Dynamic Spectrum Alliance and the ITU

DSA

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Executive Summary

The DSA represents leading innovators in wireless technology and services with solid technical expertise and a strong track record in contributing to international working groups

Member States can adopt TVWS rules without waiting for ITU action. The ITU has confirmed that this is the case

The DSA will to work with the ITU and its members to maximise the benefits from more efficient use of spectrum – globally

The DSA seeks to move spectrum management away from the polarised licensed/licence exempt legacy towards a framework that supports more efficient use and provides greater flexibility and scope for innovation – and closing the digital divide

Outline – Dynamic Spectrum Alliance a the ITU

The Role of the ITU

Key learnings for TV white spaces rulemaking

Next Steps

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National TV White Spaces rulemakin can and should go forward

"The ITU World Radiocommunication Conference of 2012 concluded that the current international regulatory framework can accommodate software defined radio and cognitive radio systems, hence dynamic spectrum access, without being changed. The development of systems implementing this concept, such as TV white spaces, is therefore essentially in the hands of national regulators in each country.

…

For this, regulators will rely on state of the art best practices which are currently developed by ITU-R Study Groups 1, 5 and 6."

François Rancy, Director, ITU Radiocommunication Bureau ITU Radiocommunication Seminar for Arab Countries, RRS13-Arab Tunis, Tunisia on December 13, 2013

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DSA values the ITU's role in securing the founda for advancing wireless benefits

SA members understand the nportant role that the ITU plays in nsuring the growing value from he use of spectrum

TU also enables best practices haring among Administrations

he *ITU's has a role in facilitating a armonised approach to spectrum anagement, which supports the evelopment of standards*, thereby urn enable affordable solutions for usinesses and consumers

- Spectrum sharing is increasingly important to our wireless world
  - Coverage – whether filling small gaps in city centres or large rural areas
  - Capacity – meeting the growing appetite for Cloud-based services on mobile devices
  - Flexibility – e.g. enabling devices to form ad-hoc connections in delivering our smarter cities
- Improved spectrum sharing requires ever closer cooperation between regulators and industry – across the world

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We have the benefit from early rulemakings by FCC (USA), IDA (Singapore) and Ofcom (in prog

ecent FCC and IDA rules permit nlicensed use on a secondary asis of TV whitespaces

fcom finalising its end2end ules

inland rules in place

n Africa, South Africa and Malawi are leading

- Singapore
  - The regulations will make available for use approximately 180MHz of spectrum when it takes effect from November 2014
  - Follows a public consultation in 2013.
  - IDA rejected complaints that the use of the 700MHz UHF band would detract from international 4G availability, although this particular band will be returned for licensed cellular use after Singapore's analogue TV switch off in 2020.
  - It will also allow devices to operate on a licence-exempt basis. Full regulatory details, can be obtained from the IDA website.

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Geolocation databases is proven "best practi and create safe innovation opportunities

Coordinating spectrum use through a database brings unprecedented flexibility for regulators

Geolocation databases provide:

- Reassurance to licensees
- Predictable capacity to white space device users
- Flexibility for regulators to evolve the regulation as experience grows
- A simple means of re-organising bands to enable e.g. clearance of a new harmonised band

- Regulators no longer need to assume the worst case, so LE applications can deliver greater value
- Geolocation databases can enable global market benefits:
  - Coping with fragmentation and flex as nations work towards harmonised bands
  - Providing a simpler way of dealing with inevitable variations in spectrum availabilit and policy between nations
- Geolocation databases provide a dynamic management capability which facilitates rapid adaption to market needs (e.g. special events) and facilitates enforcements

