



# IBM App Connect for Manufacturing:

Accelerating a Manufacturer's  
Journey to Industry 4.0

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## Agenda

IBM Cloud Pak for Integration(CP4I) - Introduction

Brief Concepts of Industry 4.0

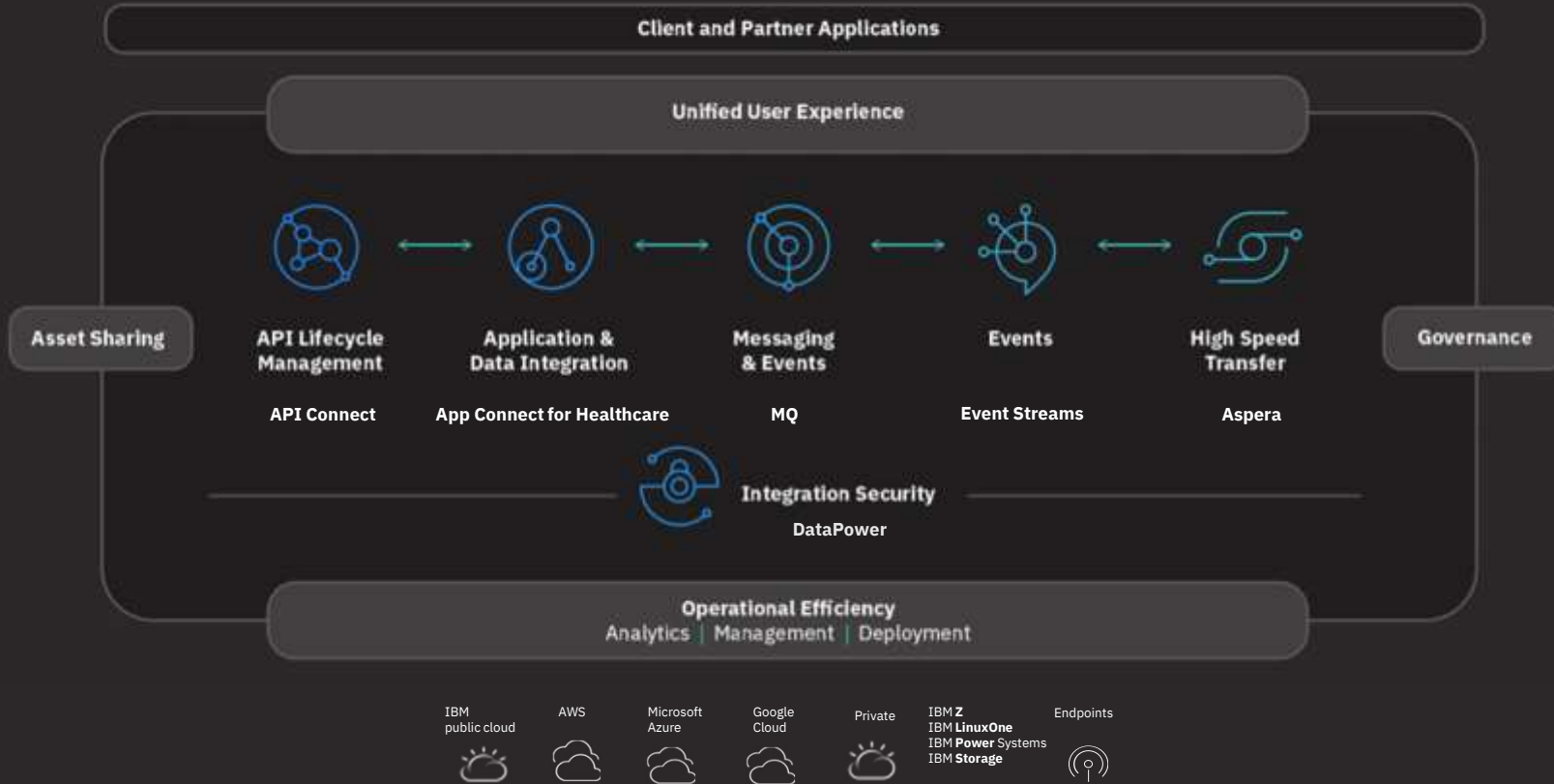
App Connect for Manufacturing

OPC-UA Server Integration

Q & A

# IBM Cloud Pak for Integration

Build once. Deploy anywhere



# Cloud Pak for Integration

## Broadest integration capabilities

Unified experience, operational efficiency & reuse

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## Deploy where needed

Container-based architecture with common enterprise services

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## Enterprise-grade

Secure, scalable



API Lifecycle



Application & Data Integration



Enterprise Messaging



Events



High Speed Transfer

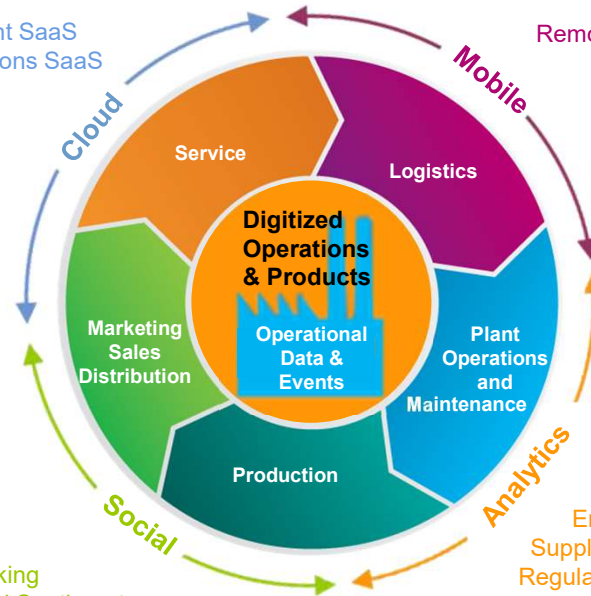


Integration Security

# Combining Operations and Advanced IT

**Cloud examples:**

Product Life Cycle Management SaaS  
 ERP for Manufacturing Operations SaaS  
 Warranty Claims BPaaS



**Mobile examples:**

Remote Human Machine Interface  
 Track and Trace materials  
 Mobile Plant Maintenance  
 Real-time Asset Location  
 Environment Safety  
 Mobile Field Service  
 Locate and account for workers, contractors and visitors  
 Worker Safety

**Analytics/Information examples:**

Predictive Maintenance  
 Condition-based monitoring  
 Key Performance Indicators  
 Enterprise Asset Management  
 Supply Chain Management (SCM)  
 Regulatory compliance governance  
 Warranty Risk Analysis and Mitigation  
 Intelligent alerts & event management  
 Overall Equipment Effectiveness (OEE)

**Social examples:**

Collaboration for decision making  
 Product Brand Awareness and Sentiment  
 Real-Time Consumer Behavior and Trade Promotion  
 Crowdsourcing/Real-World Customer Requirements  
 Planning

# Embracing IoT for Manufacturing through logical steps of value gradation in Lean Digitization

## Prereq Off-load

### Gather the data

- Instrument your equipment/assets to collect data
