

2022

GLOBAL SUMMIT



DYNAMIC • SPECTRUM • ALLIANCE

Day 1

Sep 12-14, 2022 | Paris, France

Keynote

Mario Maniewicz

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International Telecommunications Union
(ITU)



ITU – Spectrum Sharing

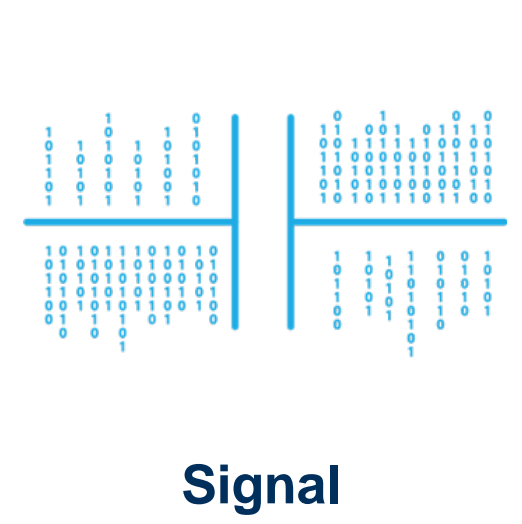
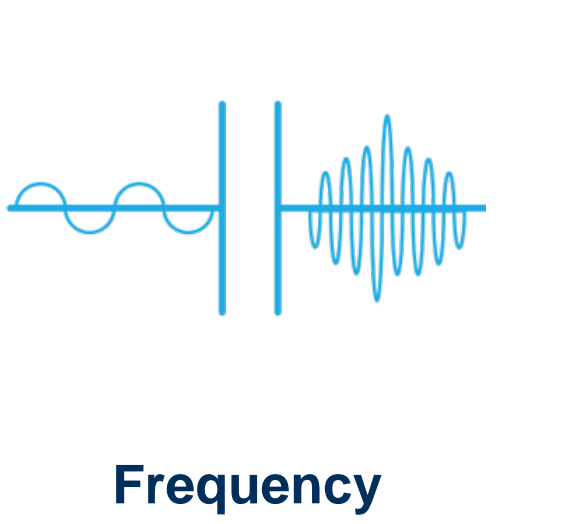
Mario Maniewicz

Director of the ITU Radiocommunication Bureau

September 2022



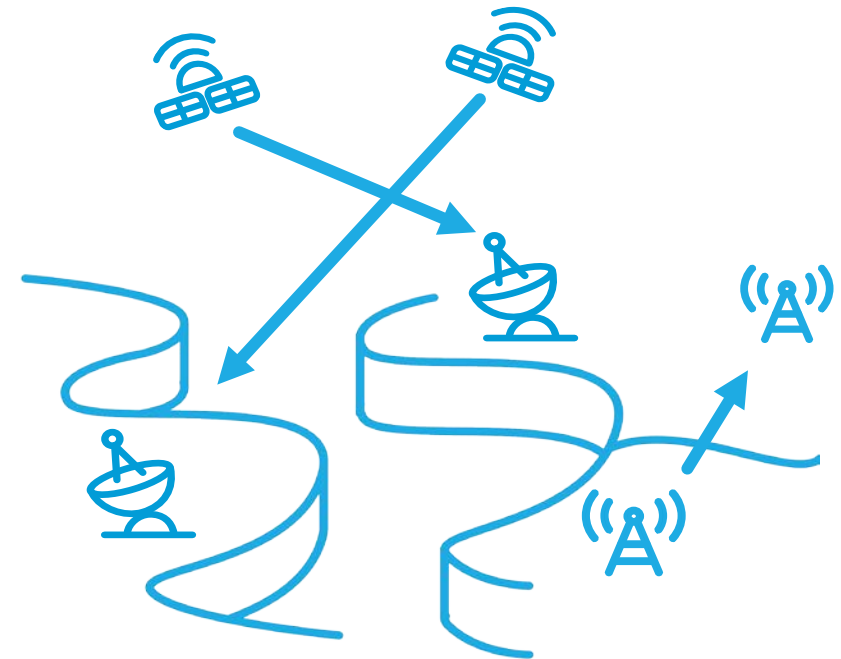
Spectrum Sharing Techniques



International Spectrum Sharing

Mechanisms to control interference

- Allocation: frequency separation of stations of different services (Art. 5 RR)
- Power Limits: pfd limits to protect terrestrial services, eirp to protect space services etc
- Coordination: between Administrations
- Recording: in the MIFR for international recognition
- Monitoring: international monitoring systems



