openspectrum.eu

Response of the Open Spectrum Alliance to the draft RSPG opinion on the coordination of EU spectrum interest.

The Open Spectrum Alliance (OSA) commends the Radio Spectrum Policy Group (RSPG) to send out a consultation on the coordination of European Spectrum.

OSA respectfully submits its response to the RSPG..

1. Abstract

In response to the Consultation of RSPG on the coordination of European Spectrum OSA urges to make the European Coordinated Positions (ECPs) transparent from the beginning, to emphasize the importance of Open Spectrum and the requirement to include in new licenses the condition that the licensee needs to accept interference from future operation of Cognitive radio and that licensees should not restrict the application of the spectrum band by others when they are not using the band.

OSA proposes to allocate the availability and to standardize the use of frequency bands to disseminate information on available open spectrum.

OSA promotes to undertake research on the requirements to be stated in regulation regarding the optimized sharing of Open Spectrum.

2. About the organization

Founded in Vienna in May 2009,

> "The Open Spectrum Alliance is a coalition of companies, organizations, and individuals working to unlock the potential benefits of bandwidth for all."

> "Current methods of spectrum regulation are based upon the assumption of scarcity reflecting the technologies of the early 20th Century. 'Smart' radio technologies support far more efficient and productive methods of spectrum management."

> "The Open Spectrum Alliance is united by the goal of realizing the potential social and economic benefits of this underutilized natural resource by promoting innovative public policies."[1]

---

[1] Open Spectrum Alliance mission statement - http://www.openspectrum.eu

A list of the founding members, individual members and partners and supporters of the Alliance is given at the end of this document.

3. General comments

The benefits of license exemption are increasingly recognized, yet underestimated. Considering the unprecedented success of technologies like Wi-Fi, Bluetooth and Zigbee: their versatility and proven ability to stimulate innovation – with new applications appearing constantly in health care, public safety, recreation, robotics, telephony, environmental sensing, building management, geo-location, etc. – make it impossible to put an upper limit on their benefits to society.

In comparison, the benefits produced by the traditional spectrum management tool of licensing may be easier to estimate, but they are often overstated because opportunity costs are ignored. Exclusive access to the radio spectrum is one way to support quality of service. However, the price is underutilised bandwidth, since regulators must plan for the moments of heaviest demand and accept the fact that channels lie fallow at other times.

Traditional licensing also creates an "artificial scarcity" of spectrum for other potential users. Given the rapid developments in cognitive radio and mesh networks, exclusive channel assignments are no longer the only – nor always the best – way to guarantee quality of service. Thus, exclusive frequency assignments should be made sparingly, and limited to a reasonable time horizon. We believe that the commercial interests of electronic communication network operators – who need a certain amount of time to recover the cost of developing a particular market – must be balanced against the public interest to ensure that radio spectrum use is optimised. Commissioner Reding[2] (Reding, 2008) puts it this way:

> "Most 'valuable' does not mean only the most 'profitable' services. We need to think in terms of optimisation of spectrum in a wider sense, integrating social, cultural and economic aspects. As the European Commission also stressed in our recent Communication on the Digital Dividend, there is a necessity to shift our focus from technical spectrum efficiency to an optimisation in terms of the value to society of the services underpinned by the spectrum."

OSA was pleased to see that the European Commission promotes harmonized release of the spectrum for social values in the case of Digital Dividend. OSA has filed comments on the RSPG's public consultation on the digital dividend (Open Spectrum Alliance, 2009) as well as to the Dutch consultation on the same topic.

We therefore recommend that 1) significant amounts of spectrum across all bands be made available under a general authorisation regime either on (co-)primary or secondary basis 2) new licenses explicitly reserve the right to secondary cognitive use when assigned channels are not used by the license holder or not assigned to a license holder in a geographical area.

---

[2] Vivian Reding, Member of the European Commission responsible for Information Society and Media.

Section 3 in Part 1 of the RSPG consultation document (RSPG 2009-1) mentions 5 examples of preparation and coordination on WRC agenda items carried out by the Conference of European Postal and Telecommunications Administrations (CEPT). However, OSA is missing the topic of Open Spectrum.

4. Lessons learned from available open spectrum

The Netherlands have been one of the few leading Administrations instrumental in the assignment of Open Spectrum in the 2.4 GHz band in 1991 (CEPT, 1991) and the 5 GHz band on a licensed-exempt basis in Europe (CEPT, 1992).

Since that time, the use of that spectrum by the general public as well as companies providing Internet access through hotspots has been phenomenal. However, the most striking social and cultural breakthrough has been seen in communities setting up networks to bring broadband communication services to rural areas where the incumbent service provider did not or could not provide a broadband infrastructure. Moreover, even urban areas were deprived from broadband and community networks have been set-up successfully leading to alternatives for commercial networks.

