Demonstrating the Potential of Private 5G Network Combined with Edge Computing for a Middle Eastern Telco

Overview

The client, a middle eastern telco, wanted to explore the potential of private 5G network combined with edge computing that has proposition in multiple industries. TechM collaborated with the client for 5G network and a global tech company for edge computing. We identified the use case for port industry on Container damage detection and demonstrated the use case with highly distributed private 5G network and edge computing in client's premises. This also enables the market opportunities using the replica in various industry segments.

Client Background and Challenge

The client, a leading middle eastern telco, has been at the forefront of technology-driven and digital enabler. They were one of the first operators to launch a 5G network in their country and intend to leverage this infrastructure and early mover advantage to power industrial automation. Their cloud infrastructure team wanted to demonstrate the potential of private 5G network when combined with the computing power of mobile edge cloud. To further this vision and opportunity area for enterprise customers, TechM collaborated with the client and the American tech company for creating an edge solution that has propositions in industries such as ports, energy and utilities, and healthcare. As part of this collaboration, the client brings in the private 5G network infrastructure (including the RAN, network core, and physical infrastructure).

Tech Mahindra provides industry-leading use case identification, consulting, IT-OT integration, field survey, digital application solution, and services. The tech company brings its Azure Edge Stack, which simplifies the deployment of distributed, secure, private 5G network and empowers the development of low-latency services at the edge

Our Approach and Solution

TechM identified shipping container and port operations as one of the high-impact areas based on the market potential.

Container damage detection- A shipping container in a bad condition could lead to a lot of unforeseen losses to the tune of millions of dollars. Millions of twenty-foot equivalent units (TEUs) are handled in a port in a day. Inspecting each of them manually to prevent such losses is time consuming and prone to error. To handle insurance claims, ports analyze multimodal data including visual inspection logs cargo manifests which takes time. Automated inspection using visual analytics and real time detection of damage at the entry of the port significantly reduces such scenarios and unlocks a lot of productivity for the shipping personnel.

For demonstration of the use case in client's premises TechM simulated the case study by using damaged cars instead of Shipping Containers

The 5G private network setup to simulate the use cases in client's premises included

- ▶ 5G-enabled cameras
- ▶ Azure edge stack
- ▶ 5G connectivity, access, and core network
- ▶ Visual analytics application deployed by Tech Mahindra, on the Azure edge stack

Tech Mahindra conducted a field survey to identify the right location for camera installation. The cameras thus installed at the entry gate of the yards, capture the image feed of shipping containers on trucks, and the private 5G network acts as a catalyst to carry this data to the edge cloud. Visual analytics application deployed on the edge cloud processes and analyses the image feeds in real time. The application leverages machine learning to detect dents, rust, welding damage, and door alignment.

Business and Community Impact

For this use case, the solution demonstrated:

Damage detection accuracy

Detection of damages on the containers when they are entering / exiting the yard facility

Ability to reduce damage claims hence saving in insurance cost in millions of dollars

Overall, the setup is the first of its kind in the region to unleash the potential of a highly distributed 5G network combined with intelligent computing at the customer's edge, to deliver low latency services. The impact it created on the client was as follows:

It enabled the client and Tech Mahindra to scale it to more use cases such as intelligent crane movement, intelligent number plate detection, container damage, container id detection, leakage detection, container location identification, control the cranes using this setup in ports.

It will help the client and Tech Mahindra address wider market opportunities as it is replicable for demonstrating use cases across other industry segments like healthcare, oil and gas (O&G), mining, and manufacturing.

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