
Overview

This standard is about architecting end to end Industrial Internet of Things (IIoT) solutions. This includes developing, evaluating and maintaining IIoT solution architectures as well as evaluating new IIoT technologies. They provide solution leadership and support on complex IIoT projects spanning across enterprise level IIoT domains. They liaise with those involved in implementing IIoT security and will align the IIoT system architecture with the IT security architecture to build in resilience.

IIoT solution architecture involves managing the IIoT system requirements and collaborating with various stakeholders involved in the specification and operation of complete IIoT solutions. This includes specifying the IIoT functionality through the range of platforms and smart devices that are used to control machines, collect data and communicated with each other. They need to understand data quality, data governance, and data standards. They will require an appreciation of security as it applies the IIoT system and the different attack surfaces this can present.

This standard also includes understanding the organisational analytical capability needs that are enabled through the range of IIoT smart devices and sensors. This covers the processes that gather information that is passed through gateways and collect and convert raw data into standardised data streams ready for analysis using cloud-based technologies.

This standard is for those who develop IIoT architecture solutions.

Performance criteria

You must be able to:

1. identify and review business requirements to develop IIoT architecture specifications
2. assess IIoT system requirements and data structures to be implemented in order to develop overarching IIoT system architectures and data models
3. provide end-to-end solution architecture and design leadership on complex IIoT projects spanning across the IIoT architectural domains
4. evaluate different platforms for the IIoT solution implementation, making recommendations based on solution requirements and architectural constraints
5. specify the data flows including data gathering, data processing, data storage, data quality checks and data communications required to deliver the IIoT solution
6. develop new system level IIoT solution architectures in line with specifications and organisational standards
7. define the IIoT smart device components required to be integrated into the IIoT solution in line with requirements
8. architect hybrid IIoT systems to integrate edge-of-network Programmable Logic Controllers (PLCs) and utilise and transmit data for IIoT processing
9. optimise data ingestion and processing capabilities of the IIoT platform architectures to remove constraints and increase efficiency
10. identify data governance issues, including PII (Personally Identifiable Information) regulations, GDPR (General Data Protection Regulations), security and privacy
11. validate proposed IIoT solution architectures in line with organisational standards
12. evaluate and articulate the features and benefits of new IIoT technologies, solutions and vendor products for potential integration into IIoT solutions
13. produce IIoT solution architecture documentation in line with organisational standards and stakeholder needs
14. communicate the IIoT solution architecture to relevant stakeholders tailored to audience needs
15. identify and evaluate new IIoT technologies for potential inclusion in IIoT architectures

Knowledge and understanding

You need to know and understand:

1. the organisational policies, procedures and guidelines which relate to developing and maintaining IIoT system architectures 2. the principles and methods of enterprise architecture which conform to industry standards and frameworks 3. the different elements of IIoT solution architecture including business architecture, data architecture, application architecture, technology architecture and security architecture 4. the organisational policies and procedures for documenting IIoT system architecture proposals 5. the principles and methods of IIoT and enterprise architecture 6. the differences between IIoT-specific and existing network architectures 7. the characteristics and key concepts of IIoT systems 8. how to define components specifications for IIoT solutions 9. how to perform value engineering and analysis of IIoT solution architectures 10. the steps involved in removing constraints and optimising efficiency in IIoT architectures 11. the principles of security design and architecture relevant to IIoT systems 12. how to determine the key criteria for IIoT system architectures that involve the connection of large numbers of smart devices with low-latency communications 13. how to scale IIoT solution architectures to meet increased scope 14. how to identify potential risks and define mitigations for IIoT solution architectures 15. the different industry standard cloud and distributed computing platforms for IIoT, their associated services and how to apply them 16. the different IIoT hardware components and devices and their impact on the performance of the IIoT solution architecture 17. how to troubleshoot and resolve issues with new IIoT solution architectures 18. the characteristics of IIoT data quality 19. how to implement IIoT data management 20. the different governance issues and standards for data storage, security, privacy and monitoring 21. how to scan for new IIoT technologies and evaluate the features and benefits

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