



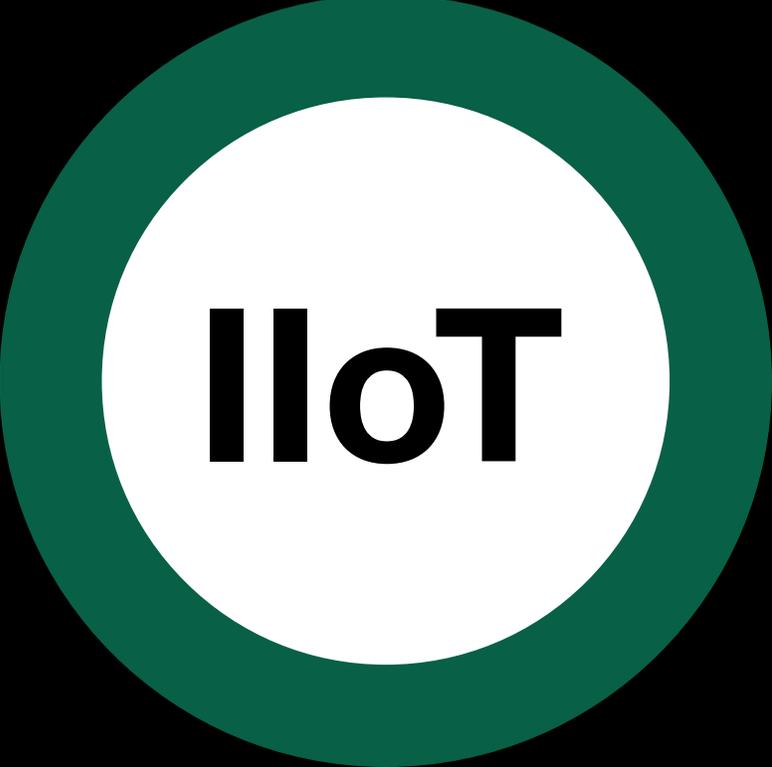
Buyer's Guide

# OPC Servers vs. Industrial IoT Platforms

Setting the Right Foundation for Data-Driven Operations

The word "OPC" in a bold, black, sans-serif font, centered within a white square. This square is set against a larger, solid orange square background.

**OPC**

The letters "IIoT" in a bold, black, sans-serif font, centered within a white circle. This circle is surrounded by a thick, dark green ring, all set against a black background.

**IIoT**

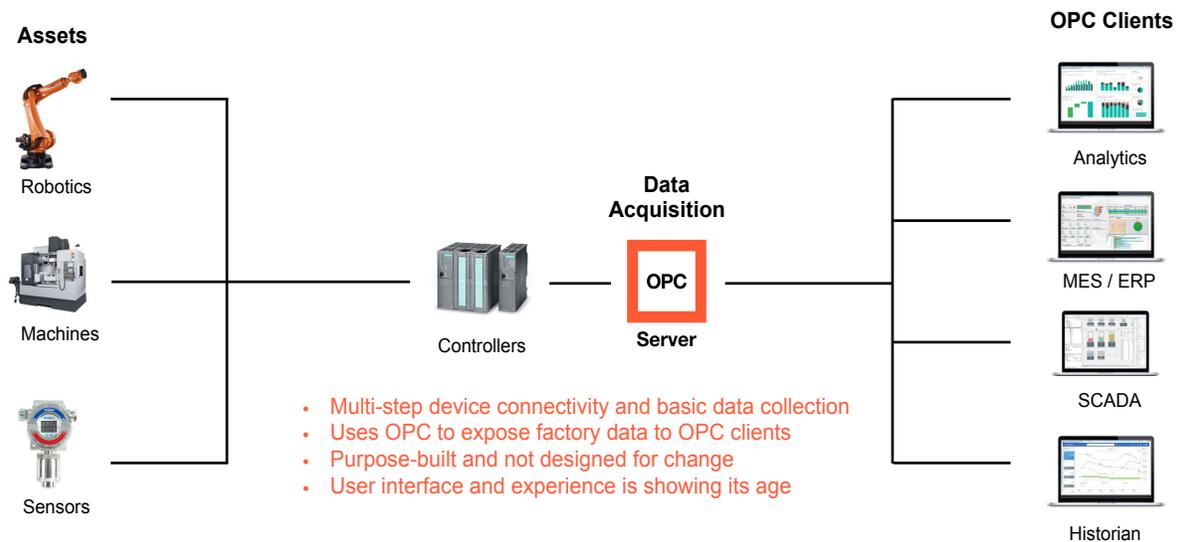
**OPC DA was introduced in the mid-1990s as an industrial communication standard to exchange data between devices and Windows programs, and many companies still use OPC Servers for data acquisition. However, modern use cases demand advanced data intelligence and flexibility, leading companies to ask what an Industrial IoT platform can do above and beyond an OPC Server.**

