branch in Chicago and resellers and SI Partners around the world



Market

- ✓ Our Founder & Team are Experts at Real-Time Software and Operations Automation
- ✓ Original Focus was OEMs now more mainstream markets
- ✓ System Integrators, End Users, and OEMs



Technology

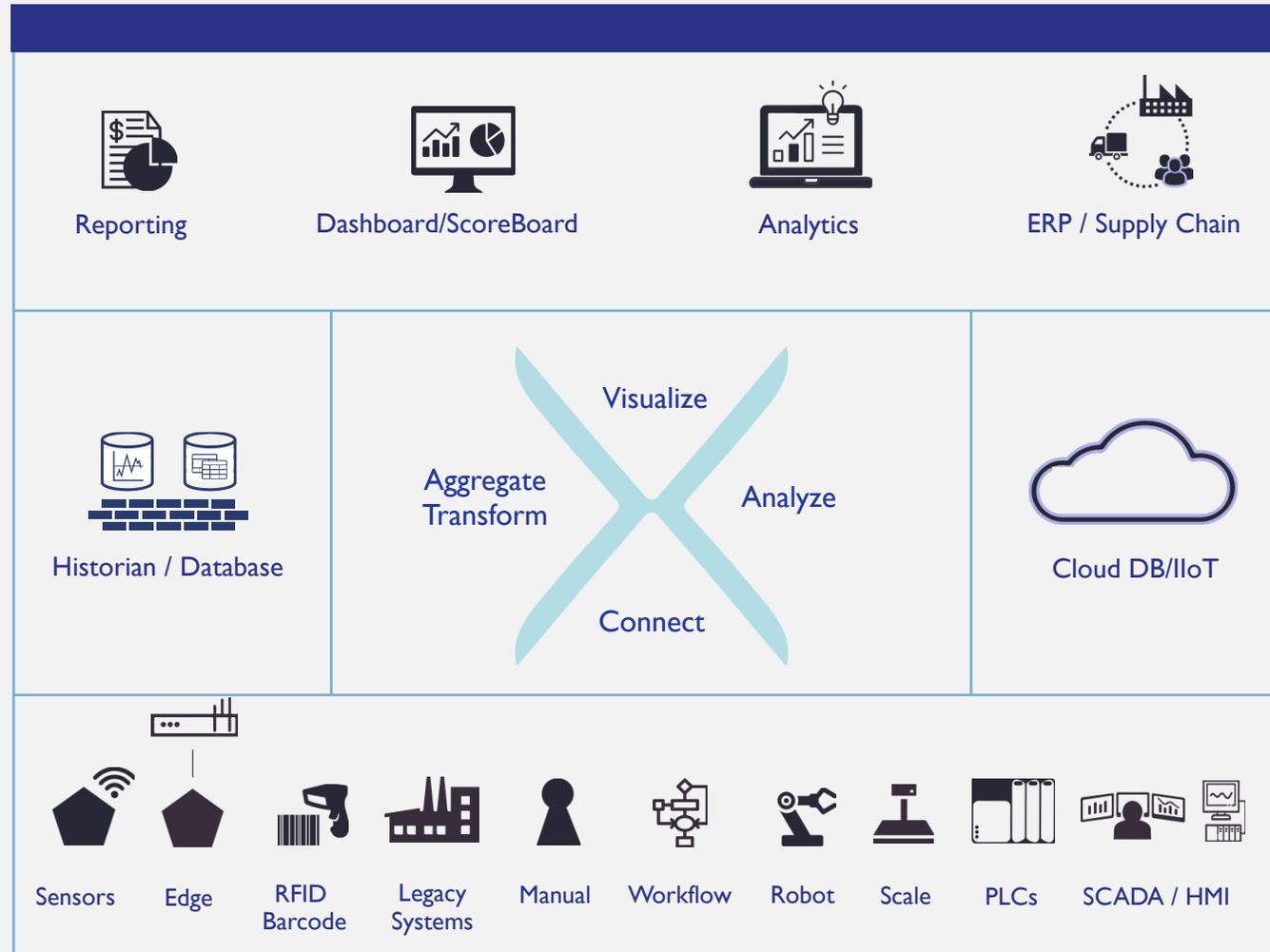
- ✓ Open - Built on OT and IT Standard Technologies
- ✓ .NET and Cross-platform compatible: Windows, Linux, Docker, iOS and HTML5
- ✓ Robust and scalable Platform



