Hot topic study - Task 3

Service Orientation with Internet of Things(IoT) is considered to be highly advantageous. However, there are certain challenges that need to be addressed. This report focuses on studying the challenges associated with implementing service orientation in the field of IoT.

Overview

Table of Challenges:

Challenges	Short description of the challenges	Link
Resources Constraints	IoT devices have limited resources, while Service Orientations require additional resources for service management, which may impact the scalability of IoT services.	Challenge1
Privacy and Trust	Sharing sensitive user data between devices and services is required by Service Orientations, but conflicts with privacy and trust concerns.	Challenge2

Challenges

Resources Constraints

A work done in this area aims to identify the key requirements for managing IoT services as well as common service management platforms for IoT. It provides a thematic taxonomy based on crucial factors, investigates recent advances in service management and IoT systems, and highlights significant open research challenges. One challenge identified is the heterogeneous nature of IoT devices, which may limit the scalability of IoT services, resulting in interoperability challenges.

Service management for IoT: requirements, taxonomy, recent advances and open research challenges

An existing statistical method is used to resolve inconsistent service decisions in service-oriented IoT deployments, requiring adequate information to make decisions. The paper proposes a cluster-based distributed algorithm to reach global consensus, which enhances the robustness and trustiness of the decision process.

A distributed consensus algorithm for decision making in service-oriented internet of things

Service-Oriented Architecture (SOA) can integrate with WSN applications to address WSN challenges like communication, power consumption, data aggregation, heterogeneities of sensor hardware, and Quality of Service (QoS) issues. SOA middleware bridges the gap between the high-level requirements of different applications and hardware constraints of WSNs. This survey explores the state-of-the-art SOA and Service-Oriented Middleware (SOM) architecture approaches that provide solutions for WSN challenges.

[HTML] Performance and challenges of service-oriented architecture for wireless sensor networks

Privacy and Trust

A Sensing-as-a-Service run-time Service-Oriented Architecture (SOA) called 3SOA is presented in this paper for the development of IoT applications. 3SOA allows interoperability among different IoT platforms and supports SOA modeling at high levels of abstraction. The paper demonstrates an intelligent transportation system and data privacy functional prototypes as proof of concepts.

A service-oriented approach for sensing in the Internet of Things: Intelligent transportation systems and privacy use cases

This paper presents an event-driven service-oriented architecture (SOA) paradigm, focused on the design of an event-driven, service-oriented IoT services coordination platform. A situational event definition language (SEDL), an automaton-based situational event detection algorithm, a situational event-driven service coordination behavior model, and a reliable real-time data distribution model that supports the effective dispatching sensory data are proposed. It illustrates various illustrations for IoT service coordination and alarming disposal processes.

Situation-aware IoT service coordination using the event-driven SOA paradigm

IoT devices are used to help patients track their health status, manage drug-dosage, among other benefits, but they also represent significant privacy, trust, and security risks to patients. This paper assesses the current security models and frameworks for IoT healthcare, and proposes future improvements for IoT e-Health.

The future of privacy and trust on the internet of Things (IoT) for healthcare: Concepts, Challenges, and Security Threat Mitigations