Dynamic Spectrum Alliance Limited
21 St Thomas Street
Bristol BS1 6JS
United Kingdom
http://www.dynamicspectrumalliance.org

3855 SW 153rd Drive
Beaverton, OR 97006
United States

DSA
DYNAMIC • SPECTRUM • ALLIANCE

DSA Response to ICASA consultation on TV White Spaces rules for South Africa

Introduction

The Dynamic Spectrum Alliance (DSA) is a global organization advocating for laws and regulations that will lead to more efficient and effective spectrum utilization[1]. The DSA's three goals are closing the digital divide globally, enabling the Internet of Things and alleviating the "spectrum crunch".

The DSA fully welcomes the draft regulations on the use of Television White Spaces (TVWS)[2] on which the Independent Communications Authority of South Africa (ICASA) is seeking input.

South Africa has hosted two notable TVWS trials. The Cape Town trial in 2013[3] provided connectivity to over ten schools, produced critical data for ICASA and proved that the TVWS technology is viable even in large urban centers, with connectivity at speeds of 12 Mbps and no recorded interference. The trial at the University of Limpopo[4] is providing ongoing connectivity to five nearby high schools. Both trials have helped demonstrate the viability and benefits of this technology, as well as how showing TVWS can play a part in meeting the goals of the national broadband plan, South Africa Connect.

The DSA congratulates ICASA on its leadership and regulatory innovation in making South Africa the first country in Africa to put in place a regulatory framework for TVWS, thereby enabling affordable Internet through dynamic spectrum access.

Strong overall support for the proposed regulatory framework

The success of TVWS technologies to meet increase access to connectivity depends on the regulatory framework governing their access to spectrum The DSA firmly supports the overall regulatory approach taken by ICASA to enable broadband services on a secondary user assignment basis in the Broadcasting TV band (470 MHz to 694 MHz).

---

[1] Our membership spans multinationals, small-and medium-sized enterprises, and academic, research, and other organizations from around the world, all working to create innovative solutions that will increase the amount of available spectrum to the benefit of consumers and businesses alike. A full list of DSA members is available on the DSA's website at www.dynamicspectrumalliance.org/members/.
[2] Draft Regulations on the Use of Television White Spaces, Government Gazette 40772 (Notice 283 of 2017)
[3] http://www.tenet.ac.za/tvws/recommendations-and-learnings-from-the-cape-town-tv-white-spaces-trial
[4] https://www.ul.ac.za/index.php?Entity=c_news&TheS=150

In particular, the DSA applauds ICASA for a number of elements which will contribute to the success of TVWS in South Africa. Firstly, it is important that the allow for both fixed and nomadic White Space Devices (WSDs), enabling a wider set of use cases.

It is also significant that WSDs will be authorized for use across the whole country, both in urban and rural areas, as this provides a larger addressable market around which the device ecosystem can develop, helping to provide necessary commercial incentives for companies to invest and to drive down the costs of devices.

Finally, the maximum power levels established in the rules are set at a reasonable level and are not unduly restrictive. Again, this will help enable a more commercially viable environment for device manufacturers, particularly for nomadic devices, which will ultimately mean that more people are able to use TVWS to access the Internet, and at lower prices.

As such, the DSA is confident that the draft regulations will lead to more efficient use of spectrum and increased Internet connectivity, while ensuring the protection of the broadcasters which are the primary users of this TV band spectrum.

Opportunities to enhance of the draft regulations

The DSA has identified a small number of areas where revisions would improve the regulatory framework, maximizing the gains to be made by enabling the secondary use of TV band spectrum.

- **Location accuracy for devices operating indoors**

The DSA notes that, under Regulations 10(7)(g) and 10(13)(g), master and client WSDs, will be required to provide "the geo-location uncertainty of its antenna not exceeding 50 metres". This requirement would not be workable for client devices operating indoors as the WSD would be unable to provide the required geo-location data unless it is near a window and thus able to receive GPS data.

The DSA recommends drawing on the regulatory approach used by Ofcom in the United Kingdom[5], under which master WSDs can use alternative means to estimate the location of a client device. When a master WSD does not know the exact location of a client WSD, the database will define an area of potential locations as a circle centered at the location of the master WSD which is serving the client WSD, with a radius calculated as the coverage range of the master WSD plus the uncertainty in its location. The database first estimates the coverage range using the transmissions characteristics

[5] Ofcom, *Implementing TV White Spaces* (Feb. 12, 2015), *available at* http://stakeholders.ofcom.org.uk/binaries/consultations/white-space-coexistence/statement/tvws-statement.pdf

of the master WSD, and then calculates EIRP limits for the client WSD under the assumption that it may be anywhere within the circle.

- **Requirements for geo-location capability**

The DSA believes that ICASA should remove the requirement for nomadic client WSDs to possess an internal geo-location capability, as this adds an unnecessary cost to the device, potentially limiting its commercial viability. Indeed, nomadic client devices are able to use a variety of form factors if they do not need to accommodate geo-location capability. Removing this requirement will therefore promote innovation and diversity in WSDs as well as helping to reduce the costs of some devices.

- **Installation**

Section 11 of the draft regulations set out requirements for installers of fixed WSDs, and the DSA recommends that ICASA add a sixth requirement to help ensure accuracy and make it more feasible to use fixed outdoor WSDs. Specifically, installers should be required to input the height of the WSD from the ground. This is because, while GPS can provide the x and y (latitude and longitude) coordinates with a high degree of accuracy, GPS has a fairly significant margin of error (+/- 15m) in relation to the z coordinate (height). Given that draft regulation 12(c) stipulates a maximum antenna height for fixed WSDs of 30m, the +/-15m margin of error in GPS accuracy could erroneously cause a fixed WSD to be identified as having too tall an antenna and be blocked from operating.

- **Clarification re OOBE**

Finally, the DSA seeks clarification on the specific limits set out in section 9 on the operation of WSDs immediately adjacent to a broadcast TV channel. Specifically, we want to confirm whether the value for the maximum out-of-bounds emissions limits is to be calculated based on the equation[6] provided in the ETSI EN 301 598 standard referenced in the Definitions of the draft Regulations. It also bears mentioning that this ETSI standard is currently being updated and the rules should have the flexibility to be able to incorporate any changes to the standard.

Conclusion

The DSA commends ICASA for its vision in becoming one of the early adopters of the TVWS, enabling it to advance important broadband connectivity objectives for South Africa while also making more efficient use of spectrum without causing interference to protected entities.

[6] POOB (dBm / (100 kHz)) ≤ max {PIB (dBm / (8 MHz)) - ACLR (dB), - 84 (dBm / (100 kHz))