Revolutionizing Industrial Connectivity with an Intelligent Mobility Framework

Problem Statement

The client, a global leader in digital transformation and industrial automation, identified a critical need to revolutionize industrial connectivity. They sought to build an Intelligent Mobility Framework that would redefine how industries interact with intelligent devices. The framework needed to achieve key objectives including reusability, extension of digital services to mobile platforms, and integration of wireless technologies such as Wi-Fi, NFC, and Bluetooth. Additionally, it was crucial to address diverse use cases such as simplified configuration, enhanced diagnostics, cloud-based content access, remote support, and secure access leveraging CIP Security. However, bridging the gap between existing components and mobile platforms while ensuring modularity and scalability presented a significant challenge.

Challenges

- Existing systems lacked a cohesive framework for seamless interaction between intelligent devices and mobile platforms, resulting in fragmented connectivity and inefficiencies.
- Components were not designed for reuse across different applications, leading to redundancy and increased development overhead.
- Ensuring secure access to intelligent devices from mobile platforms was a major concern, especially with the proliferation of wireless technologies.
- Existing architectures struggled to accommodate the growing demands of industrial connectivity, hindering scalability and future growth.
- Configuring and troubleshooting intelligent devices from mobile devices was cumbersome and time-consuming, impacting operational efficiency.

Solution

Leveraging cutting-edge technologies and innovative approaches, Utthunga devised a comprehensive solution to address the prevalent challenges. Key highlights include:

- Leveraged and evolved existing C# Digital Services code, enhancing reusability and compatibility with mobile platforms.
- Leveraged Blazor framework to seamlessly host Angular JavaScript, facilitating integration between front-end and back-end components.
- Employed the Micro Front End framework to create a modular front-end architecture, enhancing scalability and flexibility.
- Established connectivity over Wi-Fi using CIP or BNEP protocols, ensuring compatibility with legacy devices and alignment with CIP security standards.

- Implemented a digital service responsible for discovering available CIP devices on the network, streamlining configuration processes.
- Adopted modular design patterns for both front-end and back-end components, enhancing maintainability and extensibility.
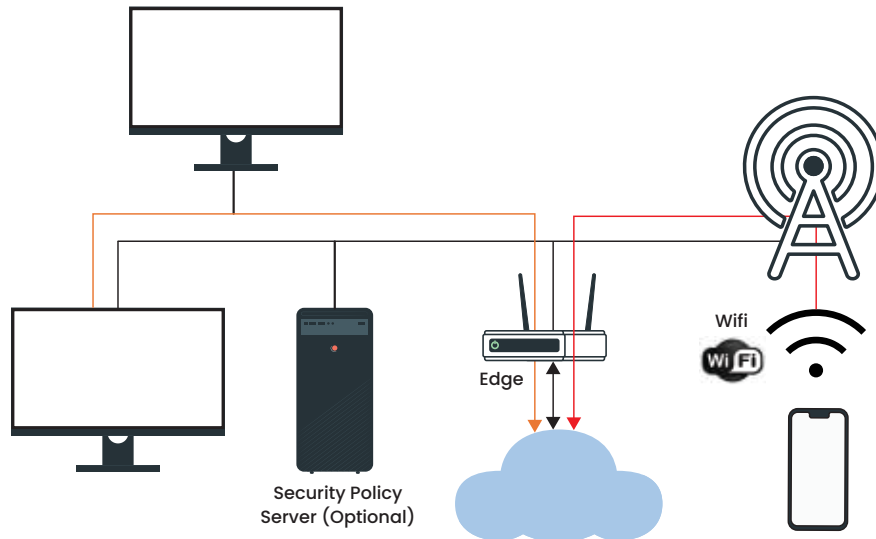
Benefits

The implementation of the Intelligent Mobility Framework yielded significant benefits for the client:.

- ✓ Achieved 78% code reusability across mobile platforms.
- ✓ Reduced integration time by 40% through seamless integration between front-end and back-end components.
- ✓ Realized a 60% increase in scalability and adaptability to evolving industrial needs.
- ✓ Ensured 100% compliance with CIP security standards while maintaining secure connectivity over Wi-Fi.
- ✓ Streamlined configuration processes led to a 30% reduction in maintenance overheads, enhancing operational efficiency.
- ✓ Increased the application performance even with large data by 50%.