



The Standards People

# F5G state of art and FTTR focus

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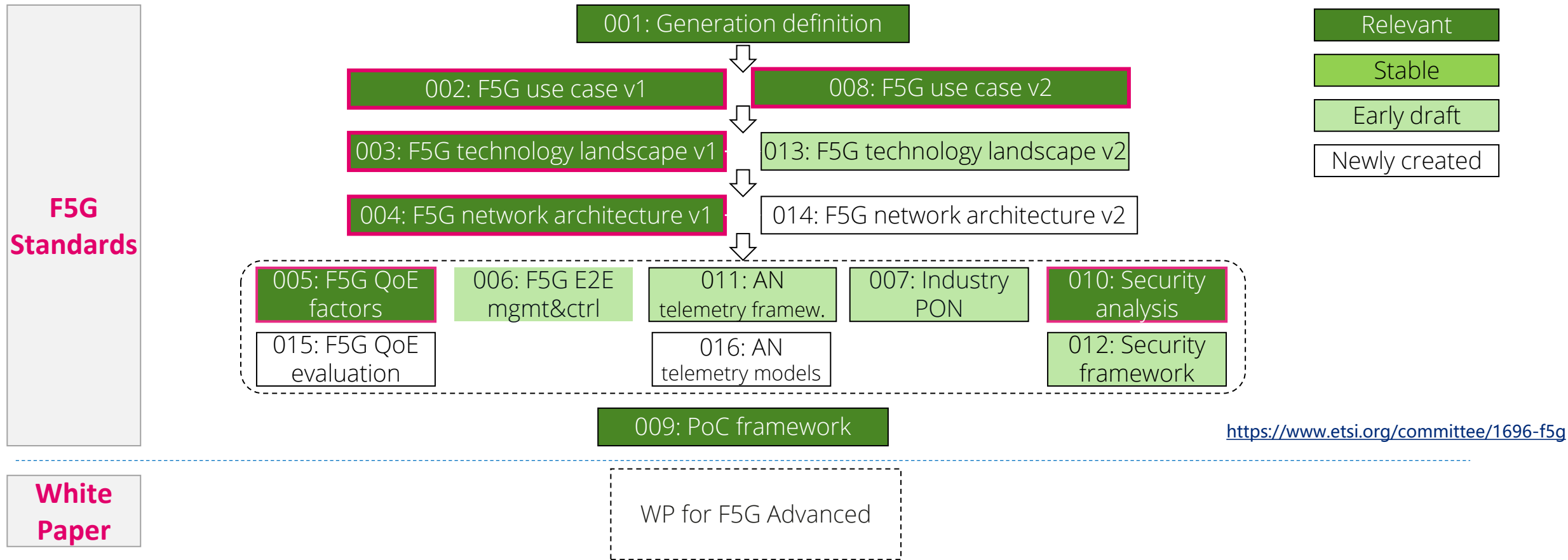
# Agenda



- ETSI ISG F5G: a quick update
- F5G FTTR
- Conclusion

The screenshot shows the ETSI website header with navigation links: STANDARDS, TECHNOLOGIES, COMMITTEES, MEMBERSHIP, EDUCATION, ABOUT, IPR, MORE. Below the header is a banner for the event: "Second Joint ETSI ISG F5G, BBF, CCSA TC6 and ITU-T SG15 Workshop on Fibre to the room (FTTR)". A navigation bar below the banner includes: Upcoming Events, ETSI Seminar, Plugtests, Webinars, Past Events, Events Contacts, Find Us. The event details section includes: Virtual Event, Free of charge, and 28 June 2022. Two buttons are present: Register now and Contact us.