- Gather already existing data



Asset needs to be connected, outfitted with sensor or data gathered

## Value

### Visualize the patterns

- Visualize your data in meaningful dashboards
- Start to see patterns
- Build with Bluemix



Use the platform to quickly build dashboards for data visualization

### Advance to analytics & digitization

- Gain insights from the data, produce models, prediction recommendations
- Streamline business processes

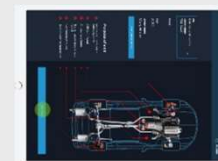


Use analytical models to predict equipment failures and provide recommendations

## Vision

### Infuse with cognitive

- Refine models with cognitive machine learning
- Utilize other cognitive functions to improve engagement



Use speech, video, image to diagnose complex problems



## Business drivers

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01

**Productivity gains:**  
higher throughput and efficiency, eliminating non-value-adding activities

02

**Failure prevention:**  
highest OEE, avoiding re-work, scrap, outages, bad product quality

03

**Flexibility:**  
hiding complexity, low (re-) configuration effort, plug&produce, avoiding technology gaps



## Requirements

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### Functional requirements

- Vertical & horizontal integration
- Lifecycle integration, digital twin
- Universal connectivity between processes, systems, machines and people
- Intelligent worker assistance
- Historical data collection and (predictive) analytics
- Flexible, business-oriented configuration at all levels – shopfloor, integration and edge

### Non-functional requirements

- Function offload to the Edge
  - Decisions, analytics, streaming, aggregation
- Autonomous factory operation
  - All directly related production system locally
- Security
  - At all levels
- Modular design
  - Microservices, service orientation

The IBM logo, consisting of the letters "IBM" in a bold, sans-serif font, with horizontal lines through the letters.

