

## Decentralised Edge Authentication in the Industrial Enterprise IoT Space

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**Abstract :** Authentication protocols based on public key infrastructure (PKI) and trusted third party (TTP) are no longer adequate for industrial scale IoT networks thanks to issues such as low compute and power availability, the use of widely distributed and commercial off-the-shelf (COTS) systems, and the increasingly sophisticated attackers and attacks we now have to counter. For example, there is increasing concern about nation-state-based interference and future quantum computing capability. We have examined this space from first principles and have developed several approaches to group and point-to-point authentication for IoT that do not depend on the use of a centralised client-server model. We emphasise the use of quantum resistant primitives such as strong cryptographic hashing and the use multi-factor authentication.

**Keywords :** authentication, enterprise IoT cybersecurity, PKI/TTP, IoT space

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