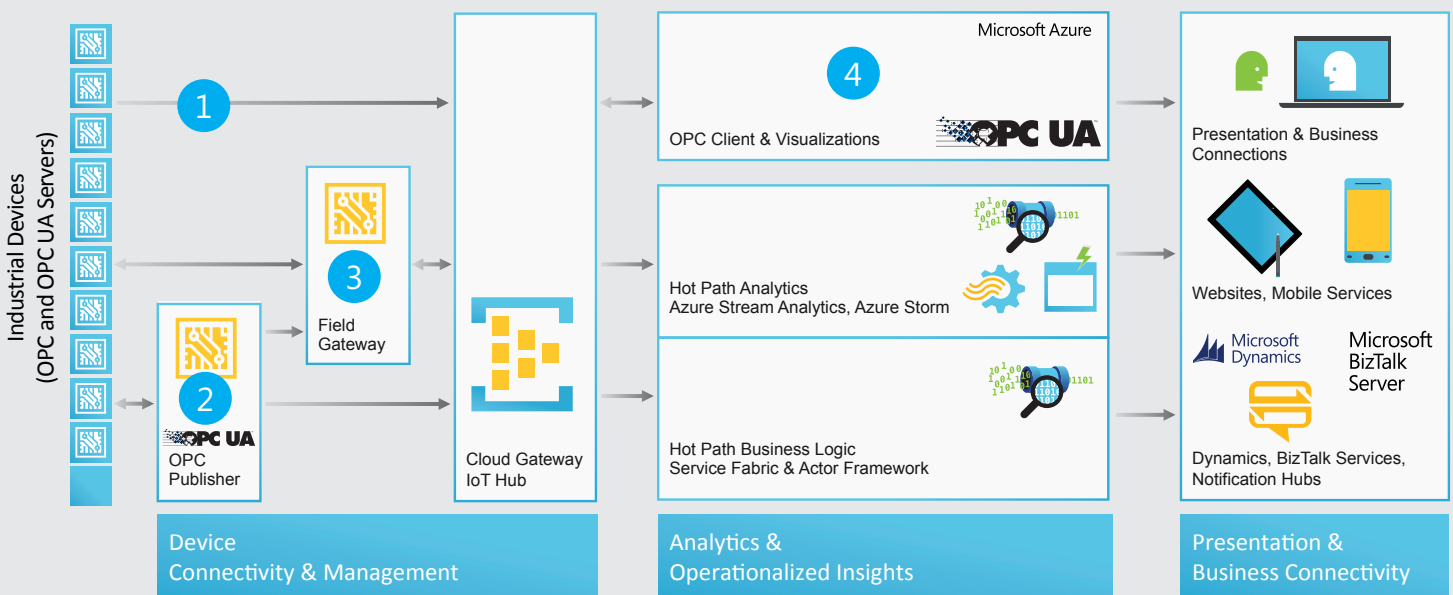


5 Clicks to Digital Factory: Connect your Machines easily with Industry-4.0-Standard OPC UA to the Cloud

Microsoft and the OPC Foundation (www.opcfoundation.org) have worked closely together over the last number of months to deeply integrate OPC UA into the Azure IoT Suite. The result of this collaboration is a reference implementation available open-source on the OPC Foundation's GitHub (<https://github.com/opcfoundation>). The architecture of the implementation is shown in the following diagram:



1 Direct telemetry channel: Pub/Sub

New OPC UA Servers supporting the upcoming Publisher/Subscriber specification extension have the ability to publish OPC node data to Azure IoT Hub for **telemetry** data via JSON/AMQP messages directly.

2 Telemetry channel via OPC Publisher

Existing OPC Servers (both OPC and OPC UA) will always support the UA-Binary protocol. The OPC Publisher connects to these servers and subscribes to OPC nodes available on the servers and publishes them to Azure IoT Hub for **telemetry** data via JSON/AMQP messages.

3 Field Gateway/Relay

If **edge intelligence** (e.g. analytics) or **store and forward** for lossy connections to the cloud are requirements, a **Field Gateway** is additionally required. It can also act as a **Relay** for UA-Binary-encoded **command and control** messages and responses. Note that the OPC Publisher and Field Gateway can also be integrated into a single device, if required. Note that Azure IoT **device management** agents (per device) will run in parallel, to manage device firmware updates and settings.

4 Cloud Services

Customers can program Industry 4.0 Services, e.g. ERP services, process optimization services, manufacturing on demand services, etc. against an OPC Graph Database and API, or they can simply run OPC Clients for visualization in the cloud. A reference implementation for both will be provided by us open-source.

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»OPC UA is an essential component of the connected products that manufacturing customers need today, and it is increasingly seen as an important part of enterprise IoT scenarios and business models. In keeping with our commitment to openness and collaboration, Microsoft is fully committed to supporting OPC UA and its evolution.«

Matt Vasey, Director of IoT Business Development, Microsoft,
OPC board member



»The road to industrial cloud analytics leads through OPC UA.«

Clemens Vasters, Principal Program Manager, Microsoft Azure and OPC Technical Advisory Council Member

OPC UA is an essential foundation for the convergence of OT and IT, providing a standardized communication, security and metadata/semantics abstraction for almost all industrial equipment. From an IT perspective, OPC UA is the programming interface of the "connected factory" and any other industrial facility and a critical enabler for Industrial Internet of Things (IIoT) as well as the Reference Architecture Model for Industry 4.0 (RAMI4.0) adoption.

OPC UA also serves as a critical gateway technology to cloud-enable industrial equipment, en-

abling data and device management, insights, and machine learning capabilities for equipment that was not designed to have these capabilities built-in. The cloud enables globally-available, industry-specific Software as a Service (SaaS) solutions that are cost-prohibitive to stand up for each industrial facility on its own. As customers and partners collaborate to modernize their plants and facilities, OPC UA is delivering digital transformation simply and easily. Microsoft's support of OPC UA offerings will reduce barriers to IoT adoption and help deliver immediate value.