ETSI ISG-F5G: Results and Ambitions while approaching 2 years of activity

Presented by:

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Broadband World Forum

Physical Event: 12-14 October 2021, RAI, Amsterdam
Virtual Event: 11 - 15 October, 2021
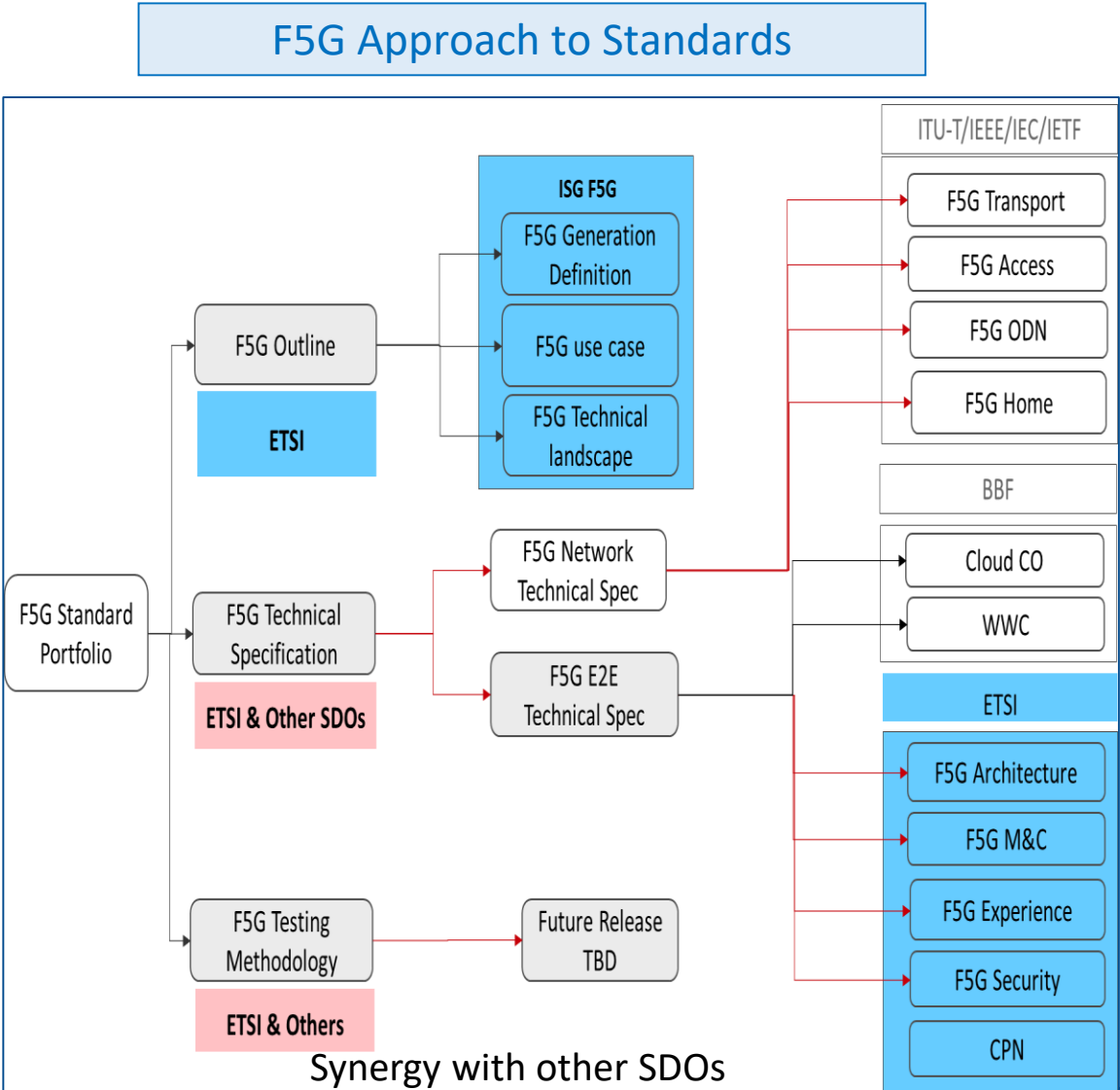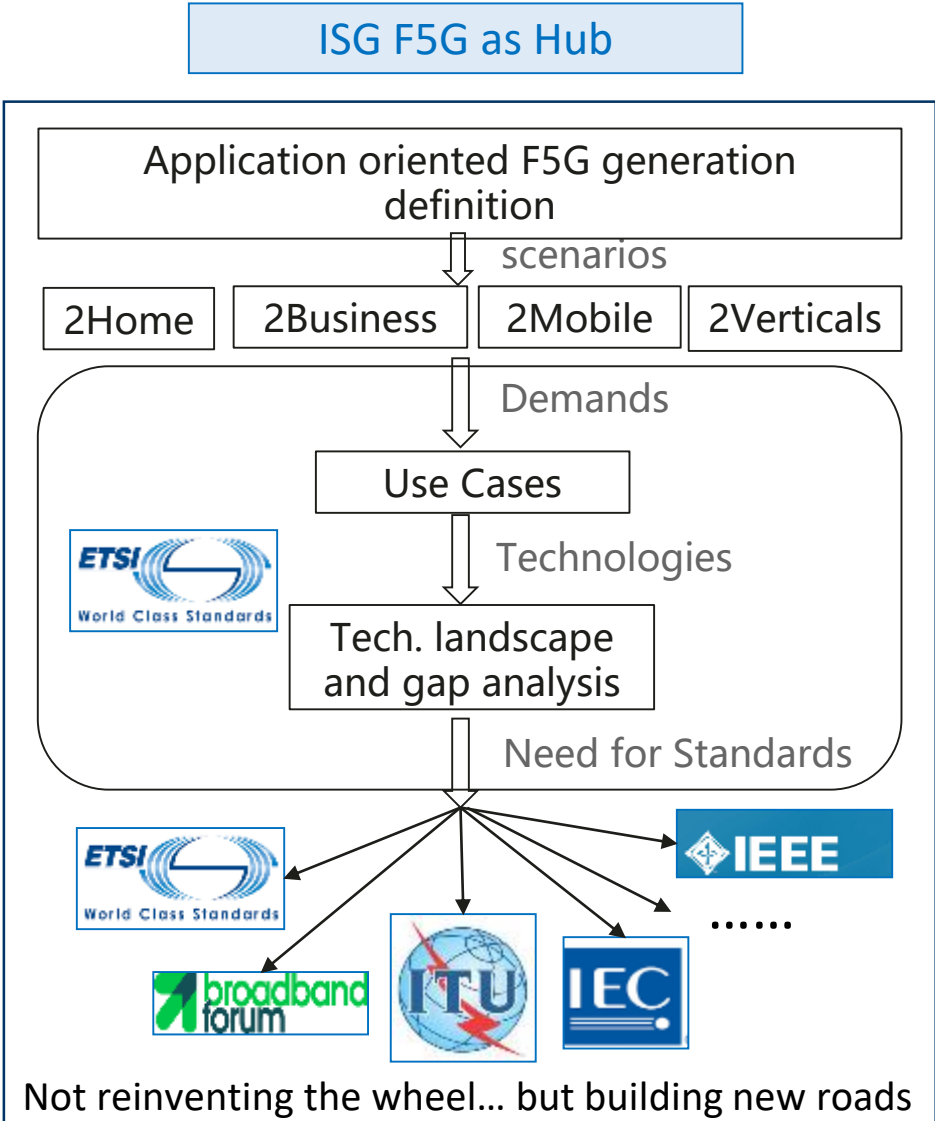
Agenda

