IE19
FactoryTalk Optix Architectures and Use Cases: From Edge to Enterprise

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Rockwell Automation
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Agenda

01 FactoryTalk Optix software components

02 FactoryTalk Optix for Edge

03 FactoryTalk Optix for HMI

04 FactoryTalk Optix for SCADA

05 Demo

SCALABLE

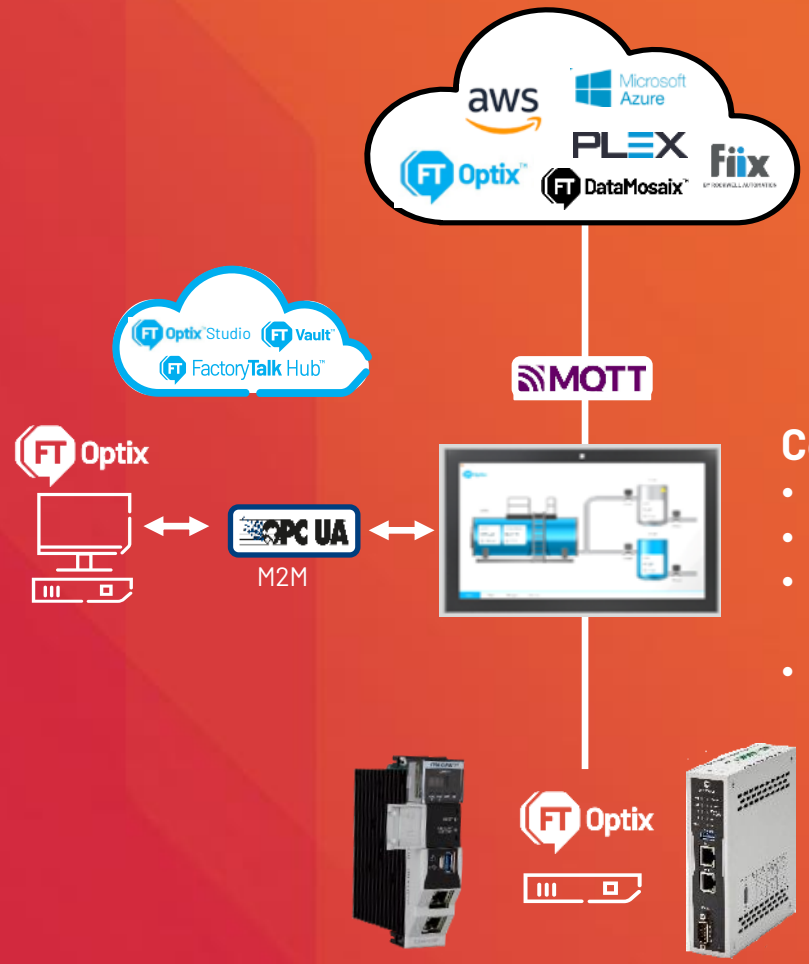
The FactoryTalk Optix platform

FactoryTalk® Optix™ for SCADA[1]
- System configuration and monitoring
- Cloud-hosted deployment
- Remote management and deployment

[1]Initial offering available in 2026

FactoryTalk® Optix™ for HMI
- Responsive Graphics
- Embedded and Station deployment
- Third-party Drivers
- OPC UA machine-to-machine

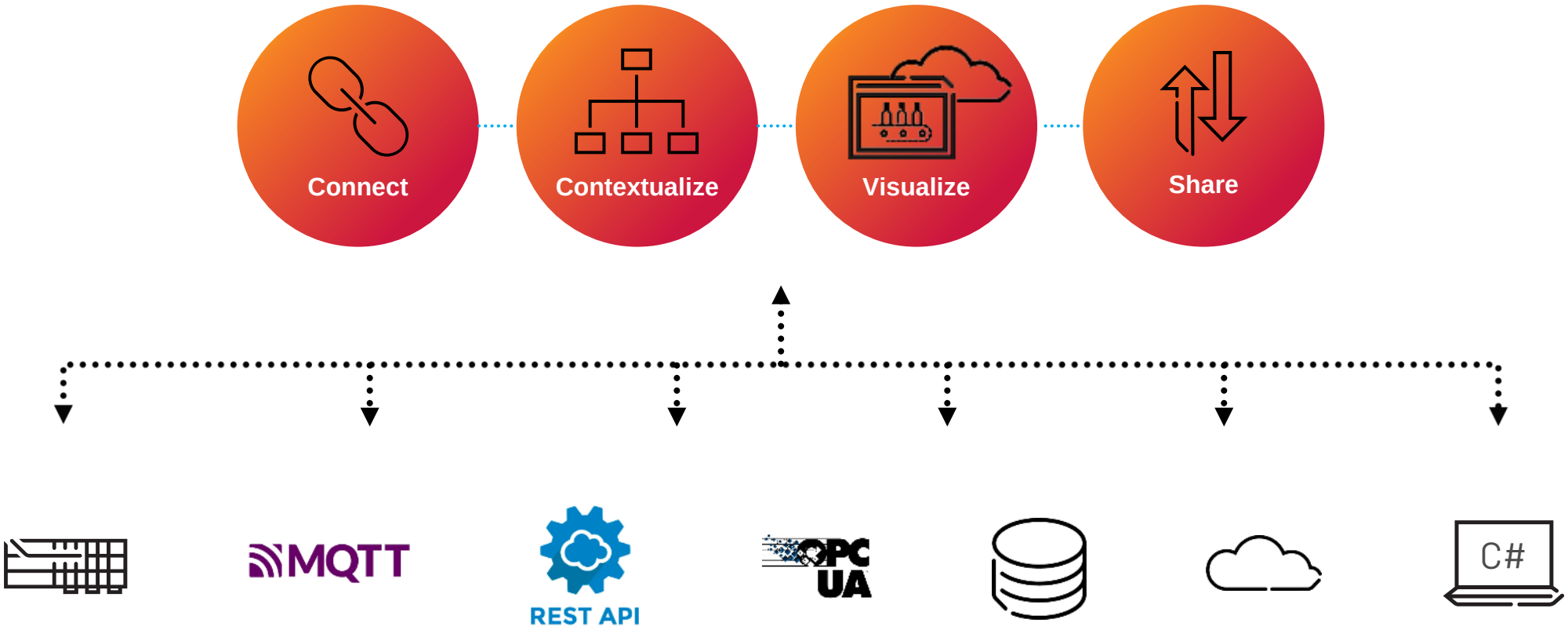
FactoryTalk® Optix™ for Edge
- IoT connectivity, MQTT
- Smaller, purpose-built applications
- Embedded runtime devices like: LEEC and OptixEdge™



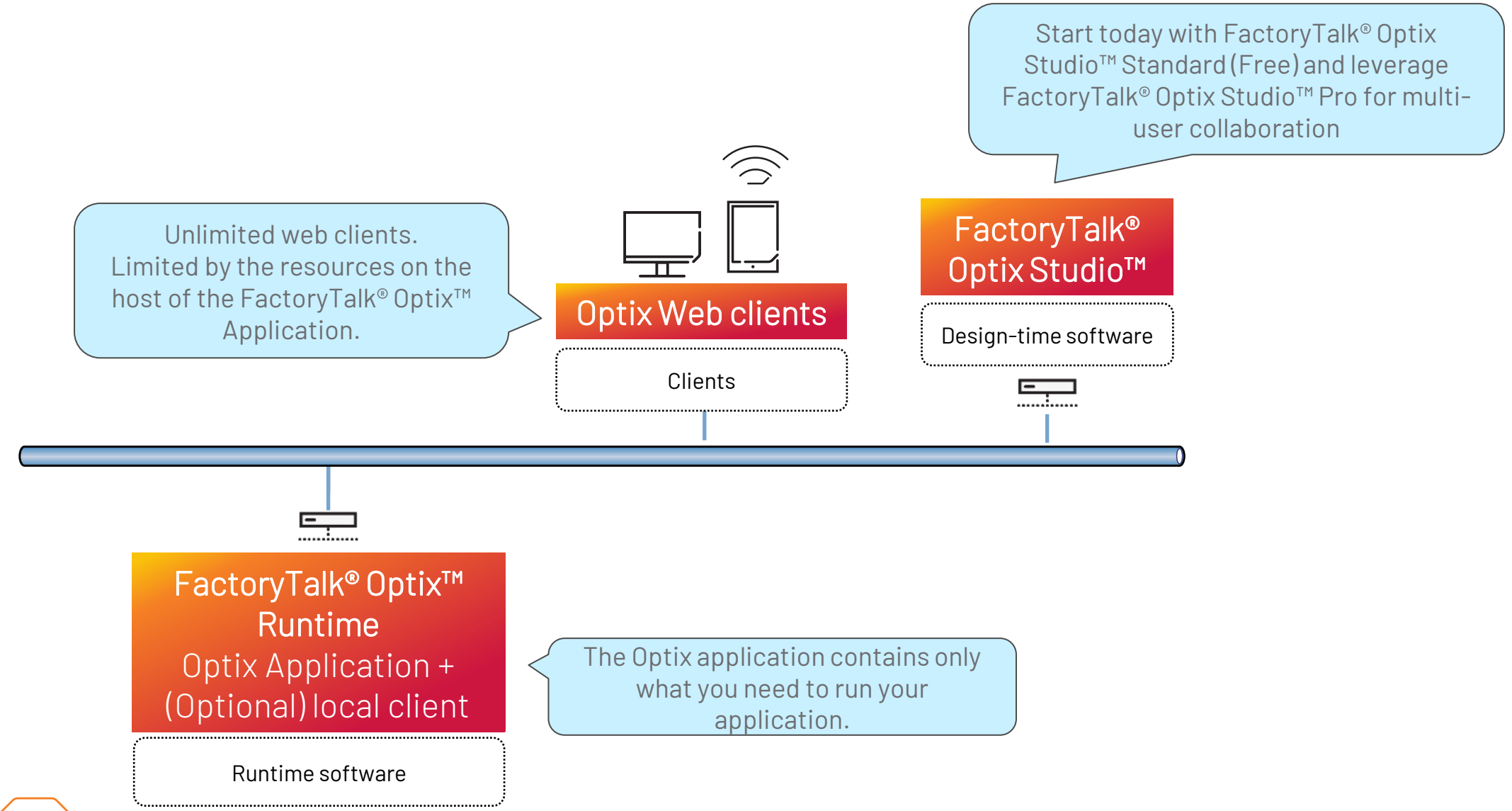
Common platform
- Collaborative Workflows
- Connectivity to devices
- Integrated version control
- Pay for only what you use

FactoryTalk Optix platform

Robust edge connectivity platform to enable data and analytics with core operations data



FactoryTalk Optix software components



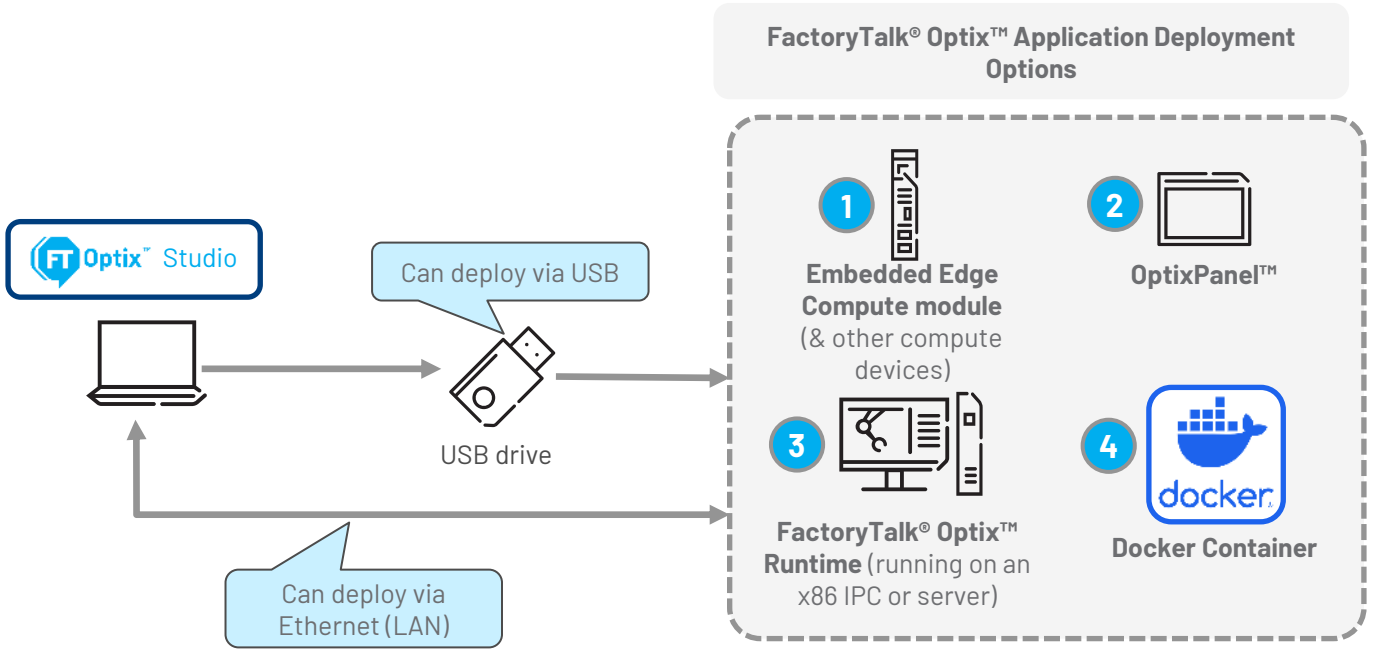
FactoryTalk Optix software components

Design-time and Runtime software

- FactoryTalk® Optix Studio™
  - Integrated development environment (IDE) for designing and compiling HMI or Internet of Things (IoT) applications.
  - Available as a desktop IDE (for Windows®) and a Web IDE that can be accessed from an HTML5 web browser
  - (optional) External code editor: Rockwell Automation recommends using Microsoft® Visual Studio® 2022 or Microsoft® Visual Studio® Code as the default code editor.
- FactoryTalk® Optix™ Runtime
  - Runtime software installed on the target device. Available for Windows® and Linux
    - FactoryTalk® Optix™ Application Update Service
      Software that is installed on the target device for updating and deploying FactoryTalk® Optix™ Applications from FactoryTalk® Optix Studio™ to the target devices
    - Entitlement Manager
    - FactoryTalk® Optix™ Runtime Service: (optional) Service when needed to run FactoryTalk® Optix™ as a service on the target device with or without a user interface.
- Optix application
  - An HMI or IoT application developed and compiled in FactoryTalk® Optix Studio™