International Spectrum Sharing

International Framework

- Radio Regulations
- ITU-R Study Groups sharing and compatibility studies
- ITU-R Recommendations and Reports
- Regional Frequency Coordination
- Regional Agreements



National Spectrum Sharing

More stations in the same network
(Radio stations sharing)

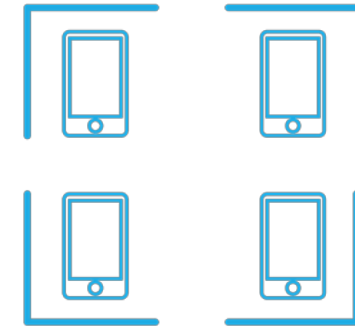
Examples of Multiplexing Techniques and Access Protocols

Licensed

- Frequency (FDMA)
- Time (TDMA)
- Code (CDMA)
- Orthogonal (OFDMA)

Unlicensed

- Sensing (CSMA)
- Orthogonal (OFDMA)



National Spectrum Sharing

More service providers and users (Intra-service sharing)

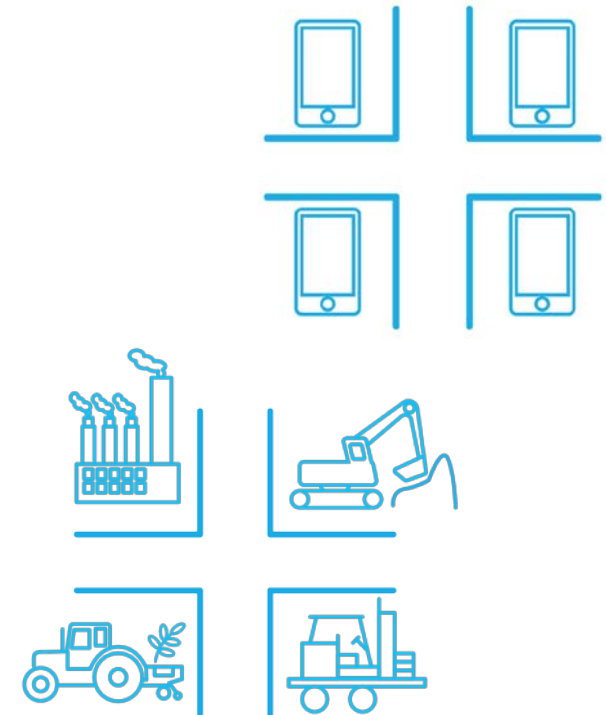
Examples of Licensing Schemes

Increase coverage and efficient use of spectrum

- Local Access License (OFCOM - UK)
- Use-it-or-lease-it (AGCOM - Italy)

Verticals, Industries

- Local and Private Networks (BNetzA - Germany)
- Shared Access License (OFCOM - UK)
- Club use (AGCOM - Italy)

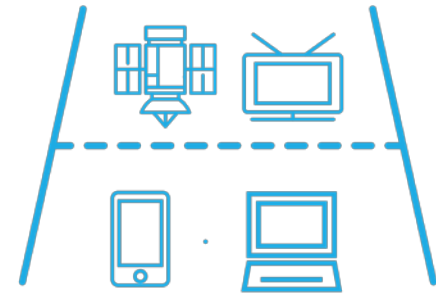


National Spectrum Sharing

More services sharing the same spectrum
(Interservice sharing)

