

TV White Space and Super WiFi

Telecommunications Users and Consumers Advisory Committee

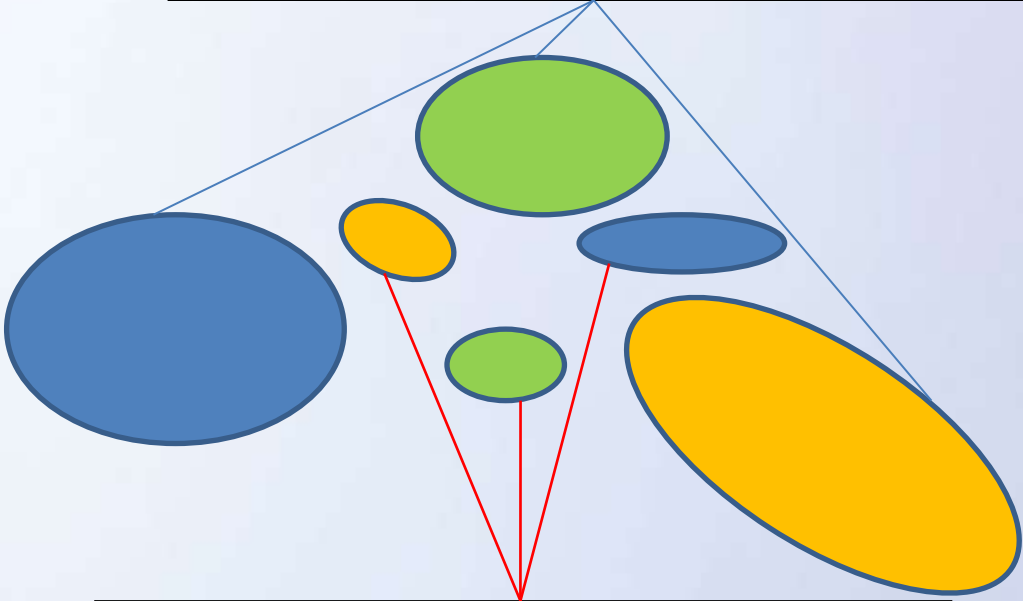
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TV White Space (TVWS)

- In traditional radio planning, coverage areas of co-channel (same channel) TV broadcasting stations are geographically separated so as to avoid radio interference in overlapped areas
- TV White Space (TVWS) generally refers to those TV channels that are not being used for TV broadcasting at certain locations at all times i.e. for avoidance of interference or some other reasons

Concept of TVWS

High power TV stations using different frequencies to provide territory-wide coverage