FactoryTalk Optix Studio standard

Design and deploy applications locally

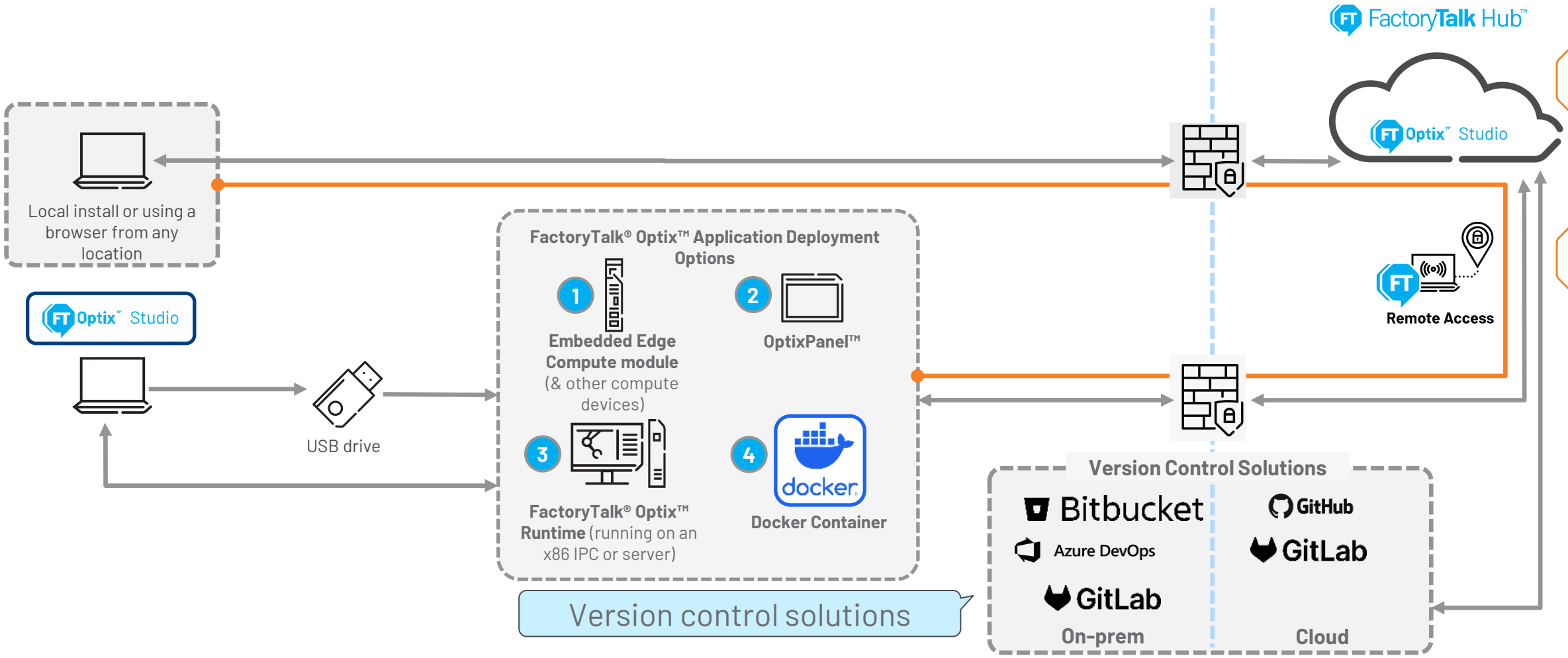


Edge

Cloud

General Data Flow

FactoryTalk Optix Studio Pro: Design

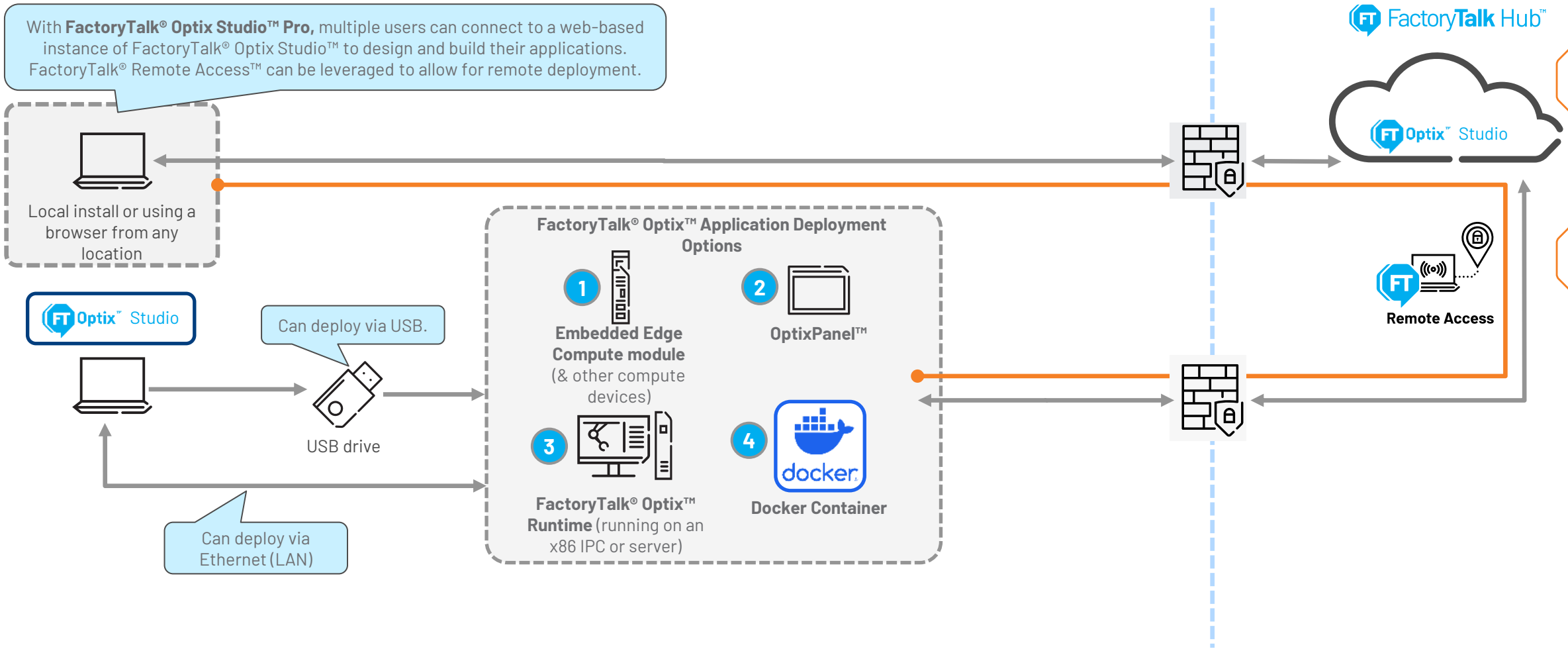


[1] FactoryTalk® Vault™ integration will be available in a future release.

General Data Flow

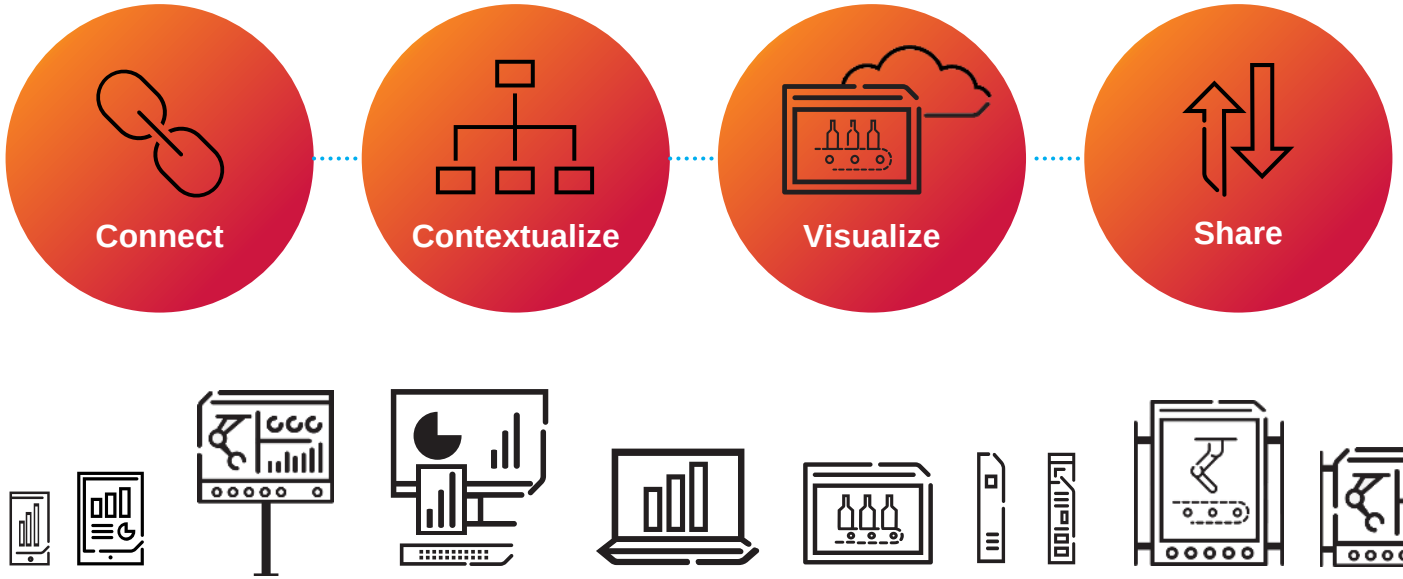
VPN Tunnel (FactoryTalk® Remote Access™)

FactoryTalk Optix Studio Pro: Deploy



FactoryTalk Optix platform

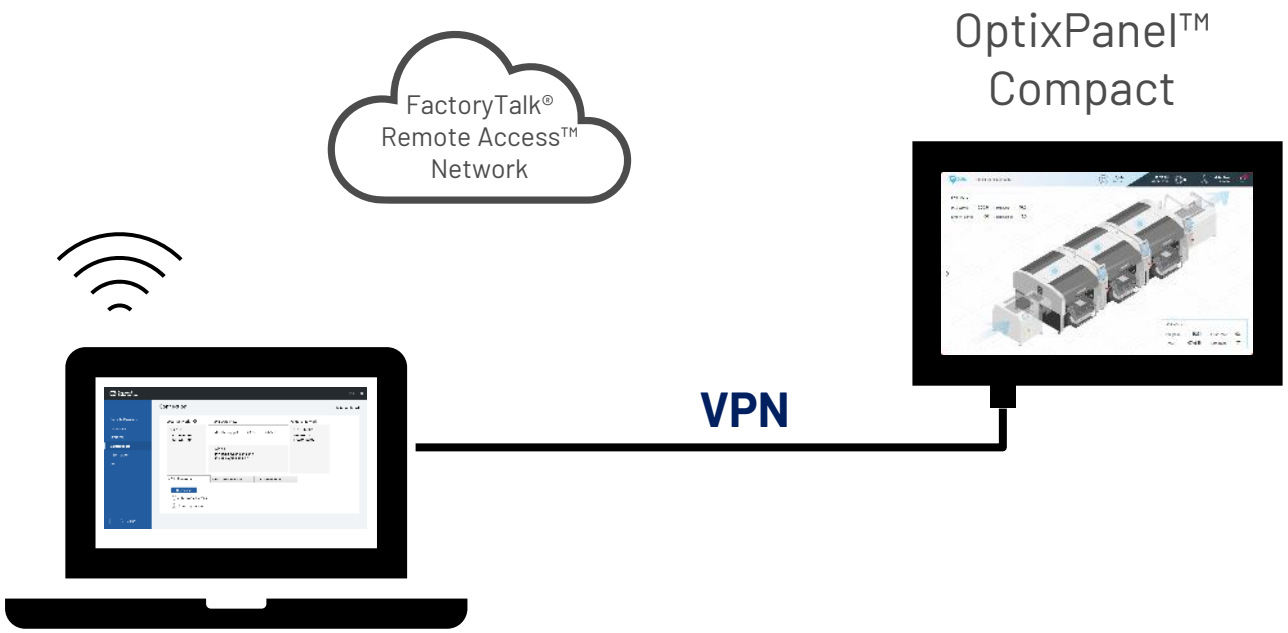
A portfolio of software and hardware with remote access