Examples of Sharing Mechanisms and Licensing Schemes

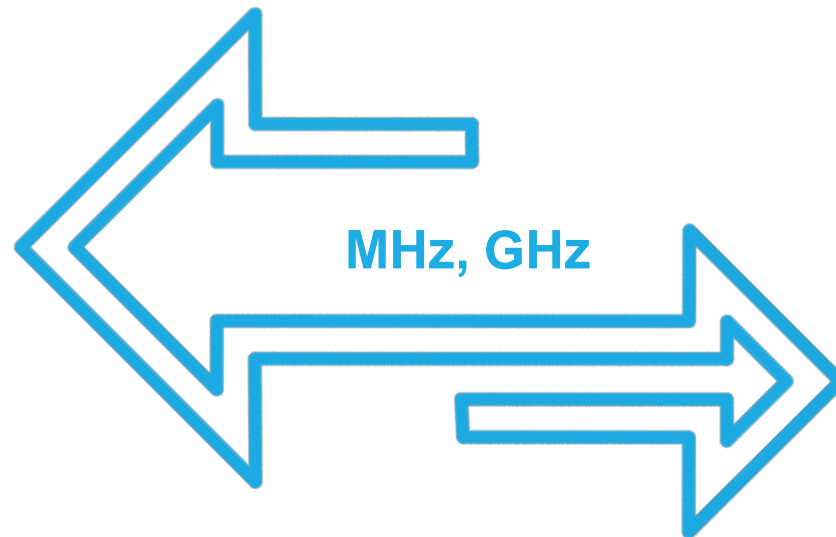
- DFS - Dynamic Frequency Selection
- AFC - Automated Frequency Coordination (FCC – US)
- TVWS - TV White Spaces
- CBRS - Citizens Broadband Radio Service (FCC - US)
- LSA - Licensed Shared Access (Europe)
- Blockchain-based solution (ARCEP - France)