OPC servers were meant for Industry 3.0 challenges related to automation and legacy OT systems. They simply pass data through, they do not add any intelligence on top. Industrial IoT platforms provide a more flexible and complete foundation for Industry 4.0 and data-driven manufacturing by seamlessly handling data acquisition, edge computing, and application enablement.

This paper will define OPC Server and Industrial IoT platform technologies, compare their core capabilities, and discuss why customers are switching from OPC Servers to IIoT platforms to set the right foundation for modern, data-driven operations.

# What is an OPC Server

OPC DA Servers act as a source of industrial data exposed in its native format to bridge devices (PLC, DCS, CNS) and clients (SCADA, MES, Cloud). Set-up requires multiple steps for connectivity and the system is built on legacy Windows technology not designed for change. OPC Servers are purpose-built to solve the primary Industry 3.0 challenge of connecting to legacy OT systems and exposing the data but do not add any intelligence on top.



## Data Acquisition

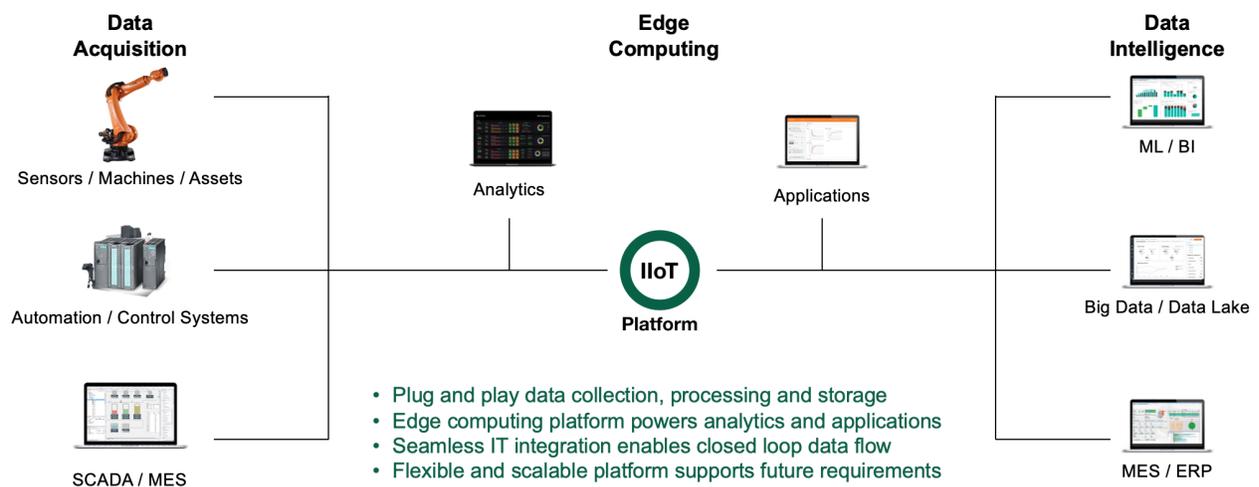
OPC Servers have a large footprint in the market for data acquisition since they have been around since the 90s connecting to automation equipment and collecting data. They have many drivers available to connect to devices, typically offered at an extra cost, but offer little data control other than polling rate. Storing data requires an external source like a database or historian.

## Data Access

OPC Servers expose data including tag value, tag name and quality of the message to factory, IT and cloud applications in standard OPC UA or DA format. They offer very limited pre-built integrations, although some plug-ins have been added to try to expose data with more modern technologies such as MQTT or REST API. OPC is a client/server technology, so all data consumers act as OPC Clients to access the data from the OPC Server.