# ISG F5G Standards Contribution and Industry Outreach



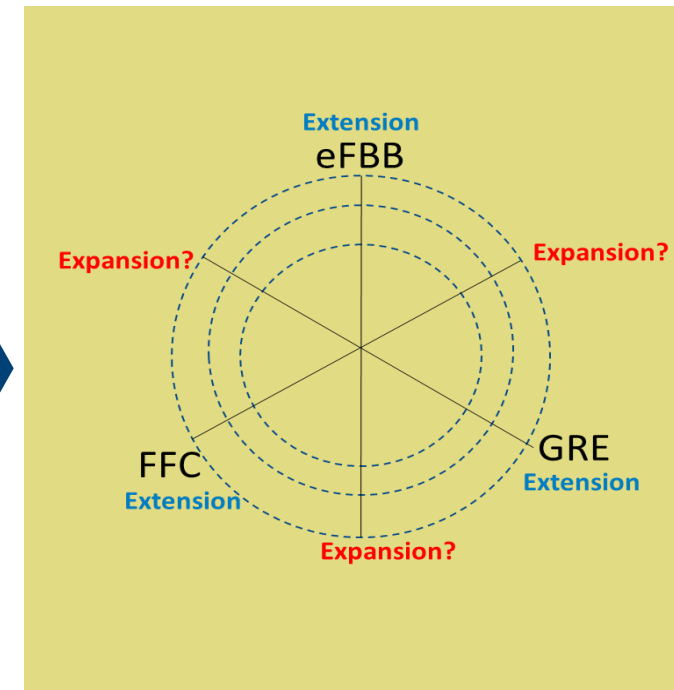
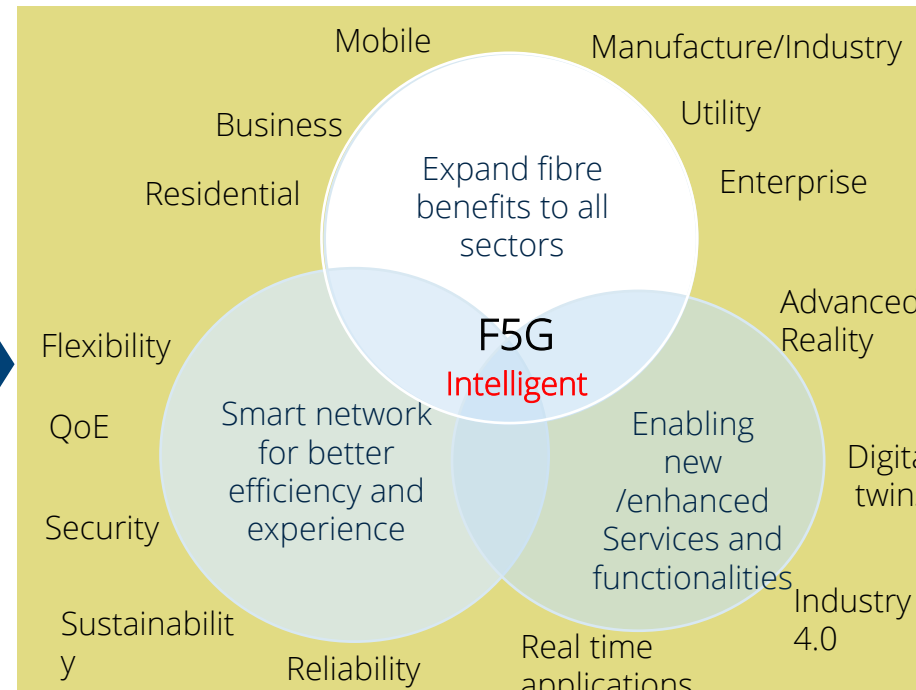
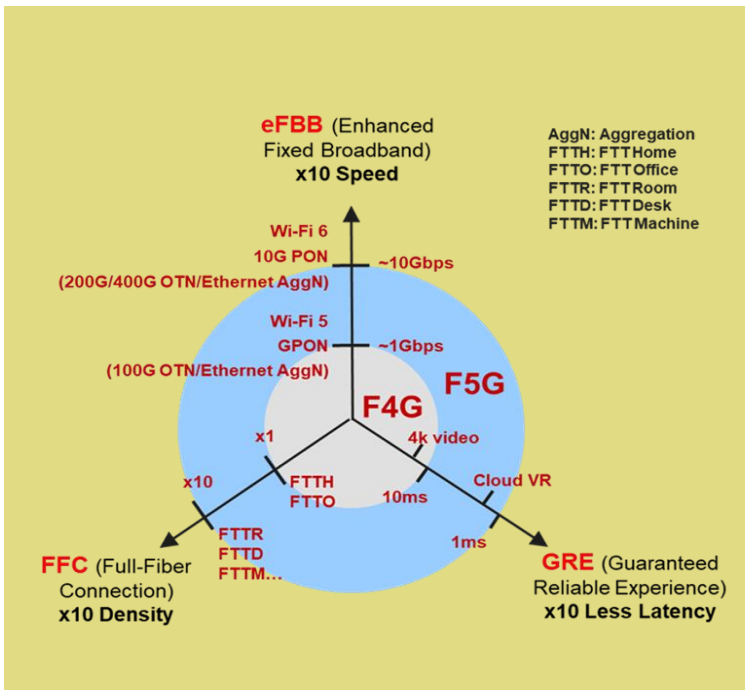
# It's Time to Discuss the next level of F5G –F5G Advanced



