



5G e a Internet do futuro

*Da internet de dados à
internet das coisas*

O papel do espectro

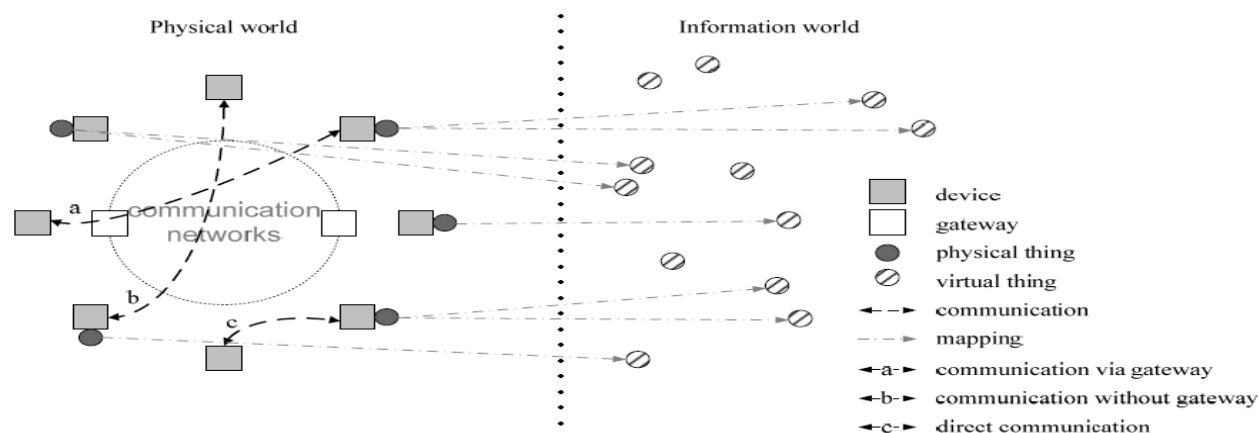
Jaime Afonso

9º Congresso URSI, Lisboa, Dezembro 2015

- *Global IP traffic has increased more than fourfold in the past 5 years*
- *Nearly half of all IP traffic will originate with non-PC devices by 2017.*
- In 2016, **about 1 in 7 people** (or about 1 billion) are forecasted to purchase **new smartphones**.
- **Traffic from wireless and mobile devices will exceed traffic from wired devices by 2019.**
- *In 2017, the gigabyte equivalent of all movies ever made will cross global IP networks every 3 minutes.*
- *More than 500 million photos are uploaded and shared every day.*
- *About 100 hours of video is uploaded to YouTube every minute.*
- Globally, consumer internet **video traffic will be 80 percent** of all consumer Internet traffic **in 2019**, up from **64 percent in 2014**
- *Mobile internet traffic as a percentage of all internet traffic is expected to continue growing one-and-a-half times per year.*
- *The number of connected devices could reach more than 50 billion over the next decade*
- *More than two-thirds of the world's mobile data traffic will be video by 2018, with video traffic growing 14-fold over the next five years.*
- *More than half of all smartphone traffic appears to be routed over Wi-Fi networks, and this nomadic traffic is growing 4-6 times faster than mobile traffic.*
- 28,000 GB of internet traffic is **generated every second** by, amongst other things, 2 400 000 emails, 1 800 Skype calls, 49 000 Google searches and 103 000 YouTube video
- **Africa** is the only region where mobile broadband **penetration remains below 20%**

IoT (*Internet of Things*):

- ▶ M2M, NFC, RFID, USN, MTC, WASN, Smart*** ..