ISG F5G

- ETSI ISG F5G: our approach to work
- F5G activities
- Details on the fundamental Work Items
- Planned evolution
- Conclusions

Value Proposition of ISG F5G and its Approach to Standardization

ISG F5G as Hub

Application oriented F5G generation definition

scenarios

2Home | 2Business | 2Mobile | 2Verticals

Demands

Use Cases

Technologies

Tech. landscape and gap analysis

Need for Standards

Not reinventing the wheel... but building new roads

F5G Approach to Standards

ITU-T/IEEE/IEC/IETF

ISG F5G
- F5G Generation Definition
- F5G use case
- F5G Technical landscape

ETSI

F5G Outline

F5G Standard Portfolio

F5G Technical Specification
ETSI & Other SDOs

F5G Network Technical Spec

F5G E2E Technical Spec

F5G Testing Methodology
ETSI & Others

Future Release TBD

F5G Transport
F5G Access
F5G ODN
F5G Home

BBF
Cloud CO
WWC

ETSI
F5G Architecture
F5G M&C
F5G Experience
F5G Security
CPN

Synergy with other SDOs

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Progress of ISG F5G (1) -Members/Participants Update

Progress of ISG F5G (3) -Work Items and Contribution Update

ISG F5G Work Items

WI-1 Generation Definition	WI-2 Use Cases	WI-3 Technology Landscape	WI-4 Architecture	WI-5 QoE	WI-6 E2E Management	WI-7 Industry PON	WI-8 Use Case V2	WI-9 PoC	WI-10 Security	WI-11 Security Architecture	WI-12 Telemetry
F5G main characteristics • Driving forces and path of fixed network evolution • High bandwidth • Massive connection • Extreme experience • Typical technologies	**14 use cases defined** • CloudVR • Security certificate • FTTR • POL • QuickCDN • Premium Private Line • Industry PON • Smart City • ...	