# What is an IIoT Platform

Industrial IoT platforms go beyond data acquisition to add data intelligence and centralized management – key pieces of the foundation for data-driven operations. An IIoT platform combines rapid device connectivity with edge analytics, then shares that data intelligence securely with OT, IT and Cloud applications. Add the ability to run any application or machine learning model back at the edge, and IIoT platforms offer a complete solution for Industry 4.0.



## Data Acquisition

IIoT platforms ship with all OT drivers for instant and intuitive device connectivity and data collection. They offer a modern, web-based user interface to connect and configure devices in a few clicks. IIoT platforms include message broker technology and a built-in time series database for plug and play data collection, processing, and storage.

## Data Intelligence

IIoT platforms analyze data at the edge with pre-built analytics and KPIs for instant value. Manufacturers can create data visualizations and build dashboards for machine downtime, condition monitoring, OEE and more. IIoT platforms also add the ability to run applications and machine learning models at the edge within the platform for closed loop improvement.

## Data Access

An IIoT platform normalizes data into a JSON message with metadata, and can also publish data using OPC UA, MQTT, Kafka and other modern protocols for easy data access. The platform offers control over how and when data is published and includes deep pre-built integrations to any cloud or enterprise system.

## Centralized Management

IIoT platforms were built with scale in mind, with flexible deployment options and centralized management for IIoT deployments at any number of sites. Features like over-the-air updates and deployment templates make it simple to scale to collect, analyze and integrate data at any scale for complete digital transformation.

# Capabilities

In terms of data acquisition, OPC Servers and IIoT platforms are very similar - both connect to devices to collect and expose data. They diverge when we start to talk about edge computing functions and management capabilities. This list of core capabilities can help manufacturers determine the right investment depending on their use cases and plans for moving to data-driven manufacturing.

	 <b>OPC Servers</b>	 <b>Industrial IIoT</b>
<b>Connect Devices</b>	<ul style="list-style-type: none"> <li>• Drivers available for install</li> <li>• Legacy Windows-based user interface</li> <li>• Connect devices with a Windows configuration wizard</li> <li>• Based on DCOM</li> </ul>	<ul style="list-style-type: none"> <li>• Ships with all drivers</li> <li>• Intuitive and easy-to-use with a modern, web-based user interface</li> <li>• Connect and configure devices in a few clicks</li> <li>• Comes with utilities to troubleshoot connection issues</li> </ul>
<b>Collect Data</b>	<ul style="list-style-type: none"> <li>• Exposes data in standard OPC format</li> <li>• Limited data control</li> <li>• Storage requires an external source (database, historian)</li> </ul>	<ul style="list-style-type: none"> <li>• Normalizes data into a JSON message with metadata</li> <li>• Message Broker technology</li> <li>• Built-in time-series database</li> </ul>
<b>Expose Data</b>	<ul style="list-style-type: none"> <li>• Uses OPC UA or DA to expose data to factory, IT and cloud applications</li> <li>• Limited data control</li> <li>• Limited pre-built integrations</li> <li>• Data is lost if connection fails</li> </ul>	<ul style="list-style-type: none"> <li>• Can publish data using OPC UA, MQTT, Kafka, and other modern protocols</li> <li>• Precise control over how and when data is published</li> <li>• Deep pre-built integrations</li> <li>• Store and forward capability</li> </ul>
<b>Analyze Data</b>	<ul style="list-style-type: none"> <li>• Send data to third party software for analytics</li> </ul>	<ul style="list-style-type: none"> <li>• Create custom dashboards and data flows</li> <li>• Data visualization with applications running on the platform itself</li> <li>• Access to a library of pre-built KPIs such as OEE, Production Count, Moving Average etc.</li> <li>• Organize data into data models</li> </ul>



### Run Applications

- Send data to applications

- Write, manage and orchestrate applications and expose data to them
- Run any application regardless of coding language
- Deploy applications with containers

### Run ML Models

- Provide data to third party applications to build ML models

- Feed ML systems with data stored in time-series database
- Run ML models at the edge within the platform
- Strong ML Ops cycle – experiment on models