# Business Value – Operation Data Visibility

Connect operational and business applications throughout the organization, with secure exchange of production information



## Enterprise-wide

- Visibility of operational data and KPI's across business units. Reduce time spent seeking information/status.
- Near real time data and event information enables improved decision making and optimisation analysis.
- Advanced IT solutions fuelled by operational data improve enterprise performance
- Speed & flexibility to add new data sources when required
- Reduce skills/ownership costs by eliminating bespoke connectivity/integration code

## Operational

- Add new applications quickly
- Remove complex and costly point-to-point connections
- Monitor and manage supply of operational data to consuming applications
- Securely move data around the enterprise consistently using trusted and open standard technology

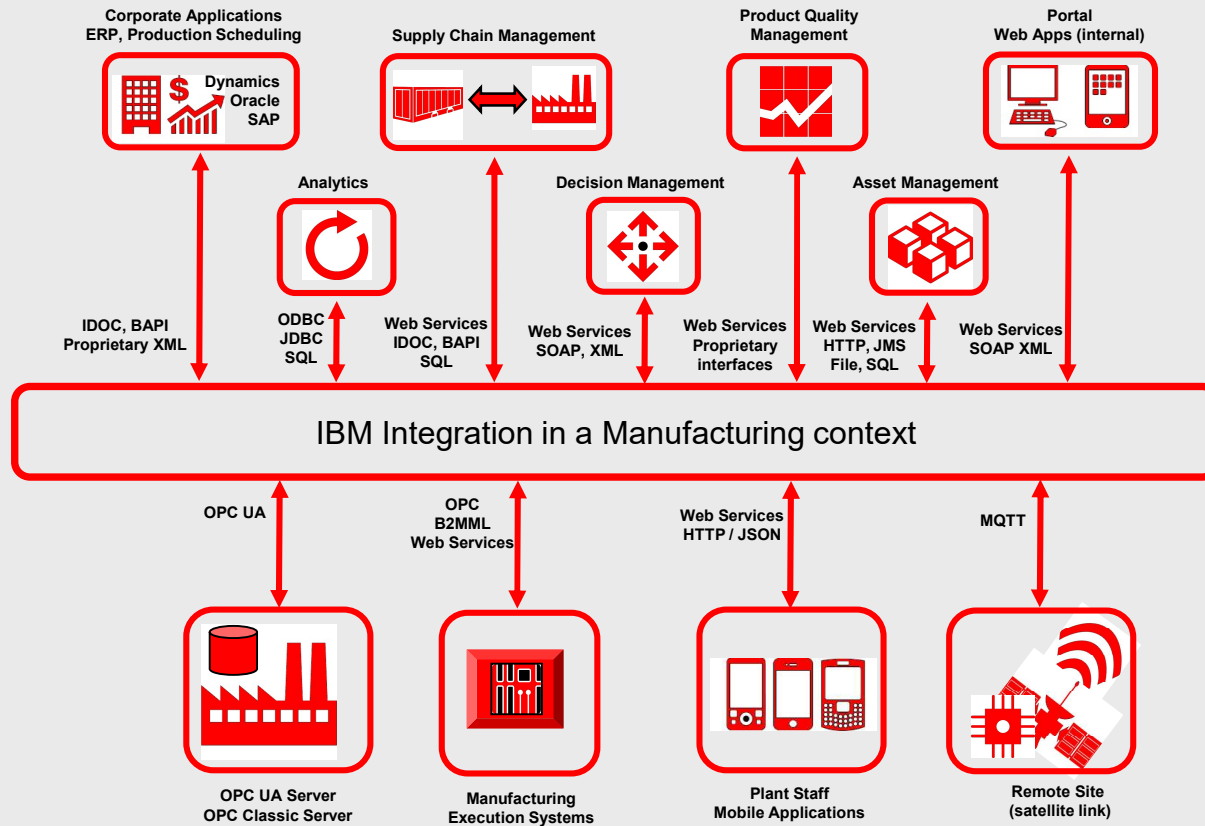
# About IBM Integration

*A high performing, robust enterprise integration to integrate data across heterogeneous IT systems and applications.*