4.1. Case studies

4.1.1. Djursland.net

The Djursland Network (Denmark) has brought broadband internet access to more than 7000 (2008 status) households, institutions, and firms in the rural area, giving connectivity to more than 20.000 rural people who were otherwise not having connectivity since the investments were considered prohibitive by the incumbent telephone and cable companies. The method based on Wi-Fi provides comparable service to the rural people against prices much lower than those paid by people in the city (Nielsen, 2008).

4.1.2. Athens Wireless Metropolitan Network (AWMN)

AWMN was formed as a community (Greece) back in 2002. Due to the tremendous problems with broadband services in Greece then, the number of broadband services available to home users was extremely limited. Thus AWMN was founded as an alternative broadband network, which allowed its users to experience real broadband services.

However after a short period from its "birth" AWMN started to change. An increasing number of people started to have an interest in the network, expressing their interest in joining this project. Very soon the number of network nodes started to grow exponentially, and the network's character changed from an alternative telecom network to a social network of people based on their interest in the IT/Telecom sector.

More information is available on http://en.wikipedia.org/wiki/Athens_Wireless_Metropolitan_Network and on http://wind.awmn.net/?page=nodes&session_lang=english

4.1.3. Freifunk.net

Freifunk.net is a non-commercial free open wireless "meta" community, founded in 2003 with its roots in Germany. In first hand it was a reaction to the fact that German Telekom was not able to provide broadband access (due to OPAL), especially in the newly-formed German states after the reunion, but also in many rural areas in the Western parts of the country.

Based on the concept of an "open public local access network" (OPLAN foundation), developed by Malcolm Matson (a UK network pioneer) and inspired by other pioneer wireless community projects freifunk.net aims not only to provide technical and general information about open wireless networks, but seeks to help individuals and organizations raise public consciousness about freedom of information and communication.

Freifunk.net provides websites, Free Open Source Software (FOSS) based accesspoint firmware, technical expertise, teaching material and easy-to-understand Do-It-Yourself-manuals for starting wireless community networks in almost every environment. It follows a path of maximum decentralization in it's community structure and in its technical solutions. Enabling and supporting local activities and actors and using the snowball effect are absolutely key to all activities.

Digital wireless communication in general is seen as one of the most beneficial technologies, especially in the developing countries. Not every angle of the world can be reached by either commercial or state-run top down organizations. There are many places on the globe which can be seen as so called "areas of market failure" - places where people have to help themselves. These are freifunk.net's targets. By setting up local wireless intranets (OPLANs) the community members can share their knowledge, data and bandwidth. On top of their networks they can run various applications like VoIP, community-radio, Wikis, etc. Existing network infrastructures can be included. The community members can share expensive broadband internet connections and expand the geographical outreach of the internet.

Today the activities have expanded way beyond Germany and the topics addressed reach out to all aspects of free communication infrastructures, such as the development of new innovative technologies and devices, spectrum licensing politics or lobbying manufacturers for the global availability of inexpensive and FOSS compliant hardware.

There are many villages, towns and cities in Germany and all around the globe where people make use of wireless technology and the knowledge and technical solutions provided by freifunk.net and other wireless community projects to bridge the digital divide in a D.I.Y.-manner. There are thousands of Wi-Fi accesspoints out in the world, running the freifunk.net firmware, making use of meshing technologies like OLSR or b.a.t.m.a.n., that link the people in rural and urban environments to the internet and provide them with local ICT services.

Over the past 5 years freifunk.net has proven that it provides a community model, teaching material, technical solutions and workshops to really serve people's need for low-cost do-it-yourself local digital communication infrastructures.

4.1.4. Funkfeuer

Funkfeuer.at is a meshed wireless community Wi-Fi network in Vienna , Graz and other rural areas in Austria.

The Vienna network covers the whole city and extends 30 km towards Bratislava and Hungary.

Funkfeuer is a community Wi-Fi network. It is built and maintained by its users (the node owners). Data rates are often in the 20 Mbit/s range and can stretch many kilometres. Access to the internet is provided by the funkfeuer.at association for free to the node owners. Thus, all a node owner needs to do is to connect to the network via the mesh and pass along packets for other node owners.

The meshed community Wi-Fi network uses OLSR (RFC 3626) as mesh routing protocol. The OLSR.org implementation of OLSR is actively maintained by Funkfeuer.at individuals who participate in the network. A mesh has the additional benefit that it will "self-heal" dynamically whenever nodes become unavailable. Since Funkfeuer and individual open source coders actively enhance and extend OLSR.org (and test the implementation in a real life test bed), OLSR.org became highly scalable reaching a scalability target of a couple of thousand nodes while still running on small embedded devices such as a 200 MHz embedded processor.

