Industrial Robots in Discrete Manufacturing

Industrial robots are a mainstay in the manufacturing of automobiles and automobile parts, and their use is spreading widely to other areas of discrete manufacturing. KUKA Robotics, a leading supplier of Industrial Robots for the general industry and for the automobile manufacturing sector found some compelling use cases to deploy fog computing as part of their robotic ecosystem.

Customer Problem

While industrial robots are one of the most expensive machines in the factory floor and they deliver their main functions efficiently, KUKA's customers were hampered by other problems:

- There was no asset management solution for the robots. Factories with tens of thousands of robots use outdated technologies to track the deployment status, software configuration, maintenance records and end effector (like gripper) status.

- Maintenance events like fault notifications, software upgrade, etc. are still done on one off basis with no visibility and actions at a factory level.

- The rich data from robotic controller was dormant.

KUKA's customers were ready for a solution to address these problems and at the same time enhance the value of their robots by unlocking the data source from within them.

Nebbiolo Technologies Solution

The fog**Node**TM product with its integrated hardware and software system that runs the fog**OS**TM and the corresponding cloud component, fog**SM**TM, offer a strong platform on which the KUKA Connect solution is built. The challenge was to deploy this in a brown field setting without any disruption to the production line and without any changes to network topology.

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KUKA Connect USE CASE
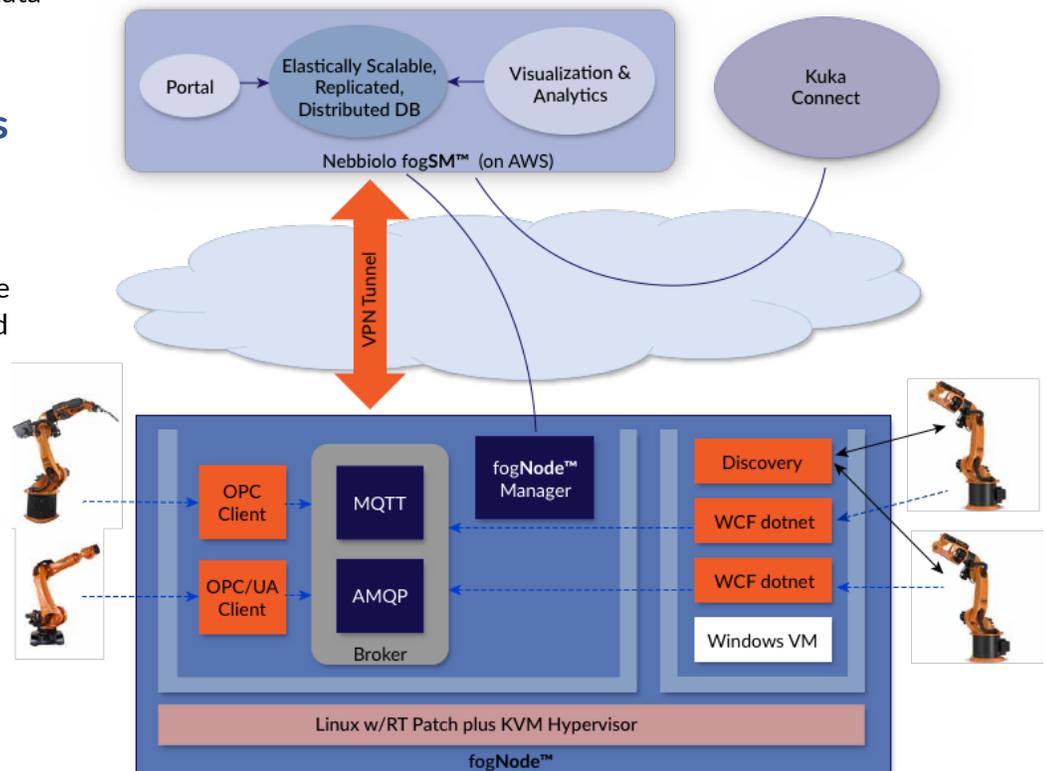
The following features of the Nebbiolo Platform are the foundation of the KUKA Connect solution and enable its brown field deployment:

- Zero-touch-deployment and Zero-client-modification: Robot discovery mechanisms and automatic configuration allows easy installation and device on-boarding.

- Data Connector middleware for different types of robots allows uniform north bound interface to the KUKA Connect application. Robotic device differences are hidden.

- Asset management feature enables remote management of multiple robots including secure and safe software upgrades.

- Application store in the fog**SM**^{TM} provides the infrastructure to host applications from KUKA as well as from 3rd parties

- Secure tunneling features allow seamless integration the factory IT network and to the cloud across disparate networking topologies.

- Virtualization feature allow legacy applications from KUKA to be run without any modifications.

- Scalable hardware and software solution allows both expansion in terms of capacity and features.

Benefits and Summary

- A comprehensive fleet management solution that can be deployed in brown field has enabled KUKA to solidify their market share. KUKA is seen as a technology innovator with a vision to address its customers' problems.

- A scalable fog**Node**^{TM} that can service up to 40 robots has enough room to cater to more robots and to host advanced features like preventive maintenance in the future.

- A service based business model ensures a steady revenue stream to KUKA.

Notes

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