Product

- ✓ FrameworkX unified development
- ✓ Dynamic Connectivity to Any Device and Any Data Source
- ✓ New Release 9.2 introduces Dynamic Tag Provider and consolidating distributed Asset models

Create **Real-time Applications** with No Limits



Connect | Aggregate Transform | Visualize | Analyze

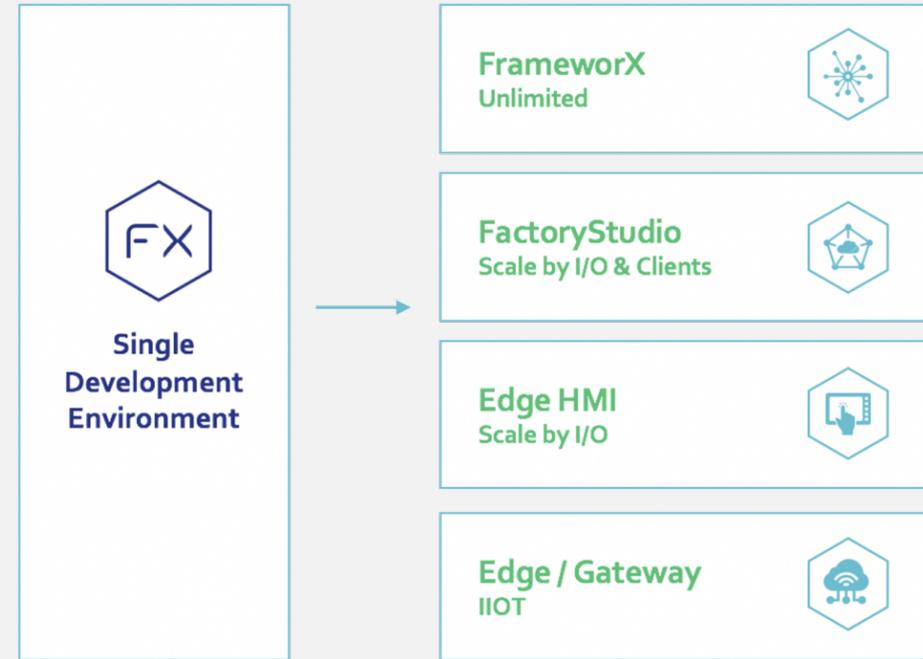


FrameworkX Product Family

Complete, Unlimited, Scalable

- FrameworkX is our Unlimited version, unlimited Clients, I/O and development, server based with all the tools you need
- FactoryStudio is scalable, by the number of I/O & clients
- Edge HMI scale by I/O, more affordable
- Edge/Gateway embedded device communications and processing at the edge or as flexible secure gateway

For even more flexibility, we also offer our FrameworkX Unlimited licensing as perpetual plus maintenance or software as a subscription (SaaS)



Delivers A **Complete Toolset** Out Of The Box



Collecting Factory-floor realtime data

'Cliffs Notes' history...

Four Generations of Software Development



1986
First PC-resident automation solution at General Motors plant in South America

1986



1994
Bosch Germany OEM agreement.

1995
Second generation technology developed w/ C++ + Object Oriented Programming, Bosch branding, **UniSoft** founded.

1988
Foundation of **UNITEC**.
First generation of technologies running in DOS.



1996
First Windows CE- HMI software, brought by UniSoft and branded-label to dozens of companies.



1996

Third-generation technology, MFC based, branded-label and licensed to many companies around the world, including **InduSoft Web Studio**, currently known as **AVEVA Edge**



2009
Tatsoft LLC founded.
Fourth generation technology using .NET framework, WPF, managed code

2012: FactoryStudio initial release
2014: OEM versions release
2016: Oil&Gas Rig Monitoring solution
2018: Major release focus on Edge HMI, HTML5
2020: Release focus on IoT, Python, Linux
2021: Major release for IIoT and Industry 4.0
Enhanced connectivity, Asset modeling, Dynamic Tag Providers and MQTT tools

2000

Managing Factory-floor realtime data

'Cliffs Notes' history...