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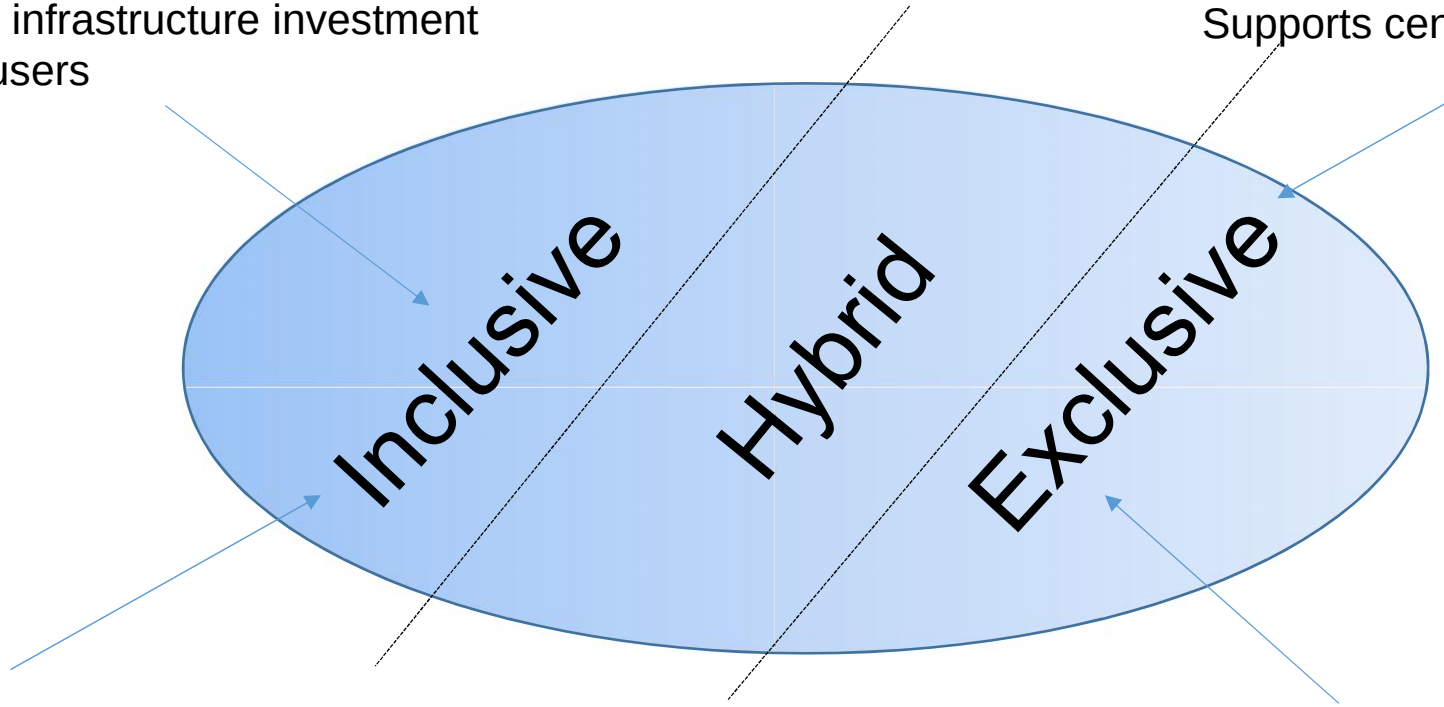
Dynamic spectrum access helps fill the chasm between li and licence-exempt use – and may help close the digital

Enables infrastructure investment by end users

Supports central infrastructure investment



- Increased scope for rapid innovation
- Swifter market entry for new technologies, applications and services
- Scope for technology-based coordination

- Provides greater service quality predictability when demand is high
- Coordination via regulatory intervention

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DSA enables greater usage efficienc ahead of any potential clearance

Clearing spectrum makes it easier to deploy large scale networks

However the process of clearing spectrum for a new use is slow and expensive – perhaps up to a decade (as happened with 3G)

DSA does not hinder spectrum clearance

It allows fragmented capacity to be harvested to meet applications needs now

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Low power networks help maximise spectrum re-use

A 4W EiRP limit does not represent a waste of spectrum capacity

Within the coexistence limits defined by regulators: the less power an application needs, the more white space capacity will be available

Lower power enables a greater degree of spectrum reuse

- Different applications and infrastructure deployment model have different power requiremen
- More dense networks can use lower power to enable better coverage for mobile devices especially when used indoors
  - Home and office networks will be a important market for DSA technolo
  - End-user deployed infrastructure w generally be at the lower power en sufficient to serve local needs

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Outline – ITU, Rule Making & Way Forw

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Next Steps: Engagement with ITU-D

Step 1: Meet and have discussions with ITU-D Director/Team – (completed)

Step 2: DSA Join ITU-D (in progress)

Step 3: Participate in ITU-D Study Group:

- In accordance with agreement reached at the WTDC in April 2014 on Resolution 9, the ITU-D will be considering dynamic spectrum access (DS and spectrum sharing approaches during its next study cycle
- DSA arranging to participate in ITU-D Study Group 1 that will be meeting 15-19 September 2014 in Geneva.

