

# Summary of OPC UA support (all open-source on GitHub)

| Feature                       | Why it is important                                                                                                                                                                                                                                                                                                                                                                                              | How Azure IoT delivers this                                                                                                                                                                                                                      |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Edge Support                  | Machines cannot be modified after being deployed for security, safety or downtime risks. Therefore, Edge support to act as an “adapter” between the machine and the cloud is essential. For machines that do not support OPC UA yet, a protocol converter must be used. Azure decided a long time ago to leverage its partner ecosystem for the converters and edge enable them.                                 | Through IoT Edge support, we have the ability to deploy Docker container workloads from the cloud including 3 <sup>rd</sup> party modules available through our Edge Marketplace.                                                                |
| Read info models              | To understand the semantics/meaning of the telemetry data, the machine info model must be read. Otherwise the data is meaningless.                                                                                                                                                                                                                                                                               | OPC Twin allows browsing of the OPC UA info model from the cloud using a simple REST API and it also uploads entire info models to the cloud and stores it in a CosmosDB Graph database for offline access.                                      |
| Read data                     | To send machine telemetry data to the cloud, the machine data must be read.                                                                                                                                                                                                                                                                                                                                      | OPC Publisher has a built in OPC UA client that can access the OPC UA server built into the machines.                                                                                                                                            |
| Info model available in cloud | Machine builders and manufacturers have spent significant expense to model their machines and they don't want to lose access to this asset when moving workloads to the cloud. Therefore, it is important to make the machine data model available in the cloud.                                                                                                                                                 | OPC Twin allows browsing of the OPC UA info model from the cloud using a simple REST API and it also uploads entire info models to the cloud and stores it in a CosmosDB Graph database for offline access.                                      |
| OPC UA telemetry format       | Manufactures and machine builders want telemetry from all brands and types of machines to be in an open, consistent format, to not be locked into a proprietary ecosystem. The OPC UA PubSub format achieves this.                                                                                                                                                                                               | OPC Publisher converts OPC UA client/server data (“UABinary”) to OPC UA PubSub data (a JSON format sent using MQTT).                                                                                                                             |
| Security management           | An OPC UA-enabled machine has a list of trusted certificates which represent the applications it trusts and allows connections from. Certificate management using a PKI is non-trivial, though, and requires the use of a private Certificate Authority (CA). OPC UA security must be simple to use and mostly automated, otherwise factory operators turn off security which prevents a successful IoT rollout. | OPC Vault is a microservice that can configure, register, and manage certificate lifecycle for OPC UA server and client applications in the cloud. It offers simplified and secure certification management and application security management. |
| Command and control           | To close the “digital feedback loop”, command and control must be enabled for accessing machine methods/functions.                                                                                                                                                                                                                                                                                               | OPC Twin allows command and control through a simple cloud-based REST API.                                                                                                                                                                       |