52. SRUTHY PRAKASH

Using Smart Edge IoT Devices for Safer, Rapid Response With Industry IoT Control Operations

ABSTRACT The Internet of Things (IoT) offers the user seamless interoperability and connectivity between devices,systems, services, disparate networks, and in particular control systems. End users expect to connect quickly and transparently via any endpoint device, be it a phone, tablet,wearable, TV, car, or other system that is Internet enabled.Smart IoT devices can serve as versatile control system interfaces, allowing for rapid response and potentially ubiquitous access. However, these devices can present significant security challenges. Using these technologies for user access control at IoT endpoints is vulnerable to replay, man-in-the-middle, and denial-of-service attacks. This paper presents a model that combines the capabilities of smart IoT devices with control system gateways using real-time challenge response for secure control operations. The proposed solution using both endpoint and gateway devices employs a mix of compute, cryptography, signal/image processing, and communication capabilities for authentication and authorization function. We propose a model that is more secure, scalable, and resilient with real-time performance as compared to traditional approaches. We also provide an example IoT architecture, by showing an overview of Intel's IoT frame-work for control system gateways currently deployed in control, manufacturing, transportation, and retail tracking environments.