VIEWS ON 5G ARCHITECTURE

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Future Connectivity Systems
5G as an EC DSM Priority

The 5G Public Private Partnership (5G PPP)
- 700 M€ initiative under R&I H2020 programme
- Technologies, systems, applications,
- spectrum, standards;
- International cooperation
- Supply Side

The 5G Action plan
- Commission Communication: to support European industrial leadership;
- Part of the September 2016 "Connectivity Package"
- Preparing Framework Conditions at EU level for 5G deployment
- Demand Side
5G EU Approach

"Pervasive fixed and mobile connectivity"
"Single Market" approach to EU 5G Introduction

- **Early 5G launch in selected areas/TRIALS**
  - 2018
  - Commercial launch of 5G services in at least one major city in all MS

- **2020**
  - 5G in all urban areas and along main transport paths

- **2025**
  - Coordinated/quasi-simultaneous launch throughout single market
  - Aggressive roll-out with geographical and sectorial focus

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ETS Summit
5G Network Infrastructure
5G PPP supporting Groups

- Pre-standards
- Spectrum
- Vision and Societal Challenges
- Trials
- SME support
- Use cases and performance evaluation models
- Network Mgt, QoS
- Security
- Software Nets (SDN and NFV)
- Architecture
- Activity Community building and Public Relations
- Activity 5G PPP Contractual Arrangement, KPIs
- Trials
- Vision and Societal Challenges

and further international partners...

ETS Summit

5G Network Infrastructure
5G Multiplicity of Requirements

- Support different vertical markets
- Multi-tenancy and multi-service
- Accelerate the service delivery
- Provide service providers flexible access to network and computing resources
- Support multiple e2e slices with desired performance characteristics
- Flexible network sharing schemes
- Support solutions across multiple administration domains
- Ubiquitous coverage of services
- Energy efficiency
- Future proof framework, evolution
Why a new architecture?

- Multiplicity of requirements ➔ flexibility
- New business models
- Challenging KPI's, 10 to 100 times difference from 4G to 5G KPI's;
- Need of simplification
- New supporting technological approaches:
5G Ecosystem

One unified infrastructure, multiple logical network instantiations
Architecture "multi view"
Key Topics for 5G Architecture Design

- End-to-End Network Slicing (NGMN)
- SDN/NFV as enabler
- Integration with LTE
- Control/User Plane split
- Radio Access Network/Core Network split
- Scope of virtualisation
- VNF flexible placement
- New 5G functions

- Multi-connectivity
- C-RAN and D-RAN and functional splits
- New fronthaul
- Fixed-Mobile Convergence
- Deployment of cloud facilities
- Multi-domain orchestration
- Security at design
5G PPP Phase 2

Novel architecture key features from radio resource flexibility to net programmability to be demonstrated through about 30 experiments/demos in the field of:

- Broadcast, object based content, small cell deployed over stadium
- Smart grid, energy networks, URLLC;
- Connected cars, autonomy assistance
- Smart health URLLC, safety critical services
- In flight systems multitenancy;
- Public Warning System
- Railway;
- Cell less factory
5G PPP Phase 3 (WP18-20)

Survey on user needs, studies on applications/services

Phase 2 - Demos PoC - Core Techs Components

Phase 3 a) Verification Demo/Trial
- Long term Architecture
- Integration radio+

Early 5G introduction
Lower frequency bands

Later 5G introduction
Higher frequency bands

Phase 3 b) Large Scale Experiments services/functions
- Advanced Architecture
- radio+network+applications

Under Discussion With Member States

The 3rd Global 5G Event in Tokyo, Japan

The 3rd Global 5G Event will be held on 24 - 25 May 2017 with Wireless Technology Park (WTP 2017).

Rainbow Bridge

WTP (Exhibition)

Tokyo Big Sight

ETSI Summit
5G Network Infrastructure
Conclusions

- Early 5G deployments based on NSA will not require in-depth rework of core architecture.
- Redesign considered important to support new digital business models and B2B revenue streams.
- Standardisation moving ahead with 3G PP SA (and RAN).
- No Vertical readiness to invest now. Concepts (slicing) still need a lot of validation work, both technical and business.
- EC support ready to help, towards early deployment in Europe.