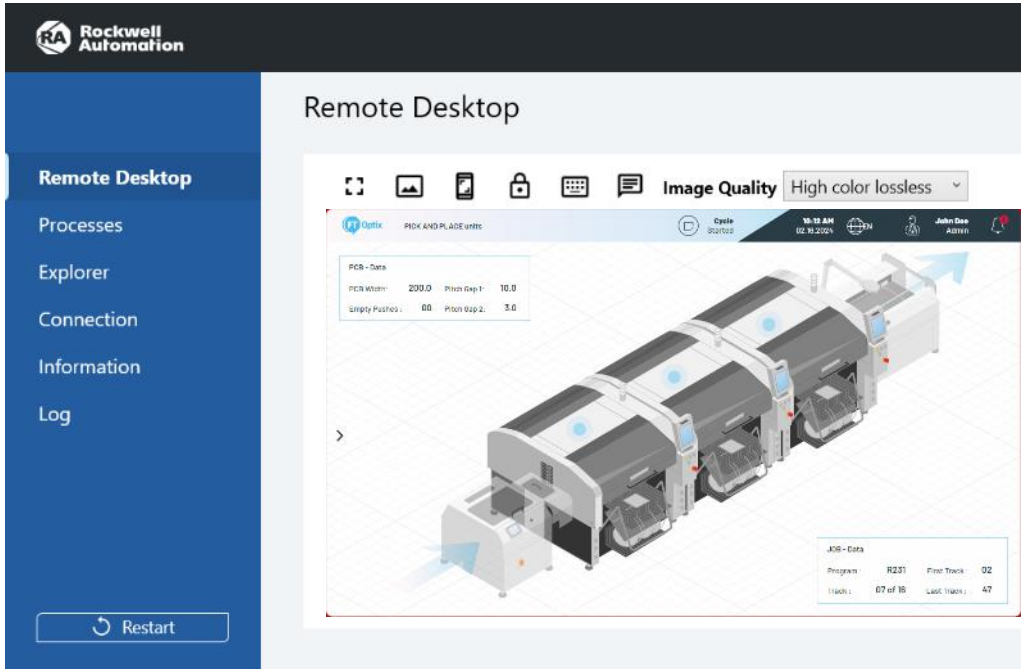


Rockwell industrial PCs include FactoryTalk® Remote Access™ Runtime

FactoryTalk Remote Access Runtime Basic

A point-to-point VPN with additional capabilities





FactoryTalk Remote Access Runtime Pro

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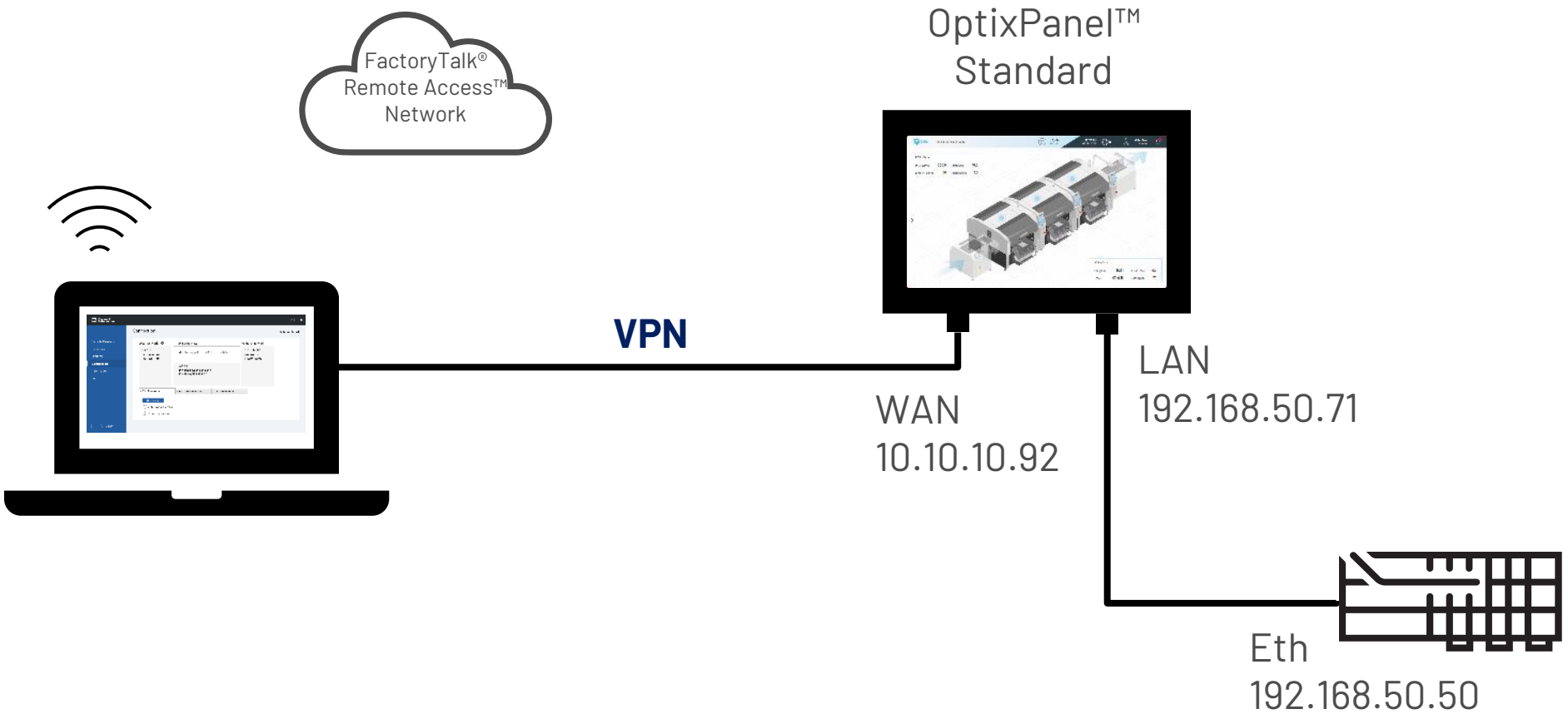

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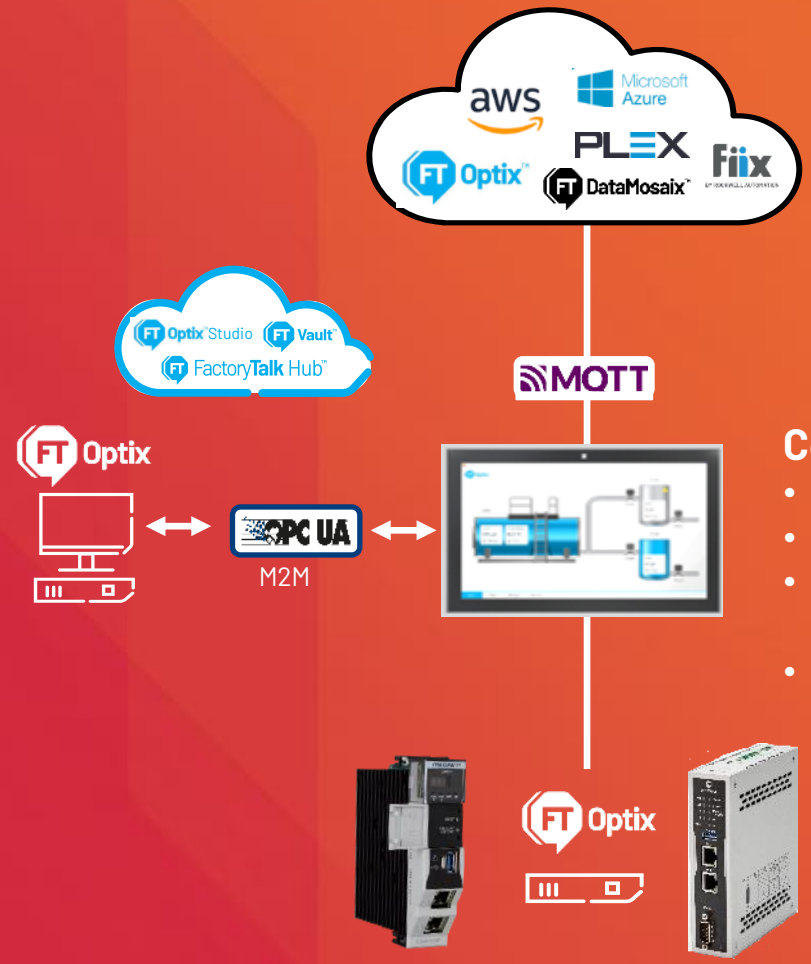

Common platform
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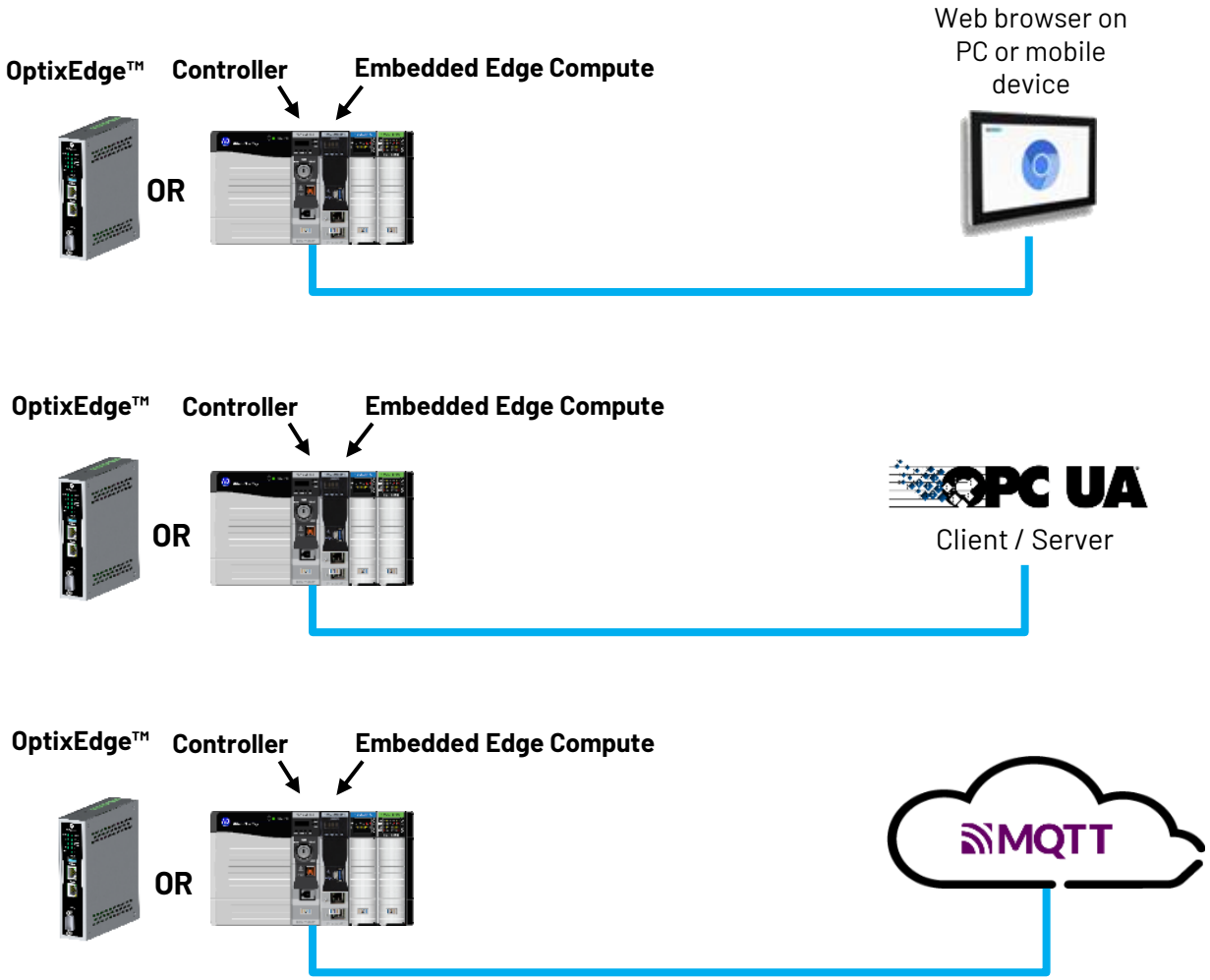
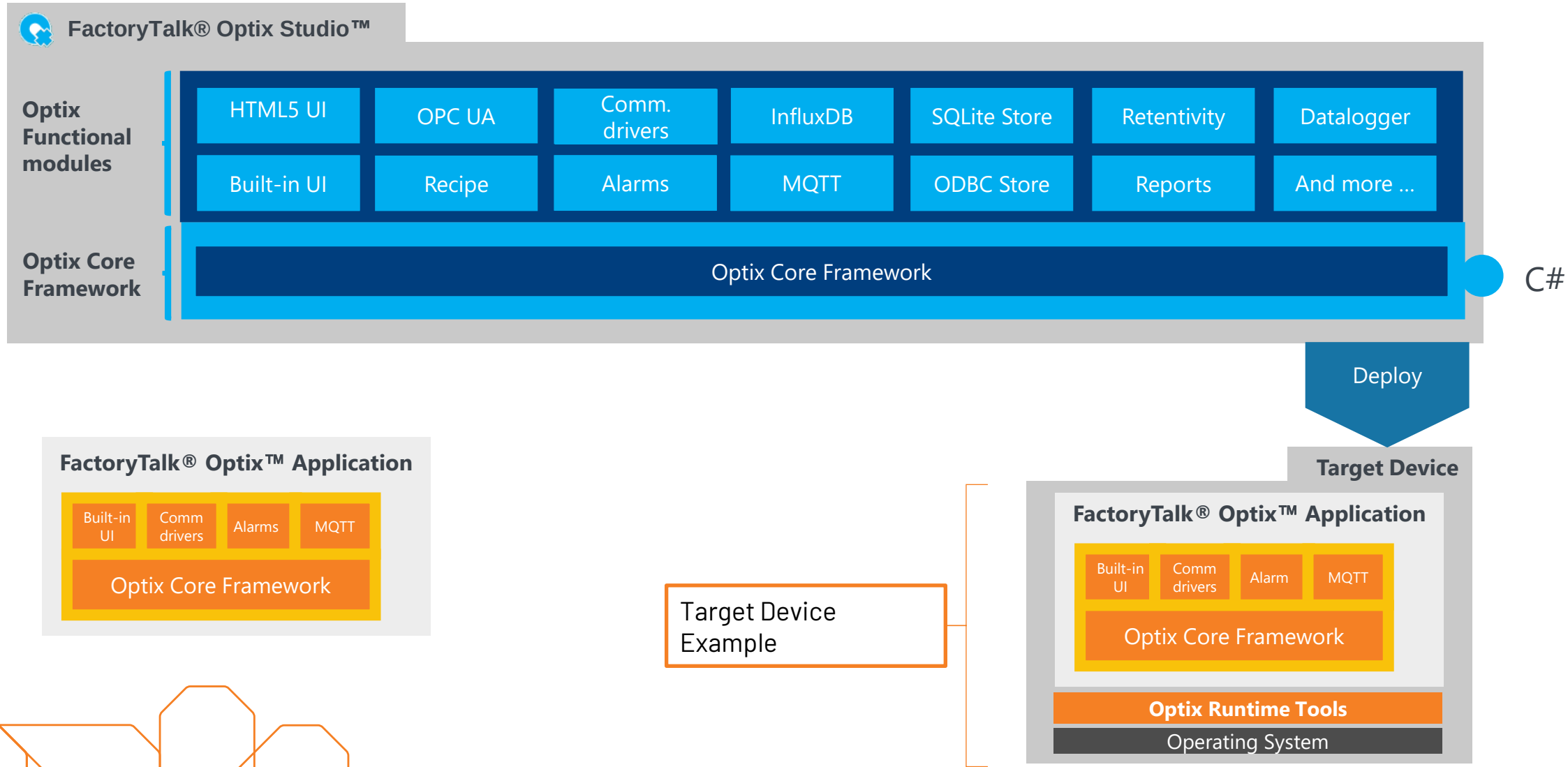
FactoryTalk Optix for Edge use cases

- HTML5 web-based HMI
  - Dashboarding
- Middleware
  - OPC UA (Server/Client)
  - MQTT (Publisher/Subscriber/Broker)
  - REST API (Server/Client)
  - SMTP / FTP
- Protocol gateway
- Data collection
  - ODBC (SQL) / InfluxDB
- Build your Own App - C# extensibility
- FactoryTalk® Remote Access™ Runtime Pro
- **And more...**



FactoryTalk Optix: Lightweight and self-contained



FactoryTalk Optix sizing tools on FactoryTalk Hub

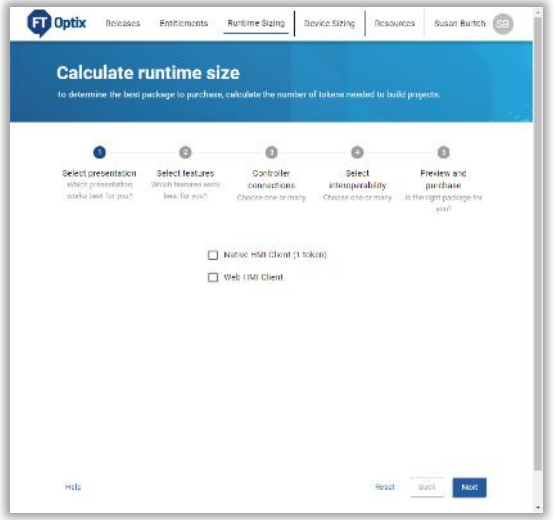
Tools to help you optimize software and hardware options for cost and performance

Runtime Sizing Tool

Walk through FactoryTalk® Optix™ feature options to determine the right Optix Runtime license for your application

Takes you to the ecommerce portal to purchase

Accessed through the FactoryTalk® Optix™ tile on FactoryTalk® Hub™

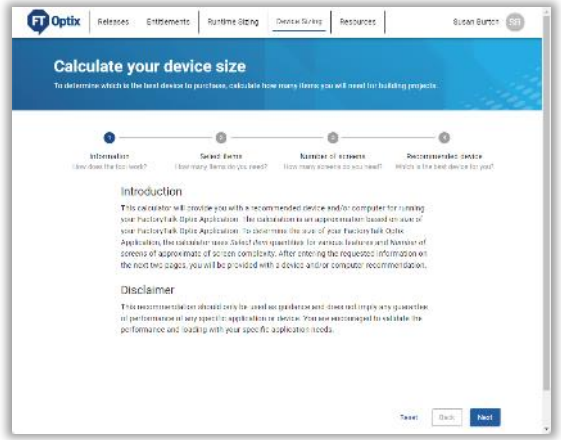


Device Sizing Tool

Walks through elements in a project that affect system performance, estimates system memory and horsepower required, and recommends a device: OptixPanel™, ASEM™ 6300, or Embedded Edge Compute module

Sizing based on tags, alarms, data logger, recipes, web clients, number of displays and screen object density, etc.