**Gaps evaluation:** • Low latency Wi-Fi • Liquid OTN • E2E slicing • Short distance PON • Edge ONU • MWDM • Smart O&M •	**New architecture** • Ultra broadband • Simplified • Agile • High quality • Smart • Automation	**User experience QoE** • High bandwidth • Low latency • Massive connection • High reliability • High security •	**Smart management** • E2E management and control • OAM&P • AI enabling	**Industry 4.0 enabler** • Use Case • Demand analysis • Protocol and Interface • Management • Quality assurance • ...	**New Use cases** • Version 2 with new Use Cases • From Telco to any domains • Each with unique technical requirement	**PoC Framework** • Test protocol • F5G concept validation • Inter-connection and Inter-operability • ...	**Security evaluation** • Threat Vulnerability Risk Analysis • Countermeasure recommendations • ...	**Security evaluation** • Framework *Confidentiality/ Integrity/Availa bility (CIA) paradigm* ...	**Telemetry** • *framework* • *requirements* • *interfaces and data models ...*
published	*published*	*publication*	*Stable Draft*	*In Progress*	*In Progress*	*In Progress*	*Early Draft*	*Published*	*Stable Draft*	*In progress*	*In progress*

Feb 2020 (#1 ISG)   May 2020 (#2 ISG)   Aug 2020 (#3 ISG)   Feb 2021   March 2021 (#5)   June 2021 (#6)

New WI 13 Opened for R2 of T.L.

2 White Papers published

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F5G White Papers

F5G Vision: [The Fifth Generation Fixed Network (F5G): Bringing Fibre to Everywhere and Everything](#)

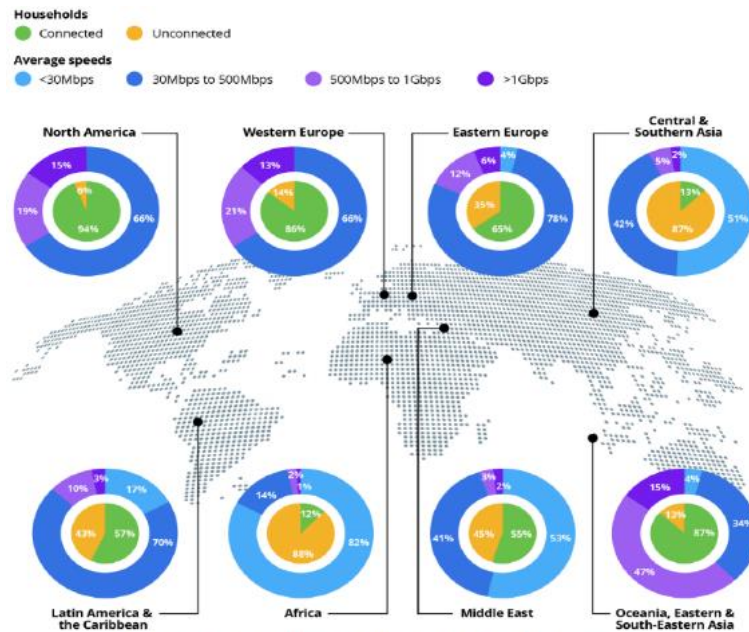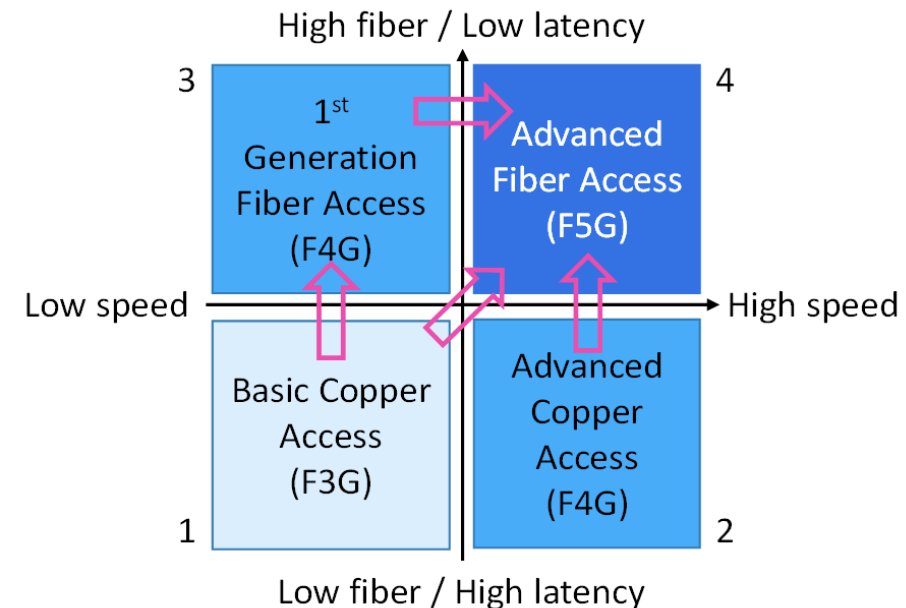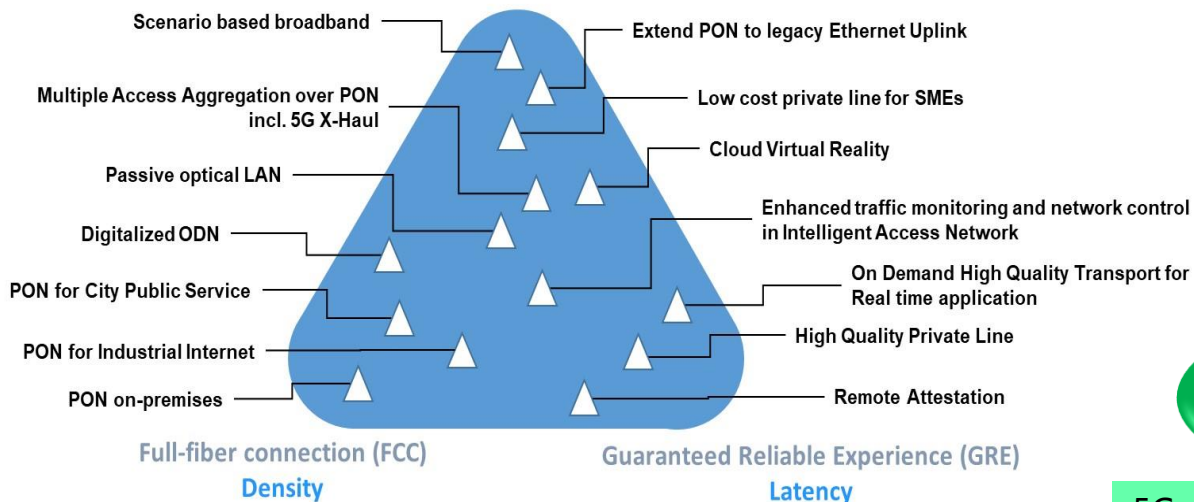F5G Impact & Benefits: [Fibre Development Index: Driving Towards an F5G Gigabit Society](#)

