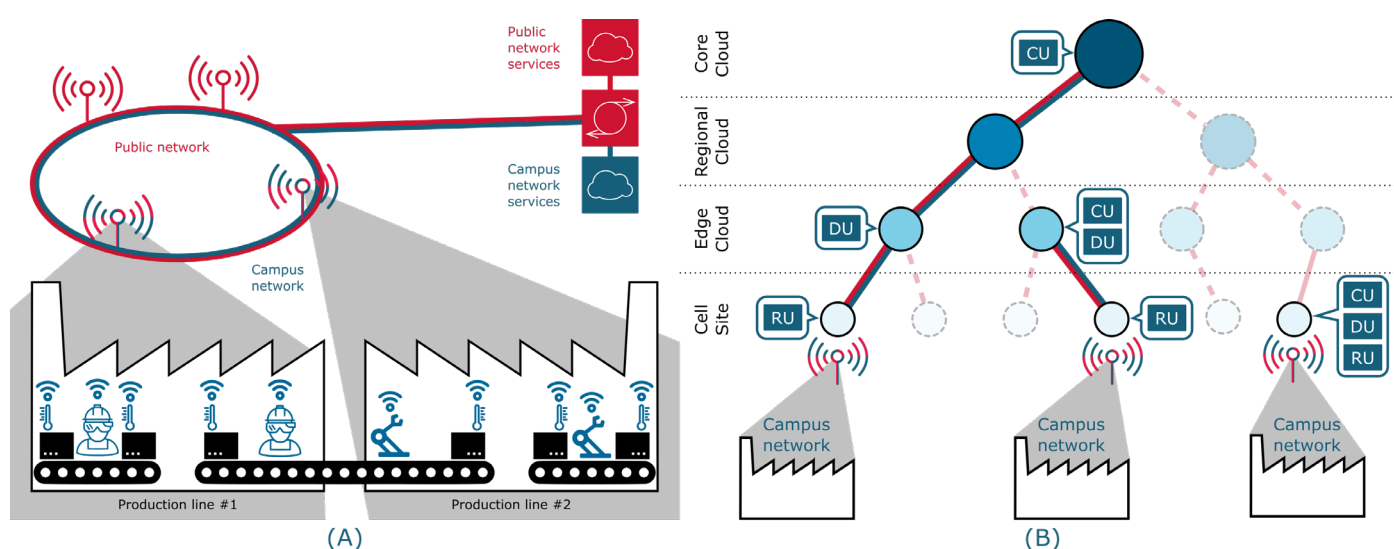


Employing network slicing to support Ultra-reliable Low Latency Communication (URLLC) in campus networks

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What is the impact of disaggregated RAN functions on total service delay experienced by multiple types of applications? How does the dynamic placement of Centralized Units (CUs) and Distributed Units (DUs) affect the total service delay of applications?



(A) Deployment scenario of campus network with the support of a public network. Multiple production lines are monitored with the help of sensors connected to a 5G campus network characterized by different requirements regarding end-to-end latency (Adapted from "5G Non-Public Networks for Industrial Scenarios", 5G Alliance for Connected Industries and Automation - 5G ACIA). (B) Three examples of virtual RAN allocation in a multi-tier public network aiming to fulfill different application end-to-end latency requirements.

KEY FINDINGS

Campus networks are pointed out in the literature as one of the cornerstones of Industry 4.0. Within the set of options to provision campus networks, the deployment with the support of a public mobile network is especially attractive for industries seeking a low capital expenditure for the deployment or for those that do not have the know-how to operate a mobile network infrastructure. Vertical slicing or public networks enable the provision of campus networks, creating isolated subnetworks on top of shared infrastructure. We are investigating the efficient use of network slicing of public shared infrastructure to provision campus networks with high isolation and ultra-reliable low-latency requirements. In previous work, we took advantage of the disaggregated RAN concepts where each functional block of the RAN could be placed individually as a virtual network function (VNF). Due to the inherent characteristics of modern networks, multiple tiers are considered, ranging from simple computing nodes at the cell site to big data centers at the cloud with abundant computing resources.

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