F5G : tri-dimensional evolution features

New scenarios and services drive F5G development

New F5G evolution directions

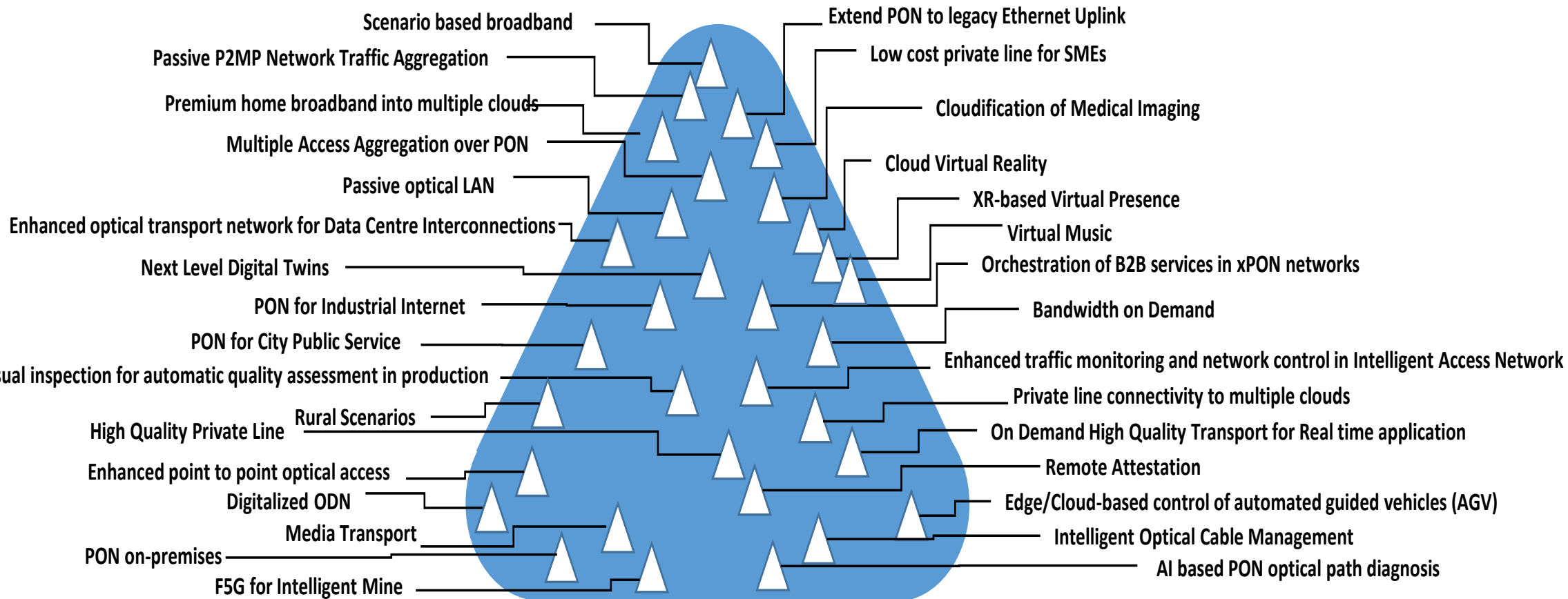


Fibre to everything everywhere  
Higher speed  
Greener  
Smarter to guarantee experience of both operator and end user(digital twins, ADN L4)  
Lower latency and zero jitter for machine

F5G Advanced and Beyond White Paper was created in February during #9 plenary meeting of ISG F5G and plan to publish in September 2022

# F5G UC after 2 releases

eFBB  
(Enhanced Fixed Broadband)



FFC

(Full-fibre connection)

GRE

(Guaranteed Reliable Experience)