4.1.5. Guifi.net

Guifi.net has promoted the deployment of open telecommunications networks, based on peer to peer connection agreements, since 2004. Participants connect their own network segment with others. The network is open, free and neutral. It is *Open* because they publish complete information about how it works and its components, allowing the participation of everyone who is interested in it. It is *Free* because the conditions are the same for everyone – it does not have a single or corporatised owner who may impose unilateral conditions on others. It is *Neutral* because the extent of the peer to peer agreement is limited to the terms of connectivity only, and not the content.

Until now, the scope of the activities of guifi.net has been in what is known by the "user loop". Currently (July 2.009) guifi.net provides broadband to more than 7,000 homes and the total network "path" extends over 9,000 kilometres of connections. They experience continuous and sustained growth, based entirely on self-generated user demand, which has been experienced in Catalonia, Spain. Guifi.net is willing to extend the experience all over the world.

Guifi.net participants chose this model motivated for various reasons. Among these we have listed the following illustrations, without intending to limit our reach:

1. The need to seek solutions where there were no options for access to broadband -- often in rural areas.

2. Technology enthusiasts, free-networkers or volunteers have more to gain while they cooperate.

3. Small and medium-sized service companies in the territory, that see options and possibilities to lend their services

4.   Municipalities interested in improving digital inclusion.

5.   Professionals or businessmen who prefer a model where they maintain decision-making control over investment costs, lower Total Cost of Ownership (TCO), reliability and control over service levels, and ownership over the segment of the network of their interest.

5. Specific responses to Part 1 of the RSPG consultation document (RSPG 2009-1)

5.1. Section 4, "The opinion of RSPG"

Item 1 states:

1. that World Radio Conferences adopt the modifications to the Radio Regulations, which are an international treaty and need to be applied by all ITU Member States in order to preserve access to spectrum and orbit resources in all parts of the world without harmful interference;

OSA supports this but would like to add one more aspect to it, "… without harmful interference and endeavoring towards increasing spectrum efficiency"

5.2. Unnumbered Section, "The opinion of RSPG"

Item 1 states:

1. that EU and CEPT preparations for WRCs give more emphasis on ; a) … b) …

OSA would like to add: "c) making the ECPs transparent from the beginning to avoid confusions and deadlocks at the later stage";

Item 6 states:

6. that the EU and CEPT give increased importance to achieving more flexible allocations in the RR, where possible, thus facilitating harmonisation at European level;

OSA supports this recommendation for adoption as an RSPG opinion, however, the recommendation should emphasize the importance of including Open Spectrum (sometimes referred to as Common Spectrum) and the inclusion into the conditions of new licenses the acceptance of some interference due to the operation of Cognitive Radio for Opportunistic Spectrum Access.

New item:

OSA proposes RSPG to consider adding a new item as follows:

8. The licensee should not restrict the use of the spectrum when not using it by themselves and the applications/software/hardware restriction do not apply when the spectrum is used by others when the licensee is not using it.

6. Specific comments on Part 2 of the RSPG consultation document (RSPG 2009-2)

The following agenda items are relevant to the Open Spectrum mission:

1.2   taking into account the ITU-R studies carried out in accordance with Resolution 951 (Rev.WRC-07), to take appropriate action with a view to enhancing the international regulatory framework;

OSA regrets when Option-1 in the Annex-1 to Resolution 951 would be the result of the study. Options 2, 3, and 4 are looking positive but a study needs to be conducted whether one is better or whether a hybrid model of them could be proposed.

OSA agrees to the steps put forth in Annex-2 to Resolution 951.

1.19 to consider regulatory measures and their relevance, in order to enable the introduction of software-defined radio and cognitive radio systems, based on the results of ITU-R studies, in accordance with Resolution 956 (WRC-07);

OSA supports all the resolutions in Resolution 956 WRC-07. It is reproduced here"

Begin quote "

1   to study whether there is a need for regulatory measures related to the application of cognitive radio system technologies;

2   to study whether there is a need for regulatory measures related to the application of software-defined radio,

resolves further

that WRC 11 consider the results of these studies and take the appropriate actions.

" End quote.

Further, it is necessary to have one or many standardized frequency bands to disseminate the information regarding the use of allocated spectrum, available spectrum and any general information regarding the use of spectrum. The lack of open and transparent information leads to hard compartmentalization of the spectrum. Dissemination of this information could be done through a thorough study as well as standardization of the same. We notice that this will cause some rearrangement of spectrum and also set new services. OSA recognizes that there are open questions such as who will implement this. In fact it is useful to have the information at the borders so as to adapt to the new domain while crossing the borders.