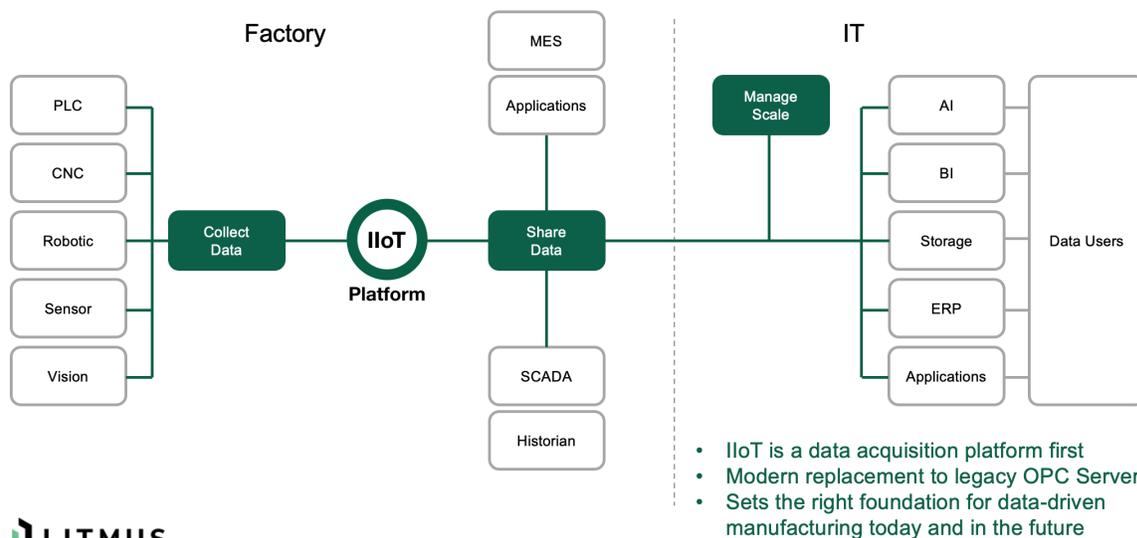
### Centralized Management

- Runs on Windows, frequent updates and patches can disrupt data collection
- Must be installed on a Windows server
- Each instance must be managed individually

- Flexible deployment options
- Runs as a secure Linux-based OS
- Can be managed remotely
- Centralized management for any number of sites
- Scales easily with templates, etc.

# Using IIoT for Data Acquisition

IIoT platforms like Litmus Edge are designed for data acquisition first and offer a modern replacement to legacy OPC Servers based on that function alone. The modern user-interface makes it very simple to connect to any machine or system and collect data in just minutes. Changes can be made on the fly with ease, devices can be added, data flows can be changed to send data anywhere - all without disrupting any other processes.



## Collect Data

With 250+ pre-built drivers, Litmus Edge can connect to any machine or industrial system out-of-the-box with no programming required. Collected data is structured and stored, and ready for use by edge and enterprise applications.

## Make Changes

The Litmus Edge interface is modern, and changes can be made without programming. Add devices easily, normalize hundreds of custom data points, build custom dashboards, and make automatic updates for an agile smart manufacturing solution.

## Share Data

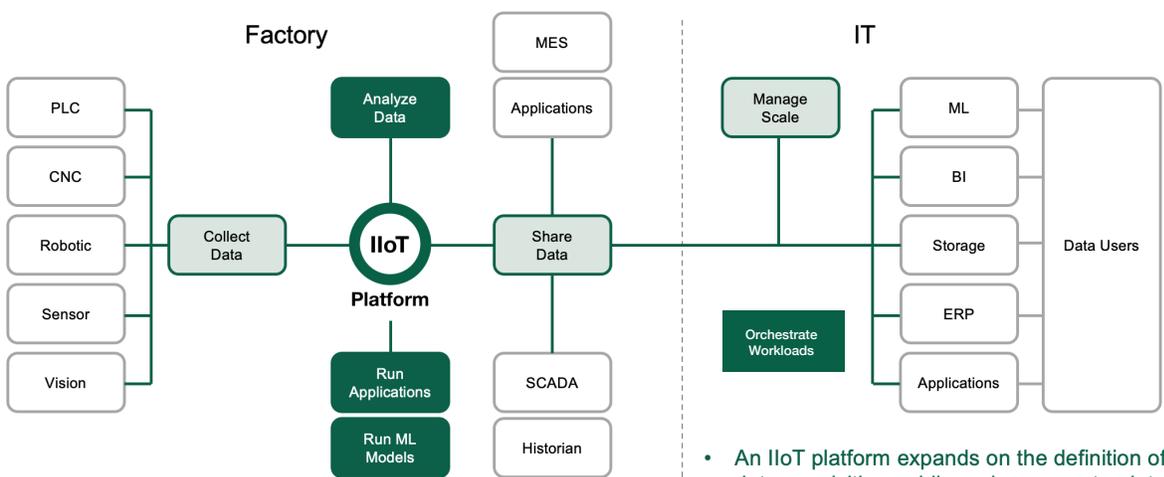
Litmus Edge comes with 20+ pre-built connectors to send machine data to cloud and enterprise systems. Integration is rapid with a simple drag-and-drop editor, and partial or pre-processed data can be sent to save time and money.