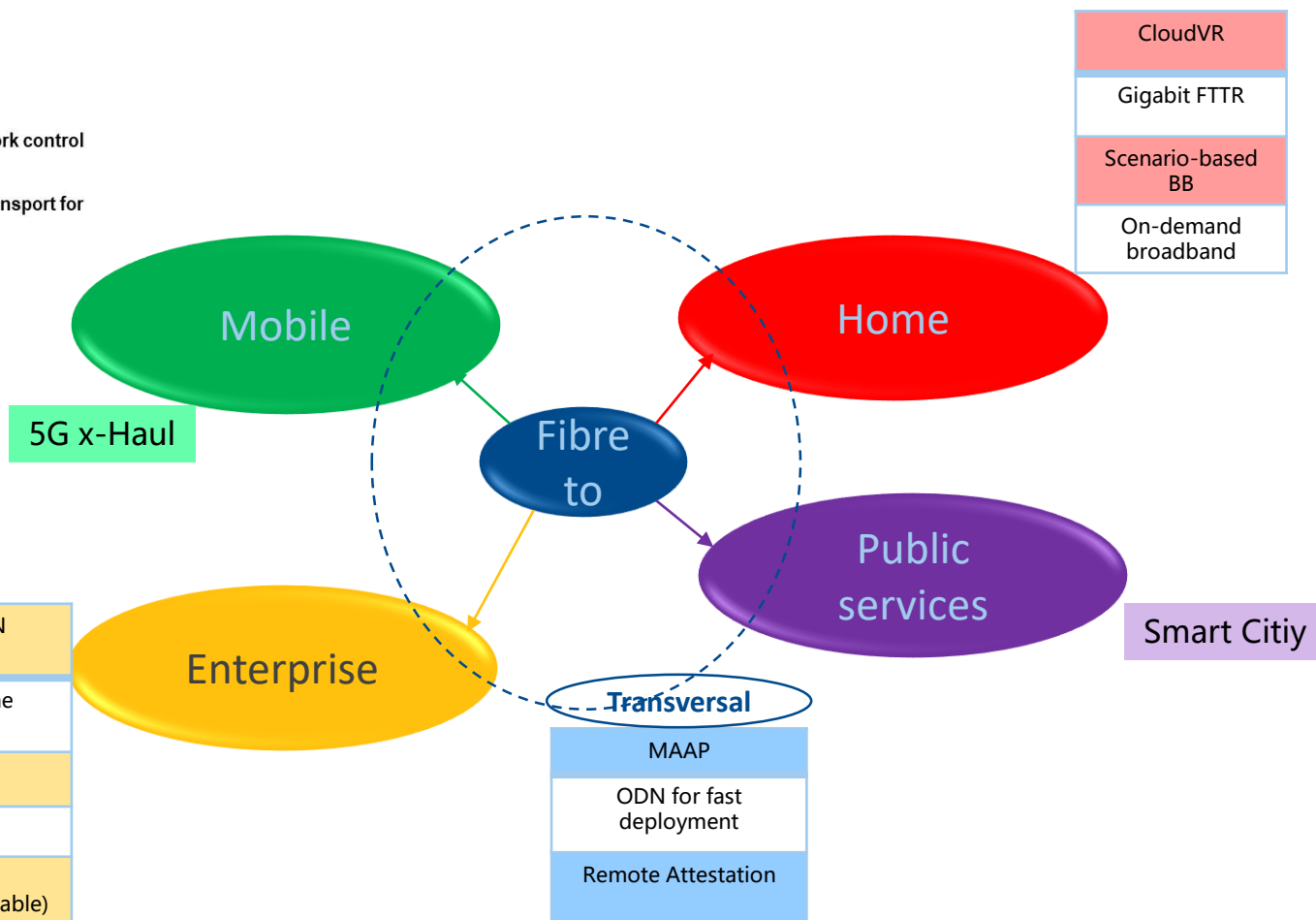Figure 2: Percentage of connected households by speed, by region, 2025

