



FUTURE ROLE OF SATELLITE TECHNOLOGY – TOWARDS A GLOBAL 5G ECO-SYSTEM

5G PPP Info- day

18 March 2016
European Commission

KEY OUTCOME OF THE WRC-2015 ON WRC-2019 ACTIVITIES FOR SCOPING IMT/5G DEVELOPMENT

- The WRC-2015 concluded that in respect of WRC-2019 activities, the ITU-R should conduct studies on frequency-related matters for IMT identification, including possible additional allocations, to the mobile services on a primary basis is needed.
- Such studies should be in portion(s) of the frequency range between **24.25** and **86 GHz** for the future development of International Mobile Telecommunications for 2020 and beyond.
- Key elements of the WRC-2015 Resolution (IMT > 6 GHz) are:
 - The core globally allocated Ka-band FSS bands at **27.5 – 30.0 GHz are excluded** from the scope of this Resolution for spectrum on IMT/5G terrestrial services.
 - To conduct and complete in time for WRC-19 the appropriate sharing and compatibility studies, for the frequency bands which have allocations to the mobile service on a primary basis:

24.25-27.5 GHz	47.2-50.2 GHz
37-40.5 GHz	50.4-52.6 GHz
42.5-43.5 GHz	66-76 GHz
45.5-47 GHz	81-86 GHz
 - **And the following bands** which will require additional allocations to the mobile service on a primary basis
 - **31.8-33.4 GHz**
 - **40.5-42.5 GHz**
 - **47-47.2 GHz**

WHAT SHOULD 5G BE ABOUT?

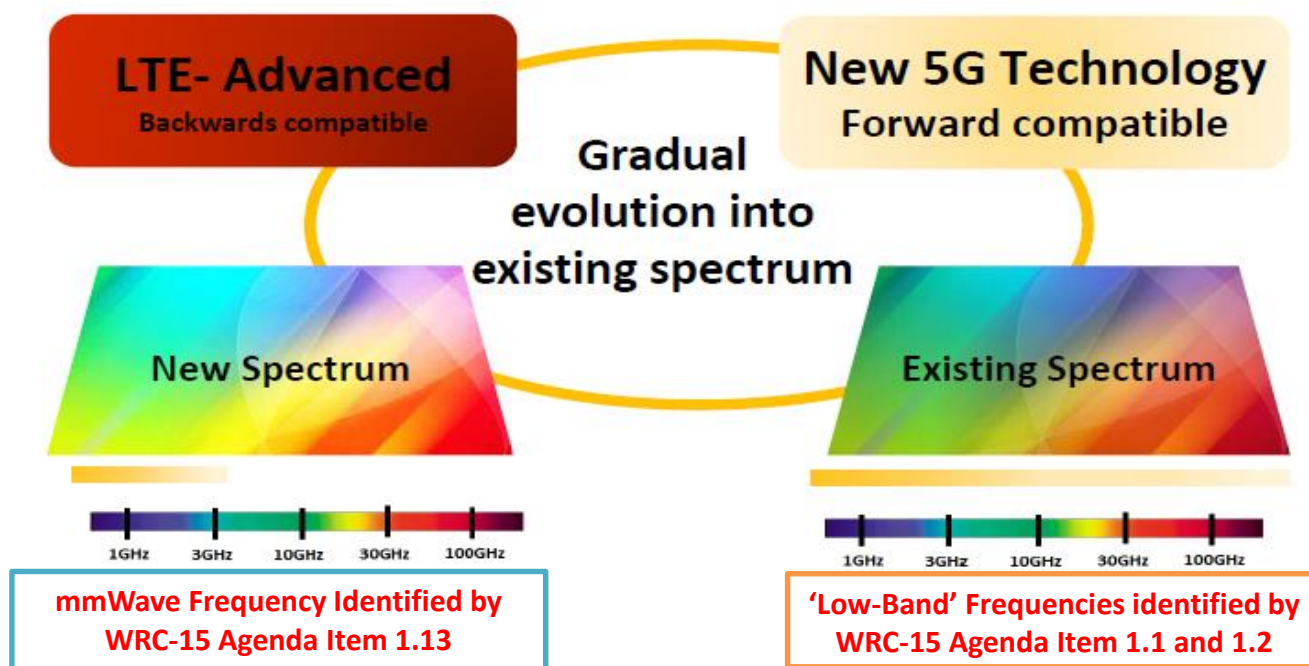
- 5G — ubiquitous access to high data services / applications from any device, anywhere, anytime. The future is about connectivity:
 - Communications & **Control**;
 - Extremely high speed **Wireless broadband**;
 - Towards Digital Economy and Society;
 - Modernisation of aging industries;
 - Smart Homes, Cities and Countries.
- To create such an environment, one needs to integrate various key technology trends:
 - Multi-RAT (Radio Access Technology) approach
 - sub 6 GHz RAT optimized for IOT / **Coverage Connection**
 - new mmWave RAT for **speed and capacity**
 - **Better Spectral Efficiency**
- 5G terrestrial wireless should **interwork / integrate** with other radio access technologies like **Fixed Satellite Service (FSS), Broadcast Satellite Service (BSS) & Mobile Satellite Service (MSS) Systems**.
- It should also **lower the net cost of service access (£ / month / Mbit)** for consumers.