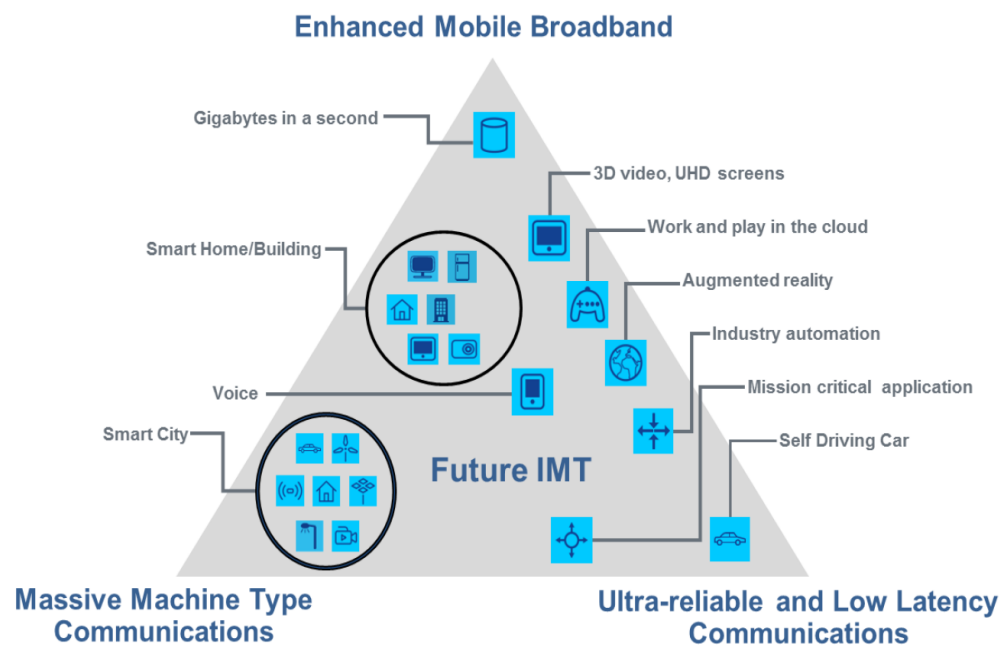


Fonte: ITU-T Rec. Y.2060

▶ ITU-R

- “..concept encompassing various platforms, applications, and technologies that are, and will continue to be, **implemented under a number of radiocommunication services**”;
- “.. implementation of the IoT **does not require specific regulatory provisions in the Radio Regulations**”

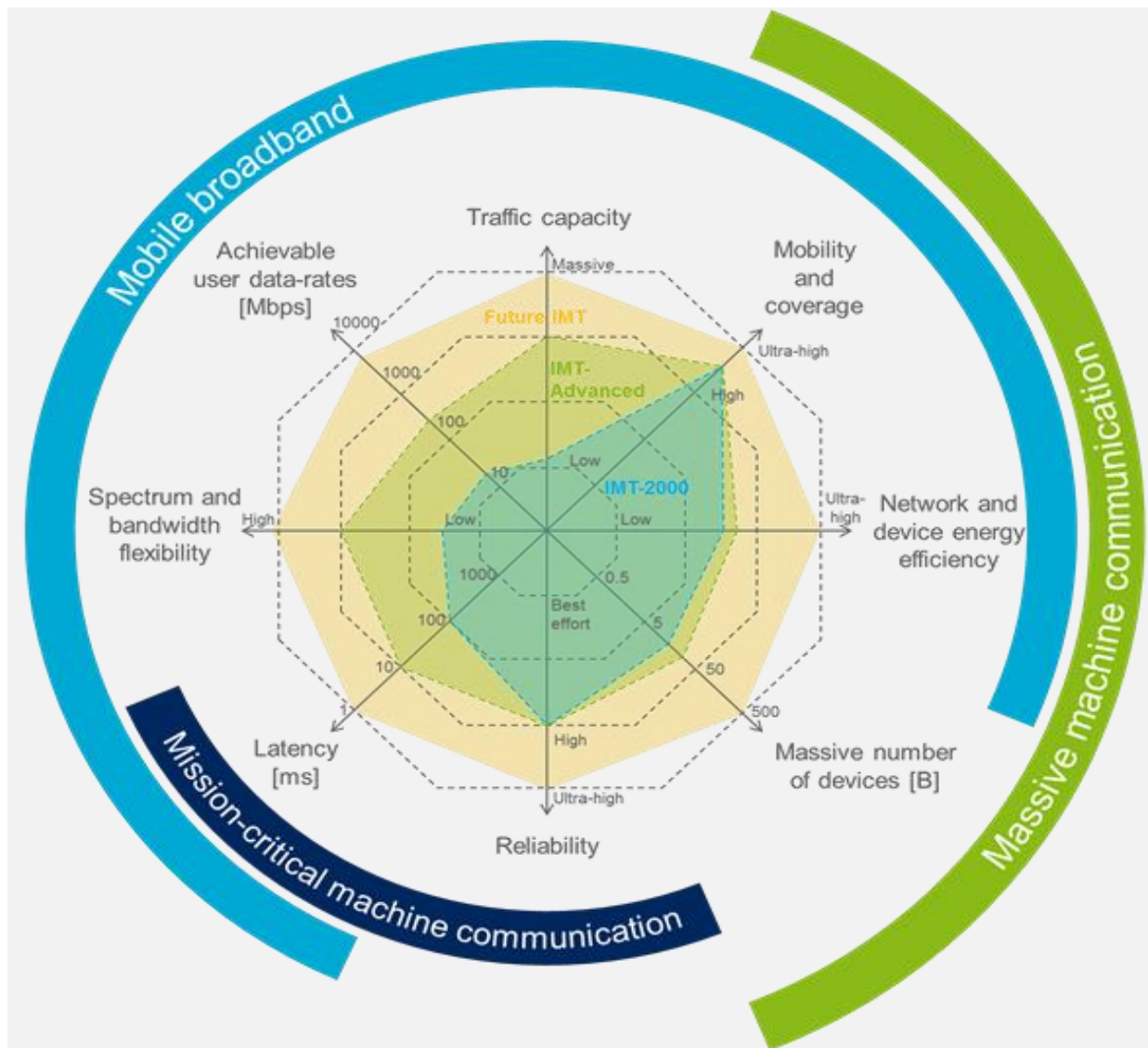
- IoT: espectro partilhado vs espectro dedicado
- Suporte nas redes móveis
- Visão “5G” – IMT. 2020