Accessed through the FactoryTalk® Optix™ tile on FactoryTalk® Hub™



OptixEdge Standard

The embedded hardware solution optimized for FactoryTalk Optix

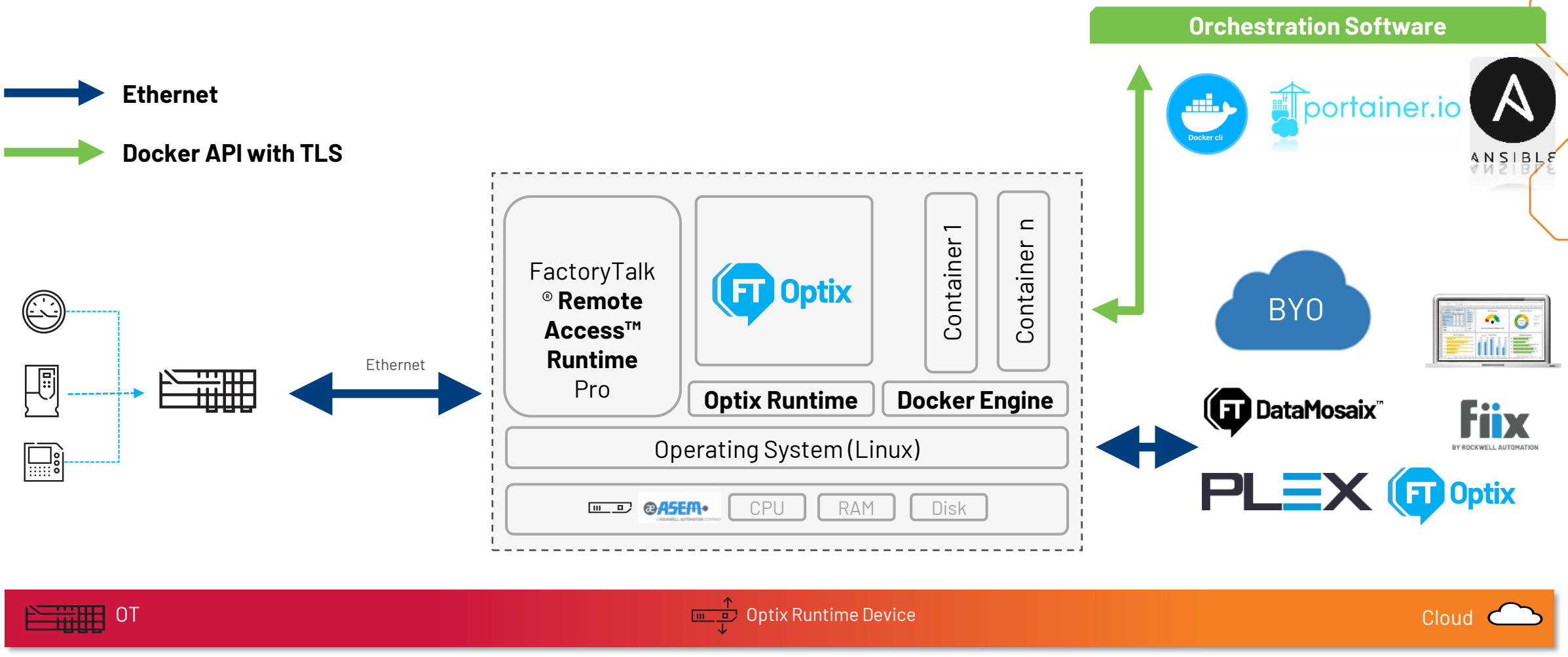
Scaled to meet wide range of customer needs:

- Simple to complex Machines and Applications
- Specifications
  - ARM i.MX8M Plus, 4GB RAM
  - eMMC (12GB available)
  - Linux OS
- Includes
  - FactoryTalk® Optix™ Runtime **Extra-Small (XS)**
  - FactoryTalk® Remote Access™ Runtime **Pro**
  - Docker Engine
- Optional license upgrade
  - FactoryTalk® Optix™ Runtime Small

Embedded Hardware with FactoryTalk® Optix™ Runtime

OptixEdge Standard

Open, secure and IT/OT ready with container support



Logix Embedded Edge Compute Module

The embedded hardware solution optimized for FactoryTalk Optix

Scaled to meet wide range of customer needs:

- Simple to complex Machines and Applications
- Specifications
  - ARM i.MX8M Plus, 4GB RAM
  - eMMC (20GB Mass storage)
  - Linux OS
- Includes
  - FactoryTalk® Optix™ Runtime **Extra-Small (XS)**
  - FactoryTalk® Remote Access™ Runtime **Pro**
  - Docker Engine
- Optional License Upgrade
  - FactoryTalk® Optix™ Runtime (Small, Medium or Large)

Embedded Hardware with FactoryTalk® Optix™ Runtime

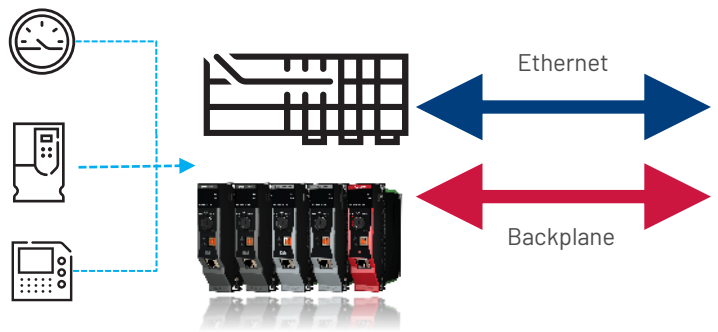
Logix Embedded Edge Compute Module

Open, secure and IT/OT ready with container support

Backplane

Ethernet

Docker API with TLS



Ethernet

Backplane

FactoryTalk® Remote Access™ Runtime Pro

Optix

Container 1

Container n

Optix Runtime

Docker Engine

Operating System (Linux)

ASEM

CPU

RAM

Disk

Orchestration Software

Docker cli

portainer.io

ANSIBLE

BYO

DataMosaix™

Fiix BY ROCKWELL AUTOMATION

PLEX

Optix

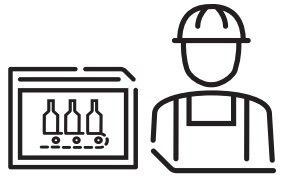
OT

Optix Runtime Device

Cloud

Optix web clients

FactoryTalk Optix for Edge, HMI, and SCADA



ThinManager: Thin client container hosting

Centrally virtualized hosts with thin clients as edge compute

Why

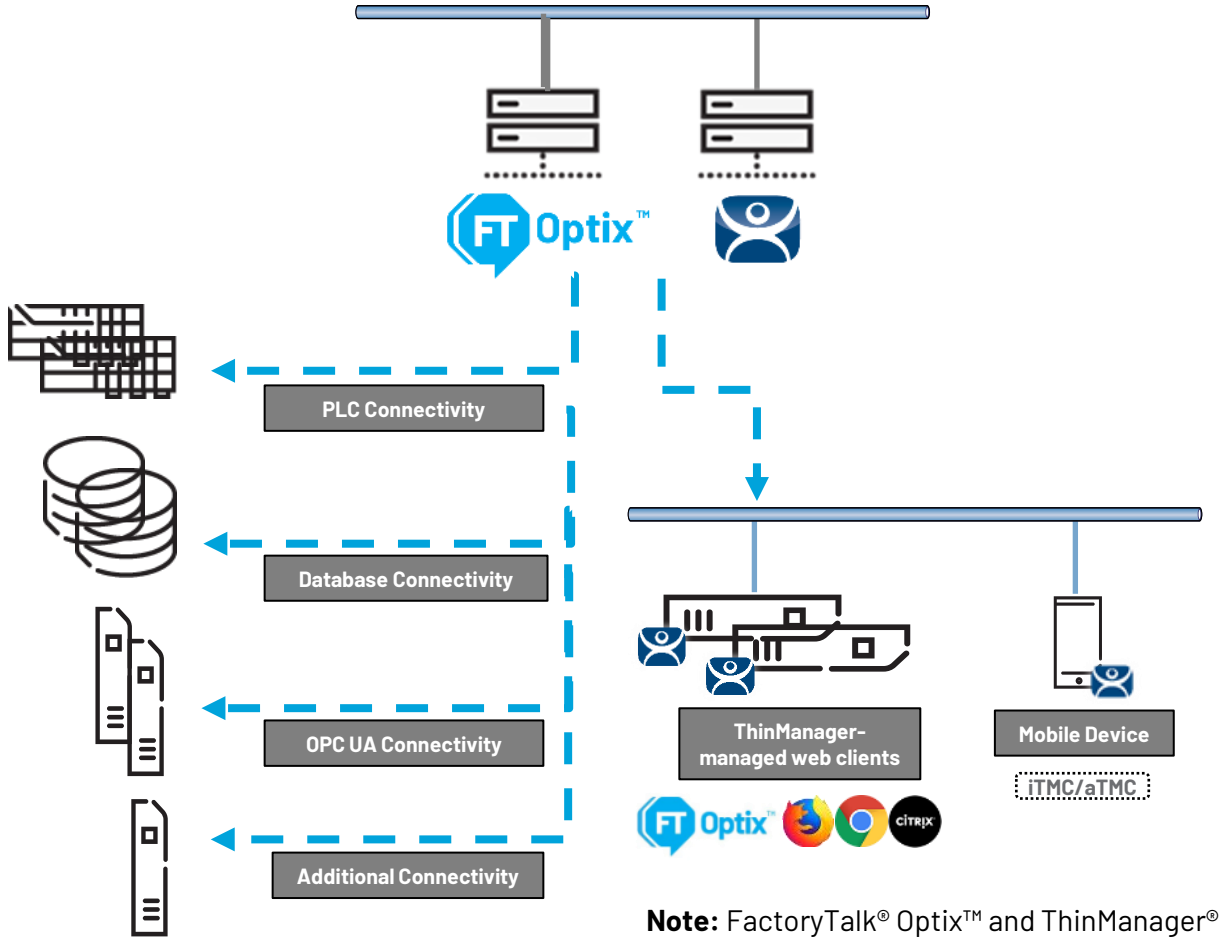
- Reduce need for server-based resources to host containerized applications
- Reduces overall footprint of devices running local OS
- Mitigate cybersecurity vulnerabilities
- Secure IT owned assets from installation of drivers and malware
- Allow decoupling from Active Directory
- Reduce IT maintenance time of web browser hosting

How

- Host web applications using containers on local and remote thin clients
- Currently supporting: Firefox, Chrome, Citrix® StoreFront
- Web browser container managed by ThinManager® host removes RDS deployment requirement for web applications
- Pre-populate configuration, remote commissioning
- 8GB RAM recommendation for thin client container hosting

Securely deliver FactoryTalk Optix web clients

For customers who want secure, centrally managed FactoryTalk Optix web clients



Note: FactoryTalk® Optix™ and ThinManager® can also be co-located on the same workstation

Increased Security

- Reduce cybersecurity footprint with zero clients running docker containers utilizing local device memory
- Double-layered security: **Web browser isolated within a Docker Container hosted on closed Linux firmware**

ThinManager: Thin clients requirements for containers

- It is recommended to have at least **8** GB of physical RAM on a thin client. An absolute minimum of **4** GB of physical RAM can be used.
  - When calculating RAM usage overall on a thin client, the following equations may be useful:
  - [total RAM used on a thin client] = [thin client firmware OS] + [container virtual RAM disk] + [container RAM allocation(s)] + [other running display client(s)]
  - [container virtual RAM disk] = [installed container image]+ [compressed container image] + [300 MB docker engine] + [swap and temporary files space]
- The container images consume the following amount of RAM disk space according to the table below:

Container Name	Installed Container Image (MB)	Compressed Container Image (MB)
Chrome	760	266
Chrome with Citrix Client	1280	448
Firefox	694	299
Firefox with Citrix Client	1220	410
Base	467	N/A

See Knowledgebase article: ThinManager® Terminal Containers for more info.

BUT WAIT…

- What if I want to run on different hardware?
- What if I want to run bigger containers?
- What if I want to leverage thin clients?
- What if I want more?

