

Partnering to share risks and anticipate the future: The 5G-PPP

IEEE-ICC'13

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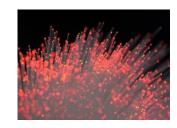
Panel: Future Network Technologies - impact on carrier networks and services

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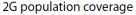


Trends driving Future Networks I

- Data explosion, content
 - High capacity networks
 - Architectures
- Service platforms
 - Open programmable and virtualised networks
 - End-to-End, cloud interoperability/integration
 - User involvement: personalised, social
- Ubiquitous access/Mobility
 - High capacity wireless, spectrum efficient and flexible technologies
 - Low radiation
 - From Convergence to fully integrated <u>global</u> networks









3G population coverage



Trends driving Future Networks-II

- Sustainability
 - Green networks, drastic energy reduction/user
 - All optical beyond IP routing



- Flexible self-management across multiple domains.
- Big data usage, Quality of Experience
- Leveraging network data in higher level applications
- Objects connectivity
 - Internet of Things,
 - Integration environment
- Security, Privacy...





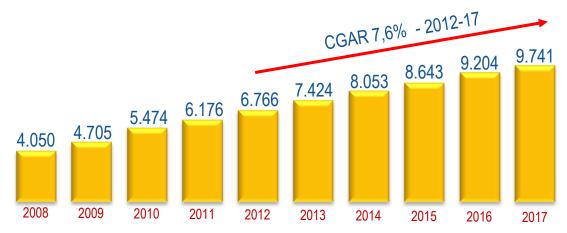
Mobile broadband: a challenging growth

- Mobile broadband penetration ⇒ positive impact on GDP
- Need to address significant challenges:
 - novel application and trillions of devices, bandwidth, capacity crunch, Spectrum and technological approaches, traffic patterns, cloud paradigm and energy
- ...exploit trends...
 - Network Function Virtualization and SDN and management issues
- ... and action
 - A bold initiative on advanced 5G network infrastructure



Things and novel applications

IoT predictions: 50 billion connected devices (2020)

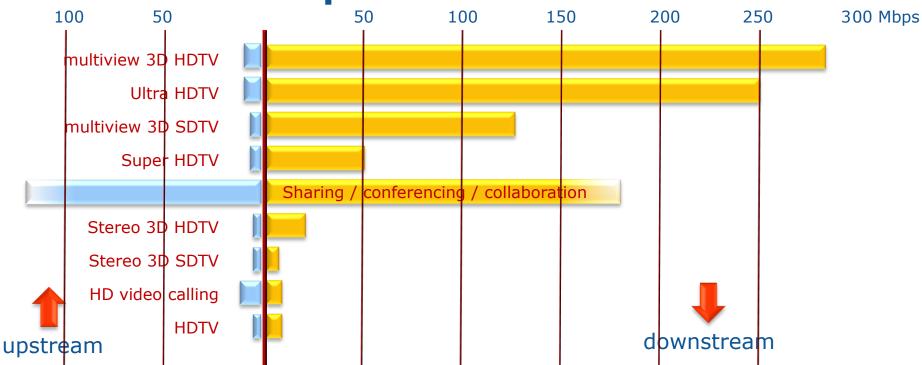


Global connection in Billions, including M2M

Source: GSMA



Restless pressure on bandwidth

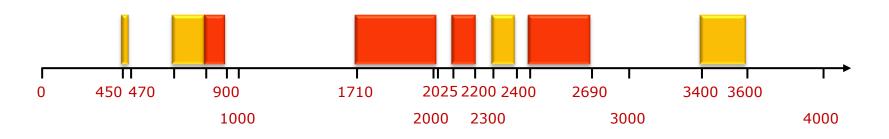


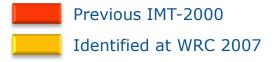
- Video Mobile data Internet traffic doubles every year. up to 1000 fold traffic increase may be expected by 2020
- Capacity/Spectrum only doubles every 8-10 years
- Video services predominant, even for mobile usages