Further steps TBD

RESOLUTION 9 (Rev. Dubai, 2014)

Participation of countries, particularly developing countries, in spectrum management

The World Telecommunication Development Conference (Dubai, 2014),

considering

) that such information would enable developing countries to benefit from sharing studie
nd other technical studies in ITU-R, including new spectrum sharing approaches such as dynami
pectrum access (DSA);

aking into account

) No. 155 of the ITU Convention, defining the aim of studies conducted within ITU-R;

) the current scope of ITU-R Study Group 1, as defined by the Radiocommunication Assembly
n Resolution ITU-R 4-6,

esolves

to prepare a report within the next study period on national technical, economic and
inancial approaches to, and challenges of, spectrum management and spectrum monitoring
aking into consideration development trends in spectrum management, case studies on spectrum
edeployment, licensing processes and best practices implemented in spectrum monitoring
round the world, including consideration of new spectrum-sharing approaches;

to compile case studies and collect best practices regarding national uses of shared
pectrum access , including DSA, and study the economic and social benefits arising from the
ffective sharing of spectrum resources;

nvites the Director of the Radiocommunication Bureau

o ensure that ITU-R continues the collaboration with ITU-D in the implementation of this
esolution.

Transition to digital terrestrial television broadcasting

t of the developing countries are currently undergoing the transition from analogue to digita
estrial television broadcasting. There is thus a need for assistance in many topics, includin
uency planning, service scenarios and technology selection, which all in turn affect spectra
iency and the resulting digital dividend.

Assistance in identifying the most efficient ways to utilize the digital idend

eloping countries, upon completing digital switchover, will have some portions of a ver
able spectrum freed, which are known as the digital dividend. Different discussions are bein
ducted on how to optimally reallocate, and enable more efficient use of, the relevant part o
e bands. In order to maximize both economic and social impacts, it will be appropriate t
sider including potential use-cases and best practices in ITU's library, and to hold regula
rnational and regional workshops on that subject.

New spectrum access approaches

n the ongoing demand for high data rates, there is pressure on the limited spectrum resourc
eloping countries need to be aware of innovative schemes for improving spectrum efficienc
spectrum use, through training, seminars and case studies on actual deployments and trial
as of particular importance include:

ring information and best practice on the use of DSA approaches;

ews around the possibility of applying DSA approaches to enable better and more cos
ctive provision of services.

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APPENDIX SLIDES

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Regulators' ultra cautious approach is still securing existing services - and addresses UHF "r

Approaches taken by the FCC and Ofcom to introducing DSA differ in detail, but share a high degree of caution

Both regulators welcome the innovation potential that DSA brings, but are not prepared to sacrifice existing services

Key is the use of geolocation databases to provide security for licenced users, whilst enabling flexible licence exemption for innovation

- In the US, the FCC has imposed power limit on different classes of devices, with the database indicating which channels are available
- The more flexible approach being taken forward by Ofcom, builds on the vital foundations provided by CEPT SE43 reports
- Ofcom's work in ETSI has underlined the protection to ensure that licence exempt applications will not harm existing services
- The resulting power limits are quite severe but the industry believes that value can stil be delivered – and that, over time, the regulators will find that they have scope fo relaxing some of the constraint

DSA's position on the licensed vs. licence-exempt debate

DSA believe that it is time to move away from this tired polarised view

The new technology supports a much richer palette of spectrum management approaches

Facilitating new business models

Enabling innovation and new entrants

Enabling sustainable capacity scaling as mobile device data traffic soars

With all applications demanding greater bandwidth, DSA believes that more efficient sharing is vital to delivering the full benefits of wireless technology

- [fine grained exclusivity]

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Licence exemption does not waste spectrum

- The DSA recognises that mobile operators will need greater capacity, as network technology evolves and market demands grow
- Some of this increase may be provided through expanded licensed bands
- However a substantial proportion of the data to mobile devices will use licence-exempt spectrum (e.g. through Wi-Fi networks)
- DSA enables licence exemption to be a much more capable tool for enabling more intensive use of spectrum

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DSA Seminar on Model TV White Space Regulations

Step 1: Assessing the opportunity

Step 2: Understanding the regulatory landscape and key stakeholders

Step 3: Understand potential use cases

Step 4: Understand key elements of rules

Step 5: Crafting rules

SA members are ready to work with policymakers and regulators o developing and implementing enabling regulation