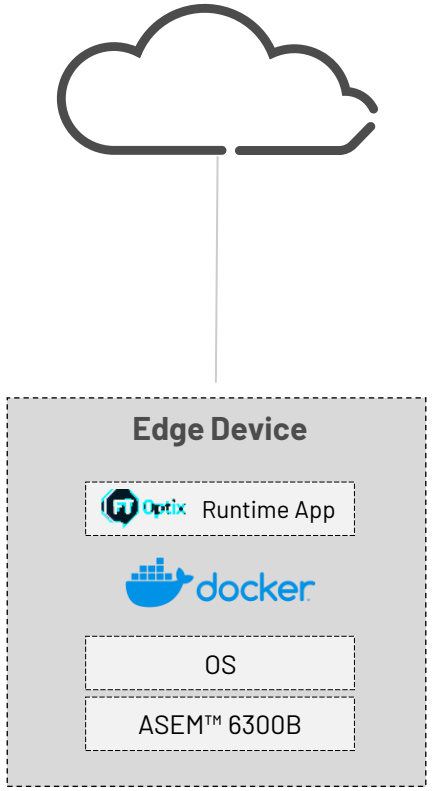
FactoryTalk® Optix™ Applications can be containerized!

FactoryTalk Optix container

Expanded architectures

- Support for deploying the FactoryTalk® Optix™ runtime application within Docker containers helps with setup and makes scaling the application across multiple environments easier
- Users can deploy the container for the runtime application manually or via container management tools

- Please note:
  - Container support with online entitlement verification was introduced in FactoryTalk® Optix™ v1.4
  - Container support with disconnected licensing is planned in FactoryTalk® Optix™ v1.8



How ThinManager Complements FactoryTalk Optix - 3 possibilities

FT Optix™ + THINMANAGER A ROCKWELL AUTOMATION TECHNOLOGY

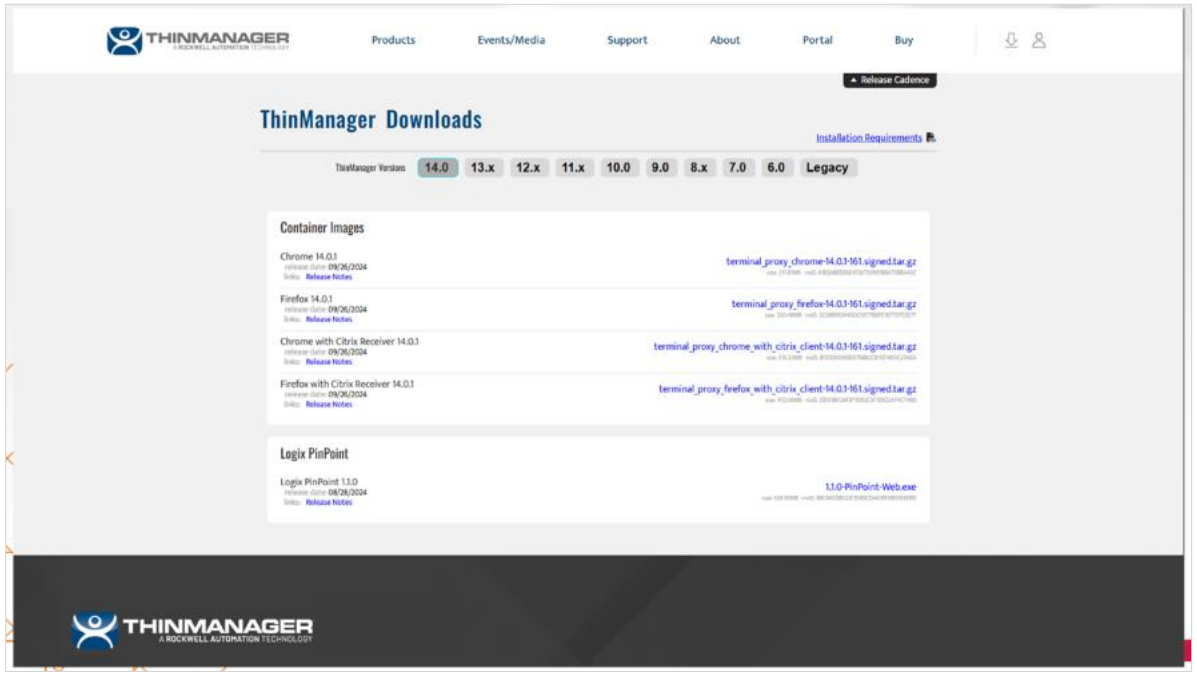
Application	Client Device	Use Case	Status
Optix Web Client	Use new or existing thin client hardware	ThinManager-managed thin clients with Chrome Docker Container	**Available today!**
Optix Runtime	Use new or existing thin client hardware	ThinManager-managed thin clients with **Optix Runtime Docker Container**	**Available today! ThinManager® 14.1**
Optix Runtime	Use new thin client hardware	Deploy to terminal with BootAssist	**AFC 2026**

ThinManager with FactoryTalk Optix

FactoryTalk Optix image and FactoryTalk Optix application

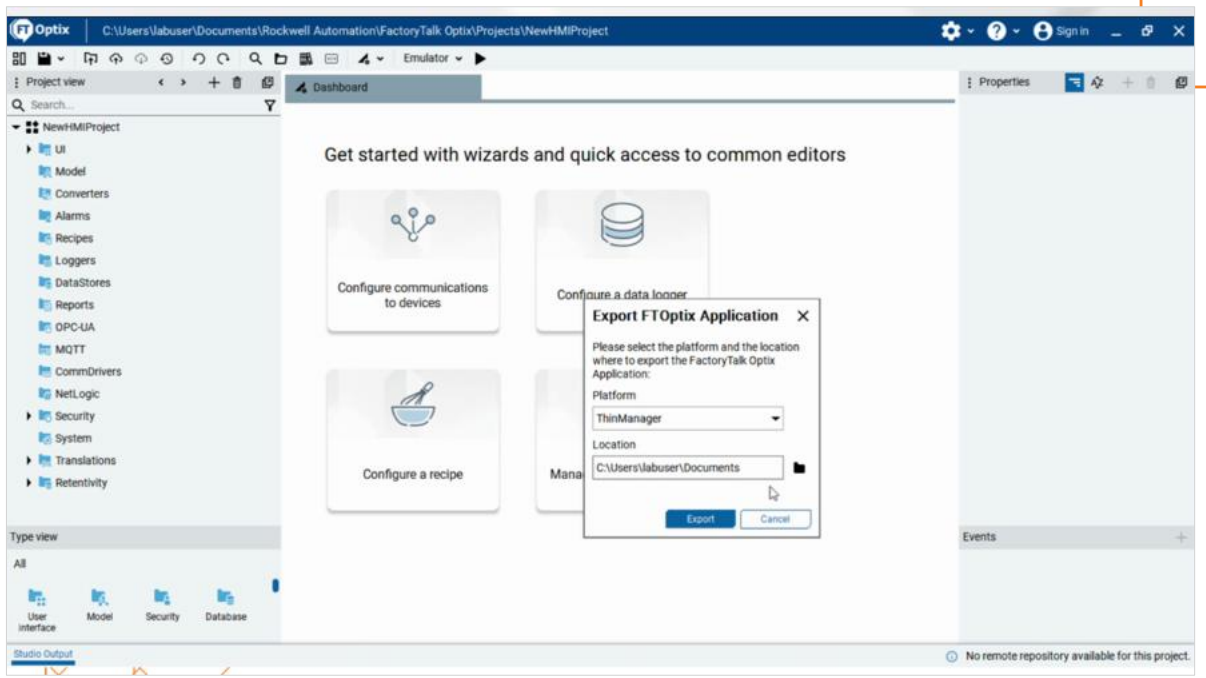
Step 1 - Download and install Optix container

Download from https://thinmanager.com/downloads



Step 2 - Export FactoryTalk® Optix™

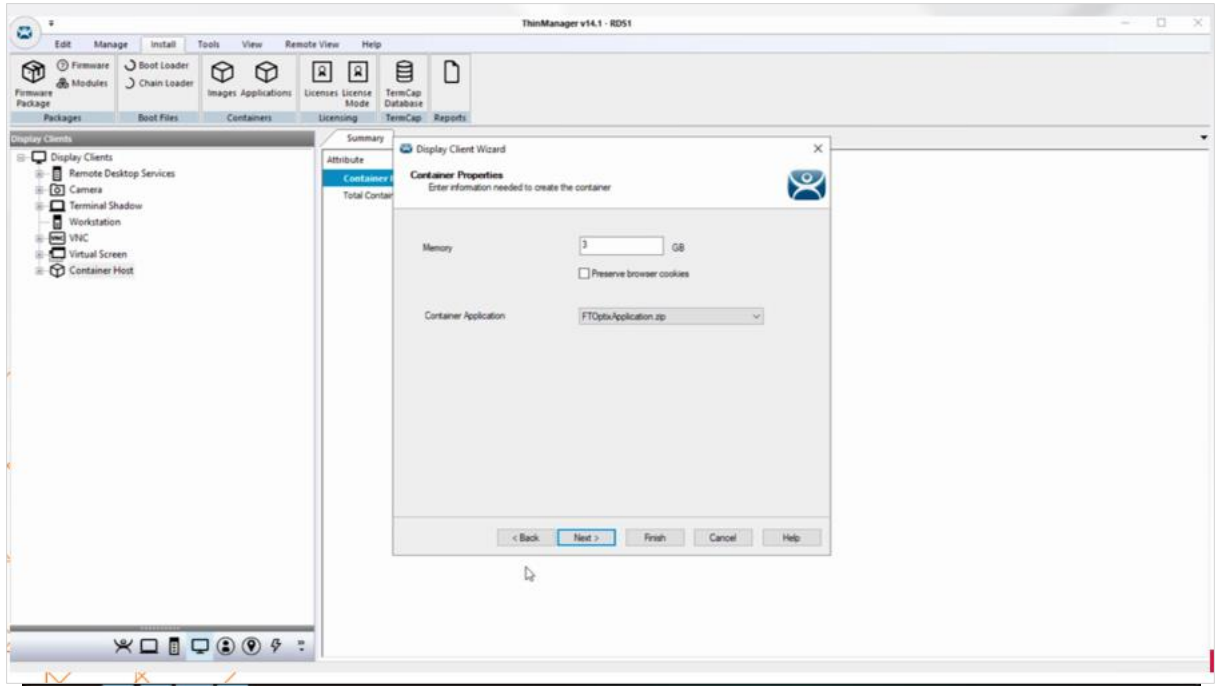
Use FactoryTalk® Optix Studio™ to export application



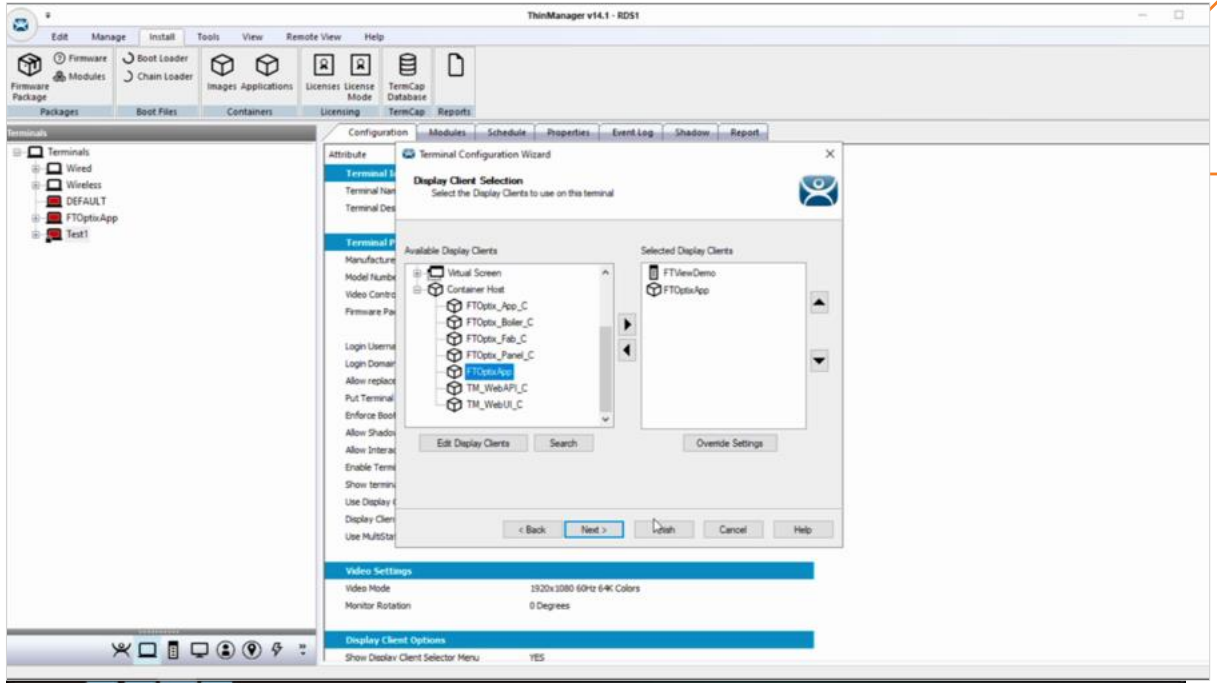
ThinManager with FactoryTalk Optix

Create a Display Client and push to terminal

Step 3 – Create Display Client



Step 4 – Push to terminal



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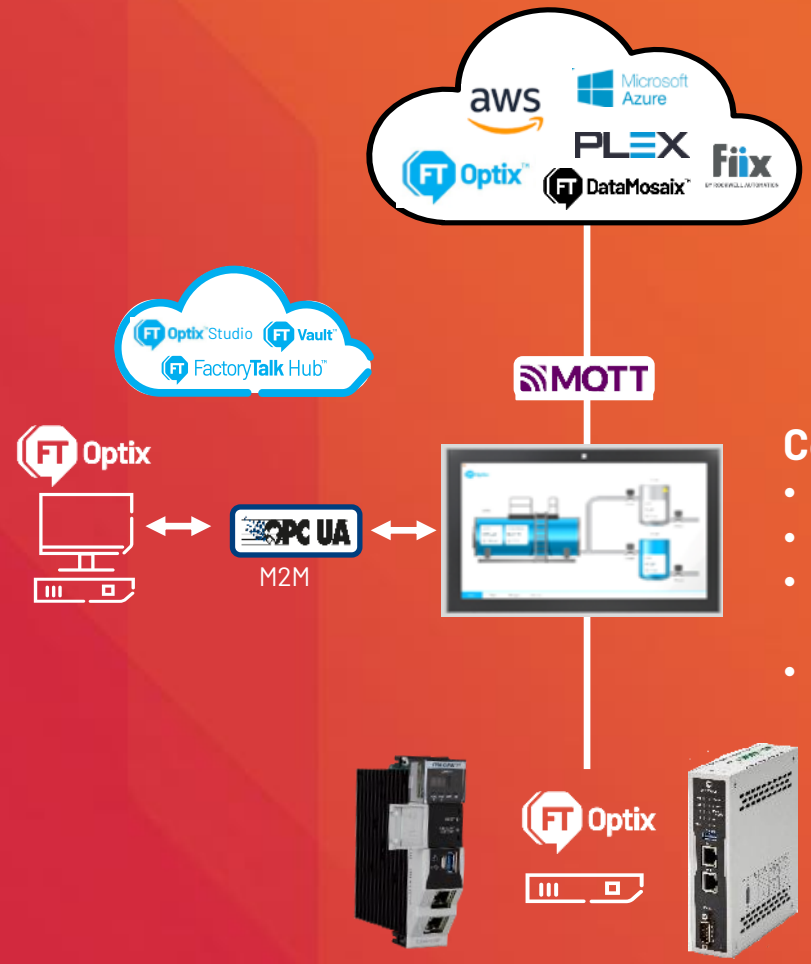