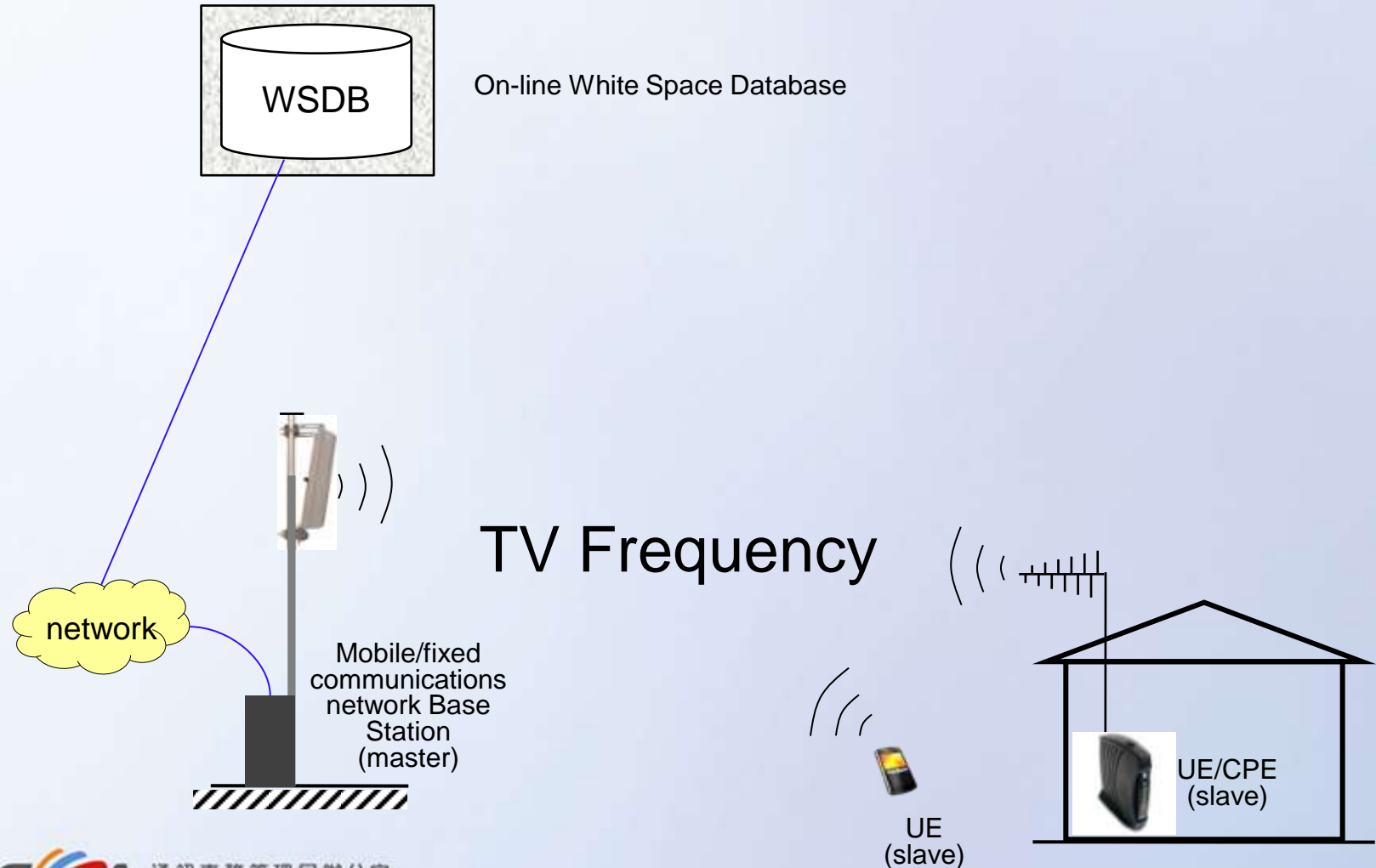


The same frequencies can be re-used by other low power TVWS applications in between the TV coverage areas

Development of TVWS

- Ever growing demand for spectrum for telecommunications services drives the need to explore ways to make more efficient and optimal use of spectrum
- Some countries are exploring and testing the use of TVWS for low power telecommunications applications, such as wireless broadband Internet access, and machine-to-machine (M2M) applications (e.g., sensor networks, smart metering)