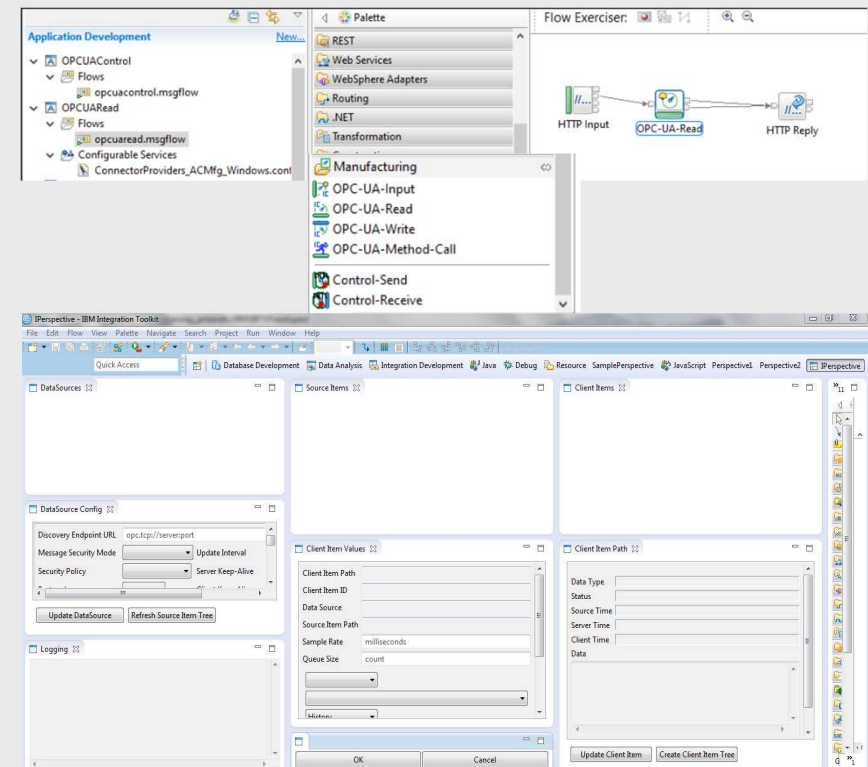
- **Integrate** virtually any service, application or data source
- Easily **convert & transform** business data
- Accelerate integration & promote best practices with **pre-built patterns**
- Built-in packaged application **connectors**
- Simple integration with **graphical tooling**
- Supports wide range of **developer skills** including Java and .NET
- Support for **IBM Worklight** to support rapid mobile integration.
- Natural fit with **MQ & WAS** environments
- Standards-based data modelling aligns with **Master Data Management**

# IBM Integration in Manufacturing Landscape



# IBM App Connect for Manufacturing v2.0

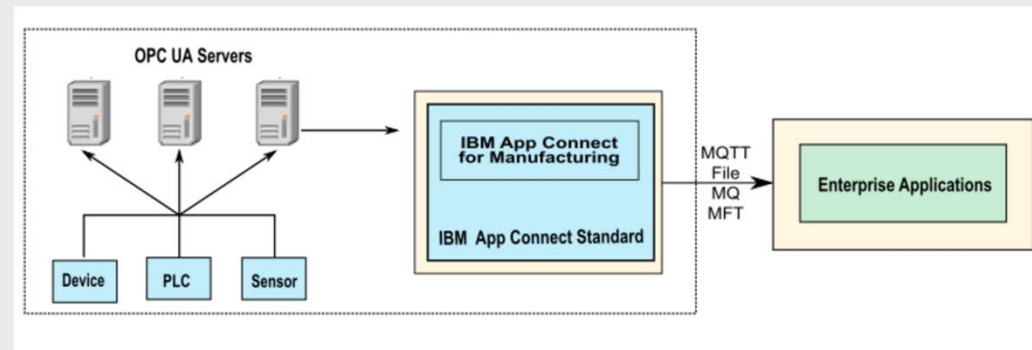
- **New Industry Client Perspective**
  - Unified OPC UA shop floor-wide view via flexible mapping
  - Available in Toolkit on ACE V11 Standard
- **New OPC-UA nodes**
  - Read, Write, Input
  - MethodCall
- **High Availability which can tolerate failure:**
  - Device Failures
  - Dropped Connections
  - OPC-UA Server failures
- **Removal of runtime dependency on a database**
- **Support for Containers**
  - Docker image available
- **Alarms and Events & Secure Connectivity**



[Read the Announcement](#)

# OPC UA Servers Integration

- OPC-UA-Input
- OPC-UA-Read
- OPC-UA-Write
- OPC-UA-Method-Call
- Control Send
- Control Receive



# IBM App Connect for Manufacturing

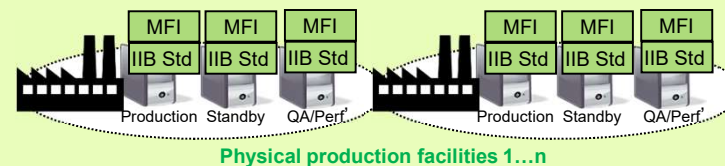
## App Connect for Manufacturing

For deployment in Factory/Mine/Platform premises – gather local operational data, distribute to local and remote applications.

