



International Telecommunication Union

Regulatory aspects of the spectrum utilisation by satellite IP and multimedia

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What are multimedia and IP services ?

- Satellite IP services already exist
 - connection to international backbone
 - VSAT networks
 - interactive digital TV
- Multimedia services encompass a wide range of applications:
 - sound and TV broadcasting
 - data IP multicast
 - web, email, intranet (VPN)



Typology of services and users

Users		Professionals			Mass market
		ISP	Niche markets	SOHO	General public
Applications		Connection to IP backbone	Content delivery (and IP access)	IP access (Web, email)	IP Access (Web, email)
Terminals	End user	Gateways	Mobile or VSAT-type	VSAT	VSAT
	Service provider		Hub	Hub	Hub
Bit rates		bidirectional: 38-155 Mbps	forward: 64-344 kbps/ 8-36 Mbps return: 64-256 kbps	forward: 4-8 Mbps return: 128-512 kbps	forward: 1-4 Mbps return: 64-512 kbps
Comments		existing	existing (ships) or emerging (planes)	increasing	emerging



What kind of applications will be delivered through HDFSS ?

- Applications using asymmetric traffic
 - forward link : hub -> terminals (content)
 - up: FSS, down: HDFSS (bit rate: 1-36 Mbps)
 - return link : terminal -> hub (requests)
 - up: HDFSS, down: FSS (bit rate: 64-512 kbps)
 - Applications using symmetric traffic
 - VSAT-type meshed networks
- ➔ Two needs :
1. a minimum amount of HDFSS up and down for symmetric traffic
 2. more HDFSS downlink for asymmetric traffic



Satellite IP/MM spectrum requirements

- o National level
 - Definition of appropriate licensing procedures
 - Coordination
- o regional level
 - Spectrum harmonization and protection



International Legal framework

- o Development of Satellite IP and multimedia require adequate spectrum/orbit resources and access conditions at international level
- o These resources and conditions are specified in the Radio Regulations (RR)
- o The RR is periodically reviewed by World Radio Conferences (WRCs)



Satellite IP/MM spectrum requirements

- Need for more spectrum ?
 - Use currently allocated frequency bands which are less congested
 - Use other types of orbits
 - Improve conditions of use of currently allocated bands
 - Make new allocations
- More freedom to use it ?
 - Use non-shared bands
 - Use planned bands
 - Make regulatory changes



Satellite IP/MM spectrum requirements

- Convergence
 - FSS/MSS for transportable terminals ?
 - MSS/MS for dual-mode terminals ?
- Appropriate protection :
 - what does “harmful interference” mean ?
 - How to protect unlicensed terminals ?



Allocations to space services available to satellite IP/MM

- Fixed-satellite service (FSS)
 - C-band (2 x 800 MHz non-planned/2x 300 MHz planned)
 - Ku-band (2 x 750/1000 MHz non-planned/2 x 500 MHz planned)
 - Ka-band (2 x 2.5 GHz non-planned)
- Mobile-satellite service (MSS)
- Broadcasting-satellite service (BSS)
 - 2 x 800 MHz/500 MHz planned Ku-band
 - 2 x 400 MHz non-planned at ka-band
 - 25 MHz for BSS (sound) below 3 GHz



WRC-95/97 decisions

- Simplifications of the RR
- 2 x 500 MHz earmarked at Ka-band for non-GSO and GSO sharing based on coordination
- 2 x 400 MHz for non-GSO MSS feeder links at Ka-band shared with GSO based on coordination
- 2 x 3.5 GHz for non-GSO/GSO sharing at Ku and Ka-band, based on GSO protection (limits)
- 500 MHz uplink for LMSS at 14 GHz



WRC-2000 decisions

- Finalisation of sharing conditions relating to non-GSO FSS
- BSS replanning in Regions 1 and 3
 - Updating of technical parameters
 - Improved sharing conditions



WRC-03 issues related to multimedia applications

- Traditional use for IP applications:
 - Finalisation of BSS/FSS sharing criteria at 12 GHz
 - Use of the band 13.75-14 GHz
- Niche markets based on IP services:
 - New AMSS allocation at 14 GHz
 - ESV at C and Ku band
- New multimedia applications:
 - HDFSS above 17.3 GHz



WRC-07 issues

- o Appendix 30B ?



Conclusions

- RR will remain technologically neutral
- Nothing should prevent the use of multimedia applications in any band allocated to a space service.
- National or regional policies need to take into account operational features
 - easier to use non-shared bands
 - easier to adapt existing systems for new applications
- Protection/unconstrained operation has a cost