Common Platform
- Collaborative Workflows
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OptixPanel Compact

The embedded hardware solution optimized for FactoryTalk Optix

OEM focus – small machines, simple applications

- Specifications
  - Wide display sizes*: 4.3″ and 7″
  - Resistive and PCAP touch
- Includes
  - FactoryTalk® Optix™ Runtime **Small** (8 feature tokens)
  - FactoryTalk® Remote Access™ Runtime **Basic**
- Optional license upgrade
  - FactoryTalk® Optix™ Runtime Medium (11 feature tokens)
  - FactoryTalk® Remote Access™ Pro

Embedded Hardware with FactoryTalk® Optix™ Runtime

OptixPanel Standard

The embedded hardware solution optimized for FactoryTalk Optix

OEM focus – midrange machines and applications

- Specifications
  - Wide display sizes*: 7”, 10.1”, 12.1”, 15.6”, 18.5”, 21.5”
  - 4:3 display sizes*:10.4”, 12”, 15”
  - Resistive and PCAP touch
- Includes
  - FactoryTalk® Optix™ Runtime **Medium** (11 feature tokens)
  - FactoryTalk® Remote Access™ Runtime **Pro**
  - Web Clients
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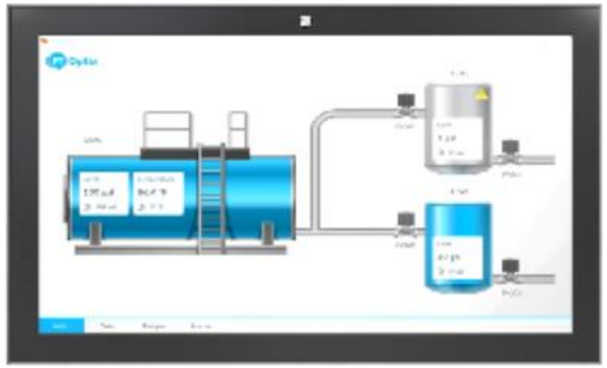


Embedded Hardware with FactoryTalk® Optix™ Runtime

Flexible deployment options

Select the optimal platform for performance, functionality and openness

Thin Clients & Industrial PCs

Use when you need...

A high-powered, open compute platform for hardware and software expandability

On-Machine™ Industrial PCs

Use when you need...

A self-enclosed IP65 industrial PC with optional configurable buttons

Sealed/Closed HMI terminals

Use when you need...

A sealed, firmware-based visualization appliance at a low total cost of ownership

Headless terminals

Use when you need...

An edge device that connects to your control system to collect, analyze, and send data to the cloud

Support for open standard and technologies

Data Sharing

OPC

MQTT

REST API

influxdb™

ODBC

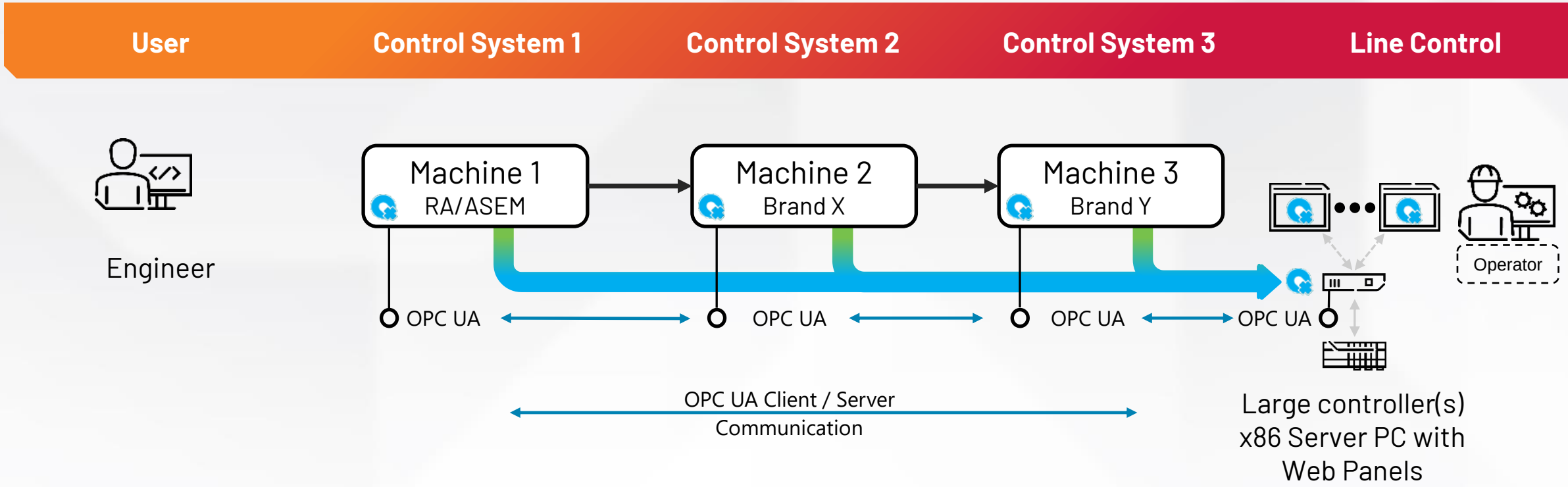
SMTP

FTP

C#

FactoryTalk Optix reference architecture

Different applications can be aggregated



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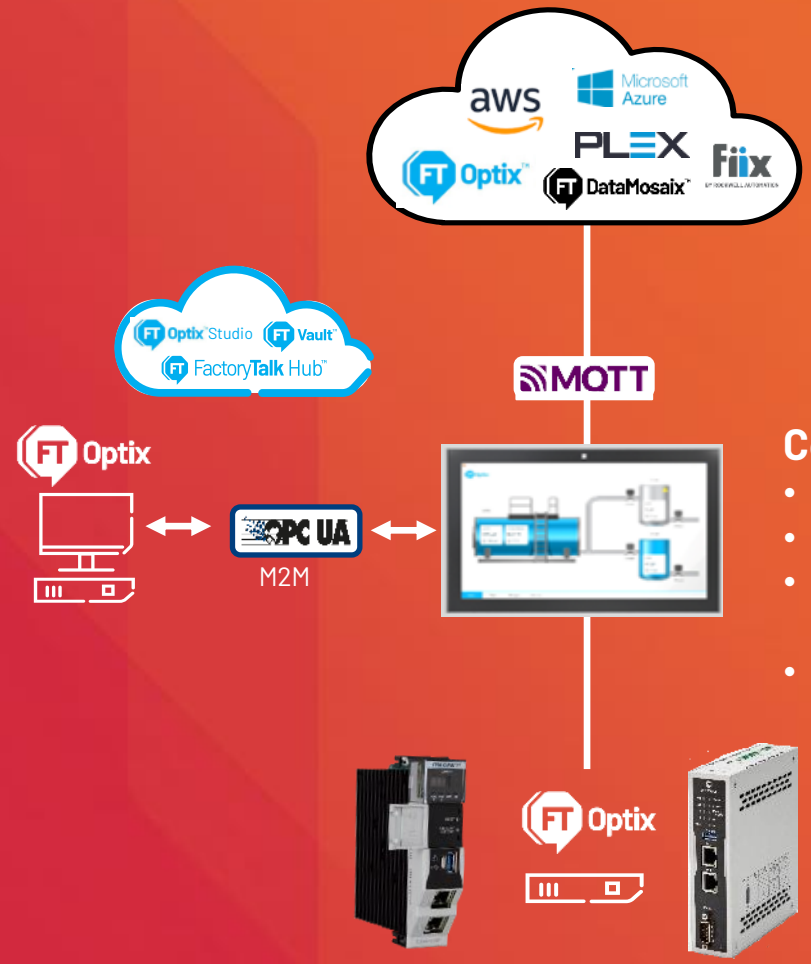

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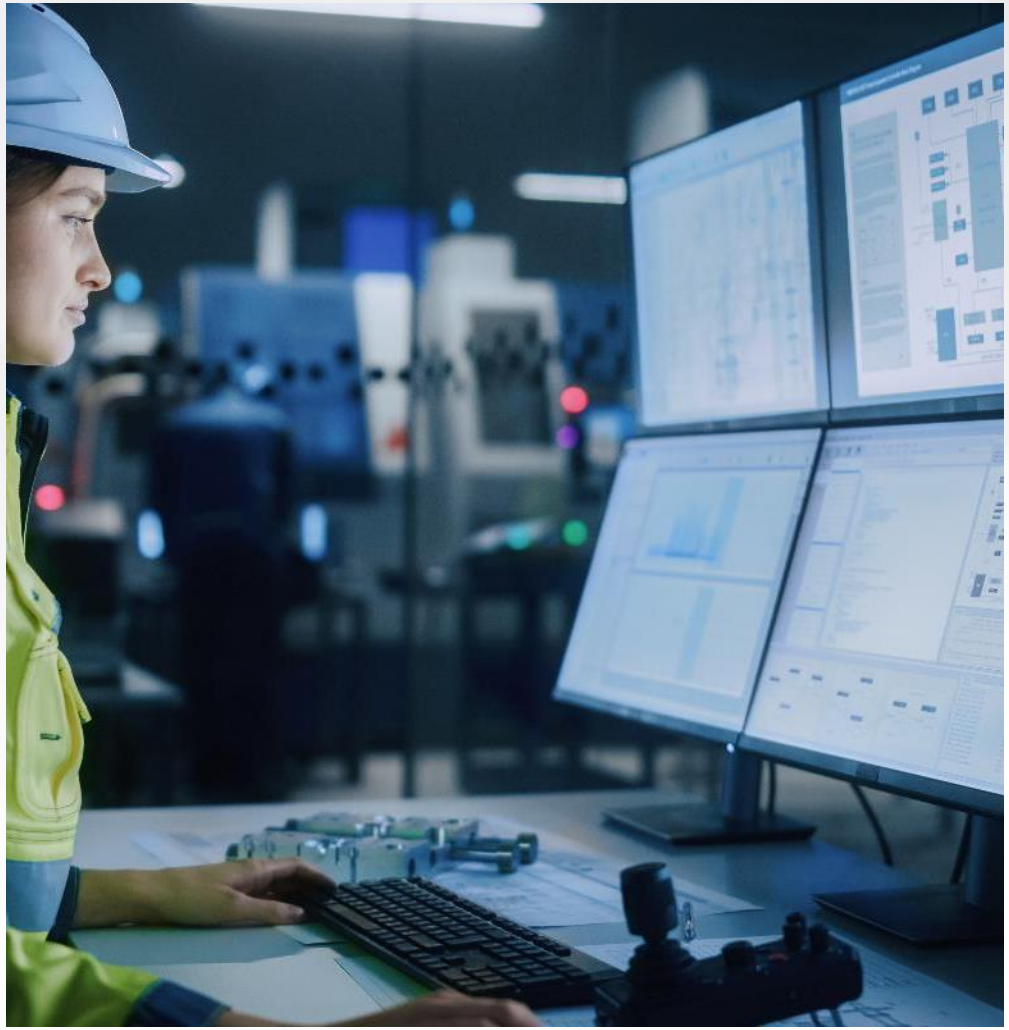
EVOLVING TO SUPPORT LARGER MULTI-NODE ARCHITECTURES

FT Optix™



System configuration & monitoring

Scaled performance and high availability. Monitor the status of lines, machines, and devices across the system.

Shared security and user management

Centralized and propagated security permissions to help prevent unauthorized access to remote sites

Secure communications

Managing cloud to remote site communications for machine control performance, latency, disconnects

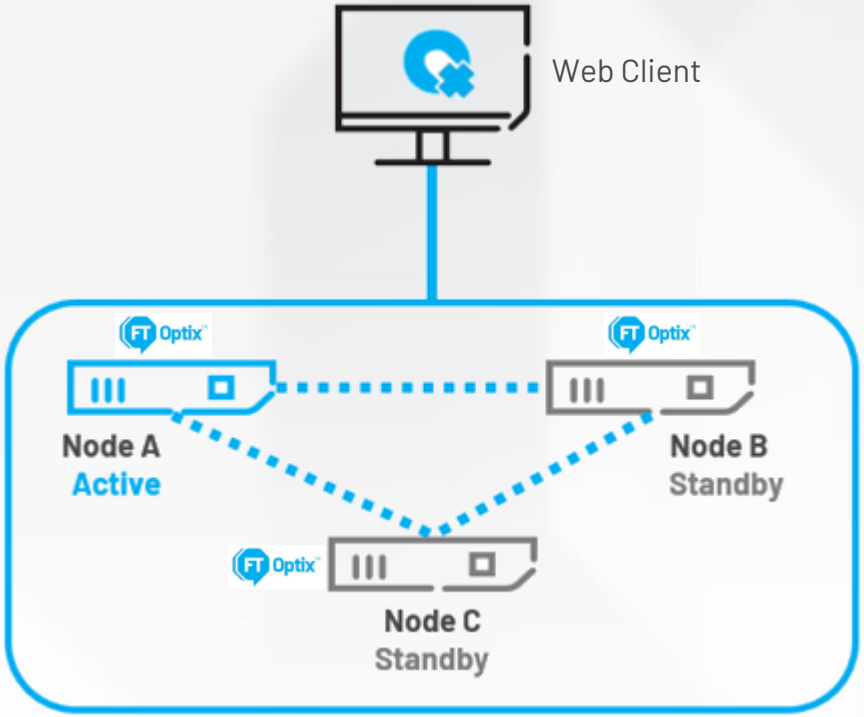
Remote management

Manage the system topology, update applications and components.

High availability

FactoryTalk Optix runtime data synchronization and failover to standby server

- Runtime application is deployed to a three-node high availability cluster.
- Data is replicated across three separate nodes to confirm availability.
- System can tolerate two node failures without losing access to data or services.
- Each node holds a full copy of critical data, allowing seamless failover from active to standby node.
- Automatic resynchronization occurs when a failed node comes back online.
- The client connects to the cluster as a whole, not to any individual node—achieving seamless access even if one node goes down.