IS IT ONLY ABOUT HARNESSING NEW SPECTRUM?

Up until now all the spectrum bandwidth identified for 5G studies meetings the “Capacity” requirement....but what about “Coverage”?

5G Eco-system will be a “**Wireless Access**” solution consisting of LTE evolution and New technology



- 4G/4G+ LTE based carrier aggregation enables high data rates of 500 Mbits or more.
- 4G/4G+ evolution in 'low-bands' is key to future 5G ecosystem – including for enabling wide area coverage. - in bands below 3.4 GHz.
- 5G should be a multi-layered, multi-RAT heterogeneous network including 2G, 3G, 4G **RLAN** and WIGIG.

ROLE OF SATELLITE SYSTEMS IN 5G ECOSYSTEM

IMT/ 5G should not be about mobile technology – it is more than just “Cellular” it is “Wireless”

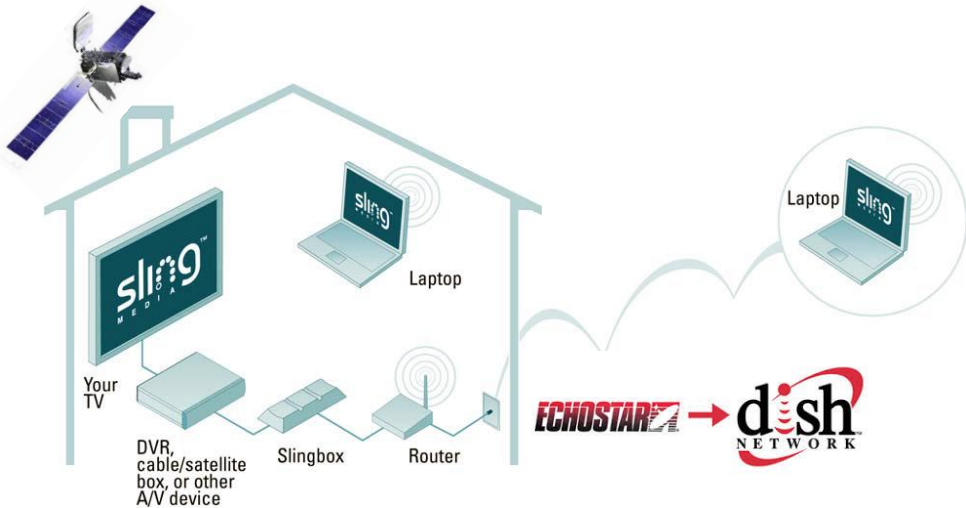


- 5G is an end to end Ecosystem of different technologies
- The role of Satellite is already mentioned in the current ITU-R WP5D – IMT/ 5G Vision
- Satellites can today deliver data rate (> 100 Mbits/s – 1 Gbit/s) in ‘broadcast / multi-cast’ mode.
- By 2020 - 2025, satellite systems can deliver > 1 – 10 Gbit/s services and will require viable spectrum access.

EXAMPLE: SATELLITE SERVICES – AN ONGOING REVOLUTION:

1 e.g. SlingBox (Echostar)

2 SAT-IP



See: <http://www.myechostar.com>



See: <http://www.satip.info>

Satellites can today deliver very high data rate services (> 100 Mbits/s – 1 Gbit/s) in ‘broadcast / multi-cast’ mode to small radio access points.