Spectrum Sharing – Interference

Lower Frequencies

- More propagation
- Bigger cells
- Higher probability of interference



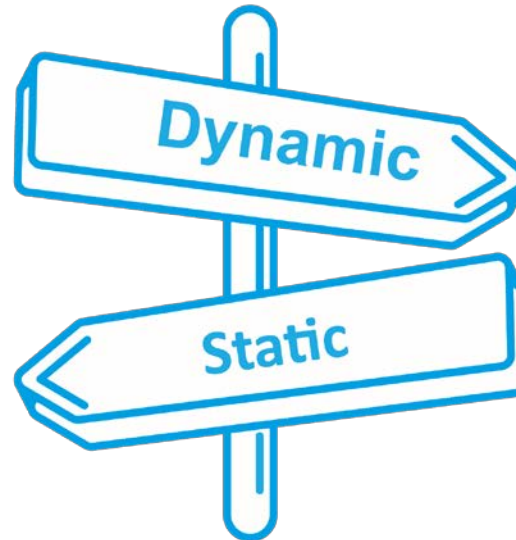
Higher Frequencies

- Less propagation
- Smaller cells
- Lower probability of interference

Spectrum Sharing – Dynamic vs Static

Static Assignment

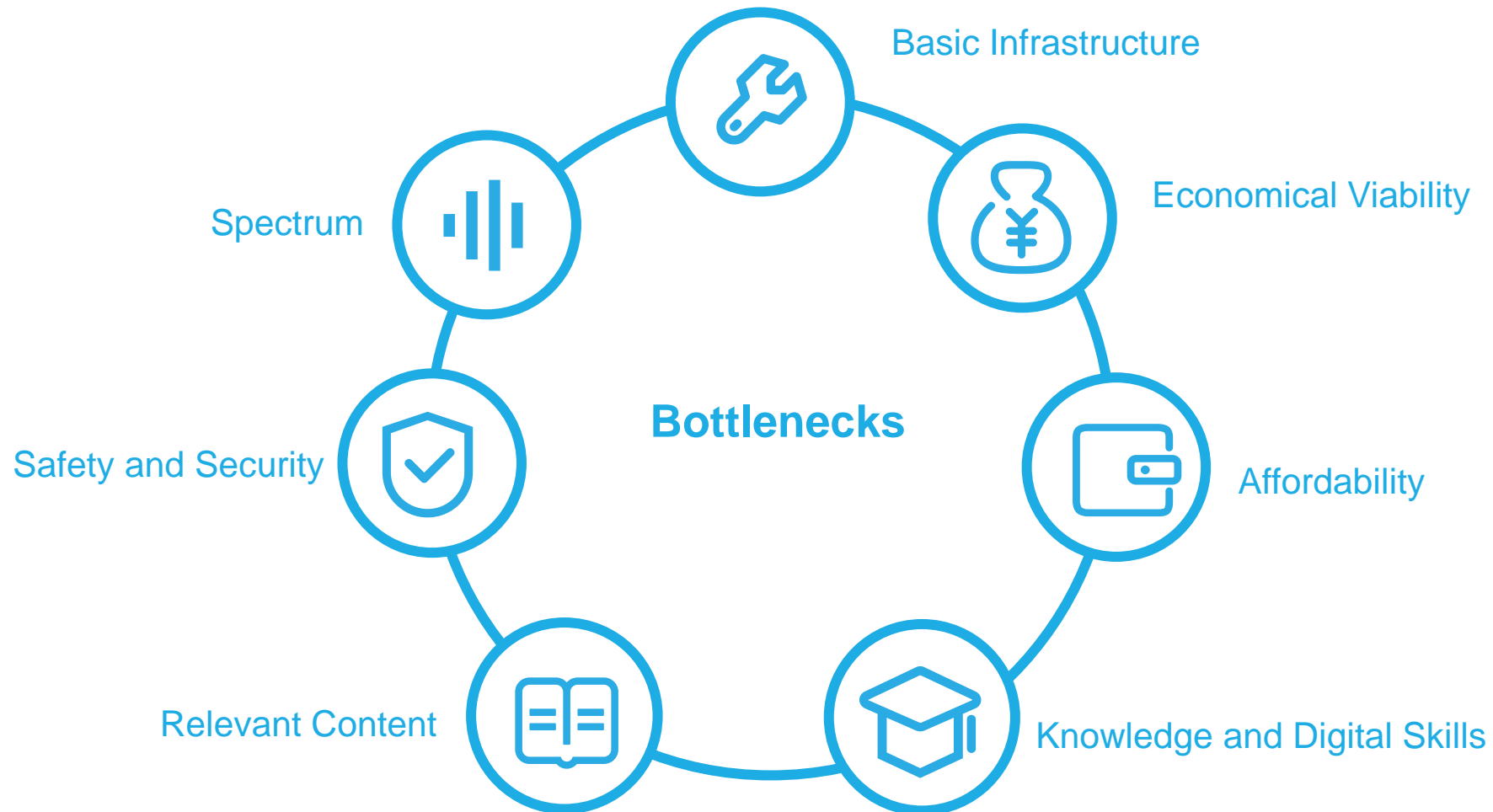
- Lower complexity
- Lower cost
- Medium/Long term assignments



Dynamic Assignment

- Higher complexity
- Higher spectrum management costs
- Short term assignments
- Higher efficiency

What are the bottlenecks?



ITU-R Publications on CRS, SDR and Spectrum Sharing

- Rep. ITU-R M.2225-0 - Introduction to cognitive radio systems in the land mobile service
- Rep. ITU-R M.2330-0 - Cognitive radio systems (CRSs) in the land mobile service
- Rep. ITU-R M.2242-0 - Cognitive Radio Systems specific for IMT systems
- Rep. ITU-R SM.2405-0 - Spectrum management principles, challenges and issues related to dynamic access to frequency bands by means of radio systems employing cognitive capabilities
- Rep. ITU-R M.2117-1 - Software-defined radio in the land mobile, amateur, and amateur-satellite services
- Rep. ITU-R SM.2404-0 - Regulatory tools to support enhanced shared use of spectrum
- Rec. ITU-R SM.1132-2 - General principles and methods for sharing between radiocommunication services or between radio stations
- Rep. ITU-R SM.2015-1 - Methods for determining national long-term strategies for spectrum utilization
- Rec. ITU-R SM.1047-2 - National spectrum management

Thank You

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