# F5G UC after R2

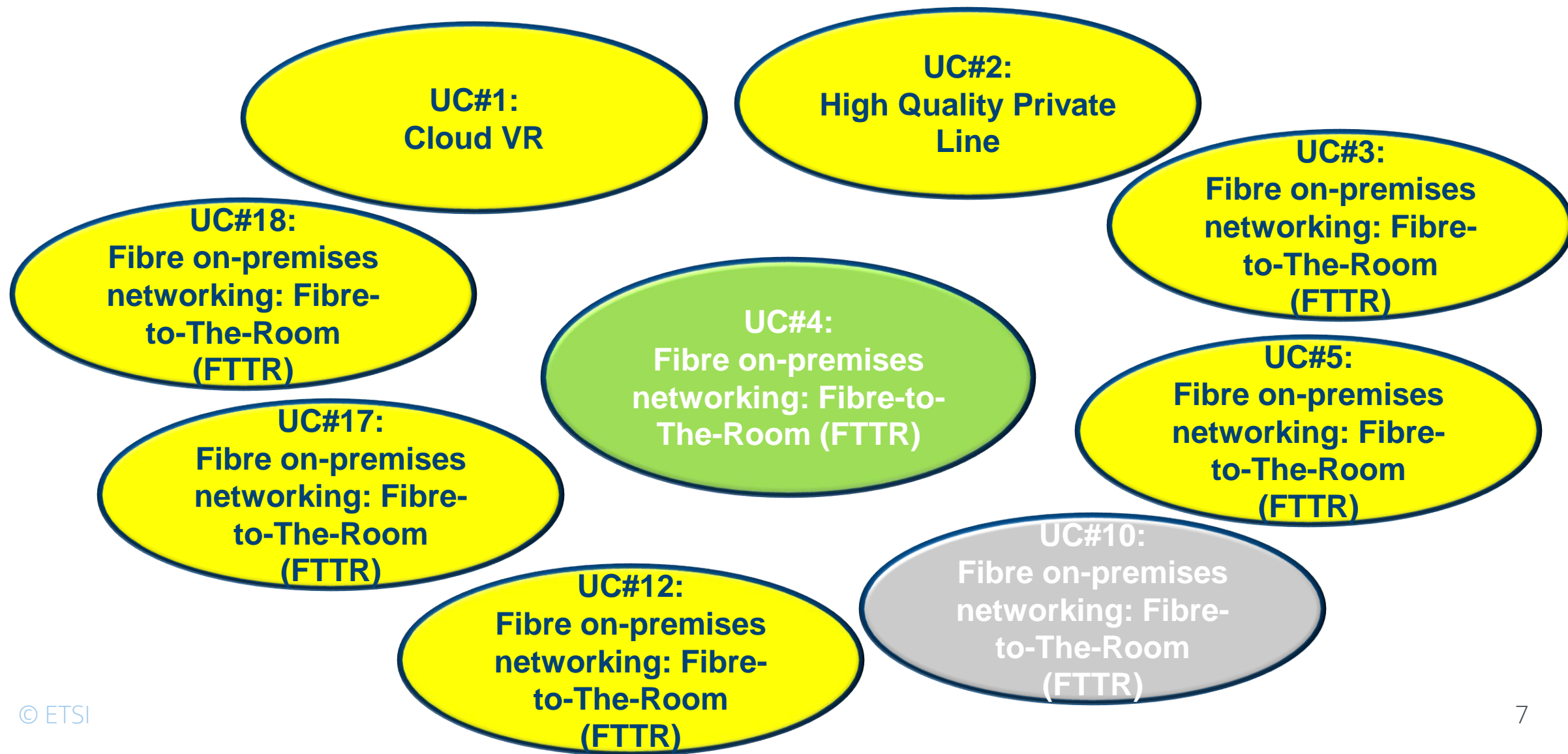
One UC specifically dedicated to FTTR, and several others related to it at various degrees