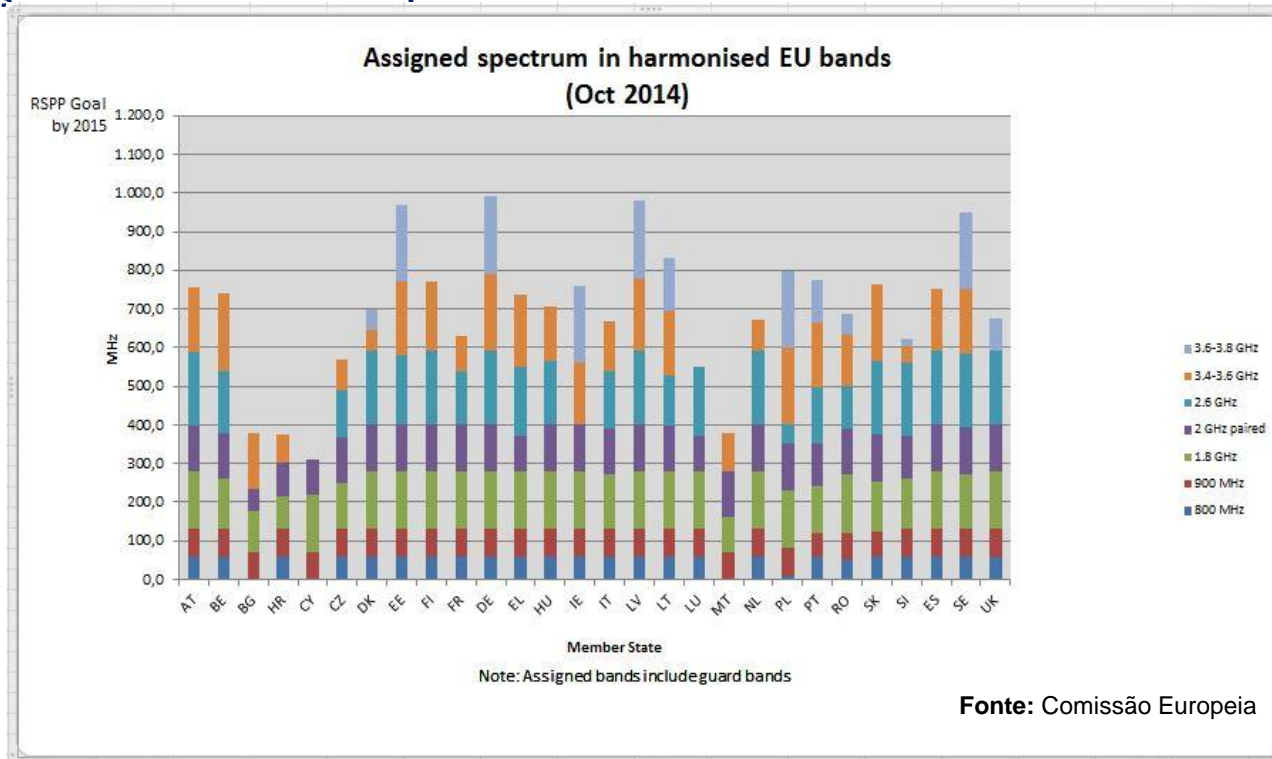
- Espectro necessário: 1340 a 1960 MHz de espectro
- Espectro contíguo e banda larga: harmonização
- Estudos sobre partilha do espectro (LSA, CR)
- Espectro “5G”: a discutir na WRC-19 (faixas acima dos 20 GHz)

5G: “use cases”



Fonte: Ericsson

- Sistemas móveis: várias tecnologias/faixas
- Utilização flexível do espectro



■ Futuro, a ter em conta:

- Programa político do espectro/Revisão do quadro regulamentar
- Espectro necessário em outras áreas: p.ex. Galileo, GMES, PPDR, PMSE
- 700 MHz

Obrigado!

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