ETSI

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 Use Cases R1

CloudVR
Gigabit FTTR
Scenario-based BB
On-demand broadband

Mobile

Home

Fibre to

5G x-Haul

Public services

Smart Citiy

Leased line by OTN
Economic leased line solution
POL
Industrial PON
SFP ONU (Small Footprint Pluggable)

Enterprise

Transversal

| MAAP |
|---|
| ODN for fast deployment |
| Remote Attestation |

GR F5G 008: Use Cases Release 2

18 new Use Cases; closing new contributions at the end of September ➡ Stable Draft

- Enhanced optical transport network for Data Centre Interconnections
- Media Transport
- Edge/Cloud-based visual inspection for automatic quality assessment in production
- XR-based Virtual Presence
- Cloudification of Medical Imaging
- Orchestration of B2B services in xPON networks
- Enhanced point to point optical access
- Bandwidth on Demand
- Rural Scenarios
- Private line connectivity to multiple clouds
- Edge/Cloud-based control of automated guided vehicles (AGV)

Data Centre Interconnections

Media Transport

Rural Broadband

Private line connectivity to multiple clouds

Edge/cloud based quality assessment in production

XR-based Virtual Presence

Edge/Cloud-based control of AGV

Cloudificaiton of medical imaging

B2B services in xPON
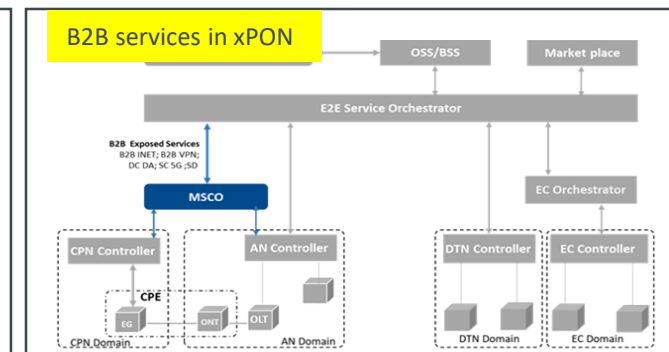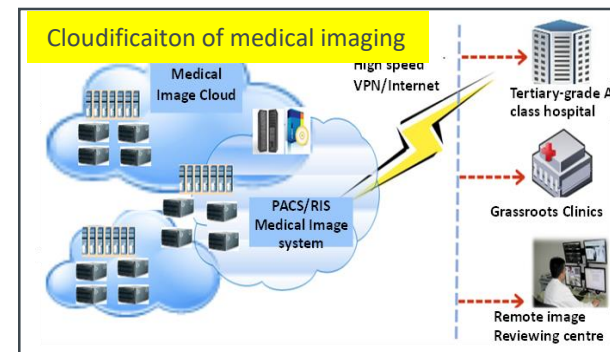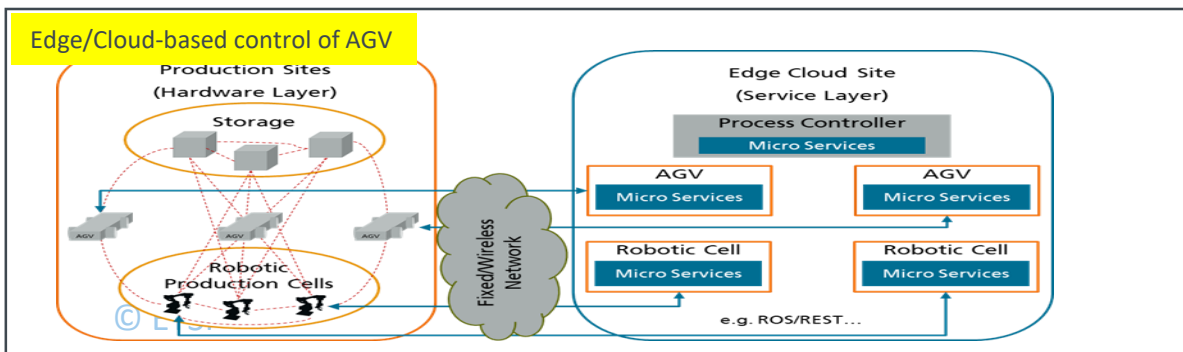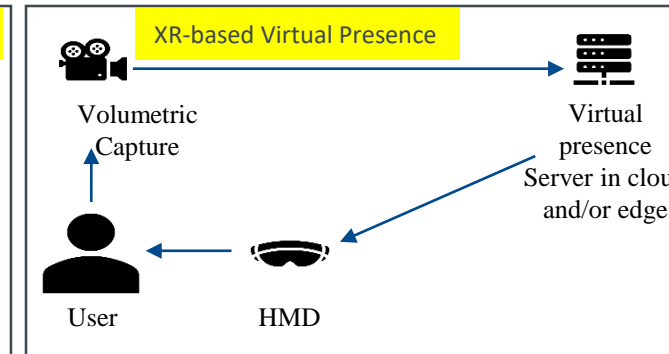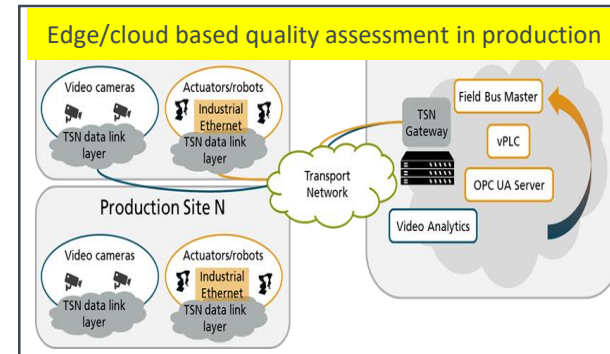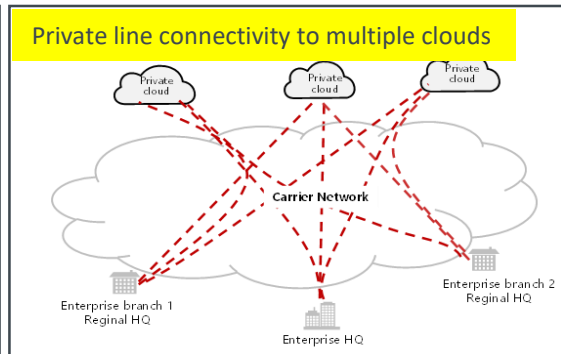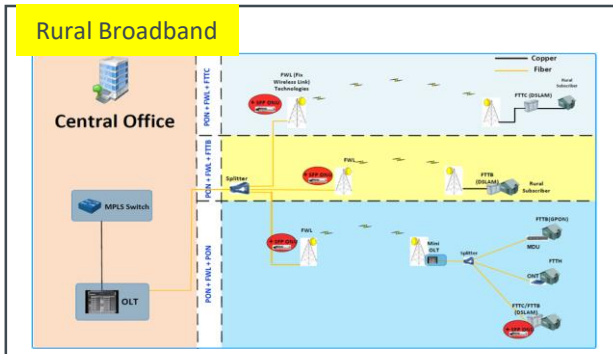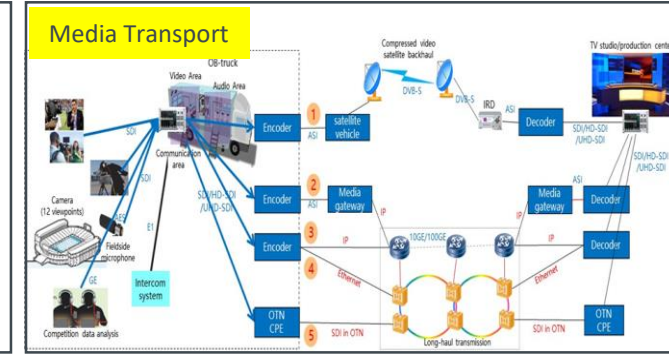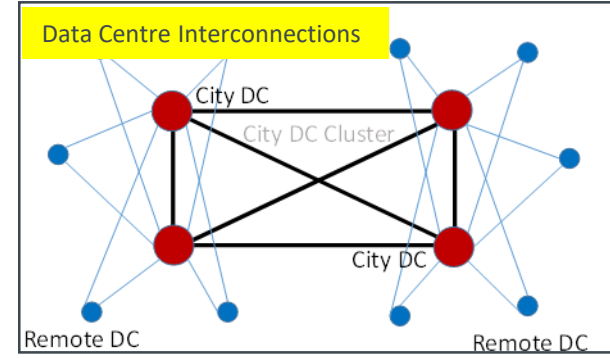
F5G GS 003: The Technology Landscape Deliverable

