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CONNECTED NETWORK – A NON-TERRESTRIAL STANDARDISED COMMUNICATION ARCHITECTURE FOR NEW IOT BUSINESS MODELS

Abstract

A high number of IoT devices are being deployed on remote areas, not covered by mobile terrestrial networks. New technologies, solutions and applications are being built every day, in an evolving market which, if enabled by an affordable, standardised, global communication solution would be further unlocked. Looking at space as the go-to solution, since 2021 about 3.9 million subscribers have been using satellite communication (satcom) to enable their IoT-based business models, with studies predicting more than 21 million subscribers worldwide of IoT via satellite in 2026. These numbers, allied to more than 450 million people living in areas without network coverage, and many others travelling through such areas on a day-to-day basis, stretches the use of satellite connectivity as we know it today, and poses a clear need for an affordable, easily accessible, standardised, and fully optimised solution for a global connectivity problem. Despite recent breakthroughs, satcom are still very expensive, complicated, inaccessible, and complex to setup and use. Promises of standardised, low-power, low-cost connectivity has not yet been materialised. Indeed, the growing demand on the users' side, especially in terms of price and easiness of use, has not been met by the existing infrastructure and, therefore, the urge for satellite-based connectivity continues to grow. At CONNECTED, a newly established startup, we are determined to provide easily accessible connectivity for everyone, everything, everywhere. To achieve this, we are targeting the expansion to space of widely disseminated terrestrial, low-power, narrowband communication networks, in the unlicensed ISM radio bands (namely using LoRaWAN), while already looking to the future integration of satellite and terrestrial networks through the 5G NB-IoT standard protocols. The ultimate objective being the seamless transition from terrestrial to non-terrestrial networks, when a standard device (i.e. without the need for proprietary technology or software) moves from a mobile network covered area to a remote one. Upholding to user needs, and keeping the prices low, we aim to launch a heterogeneous satellite constellation, both in low and higher orbits, using standard COTS technologies, together with different ground assets, all managed by an AI framework under development, forming a global connectivity network. This paper discusses the architecture of this new network, how it answers a set of new applications and fulfils CONNECTED's aim to affordably connect humankind, unleashing a new wave of IoT-based business models, while contributing to bridge the digital divide.