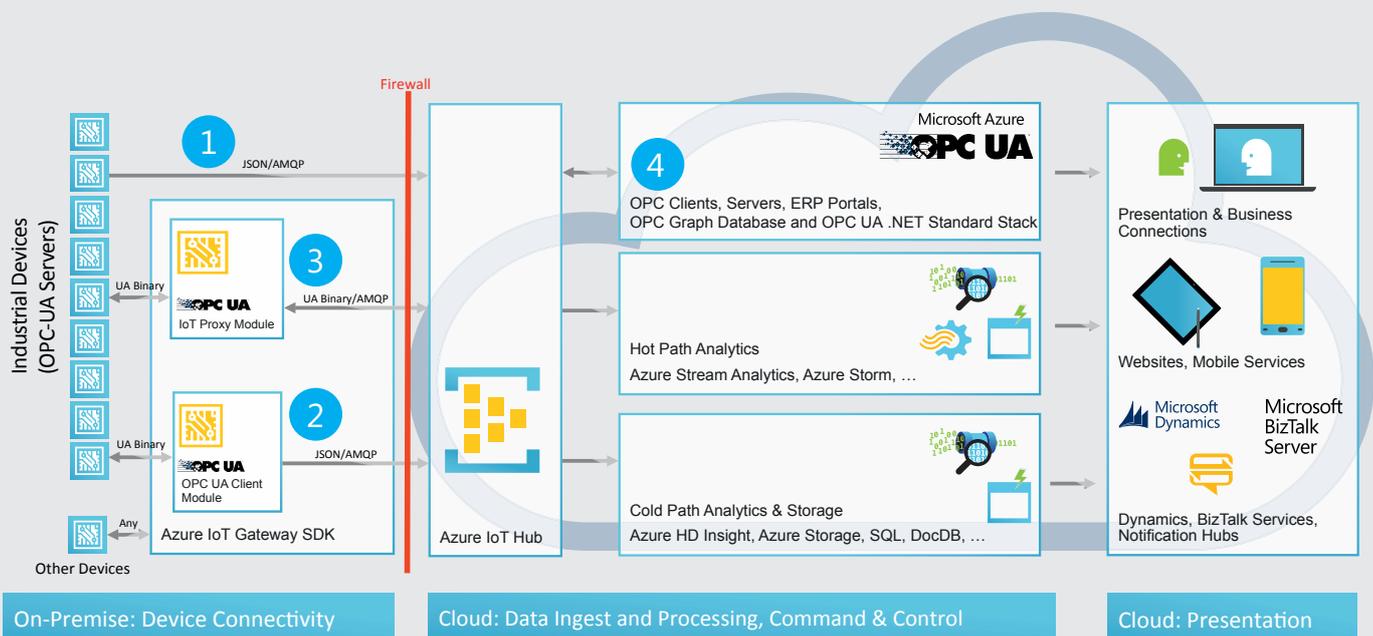


Industrial Interoperability from Sensor to Cloud OPC UA Integration into Azure IoT Suite

Microsoft and the OPC Foundation continue to partner and innovate together on Industry 4.0 solutions based on OPC UA. The result of this collaboration is a reference implementation available open-source on the OPC Foundation GitHub (<https://github.com/opcfoundation>) and the Azure GitHub (<https://github.com/azure>). The architecture of the implementation is shown in the following diagram:



1 Telemetry channel via Pub/Sub

New OPC UA Servers supporting the OPC UA Publisher/Subscriber specification extension (Pub/Sub) can publish OPC node data to Azure IoT Hub for **telemetry** data via JSON/AMQP messages directly.

2 Telemetry channel via Azure IoT Gateway SDK

Existing OPC Servers (OPC Classic via wrapper and OPC UA) will always support the UA-Binary protocol. The Azure IoT Gateway SDK's OPC UA Client Module connects to these servers and subscribes to OPC nodes available on the servers, then publishes them to Azure IoT Hub for encrypted **telemetry** data via Pub/Sub-compatible JSON/AMQP messages.

3 Command & Control channel via Azure IoT Gateway SDK

UA-Binary-encoded **command and control** messages and responses are sent via the Azure IoT Gateway SDK's IoT Proxy Module using the service-assisted communication pattern. This allows the **firewall to remain closed** to the public facing Internet. Furthermore, all traffic is **encrypted** and **UA authentication** (via X.509 certificates and security tokens) is used.

4 Cloud Services

Customers can program Industry 4.0 Services, e.g. ERP services, process optimization services, manufacturing on demand services, etc. against a **cloud-enabled OPC UA reference stack and SDK**, or they can simply run OPC UA Clients for visualization in the cloud.

Contact:

Gary Sherman, gasherma@microsoft.com
Senior Product Manager Azure IoT, Microsoft Corporation



»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, 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.