Source: NSN



Spectrum matters



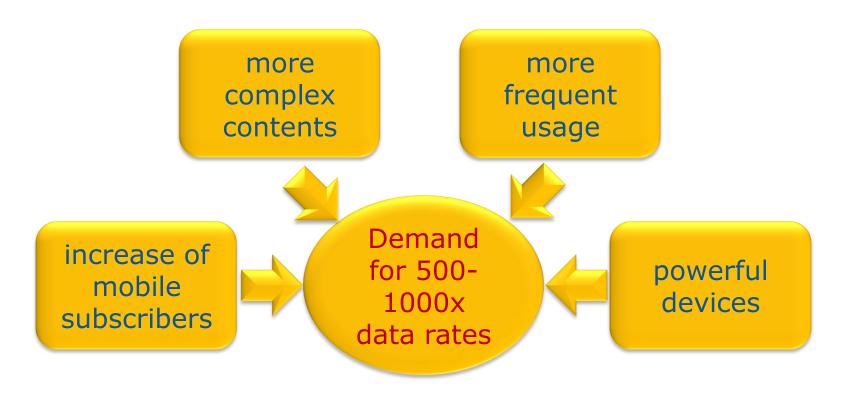


Note: simplified diagram

- At least additional 500MHz new spectrum by 2020
- More innovative spectrum usage technologies / systems



Complex traffic patterns



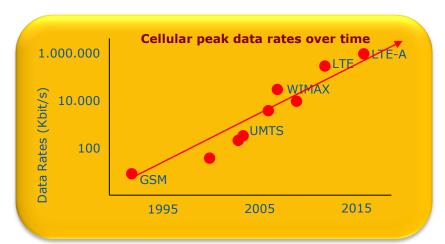


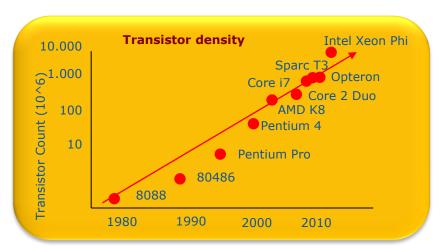
Technology trends

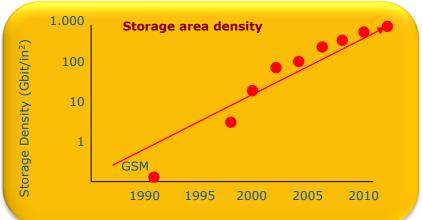
- Network Function Virtualisation
- Software Defined Networks
- Automated deployment and operation, selforganising networks
- Use of Big Data to optimise content and service delivery, security.
- Integration Fixed-Wireless access with unified management serving heterogeneous technologies

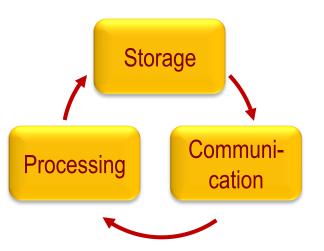


Cloud computing paradigm











Towards an Integrated ubiquitous ICT infrastructure

"5G" initiative for Europe - context

- Horizon 2020 Proposal
 - Supporting PPPs (public-private partnerships), including Future Internet.
- Speech of EC VP. Neelie Kroes
 - Barcelona, World Mobile Congress, Feb. 2013, call for action to industry to submit partnership proposals for an advanced 5G future network infrastructure
- Part of an integrated approach to Future Internet
 - Cloud strategy (research, legal and procurement), PPP Internet as an innovation accelerator (generic enablers, platforms, new actors, entrepreneurship, innovation), FIRE (experimentation)



So, what do we mean by 5G?

not a linear extrapolation of 1G, 2G, 3G, 4G... instead, focus on...

- capacity and application crunch;
- convergence environment between networks and cloud computing
- true seamless convergence between fixed and mobile
- true ABC (Always Best Connected)
- optimised operation and deployment costs
- support to innovative applications



A 5G initiative for Europe

- Multiple actors called upon to contribute: telecom, IT, microelectronic, users, SME's...
- Validation through experiments and testbeds
- Clear KPI's as design goals:
 - Providing 1000 times higher capacity and more varied rich services compared to 2010.
 - Saving 90% energy as today per service provided.
 - From 90 hours to 90 min service creation.
 - Secure, Reliable, dependable: perceived zero downtime for services



A 5G initiative for Europe - rationale

- Strong foundation:
 - Close cooperation with and within community
 - Strong and visible community (800 entities in NET!works)
 - but not restricted to.
 - Industry oriented strategy
- What the PPP brings:
 - Long term commitment from both public /private side
 - Greater impact on innovation and leverage effect on complementary sources of financing

more partnership, more commitment, more leverage!



Key factors of success

- <u>Bundle competence</u> in EU to develop next generation networks and information systems for 2020
- Address <u>full innovation cycle</u> and leverage "eIndustry"
- Smart networks and novel architectures to serve highly demanding requirements;
- Bring together IT, Cloud Computing, Network
 virtualisation, IoT/M2M, big data analytics to reap
 innovation potential of novel usages and services
- Valorization of network data(nami) in high end applications;
- Network as (open) infrastructure for innovation