Aspects	Technical Requirement	Gap Analysis
Variety of data rate profile	• R1 • R2 • R3	• Gap 1 • Gap 2 • Gap 3
Lower optical link budget	• R4 • R5	• Gap 4 • Gap 5
Seamless handover support for Wi-Fi connection	• R6 • R7 • R8	• Gap 6 • Gap 7 • Gap 8
Support of diversified transceiver	• R9	• Gap 9
Network security	• R10 • R11	• Gap 10 • Gap 11
Fibre infrastructure	• R12 • R13 • R14 • R15	• Gap 12 • Gap 13 • Gap 14 • Gap 15
Power saving and management	• R16 • R17	• Gap 16 • Gap 17
Support of network QoS	• R18	• Gap 18
Support of East-to-West data streaming	• R19	• Gap 19

E.g. UC #4 : "PON on-premises" (FTTR)

- IEEE
- ITU-T
- BBF
- TMForum
- ....

**Contribution to relevant SDOs**

ETSI Internal development

- ISG F5G
- TC ATTM
- TC Cyber
- TC BRAN
- ISG ZSM/ENI.........

Full Technology Landscape

➢ **55 actions requiring liaison with other SDOs**

➢ **105 requirements identified**

F5G Architecture (GS F5G 004) and further progress planned

- Architecture and E2E M&C are two of the main focus, and planned for publication in 3Q2021 and 1Q2022 respectively
- FTTR is one of the drivers to make the architecture and E2E M&C future-proof, by SLA based deployment, AI-enabling and dual IP and OTN fabrics…

