

# Welcome to the World of Standards

**Building a globally agreed vision of 5G**

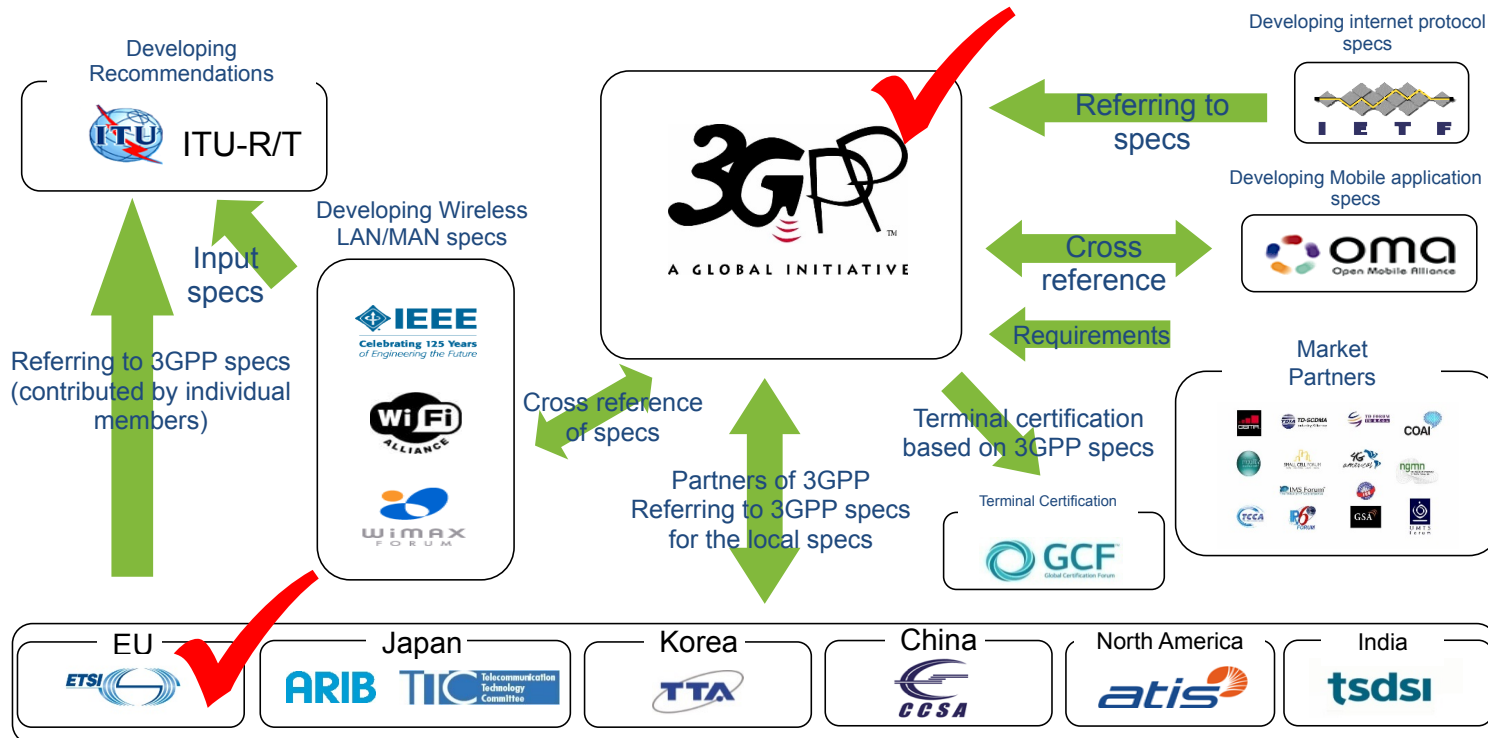
Adrian Scrase, ETSI CTO



**World Class Standards**

5G Huddle, Copenhagen, 13-14 October 2015

# The Mobile Ecosystem: Who does What?



## Some Game Changers for the Future

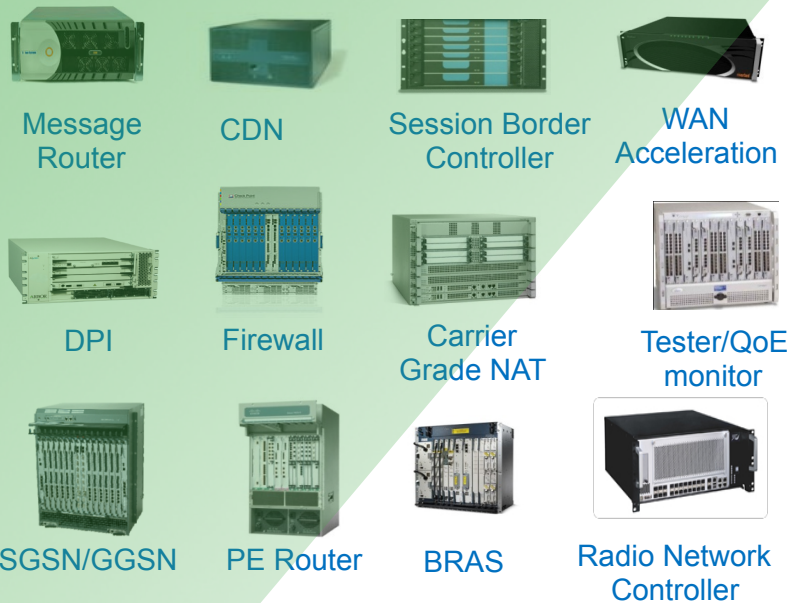


• A number of new activities have started in ETSI which will form building blocks for 5G mobile. For example:

- Network Functions Virtualisation
- Mobile Edge Computing
- Millimetre Wave Transmission

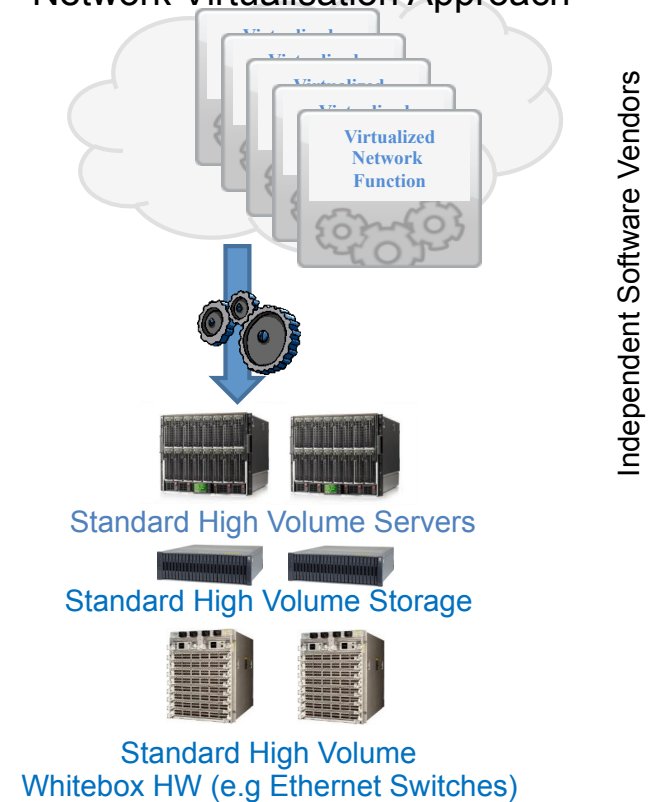


## Classical Network Appliance Approach

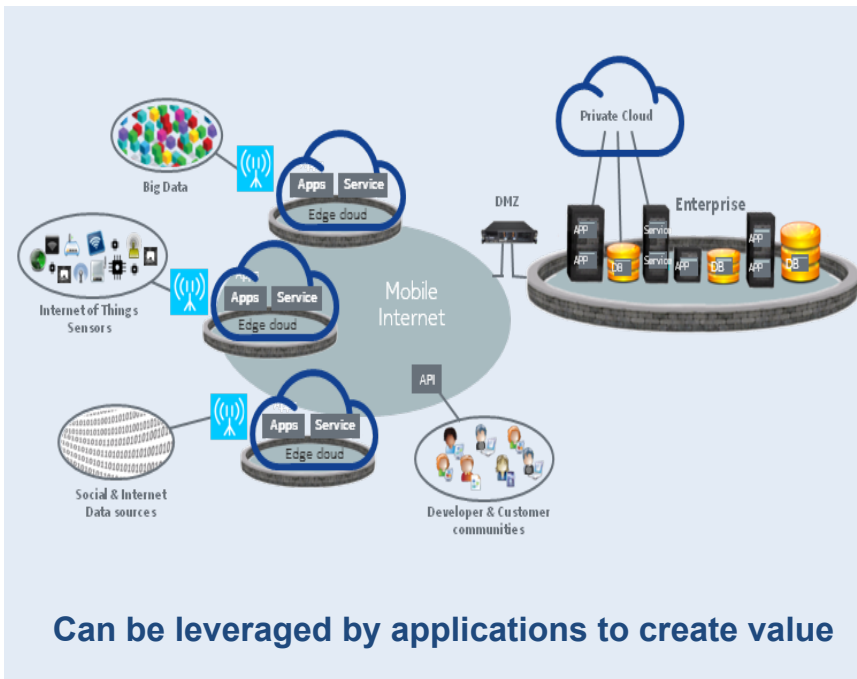


- Fragmented non-commodity hardware.
- Physical install per appliance per site.
- Hardware development large barrier to entry for new vendors, constraining innovation & competition.