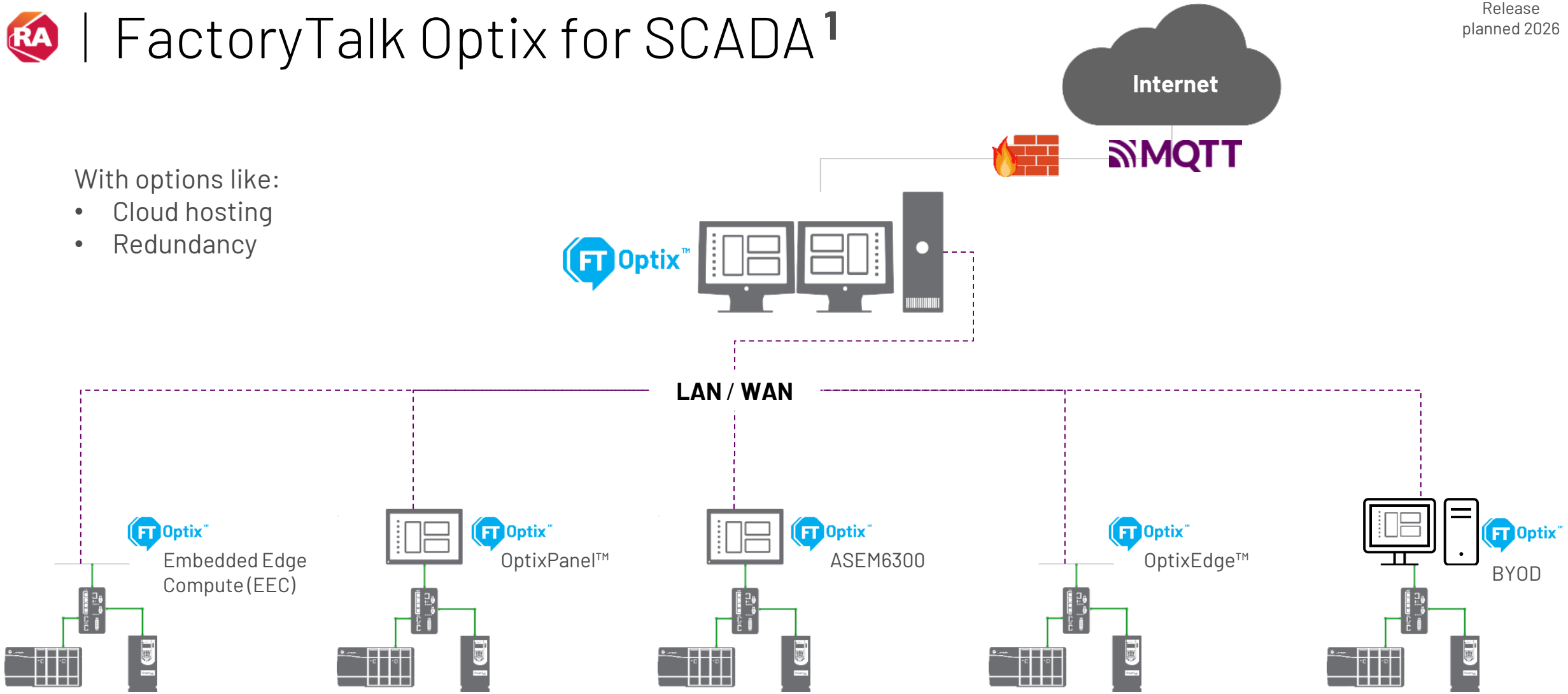
Three-node high availability cluster

FactoryTalk Optix for SCADA [1]

[1] Initial Release planned 2026

With options like:

- Cloud hosting
- Redundancy



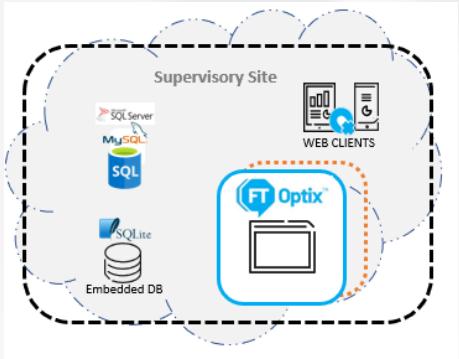
with support for local clients or web clients or both!

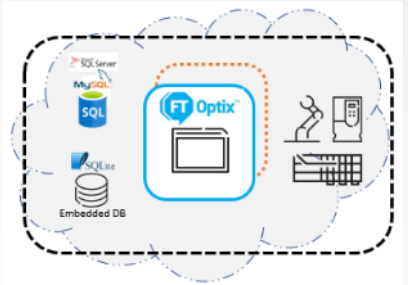
Evolving FactoryTalk Optix to support larger architectures

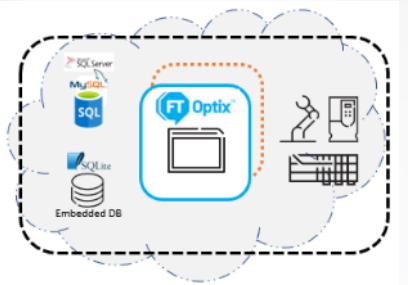
[1] Initial Release planned 2026

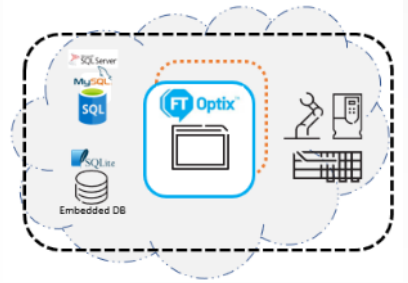
Multi-node architectures may come in several variations and combinations

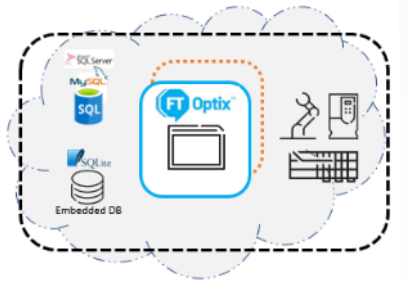
- Multi-node
  - a single site or line with multiple nodes sharing data for control and monitoring
  - may require high availability
- Supervisory / remote operations
  - centralized monitoring and control of multiple nodes, multiple sites
  - centralized administration of the multi-node system
- Cloud-hosted runtime
  - containerized runtime, hosted by Rockwell Automation or customer (third-party)





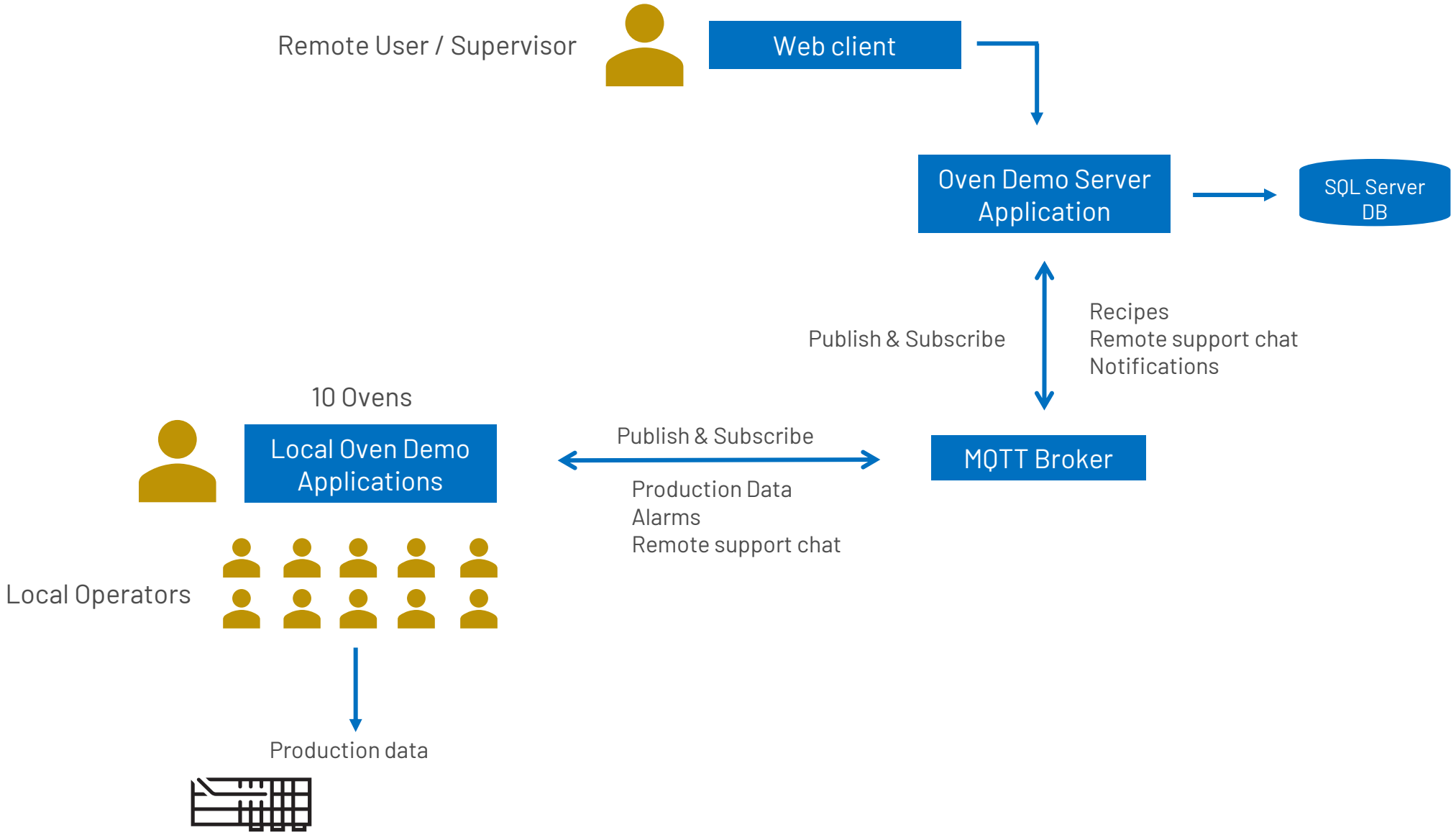






Demo

FactoryTalk Optix oven demo architecture



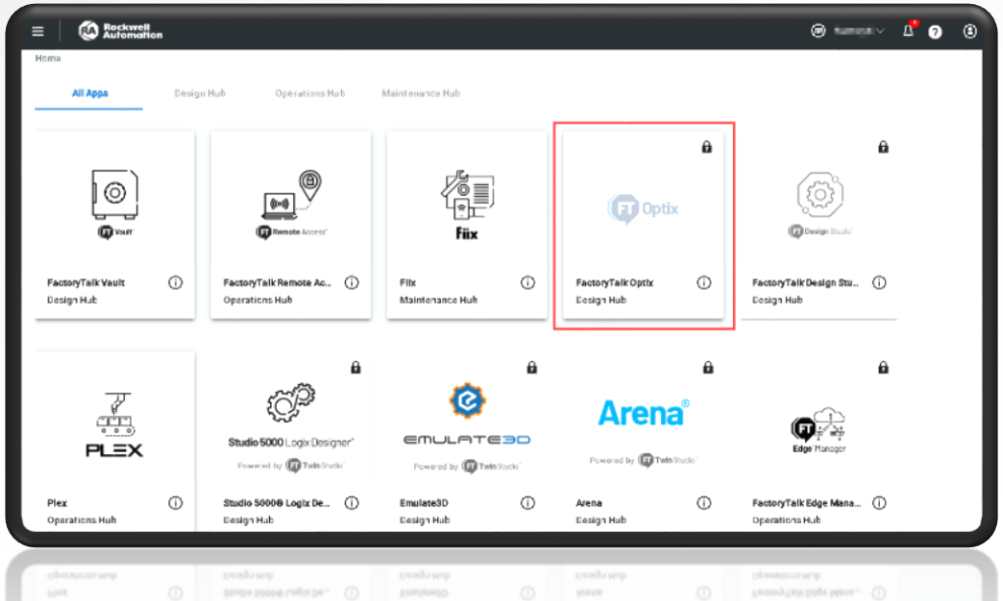
FactoryTalk Optix - Getting started

To get started, visit www.FactoryTalkHub.com

On your first visit to FactoryTalk® Hub™, you'll be prompted to choose an option:

- Create an Organization: Use this if you are the first from your company to start using FactoryTalk® Hub™
- Join an Organization: Use this if your colleagues have already created an organization

- An Organizations is a grouping of users and define how data and entitlements are shared by users
- You can be part of multiple organizations, so if you are not sure which to select, simply create a new organization
- **Note: If you don't create a new organization or join an existing one, the FactoryTalk® Optix™ tile will be grayed out with a lock icon**

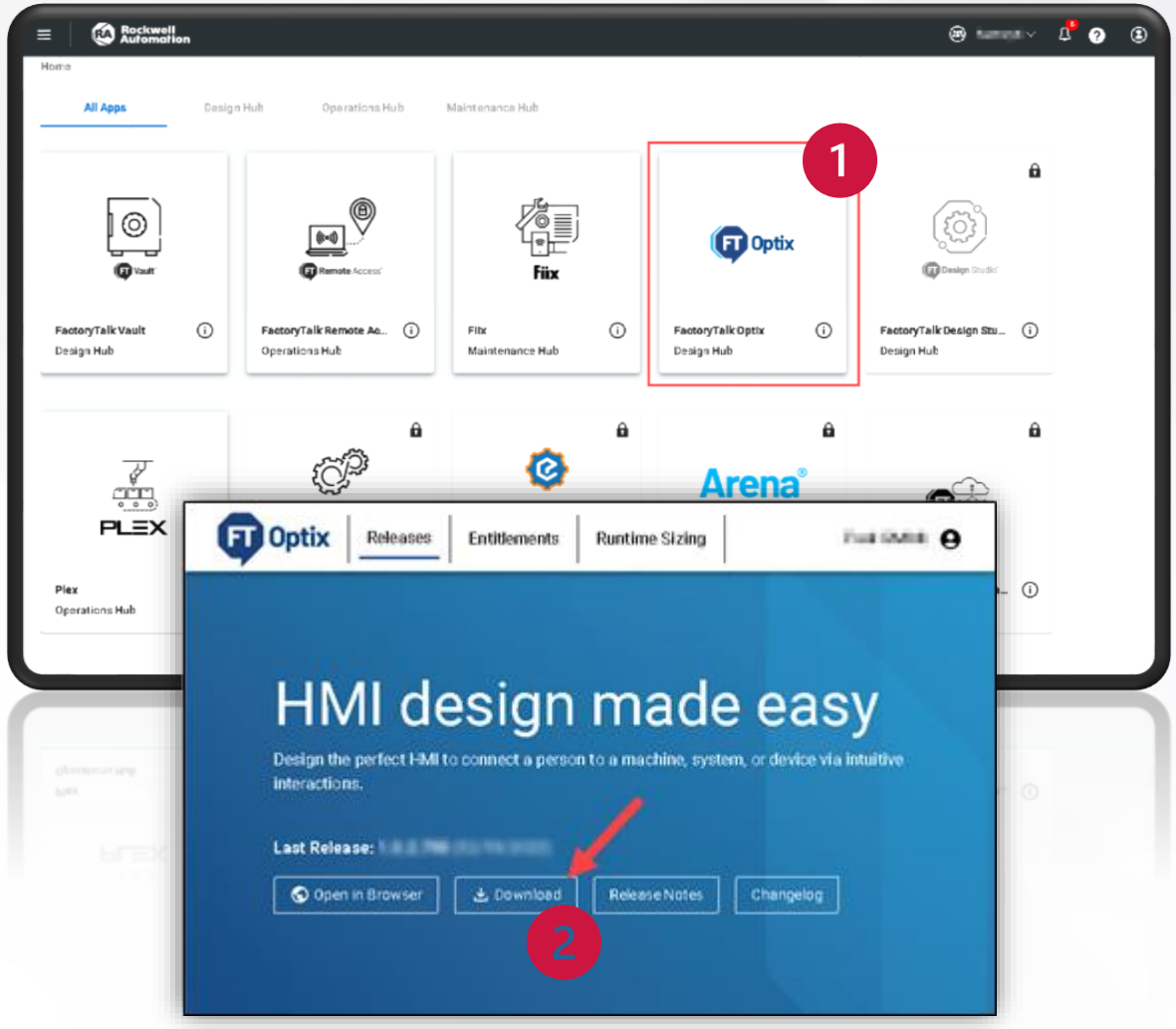


FactoryTalk Hub™

FactoryTalk Optix - How to download?

