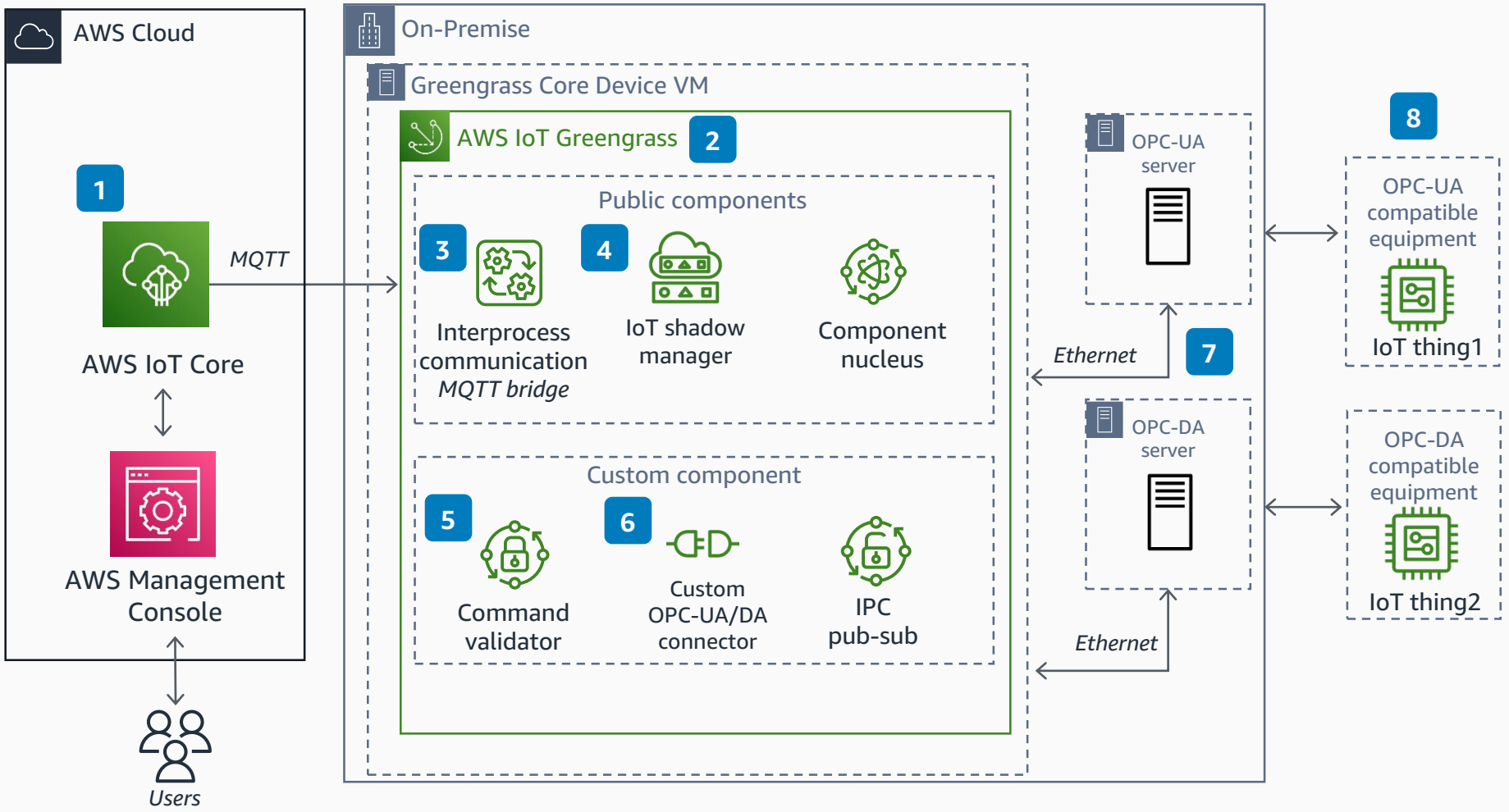
Guidance for Full Duplex Open Platform Communication on AWS

This reference architecture illustrates how to implement and monitor two-way communication with renewable energy assets such as wind turbines and solar panels using AWS IoT Greengrass.



1. Users can access **AWS IoT Core** service in the **AWS Management Console** to start sending and receiving messages through the Message Queue Telemetry Transport (MQTT) test client or **Named Device Shadows**.
2. **AWS IoT Greengrass** (V2) core runs in a Virtual Machine (VM) located on the factory premise or edge location. It manages communication between the Open Process Communication (OPC), Unified Architecture (UA), or Data Access (DA) servers and AWS Cloud.
3. Using **Inter Process Communication** (IPC), MQTT messages are available for subscription through the **AWS IoT Greengrass** provided **MQTT Bridge** private component.
4. **AWS IoT Greengrass** provides the **Shadow Manager** component that enables the local shadow service on the **AWS IoT Core** device. The local shadow service allows components to interact using IPC. Shadows allow synchronization of OPC server status, device readings, and configurations with AWS Cloud.
5. A custom component parses and validates messages received through IPC. This checks for data type, expiry time limits, and safety boundaries. It also enables the synchronization of readings and configurations of OPC compatible equipment and OPC servers to AWS Cloud by interacting with the shadow manager component provided by **AWS IoT Greengrass**.
6. A custom OPC-UA/DA connector establishes a connection to the respective OPC server from the **AWS IoT Greengrass** core VM to connect, read, and write messages to the on-premise OPC-UA/DA servers. It interacts with the provided shadow manager component to synchronize server status, errors, clock, and other critical parameters with AWS Cloud.
7. On-premise OPC-UA/DA servers run on the same corporate network.
8. OPC-UA/DA compatible equipment such as wind/solar farms and other industrial equipment communicate with the on-premise OPC-UA/DA servers.

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AWS Reference Architecture