## Network Virtualisation Approach



# Mobile Edge Computing



Offers application developers and content providers cloud-computing capabilities and an IT service environment at the edge of the mobile network

This environment is characterized by:

- Proximity
- Ultra-low latency
- High bandwidth
- Real-time access to radio network information
- Location awareness

Complements SDN and NFV and *advances* the transformation of the mobile-broadband network into a programmable world

**Programmability**

Ensures highly *efficient* network operation and service delivery, and *ultimate* personal experience

**TCO and QoE**

Enables a myriad of *new* use cases across multiple sectors

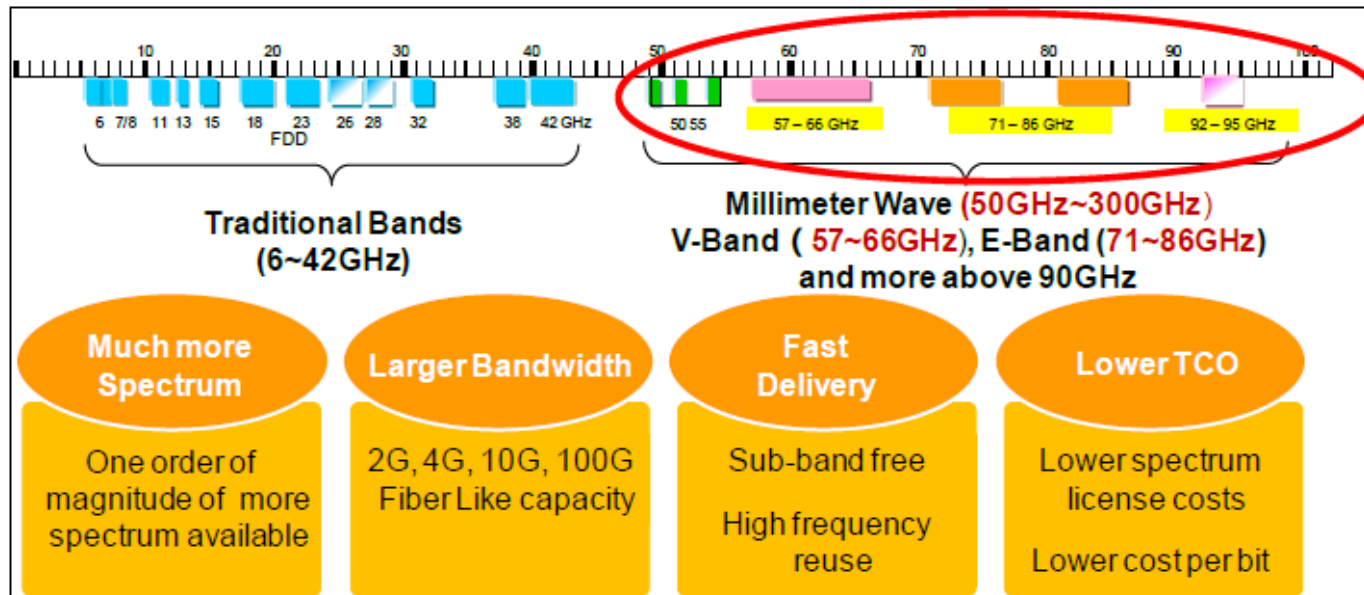
Enables a *new* value-chain, *fresh* business opportunities

**Business segments**

# Millimetre Wave Transmission



- Millimeter range radio (V-band (57-66 GHz), E-band (71-76 & 81-86 GHz) & from 50 up to 300 GHz) is ideal for large volume applications in back-hauling and front-hauling to support mobile network implementation, wireless local loop and any other service benefitting from high speed wireless transmission



## 🌐 Technology and Spectrum Choices

- There is a generic technology choice to be made:
  - Embark on a linear evolution of today's networks , or
  - Adopt a new approach, or
  - A combination of the above
- Traditionally, the 3GPP approach is evolutionary (including backwards compatibility). A pure evolutionary approach may not be sufficient for 5G
- Obtaining new Spectrum for mobile services is essential, but not the whole solution
- More efficient use of spectrum must be ensured (incl. licensed, unlicensed and shared access regimes)
- Opportunities to deliver broadcast content to mobile users (and vice versa) by exploiting synergies



## Conclusions



- LTE will continue to evolve for many years
- The User Experience will continue to evolve too
- Technology building blocks being developed as the foundation for the next generation (5G)
- The timeline for 5G development is now clear
- More efficient use will need to be made of existing spectrum allocations
- New spectrum will need to be assigned if 5G expectations are to be fully achieved



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Thank you!