Code	1/16-bit	Description	I/O Range
01	1-bit	Read coils	00001 – 10000
02	1-bit	Read contacts	10001 – 20000
05	1-bit	Write a single coil	00001 – 10000
15	1-bit	Write multiple coils	00001 – 10000
03	16-bit	Read holding registers	40001 – 50000
04	16-bit	Read input registers	30001 – 40000
06	16-bit	Write single register	40001 – 50000
16	16-bit	Write multiple registers	40001 – 50000
22	16-bit	Mask write register	40001 – 50000
23	16-bit	Read/write multiple registers	40001 – 50000
24	16-bit	Read FIFO queue	40001 – 50000

1980's

- Tag based addressing
- UDT (User Data Types), Templates
- Data Structure and metadata
- Multiple proprietary protocols
- Standards initiatives



1990's

- Asset centric applications
- Distributed data across many applications



2000's

Edge to Cloud - Architecture Requirements

Open:

- **Open technologies -> Interchangeability of components**
- **Not tied into any specific vendor solution**
- High Flexibility
- Enables self-service approach

Distributed and Secure:

- **Allow processing at Edge Devices**
- **Allow Hybrid storage (edge and on-premise historians)**
- High scalability and responsiveness
- Comply with NERC-CIP network security standards

Reliable:

- **Avoid duplication of data definition**
- Avoid hard-coded data mappings
- Resilient and secure architecture
- Reduces maintenance efforts

Distributed Data Steward

The data governance role, ensuring the collection, quality and fitness of the data assets, includes its metadata definition, is distributed across multiple systems, or sites, but abiding to Universal Namespace conventions defined within the corporation.



UNS
example:

Plant 1
...Line 1
.....HMI 1
.....PLC 1



Open Architecture and Unified Namespace

Realtime Traceability

Complete Visibility

Better Predictability

On Time Delivery

Higher Productivity

Cost Savings

Data Driven Informed Decisions

      **DEVICE**



ERP   

   **CONTROLLER**

CLOUD   

Tatsoft edge connectivity and data transformation

HISTORIAN





 **OSIsoft.**

 Wonderware
Historian

 **canary**

Prediktor 



Tatsoft HiveMQ Integration

New Partnership and Product Offering

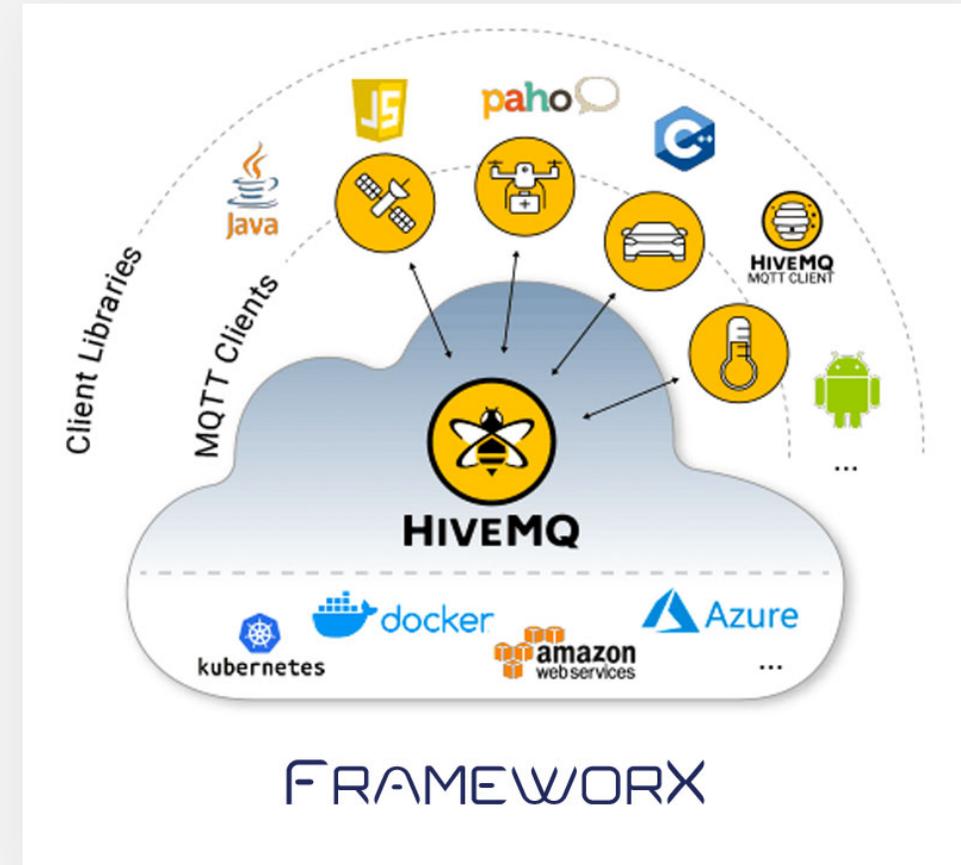
As your applications grows or you want the benefit and support of an enterprise class MQTT Broker. You can buy a bundled HiveMQ subscription license with any Tatsoft product:

25 MQTT Clients included in Tatsoft FrameworX installation

- More information on <http://tatsoft.com/hivemq>

Upgrade to multiple configurations:

- HiveMQ Industrial Edge - Basic Edition – 250 MQTT Clients
- HiveMQ Industrial Edge - Premier Edition – 1000 MQTT Clients
- HiveMQ Professional Edition – Unlimited Clients



1 *About Tatsoft FrameworX*

2 *Managing real-time data, evolution and current requirements*

3 *About HiveMQ*

Introduction to HiveMQ

- **Founded in 2012**, based outside of Munich
- HiveMQ helps **move data to and from connected devices** in an **efficient, fast** and **reliable** manner
- **130+ customers** with production IoT applications



Key Industries



**Connected Car
& Mobility**



**Manufacturing &
Industrial
Automation**



**Transportation &
Logistics**



**Connected Assets
& Products**

Key Customer Challenges



Reliability of business critical systems



Scalability to meet demand



Cost efficiency of connectivity



End to end security

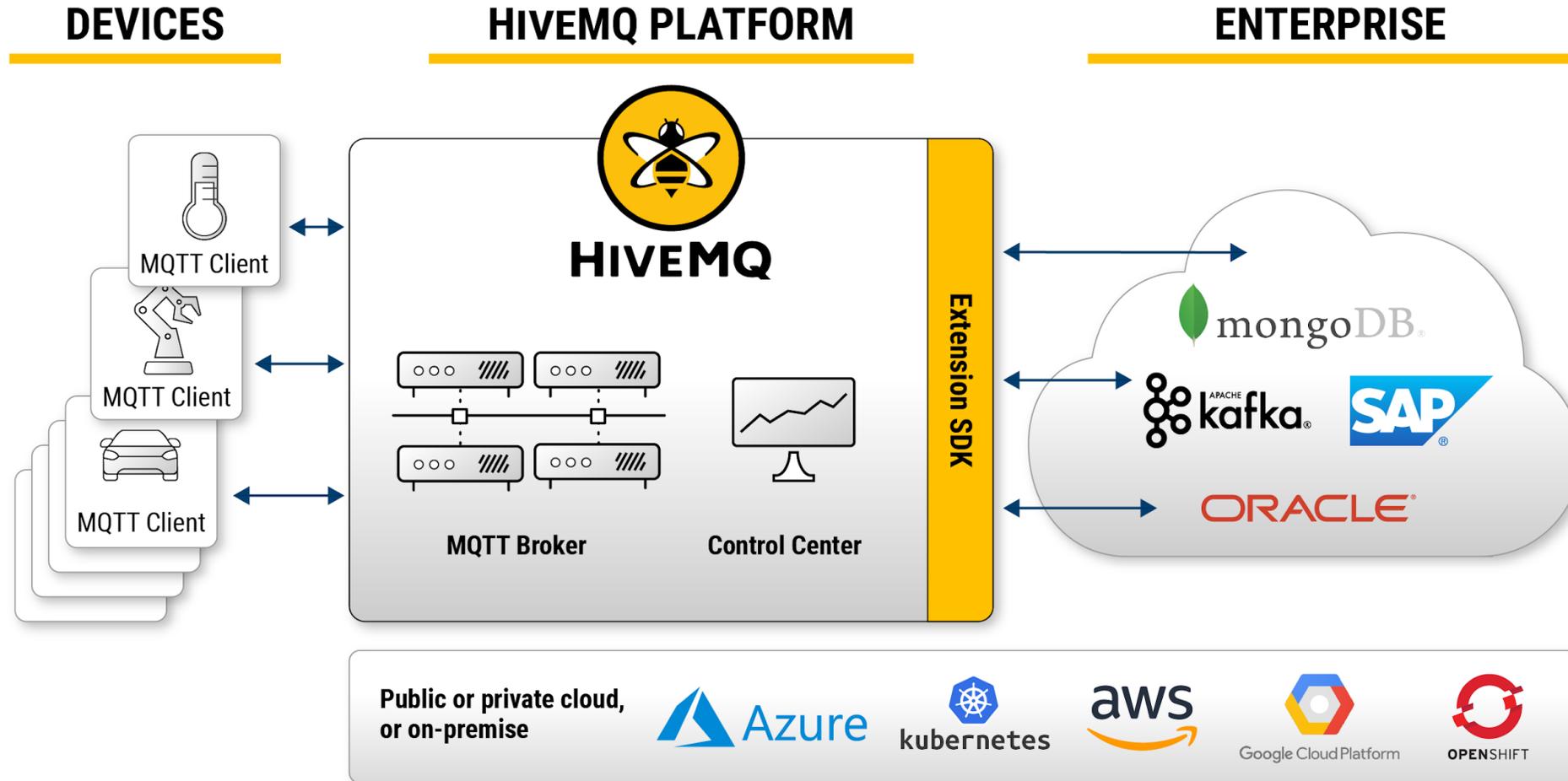


Observability of deploy devices



Integration of IoT data into existing systems

Enterprise MQTT Platform



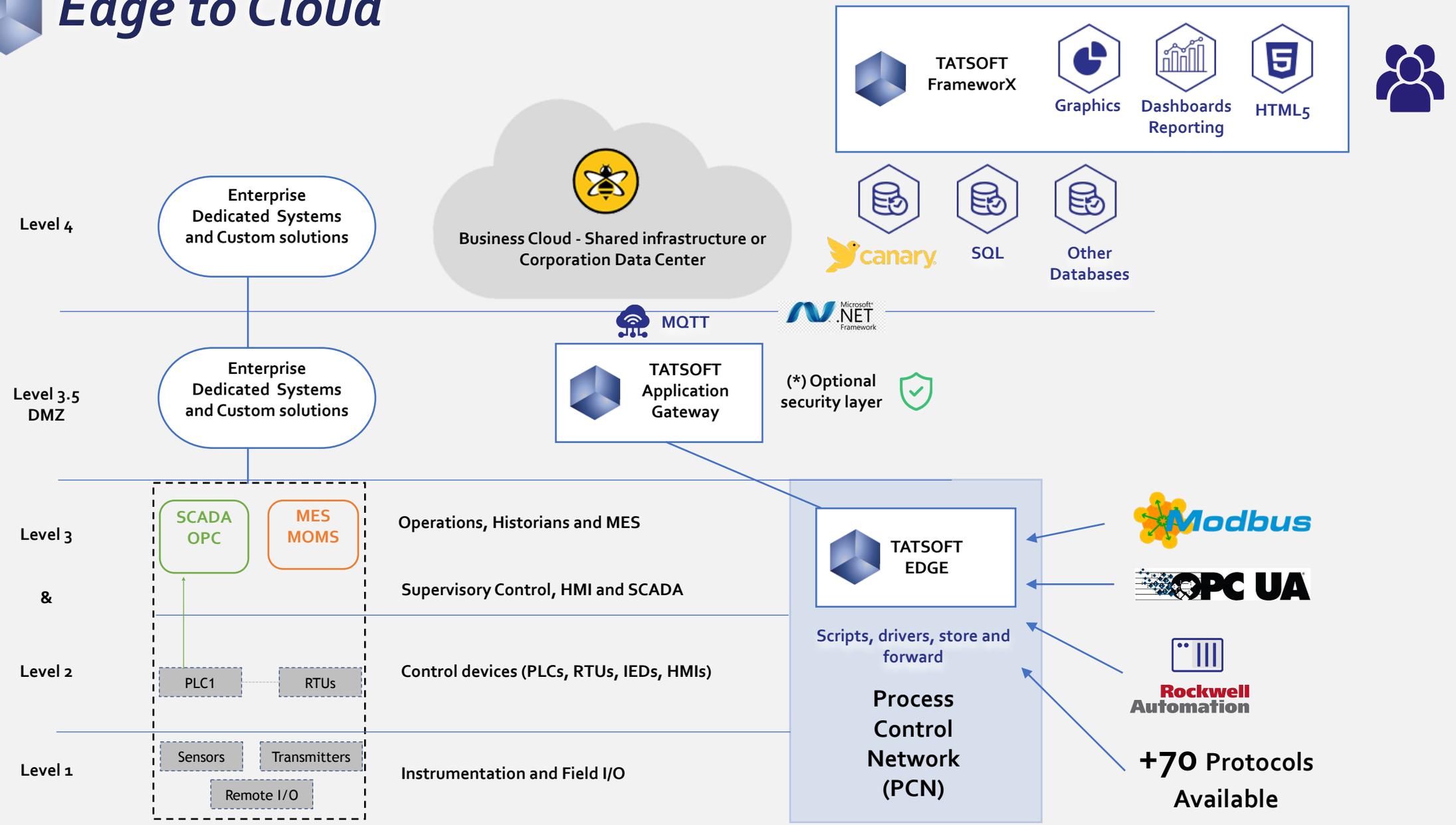
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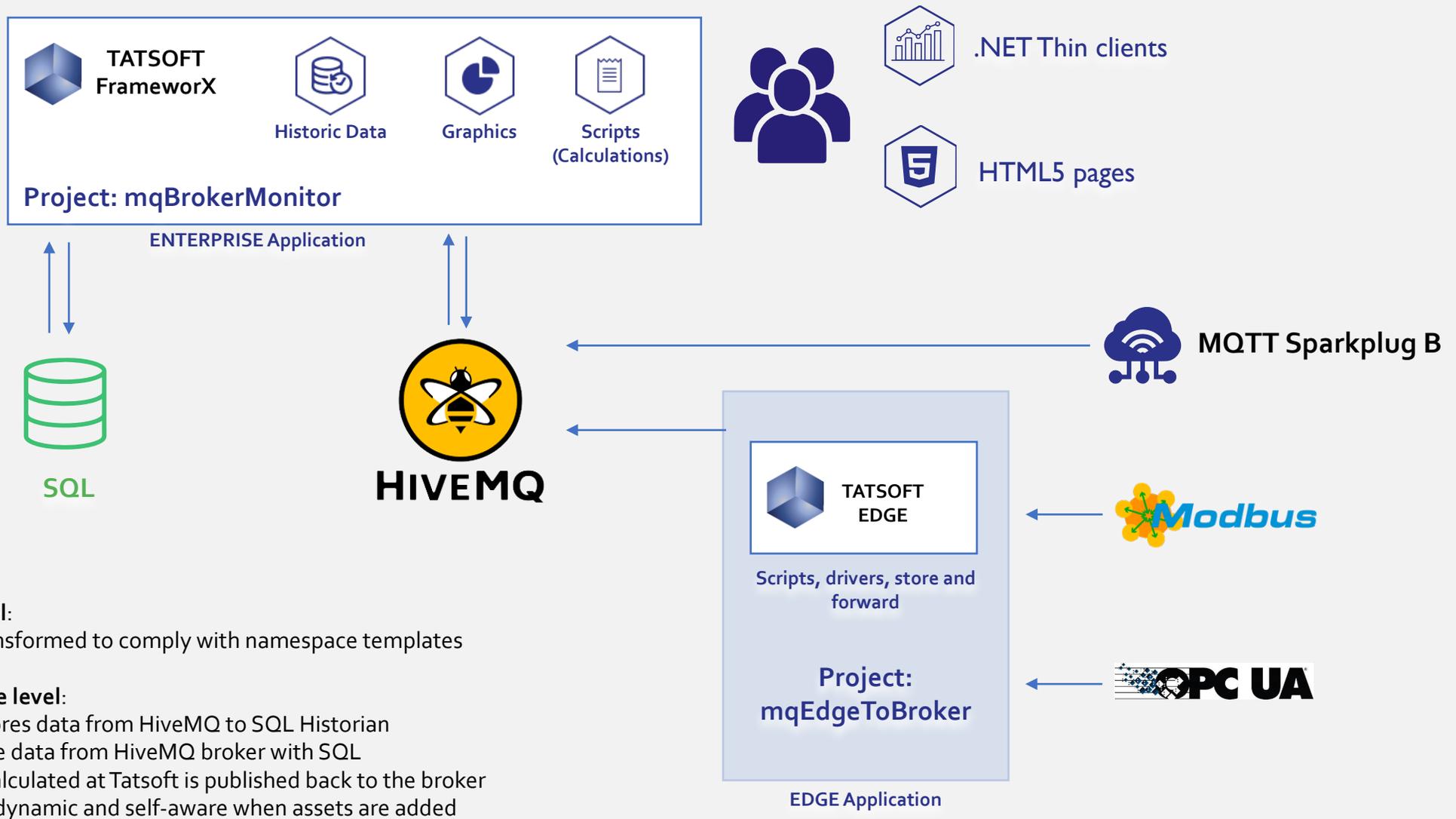
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Edge to Cloud



