Approaching the 5th Generation Fixed Network

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Fibre to Everywhere for an Unlimited Future

Full-fibre DC  →  Full-fibre Home  →  Full-fibre Campus

OTN to CO  →  Fibre to Home  →  Fibre to Enterprise  →  Fibre to Factory
→ to Site  → to FTTRoom  → to FTTDesk  → to FTTMachine

Fiber to Everywhere to make fixed access future proof

- Extending to more end-user: 2Home, 2Room, 2Business, 2Comsumer, 2Mobile, 2Device, 2Machine, etc.
- Reducing everywhere the fibre-to-end user distance: Km → 100m → 10m → 1m
- Number of connections expanding: X3 (Room), X10 (Desk), X30 (Machine), X100 (Smart city)
Learning from Mobile: improving the standard process in Fixed Networks

Mobile World: Sync’ed Work of few entities

- Technical Innovation
- Standardization
- Generation Definition
- Spectrum
- Regulation
- Industry Collaboration
- Industry Development

Convergent demands → Unified global standard

Clear roadmap, tech generations and system releases → very good synergy

Fixed World: Scattered Efforts and loose Coordination

- PON System
- Home network
- OTN/SDH/WDM

- Ethernet interfaces standards
- Wi-Fi standards

- IP Protocols
- Network controller protocols/models

- Technical innovation
- Technology standardization
- Industry promotion

No clear and coherent roadmap, no clear generations, no system releases
Need to improve!

- Access network architecture
- Home network management
- Interoperability test

- CEI/SPi/SFI interfaces
- Functional requirements
- Electrical/optical/control Interoperability test

- Technical innovation
- Technology standardization
- Industry promotion

- OTN/SDH/WDM
ISG F5G snapshot

Membership: increasing from 10 founding members in Feb to 48 in Sep 2020

Work Plan: 3 documents finalized (WP and 2 deliverables) 2 more in progress for R1 (target 2020)

Generation definition  Use Cases  Technical landscape  E2E QoE

White paper

- ETSI F5G webinar (Feb.)
- TelecomTV F5G interview
- Full-fibre Gigabit Society Webinar (May)
- HAS F5G Summit (May)
- CSPA 2020 (July)

- F5G kick-off (Feb.)
- 2nd ISG Meeting
- 3rd ISG Meeting
- BBWF2020
- 4th ISG meeting
- ECOC2020

May 27-29  Sept. 06-09  Oct. 13-15  Nov. 24-26
Identifying Generations for Fixed Network

Wireless
- 1G
- 2G
- 3G
- 4G
- 5G

Wireline
- F1G Voice
  - POTS+2.5G/λ
- F2G Web
  - ADSL+10G/λ
- F3G Video
  - Wifi+VDSL+40G/λ
- F4G 4K UHD
  - WIFI5+GPON+100G/λ
- F5G Cloud VR
  - WIFI6+10G PON+ 200G/λ WDM

F5G together with 5G as cornerstones for new digital world
F5G: what does this generation deliver

Represent the most important features in a 3 dimensional space:

- **eFBB (enhanced Fixed BB):** BB Line technology performance
- **GRE (Guaranteed Reliable Experience):** Service supported by minimum guaranteed latency
- **FFC (Full Fibre Connectin density):**

Increasing the number of parameters that F5G will address, (Energy Efficiency, Availability, Reliability, Spectrum Efficiency, Coverage...) one can gets polygonal pictures.
Enhanced Fixed Broadband (eFBB)

Speed

- Scenario based broadband
- Multiple Access Aggregation over PON incl. 5G X-Haul
- Passive optical LAN
- Digitalized ODN
- PON for City Public Service
- PON for Industrial Internet
- PON on-premises
- Extend PON to legacy Ethernet Uplink
- Low cost private line for SMEs
- Cloud Virtual Reality
- Enhanced traffic monitoring and network control in Intelligent Access Network
- On Demand High Quality Transport for Real time application
- High Quality Private Line
- Remote Attestation

Full-fiber connection (FCC)
Density

Guaranteed Reliable Experience (GRE)
Latency

14 Accepted Use Cases for R1
F5G White Paper –Approved by ETSI

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https://www.etsi.org/technologies/fifth-generation-fixed-network-f5g

https://www.etsi.org/media-library/white-papers
Moving forward

Ongoing and short-medium term

• Group Specification of Technology Landscape, Gap Analysis, and F5G Requirements for R1

• Group Specification of the F5G Architecture, E2E Management, and Quality of Experience R2

• Group Report for Use cases and technology landscape for vertical and industrial scenarios (e.g. Industrial PON)

Long Term

• Evolution to next generation

   New Use Cases for growing the F5G eco-system are welcome!
ISG F5G: a great potential for everyone

**ISG F5G grows full-fiber industry**

Target: leading global standards gathering to drive the 5th generation fixed network.

**Vision**

**Intention**

**POC/Test**

**Standard**

**Commercial**

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**Fiber opens up a trillion $ market space**

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<th>1 Trillion $ Market Space</th>
<th>50 Millions Fiber km/Year</th>
<th>50 Millions Fiber-connections/Year</th>
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**WIFI**

To Rooms

To Desks

To Mobiles

To Machines

Full-fiber connection

Typical scenario and services

F5G ISG: standards for the full-fiber ecosystem

Operators

 Enterprises

 Vendors

 Academies

 Regulators

 Verticals

 NGOs

 SDOs
Thank you!

Together, we make it happen.