



Contribution ID: 123

Type: Talk

Smart Spectrum Sharing (S3): Toolboxes to Support Efficient Utilisation of the National Spectrum Resources

The demand by consumers for access to ubiquitous and affordable communication services including the applications of the fourth industrial revolution, with the need to connect everything to the internet (machine-to-machine, and human-to-machine communications) is exponentially growing in both speed and volume. Radio frequency (RF) spectrum is a finite resource of the national ICT infrastructure necessary for enabling exchange of information. In most developing countries, wireless communication technologies remain the cost-effective and preferred solution for providing broadband communication networks due to the lack of, or limited coverage of fixed communication infrastructures such as fiber optic cables which is attributable to the high investment costs. However, the deployment of wireless network infrastructure depends on the availability of RF spectrum. As such, the demand for access to RF spectrum continues to increase and therefore necessitates for an efficient utilisation of it. Unfortunately, the dominant RF spectrum access techniques and management regimes are inefficient since they are based on the traditional command-and-control approaches, which are static in nature. The use of such (outdated) regimes has resulted into an “artificial” scarcity of RF spectrum. This artificially created scarcity leads to two main problems: i) limited or inadequate access to RF spectrum, and ii) high cost of network deployment which translates to high cost of data. Both these problems have a negative impact towards deploying wireless broadband networks for provisioning of universal broadband and communications infrastructures to the needy communities. The CSIR Smart Spectrum Sharing (S3) platform is meant to make available efficient RF spectrum utilisation toolboxes to stakeholders in the telecommunication sector value chain including the national regulators, network operators and policy-makers to support the efforts to reduce the cost of communications and ease the barrier of entry in the telecommunication sector.

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Session Classification: NICIS Cloud Projects

Track Classification: NICIS Cloud Projects