Typical TVWS System Configuration

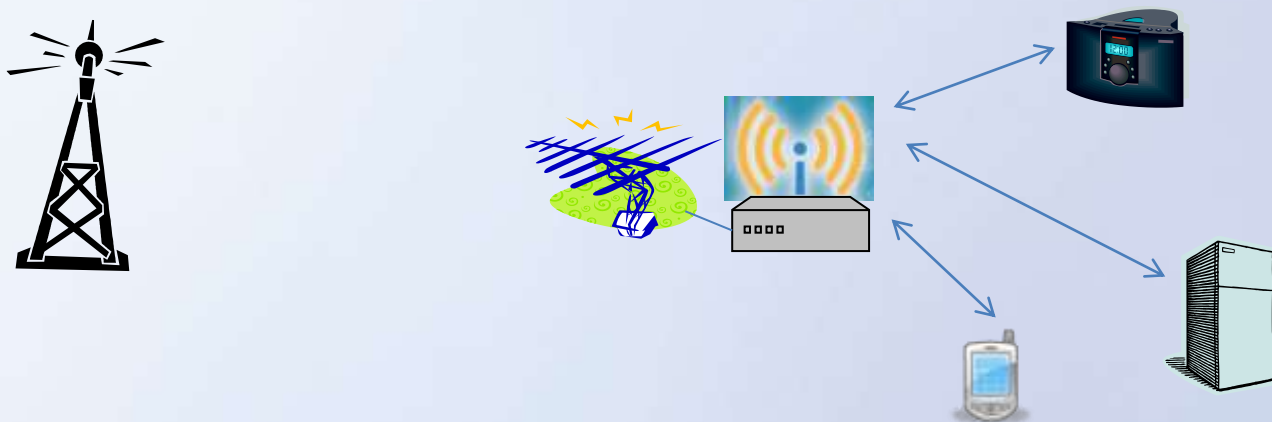


Typical TVWS Application Operation

- **White Space Database (WSDB)**
 - An on-line database with intelligence capable of providing usable TV channels at certain locations to operators, the key for TVWS implementation
 - Master TVWS devices shall query WSDB from time to time to obtain a list of available TV channels for use in a particular location, without causing interference to existing services in the vicinity
 - Effectively control the use of TV channels by TVWS devices on a dynamic basis. With updates of the WSDB, TV channels that are available for use at a particular location may vary from time to time

Potential Applications of TVWS

- The following applications are being explored or on trial in some countries –
 - Rural broadband service
 - Hot-spots (similar to Wi-Fi hot-spots)
 - M2M applications (e.g. smart metering)



Super WiFi

- A potential application of TVWS for providing WiFi-like wireless Internet access service, also named as Super WiFi
- Instead of using 2.4GHz / 5GHz band, Super WiFi works in lower frequency TV band (i.e. below 1 GHz)
- “Super” in the sense of –
 - Longer service distance (coverage in several km)
 - better penetration power
 - greater efficiencies (lower network cost and lower power consumption)

Worldwide Development

- Regulatory Framework for TVWS
 - **The US** – Federal Communications Commission (FCC) has adopted a licence-exempted regulatory framework and a certification scheme for TVWS devices since 2010
 - **The UK** – Office of Communications (Ofcom) put forward a proposed framework of TVWS technology including the technical details for implementation in 2013 i.e. pilots in progress
 - **Singapore** – with regard to a public consultation launched in June 2013, Infocomm Development Authority (IDA) issued a decision paper on the regulatory framework of TVWS in June 2014 i.e. licence-exempted framework
 - **New Zealand** – Radio Spectrum Management (RSM) has conducted a consultation on an interim licensing arrangement for the use of TVWS devices in September 2014

Hong Kong Situation

- TV Channel Utilisation
 - All 42 TV channels (8 MHz bandwidth per channel) in the 470 – 806 MHz band have been assigned for terrestrial TV broadcasting and mobile TV services
 - The Mainland is sharing the same TV band for terrestrial TV broadcasting
 - TV signals from Guangdong transmitting stations may spillover into Hong Kong and vice versa
 - Frequency coordination with the Mainland authority will be needed for the use of TVWS in Hong Kong to avoid mutual radio interference

OFCA's Preliminary Assessment

- Office of the Communications Authority (OFCA) has carried out a preliminary assessment
 - Using computer planning tool, taking into account terrain, building and other factors
 - Estimating the potential availability of TVWS in outdoor areas of Hong Kong
- A TV channel will be available for TVWS at a particular location, if
 - The receivable signal power of TV signals is less than a certain threshold, and
 - The adjacent channels are not intended for TV reception in the same area

Results of OFCA's Study

- Only a small number of TV channels in 470 – 806 MHz band might be available for TVWS applications in certain outdoor areas of Hong Kong
 - Mainly in part of New Territories and outlying islands
- TVWS may be used for indoor low power applications, e.g. in shopping malls and underground MTR stations.
However,
 - Development and availability of TVWS enabled consumer equipment in the mass market is still unclear at this stage
 - Potential high cost in setting up and maintaining a TVWS database

Way Forward

- OFCA will keep monitoring the development of TVWS and overseas TVWS deployments

Thank You