F5G network architecture

F5G Control Plane Interfaces

F5G Slicing Architecture
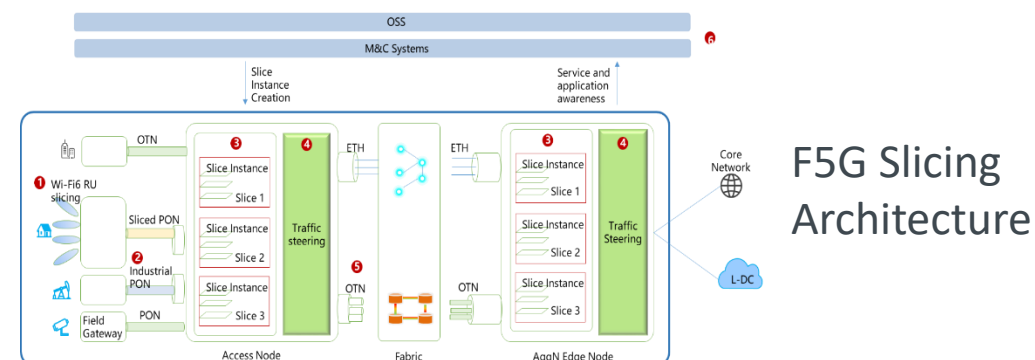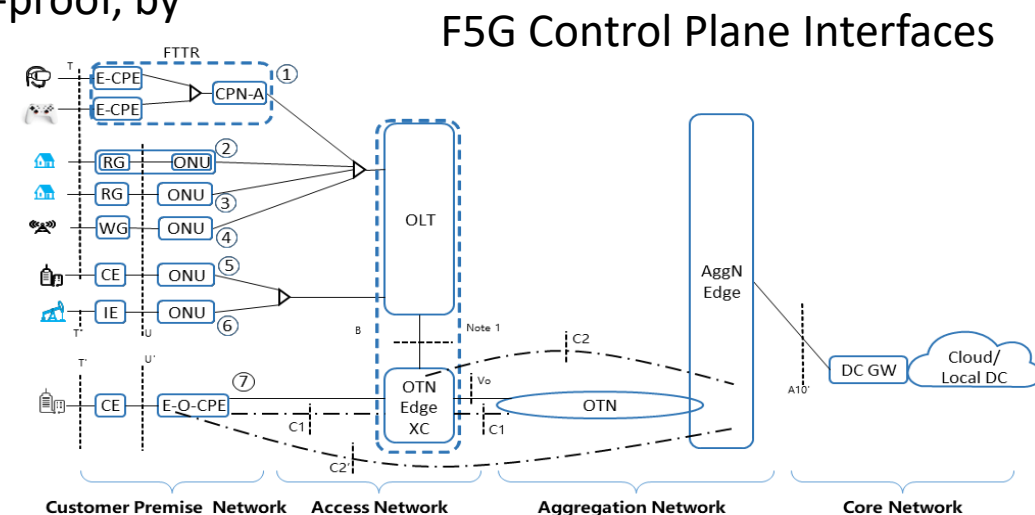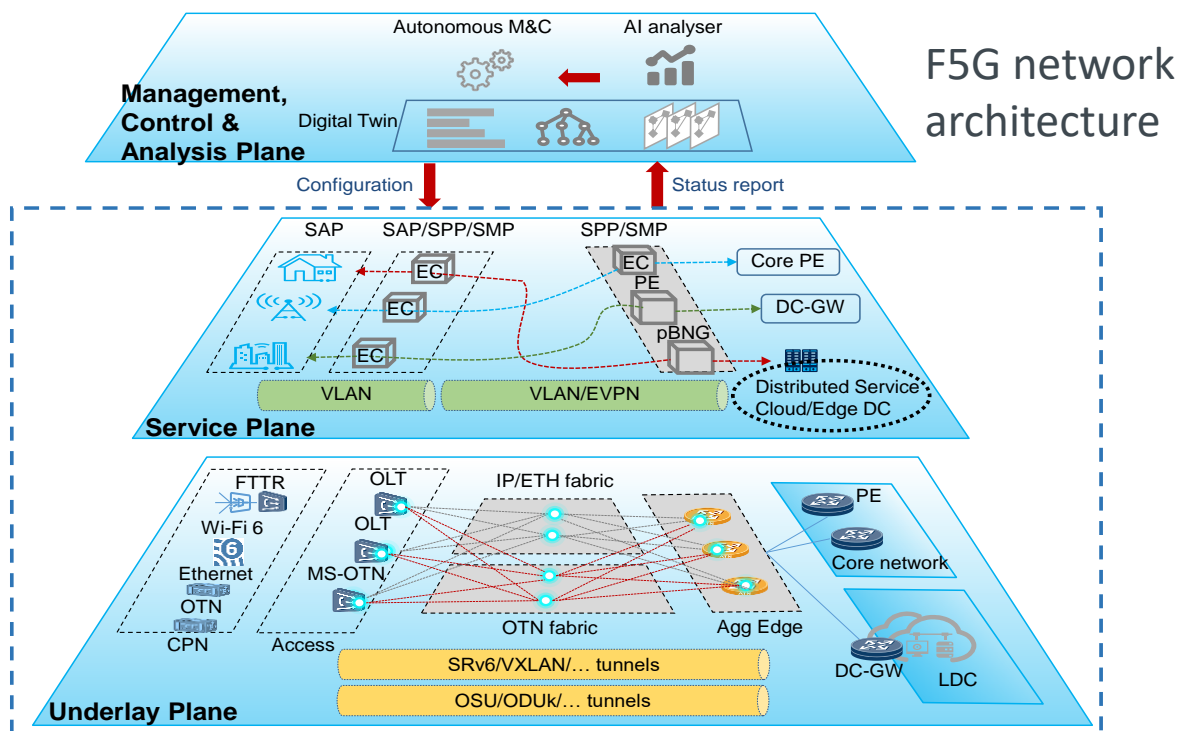
And more on E2E mgm, QoE, Industrial F5G, Security…all to be showcased in PoCs

Closing Summary and Remarks

Benefits

➢ ETSI ISG F5G purpose is to
- deliver new and better BB services to the end users, with new service scenarios
- enable 5G mobile services, with enhanced fibre back- and front-hauling

➢ Establish a collaborative model within the refence SDO's: don't reinvent the wheel

➢ Propose and define enhancements of the fixed network
- in different segments (LAN, access, aggregation, transport)
- at multiple layers (from optical components to OLT and ONT, slicing and orchestration, control and management) up to service and cloud support

➢ Address both public networks and private/verticals enabling various business models

Challenges

➢ Assure flexibility supporting disparate solutions with a single framework

➢ Simplify provisioning and OAM, e.g. by guided online self-installation and self-configuration

➢ Develop the best suited collaboration model with each reference SDO and assure all needed enhancements are timely available for implementation

Together, we make it happen.