Edge to Cloud demo application



At the Edge level:

- PLC data is transformed to comply with namespace templates

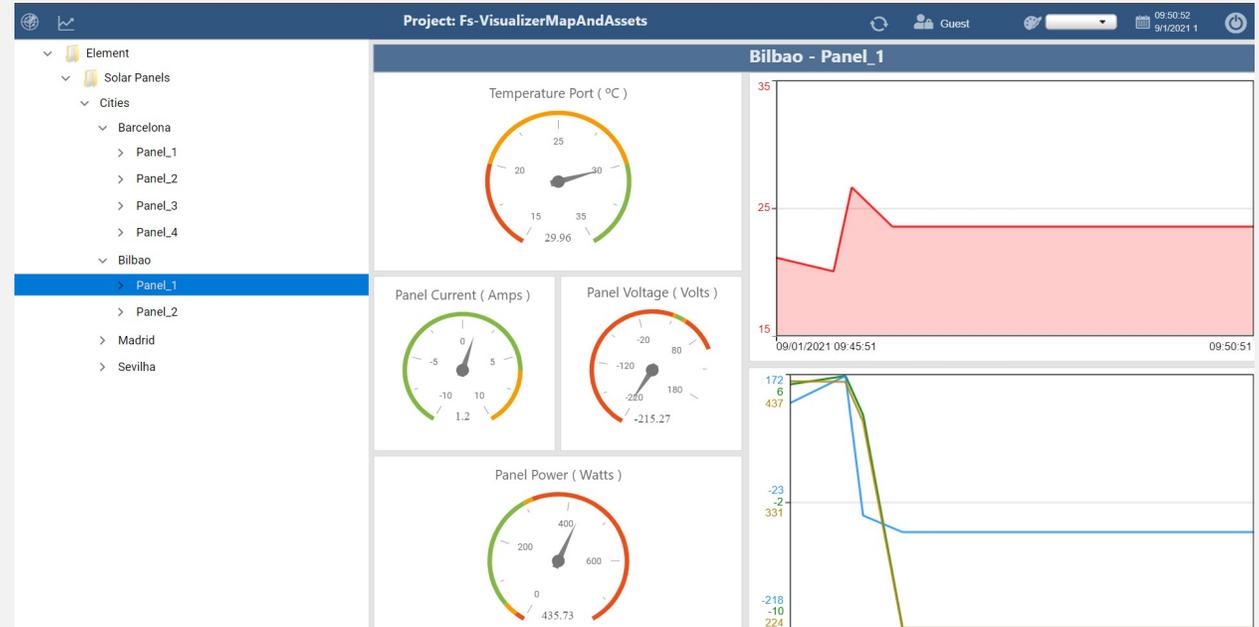
At the Enterprise level:

- FrameworkX stores data from Hivemq to SQL Historian
- Charts combine data from Hivemq broker with SQL
- Aggregation calculated at Tatsoft is published back to the broker
- Application is dynamic and self-aware when assets are added



Dynamic Asset Data Modeling

- Leverage Sparkplug B specification
- Topic Namespace and Payload Definition
- Easily add and combine metadata from multiple systems into a single cohesive Asset Model
- Birth and death messages allows easy management of dynamics systems
- Report by exception maximizes performance
- Simplify generalized analytics
- Simplify visualization and navigation through templates



Resources

- To learn about MQTT, get the MQTT Essentials eBook: <https://www.hivemq.com/download-mqtt-ebook/>
- To evaluate HiveMQ MQTT broker, visit: <https://www.hivemq.com/downloads/>
- To try the HiveMQ Cloud MQTT Broker that enables you to connect up to 100 devices for free, visit: <https://www.hivemq.com/cloud/>
- To use the public HiveMQ MQTT broker, visit: <https://www.hivemq.com/public-mqtt-broker/>
- To learn how to monitor MQTT client behaviour, visit the HiveMQ Control Center: <https://www.hivemq.com/docs/hivemq/4.6/control-center/introduction.html>
- To learn more on TATSOFT and HiveMQ, visit: <https://www.tatsoft.com/hivemq>



ANY
QUESTIONS
?



THANK YOU

Contact Details

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