## Per Factory Install

PID: D1MI8LL

Includes App Connect Standard as a supporting program  
No charge for Development Only installations



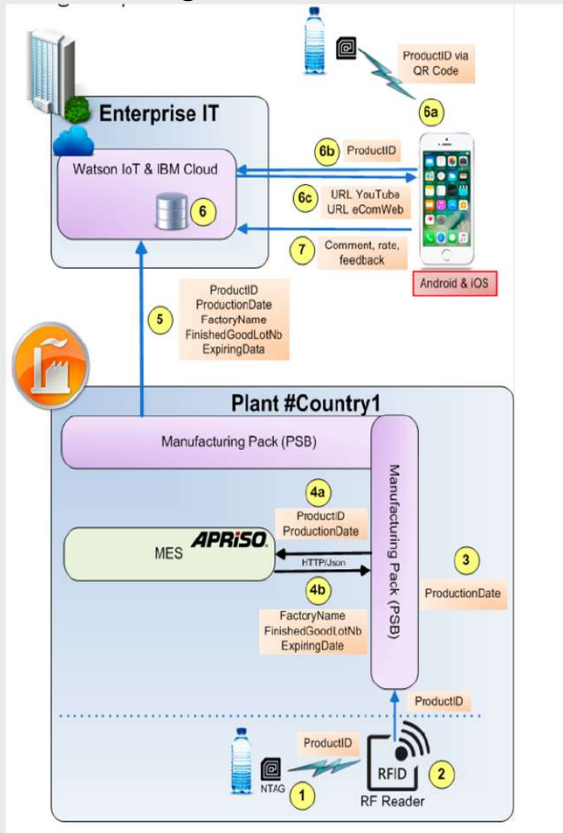
Part number name and description	Part number
IBM App Connect for Manufacturing Factory Install License + SW Subscription & Support 12 Months	D1MI8LL
IBM App Connect for Manufacturing Factory Install SW Subscription & Support Reinstatement 12 Months	D1MI9LL
IBM App Connect for Manufacturing Factory Install Monthly License	D1PI9LL
IBM App Connect for Manufacturing Factory Install Annual SW Subscription & Support Renewal 12 Months	E0MKXLL

- A building, or group of buildings within an area spanning up to 6 kilometers whose core function is devoted to the production, manufacturing, assembling, or industrial processing of physical products.“
- Definition is broad enough to enable deployment of App Connect for Manufacturing at Factory, Mine and Platform (e.g. Oil Rig) premises.
- Additionally, Licensee's use of the Program is limited to making the Program available to no more than four Processor Cores. A Processor Core consists of at least an instruction control unit and one or more arithmetic or logic units. With multi-core technology, each core is considered a Processor Core.

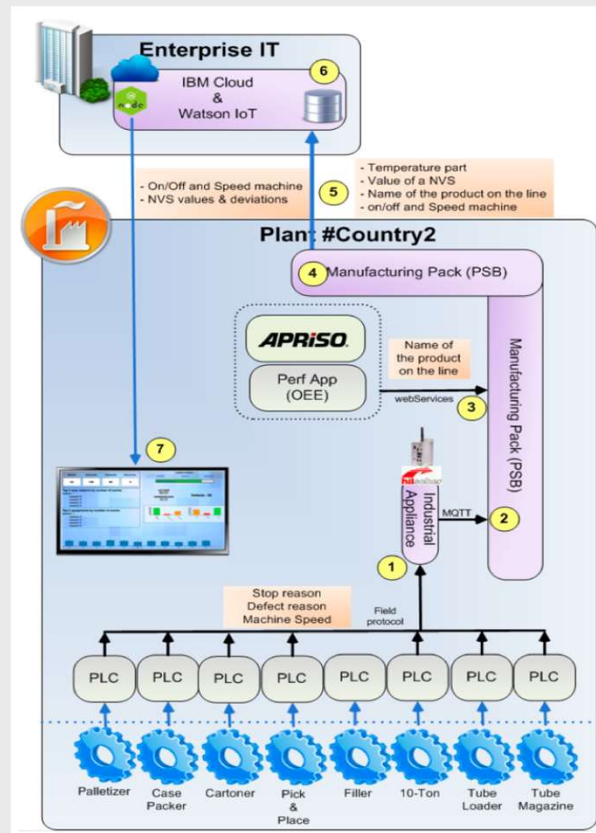
**Licence Restricts Use of App Connect for Manufacturing, and the ACE Standard included with it, to physical production locations only.**