We see many researches in this area, Pawelczak's dissertation "Opportunistic Spectrum Access: Designing Link and Transport Layer" (Pawelczak 2009) is an example. An other example is OFCOM's study (OFCOM 2009) on the utilization of the Key, License-Exempt spectrum bands.

OSA specifically seeks for a set of rules that optimizes the use of the spectrum for Common Use Spectrum. Therefore, OSA recommends that RSPG encourages the Commission to subsidize research on those topics on short notice.

1.22 to examine the effect of emissions from short-range devices on radiocommunication services, in accordance with Resolution 953 (WRC-07);

7. Referenced documents/websites

R. Akalu LL.B, LL.M Esq., Ir. P. Anker, V. Hayes and Dr. Ir. W. Lemstra (2008). "EC Request for Opinion from RSPG on the Common Use of Spectrum Contribution to the Debate"
http://rspg.groups.eu.int/_documents/consultations/comments_cus/consultation_cus_delft tu.pdf

Athens Wireless Metropolitan Network, AWMN
http://wind.awmn.net/?page=nodes&session_lang=english and
http://en.wikipedia.org/wiki/Athens_Wireless_Metropolitan_Network

CEPT (1991). "Recommendation T/R 10-01 (Oslo 1991, revised in Madrid 1992), Wide band data transmission systems using spread-spectrum technology in the 2.5 GHz band. Superseded by T/R 70-03."

--- (1992). "Recommendation T/R 22-06 (Madrid 1992, revised at Nicosia 1994), Harmonised radio frequency bands for high performance radio local area networks (HIPERLANs) in the 5 GHz and 17 GHz frequency range. Superseded by T/R 70-03."

Freifunk.net http://start.freifunk.net/

Funkfeuer http://www.funkfeuer.at http://olsr.funkfeuer.at/

Guifi.net http://guifi.net/en/node/2413/view/map

Bjarke Nielsen (2007). "Lessons learned from the DjurslandS.net experience. An In-Depth Case Study of the Huge Rural Area Wireless DjurslandS.net in Denmark".
http://www.diirwb.net/wp-content/uploads/2007/04/In-Depht_Study_of_the_DjurslandS_net_experience.pdf

OFCOM (2009). "Estimating the Utilisation of Key, Licence-Exempt Spectrum Bands, Final Report Issue 3 April 2009".
http://www.ofcom.org.uk/research/technology/research/exempt/wifi/wfiutilisation.pdf

Open Spectrum Alliance (2009). "Response to the Radio Spectrum Policy Group's public consultation on the digital dividend."
http://rspg.groups.eu.int/_documents/consultations/comments_digitaldividend_090515_0 630/osa_response_rspg_digitaldividendconsultation_final.pdf

Przemyslaw Pawelczak (2009) "Opportunistic Spectrum Access: Designing Link and Transport Layer"

RSPG (2009-1) RSPG09-275 Part 1 Rev. 2 "Draft RSPG opinion on the coordination of EU spectrum interest - Part 1 Preparation of ITU World Radiocommunication Conferences"

http://rspg.groups.eu.int/_documents/documents/meeting/rspg19/rspg09_275_part1_draft_opinion_wrc_preparations.pdf

RSPG (2009-2) RSPG09-275 "Draft RSPG opinion on the coordination of EU spectrum interest - Part 2 Main themes of WRC-11 of interest for EU-Wide support" http://rspg.groups.eu.int/_documents/documents/meeting/rspg19/rspg09_275_part2_draft_opinion_wrc_preparations.pdf

The OPLAN Foundation. http://oplan.org

V. Reding (2008). "The Wireless Growth Potential: the Economic Case for an Ambitious Reform of Spectrum Management", speech/08/117) at the joint dinner of the European Regulators Group and the Radio Spectrum Policy Group, Gothenburg, Sweden, 27 February 2008 http://ec.europa.eu/commission_arroso/eding/docs/speeches/2008/gothenburg_20080227.pdf

Respectfully submitted on July 15, 2009.

Founders of the Open Spectrum Alliance

Aaron Kaplan
Alexander List
Armin Medosch
Christoph Schindler
Georg Erber
Joseph Bonicioli
Juergen Neumann
Malcolm Matson
Michael Haberler
Ramon Roca
Robert Horvitz
Rupert Nagler
Sascha Meinrath
Tano Bojankin
Vic Hayes
Xavier Carcelle

Individual members

Przemek Pawelczak
Benjamin Henrion
Peter Murray
R. Venkatesha Prasad

OSA Partners and supporters