| Application category         | Corresponding use cases  |
|------------------------------|--|
| Broadband networking         | 6.3 Use case #3: High quality low cost private line for small and medium enterprises<br>(6.8 Use case #8: Multiple Access Aggregation over PON)<br>(6.9 Use case #9: Extend PON to legacy Ethernet Uplink)<br>(6.10 Use case #10: Scenario based broadband)<br>7.11 Use case #25: Enhanced optical transport network for Data Centre Interconnections<br>(7.6 Use case #20: Media Transport)<br>7.9 Use case #23: Cloudification of Medical Imaging<br>7.12 Use case #26: Enhanced Point to Point optical access<br>7.16 Use case #30: Bandwidth on Demand<br>(7.13 Use case #27: Rural Scenarios)<br>7.14 Use case #28: High-speed Passive P2MP Network Traffic Aggregation |
| Customer premises networking | 6.4 Use case #4: Fibre on-premises networking: Fibre-to-The-Room (FTTR)<br>(6.5 Use case #5: Passive optical LAN)<br>(7.9 Use case #23: Cloudification of Medical Imaging)<br>7.3 Use case #17: Premium home broadband connectivity to multiple Clouds   |
| Physical networking          | 6.14 Use case #14: Digitalized ODN/FTTX<br>(7.12 Use case #26: Enhanced Point to Point optical access)<br>7.13 Use case #27: Rural Scenarios<br>7.17 Use case #31: Intelligent Optical Cable Management<br>(7.18 Use case #32: AI-based PON optical path diagnosis)  |
| Immersive experiences        | 6.1 Use case #1: Cloud Virtual Reality<br>7.1 Use case #15: XR-based Virtual Presence<br>7.4 Use case #18: Virtual Music   |
| Time-sensitive applications  | 6.12 Use case #12: On Demand High Quality Transport for Real time applications<br>(7.9 Use case #23: Cloudification of Medical Imaging)  |
| Reliable communications      | 6.2 Use case #2: High Quality Private Line<br>6.13 Use case #13: Remote Attestation for Secured Network Elements<br>7.6 Use case #20: Media Transport<br>7.2 Use case #16: Enterprise private line connectivity to multiple Clouds   |
| High-density endpoints       | (6.4 Use case #4: Fibre on-premises networking: Fibre-to-The-Room (FTTR))<br>(6.5 Use case #5: Passive optical LAN)<br>6.7 Use case #7: Using PON for City Public Service<br>(6.8 Use case #8: Multiple Access Aggregation over PON)<br>(6.9 Use case #9: Extend PON to legacy Ethernet Uplink)  |
| Industrial ecosystems        | 6.6 Use case #6: PON for Industrial Manufacturing<br>7.7 Use case #21: Edge/Cloud-based visual inspection for automatic quality assessment in production<br>7.8 Use case #22: Edge/Cloud-based control of automated guided vehicles (AGV)<br>7.10 Use case #24: F5G for Intelligent Mine<br>7.5 Use case #19: Next Generation Digital Twins  |
| Autonomous networks          | (6.10 Use case #10: Scenario based broadband)<br>6.11 Use case #11: Enhanced traffic monitoring and network control in Intelligent Access Network<br>7.15 Use case #29: Orchestration of B2B services in xPON networks<br>(7.17 Use case #31: Intelligent Optical Cable Management)<br>(7.18 Use case #32: AI-based PON optical path diagnosis)  |

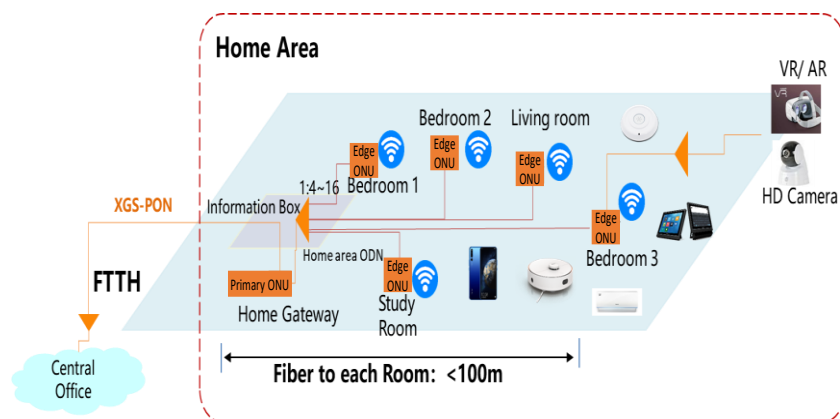


Note: the UC mapping into more than one application field are written in brackets