## Manage Scale

Litmus Edge offers flexible, scalable and repeatable IIoT deployment. Remotely configure, update and monitor IIoT devices, and achieve a single point of control to view and manage edge devices, data and applications at scale.

# Using IIoT for Data-Driven Operations

Where IIoT platforms like Litmus Edge really show their value is when customers want to do more with the data. When they want to change KPIs and parameters, when they want to start to do some analytics, to feed machine learning models, to run those models at the edge to make improvements, to scale to many sites – that’s when an IIoT Platform sets the right foundation for data-driven operations.



- An IIoT platform expands on the definition of data acquisition, adding edge compute, data intelligence and centralized management
- Sets the right foundation to grow and expand data use cases – flexibility will be baseline



## Analyze Data

With pre-built KPIs and an easy-to-use dashboard builder, Litmus Edge allows customers to analyze and put data to work at the edge immediately. Customers can run analytics for machine downtime, condition monitoring, OEE and more.

## Run Applications

Customers can host and access 45+ pre-loaded public applications or any custom application in a centralized repository in Litmus Edge, with the ability to deploy and run them at the edge rapidly using containers.

## Run ML Models

Not only does Litmus Edge feed machine learning models with good, complete OT data, any model trained by any system can also be run at the edge using container technology embedded inside the Litmus Edge platform.

## Orchestrate Workloads

Centrally deploy, orchestrate and update any application or model to any number of sites easily with one click. The centralized orchestration of workloads means rapid improvements across the enterprise based on learnings.

# Why Customers Switch from OPC Servers to IIoT Platforms

OPC technology was developed to get the data out of PLCs and other devices, OPC Servers were not designed for today's use cases. Customers who are innovative and forward-thinking want to put their effort into using the data, not acquiring the data, and they're ready to adopt a platform that can take them to the next level. Here are some of the reasons Litmus sees customers making the switch.

 OPC Servers	 Industrial IoT
✓ Built on Windows and management is cumbersome	✓ Built on Linux with flexible deployment options
✓ Showing its age in user experience and functionality	✓ Simple and modern user-interface
✓ System is static and not built for change	✓ System is built to be flexible and handle change
✓ Can be difficult to deploy and manage at scale	✓ Easy to scale with remote configuration and deployment templates
✓ Doesn't offer any edge computing functions	✓ Includes pre-built analytics and visualizations
✓ Doesn't go far enough to enable ML and data ops use cases	✓ Feeds and runs machine learning models at the edge
✓ Focuses on acquiring the data but not using the data	✓ Focuses on using data to make improvements

# Getting Started

If you already have an OPC Server in place, it is easy to add an IIoT platform to take your factory to the next level for data-driven decision making. You can continue to run the OPC Server and add the IIoT platform to fix other connectivity issues, then unify the data and share it with OT, IT and Cloud systems. Or you can rip and replace quickly because an IIoT platform connects to devices in minutes and doesn't require extra purchases for individual drivers.

If you have neither an OPC Server nor an IIoT platform in place, it is time to choose to standardize on a technology based on where you want to go. If you want to look at trends, perform analytics, feed, and run models – then you need an IIoT platform in the long run. Either one can handle data acquisition, but an IIoT platform will take you much further as you work to adopt true data-driven manufacturing by collecting the right data, sharing it with the right systems, and then running those applications back at the edge for continued learnings and improvements.

## Watch the Webinar: IIoT Platforms vs OPC Servers – Comparing Modern and Legacy Factories

<https://litmus.io/resource/iiot-platforms-vs-opc-servers/>

## Watch the Litmus Edge Platform Demo

<https://litmus.io/litmus-edge/demo/>

## Talk to a Litmus Industrial IoT Platform Expert

<https://litmus.io/get-started/>



The Industrial IoT Edge Platform

[Litmus.io](https://litmus.io)

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