The Road to 6G
A regulators perspective

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Overview

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About Ofcom

Who we are

• Regulatory & competition authority for broadcasting, telecommunications & postal industries
• Statutory duty to represent interests of citizens & consumers through promoting competition, encouraging investment & innovation in relevant markets

We adopt a tech-first approach to regulation

• Want to anticipate (rather than react to) emerging technologies/technology trends & understand how they will impact the sectors we regulate
• Recognised as thought leaders both internally & externally

Our themes for 2022/23

• Investment in strong, secure networks to ensure high-quality & reliable broadband & mobile networks
• Getting everyone connected so nobody is left behind as services evolve
• Fairness for customers & tackling scams
• Enabling wireless services in the broader economy for the benefit of everyone in the UK
• Supporting & developing UK media helping it to evolve & meet the needs of viewers & listeners
• Serving & protecting audiences from potentially harmful/offensive content, while taking full account of freedom of expression
• Establishing regulation of online safety for our new regulatory responsibilities as the Online Safety Bill proceeds through parliament

Our work in CMT will ensure Ofcom is fit to face the future

6G Themes

- IMMERSIVE HUMAN-CENTRIC EXPERIENCE
- SENSING, LOCALISATION & IMAGING
- INDUSTRY 4.0
- SMART CITY & SMART LIFE

Technology Focus on the User

- People & businesses are front & centre of our work
- Understand user needs, connectivity requirements & technologies that will deliver them
- Knowing where technology falls short helps shape our horizon scanning

Use Cases, Services & Devices

Connectivity Enablers & Spectrum

Networks & Architectures

Emerging Technologies

Non-exhaustive list but indicates technologies of interest to us

It's not just about understanding the technology....

We are interested in the technologies that will have the potential to significantly impact at least one (or more) of the following:

- Enables the delivery of new use cases/services which are valued highly by people & businesses
- Broadens & deepens access to services
- Increases the performance of networks, improving the experience for people
- Lowers barriers to entry for providers, enabling choice for people
- Reduces the cost of delivering services, increasing access & maximising value for customers
- Changes the way we authorise & regulate networks/services
- Reduces the total environmental impact of delivery of communication services & associated activities
- Assures the security & resilience of service delivery
We need to understand how networks will evolve & the challenges Network Providers will face.

### Traditional Mobile Architecture

- **User Equipment (UE)**
- **Air Interface**
- **Antennas**
- **RF Cables**
- **Radio Units (RU)**
- **Optical Fibre**
- **Cabinet**

### Service-Based Architectures

- **Network Exposure Function**
- **Network/Wire Selection Function**
- **Policy Control Function**
- **Application Function**
- **Authentication Server Function**
- **Unified Data Management**
- **Access & Mobility Management Function**
- **Sensors Management Function**

### Converged & Metaverse-Ready Networks

- **Secure Automated Programmable Intelligent Cloud-Native**
- **Network of Networks**
- **Connectivity Requirements**

#### Shift from Monolithic to Disaggregated RAN

- **Monolithic**
  - **CN**
  - **BBU**
  - **RU**

- **Disaggregated**
  - **CN**
  - **CU**
  - **DU**

**Disaggregation includes decoupling of HW/WW in addition to disaggregating network elements. Open RAN connects disaggregated RAN elements through the use of open & interoperable interfaces.**
Understanding a broad range of future use cases & enabling technologies is vital for our work

**Use Cases, Services & Devices**
- IMMERSE: IMMERSIVE HUMAN-CENTRIC EXPERIENCE
- SENSE: SENSING, LOCALISATION & IMAGING
- CREATE: INDUSTRY 4.0
- SMART: SMART CITY & SMART LIFE

Continuous activity to understand use cases & services - understand user needs & gain early insight on potential regulatory/policy impacts
Compare QoS/QoE requirements against technology capabilities - gaps shape horizon scanning activities
Understand content production & distribution techniques
Map out evolution of devices used to enable & access new services

**Open Networking Solutions**
- Locations
- Integration & Testing
- Interoperability

Our current focus is 5G Open RAN, however, open networking solutions spanning Core, Transport & RAN likely to play a key role in the deployment of 6G & beyond

**Wireless-Wireline Convergence**

Understand sustainability challenges & enablement effect of technology
Energy efficiency, network slicing, private networks, edge compute, etc.

**AI/ML**
Understand commercial, operational & consumer benefits
Understand potential security/privacy risks, etc.

**Reflective Surfaces & MIMO Evolution**
Understand spectrum impacts & deployment challenges of RIS
Examine Cell-Free & MIMO evolutions for metaverse-ready networks

**Joint Communications & Sensing**
Understand spectrum requirements for sub-1m resolution, potential security/privacy risks for CSI-based sensing, etc.

Note: this represents a snapshot of our current areas of focus.
We are becoming a respected & recognised thought leader through impactful publications
Thank you!