Downloading Optix Studio™ from FactoryTalk® Hub™

- Sign in to FactoryTalk® Hub™ using your MyRockwell credentials
- **Important:** Create a new or join an existing organization
- Click on the FactoryTalk® Optix™ tile to get started
  - Multi-factor authentication (MFA) is now active for FactoryTalk® Optix™ as well as FactoryTalk® Remote Access™
- Click **Download** to download and install FactoryTalk® Optix Studio™



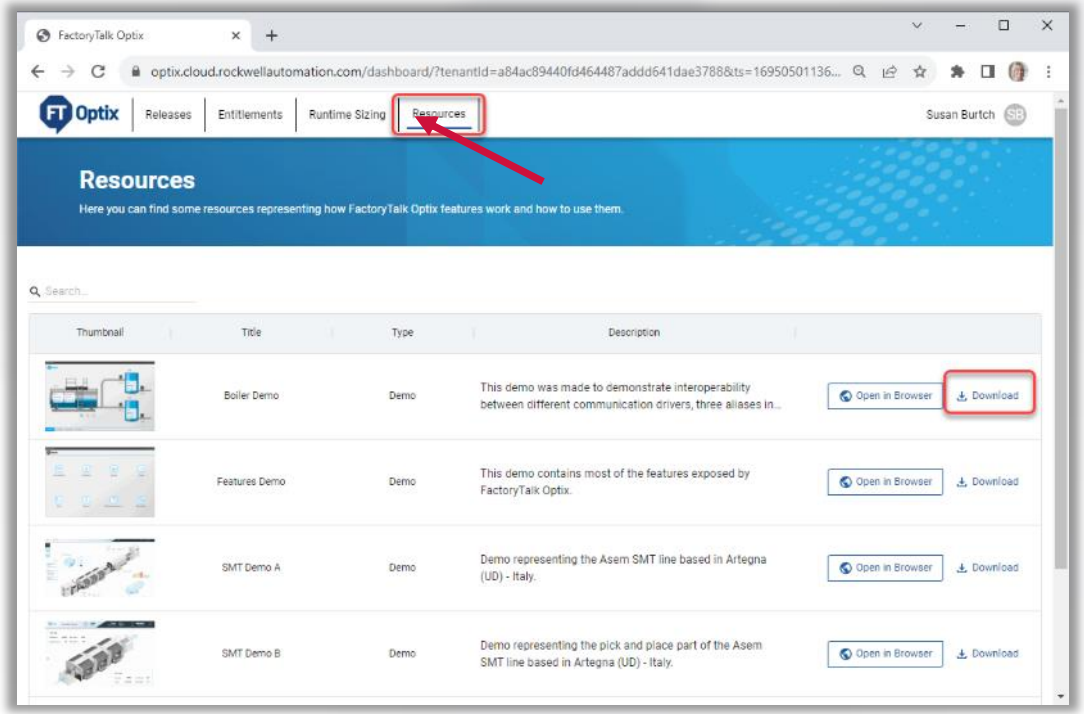
FactoryTalk Optix online demos!

Check out the **Resources** tab on the FactoryTalk® Optix™ landing page

Resources tab provides access to many FactoryTalk® Optix™ demo applications

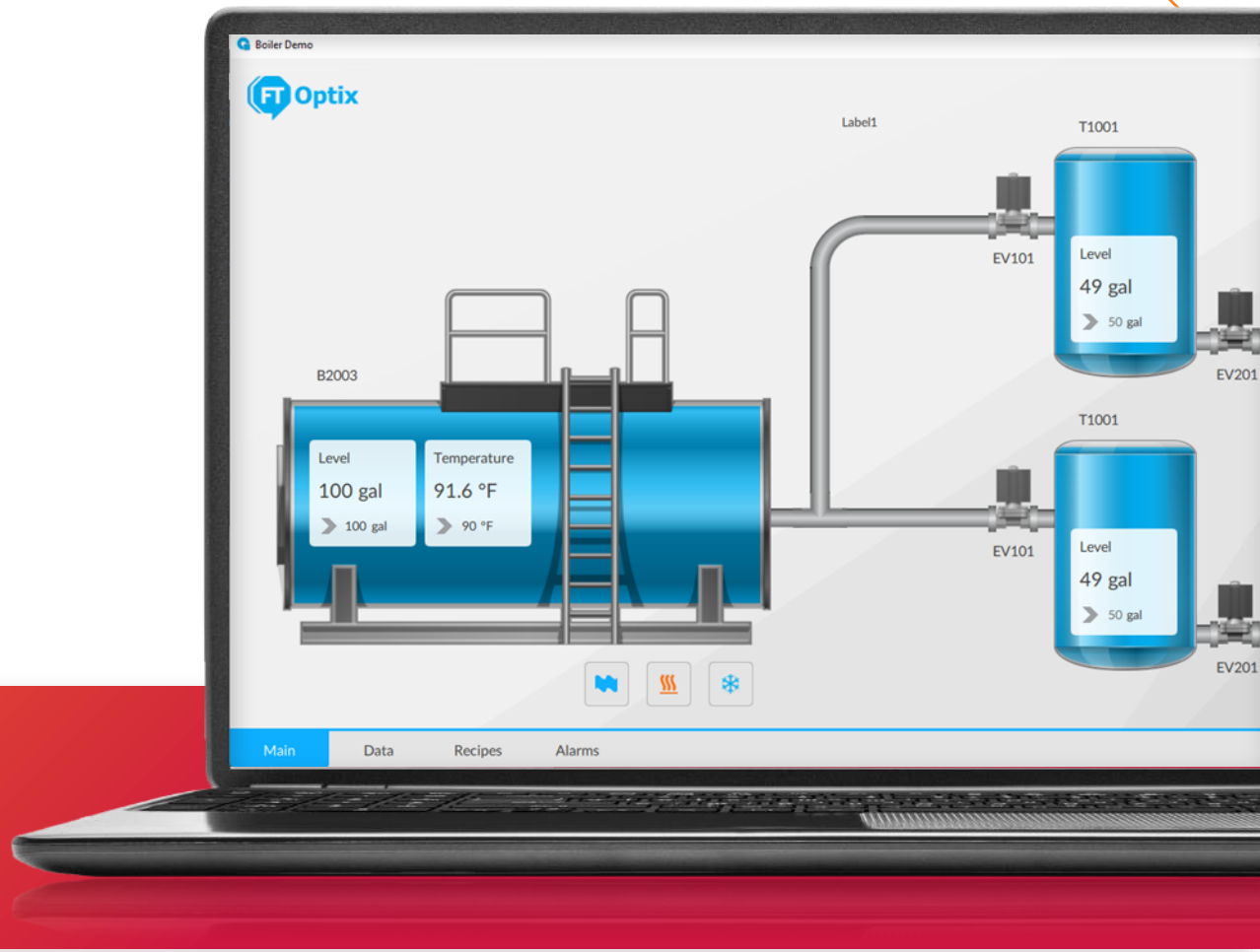
- Demo applications can be run from the cloud using only your browser
- A description for each demo is available
- Use the Search bar to look for a specific demo
- Click **Download** to download the demo application project files from GitHub

- Available to anyone with a FactoryTalk® Hub™ account
- Click **Open in Browser** to run each demo application in your web browser
  - Boiler demo
  - Features demo
  - Demo applications for ASEM™ factory machines
  - Trade show and event demo applications
  - More coming soon!



FactoryTalk Optix sample projects

Download sample projects demonstrating key features



Download our sample projects from

https://github.com/FactoryTalk-Optix

FactoryTalk Optix - YouTube playlist

FactoryTalk® Optix™ Getting Started videos

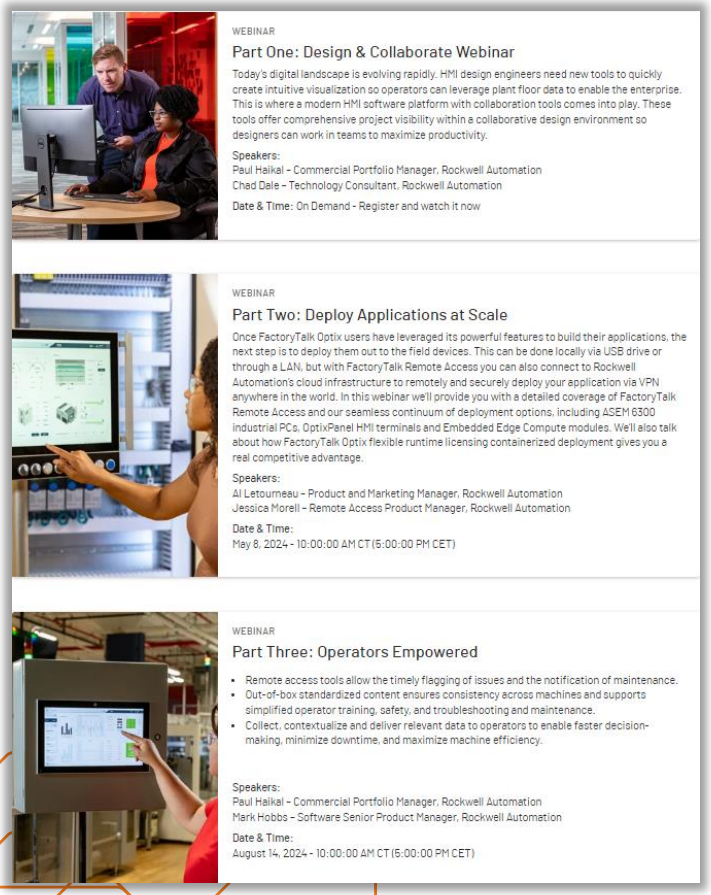
1. Studio User Interface
2. Communication Setup
3. My First Screen
4. The Containers Concept
5. Responsive Design
6. Object-Oriented HMI Design
7. Datalogger
8. Recipes
9. Alarms
10. ODBC Connectors
11. Alarm History
12. How to Create and Deploy Your First Library
13. Language Switching using User Accounts and Locales

YouTube Playlist

FactoryTalk Optix continuous webinar series

On-demand and live options to fit your schedule

Revitalize Your HMI
3-Part Webinar Series
ON DEMAND



WEBINAR

Part One: Design & Collaborate Webinar

Today's digital landscape is evolving rapidly. HMI design engineers need new tools to quickly create intuitive visualization so operators can leverage plant floor data to enable the enterprise. This is where a modern HMI software platform with collaboration tools comes into play. These tools offer comprehensive project visibility within a collaborative design environment so designers can work in teams to maximize productivity.

Speakers:
Paul Haikal - Commercial Portfolio Manager, Rockwell Automation
Chad Dale - Technology Consultant, Rockwell Automation

Date & Time: On Demand - Register and watch it now

WEBINAR

Part Two: Deploy Applications at Scale

Once FactoryTalk Optix users have leveraged its powerful features to build their applications, the next step is to deploy them out to the field devices. This can be done locally via USB drive or through a LAN, but with FactoryTalk Remote Access you can also connect to Rockwell Automation's cloud infrastructure to remotely and securely deploy your application via VPN anywhere in the world. In this webinar we'll provide you with a detailed coverage of FactoryTalk Remote Access and our seamless continuum of deployment options, including ASEM 6300 industrial PCs, OptixPanel HMI terminals and Embedded Edge Compute modules. We'll also talk about how FactoryTalk Optix flexible runtime licensing containerized deployment gives you a real competitive advantage.

Speakers:
Al Letourneau - Product and Marketing Manager, Rockwell Automation
Jessica Morell - Remote Access Product Manager, Rockwell Automation

Date & Time:
May 8, 2024 - 10:00:00 AM CT (5:00:00 PM CET)

WEBINAR

Part Three: Operators Empowered

- Remote access tools allow the timely flagging of issues and the notification of maintenance.
- Out-of-box standardized content ensures consistency across machines and supports simplified operator training, safety, and troubleshooting and maintenance.
- Collect, contextualize and deliver relevant data to operators to enable faster decision-making, minimize downtime, and maximize machine efficiency.

Speakers:
Paul Haikal - Commercial Portfolio Manager, Rockwell Automation
Mark Hobbs - Software Senior Product Manager, Rockwell Automation

Date & Time:
August 14, 2024 - 10:00:00 AM CT (5:00:00 PM CET)

Maximize Your HMI Potential
3-Part Webinar Series
Register at rockwellautomation.com

Modernization Strategies for Success

- April 2, 2025 – Elevate Operations with Cutting-edge HMI Features
- May 8, 2025 – Operational Efficiency through Machine Equipment Data
- June 24, 2025 – Supplement your DCS

Digital transformation, edge-to-cloud and modernization are important concepts to recognize when developing a forward-looking strategy for your automation system.

THANK YOU

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