# Typical Integration Use cases

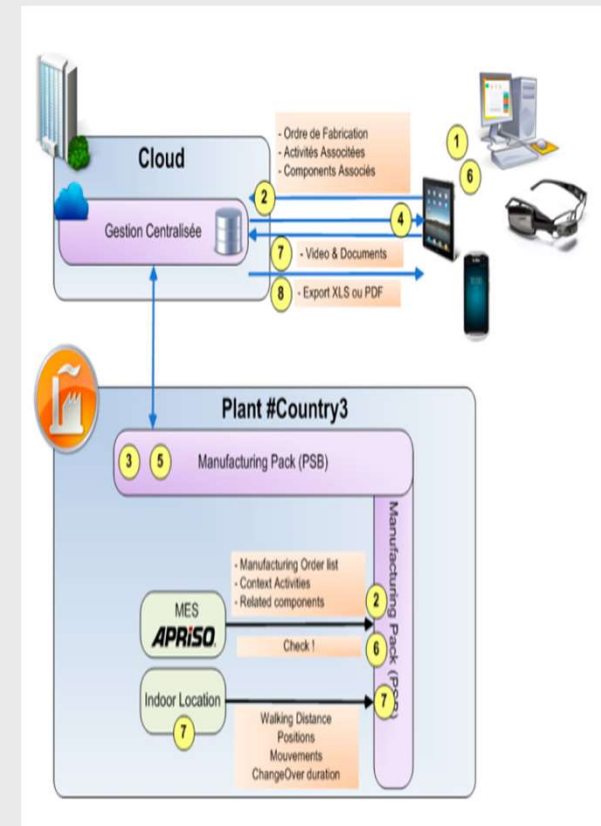
## Augmented Product



## Augmented Equipment



## Augmented Operator



# Shop floor integration with IBM App Connect for Manufacturing (ACMFG)

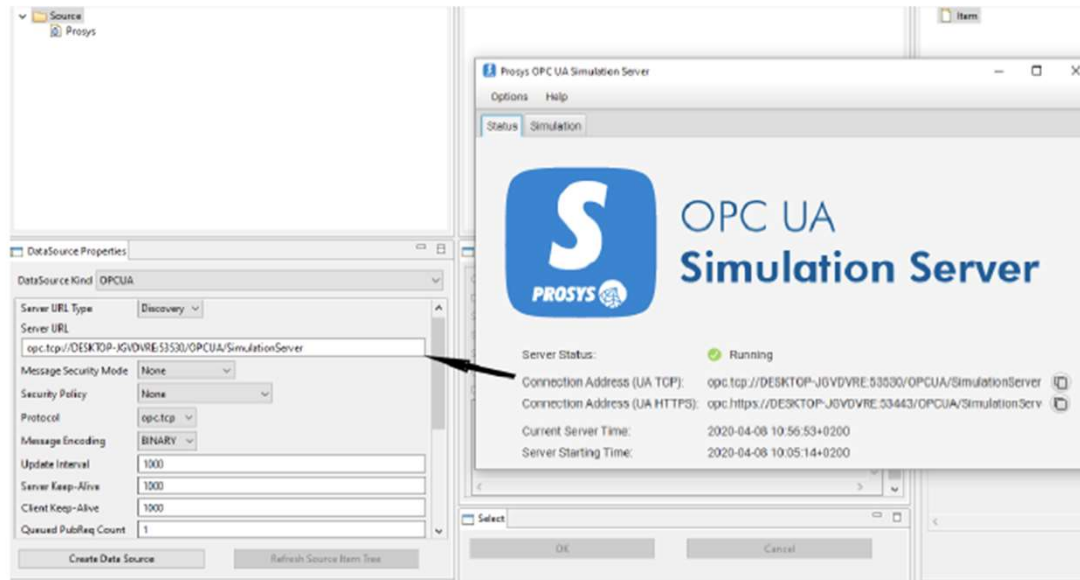


Fig. 1.5. Create Data Source parameters

<https://developer.ibm.com/integration/blog/2020/04/27/shop-floor-integration-with-ibm-app-connect-for-manufacturing-acmfg-as-part-of-plant-service-bus/>



**Thank you!**