# Close-up on the most relevant UC for FTTR



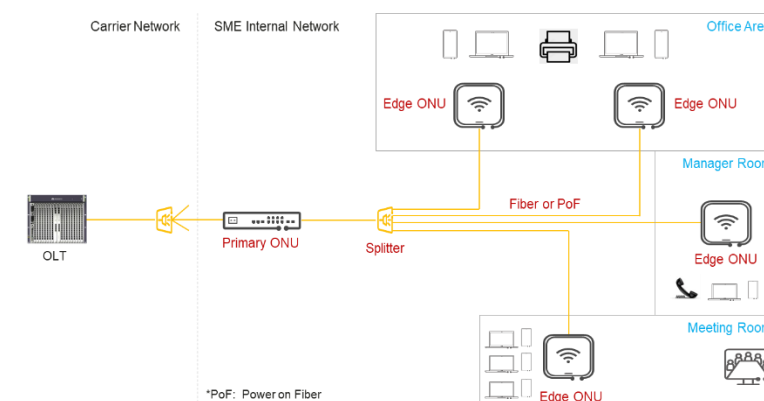
# F5G UC #4: FTTR



**FTTR for home area networks**



**FTTR for apartment buildings**



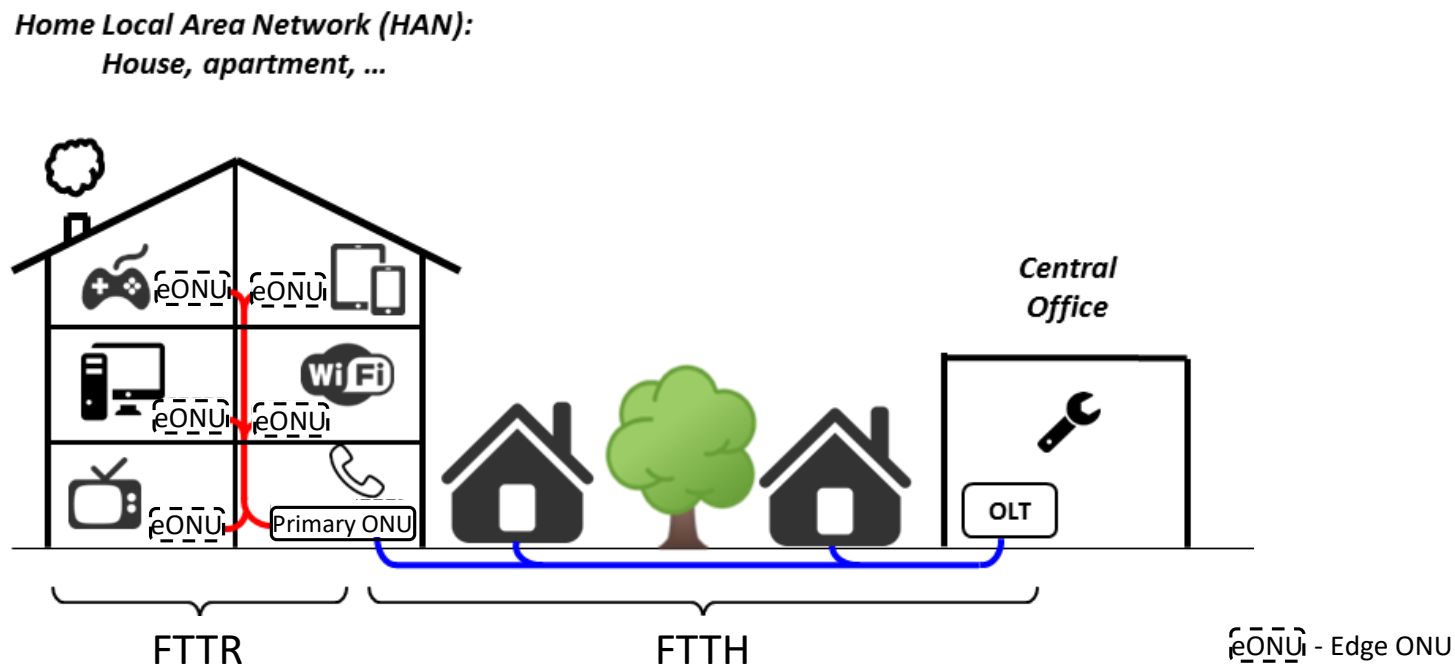
**FTTR for SME work space**

## ● Motivation for on-premises fibre extension

1. The bandwidth can be sensibly upgraded, making this deployment future proof
2. Since the insertion loss of fibre is quite low ( $< 0,3$  dB/km), low power consumption in the transmission link is possible
3. Wavelength multiplexing in one fibre could provide divided transmission channels for different services
4. The optical signal in the fibre is immune to electro-magnetic interference (EMI)
5. The fibre is lightweight and small in size, allowing an easy deployment
6. The lifetime of fibre can be as long as 30 years even in an extreme environment

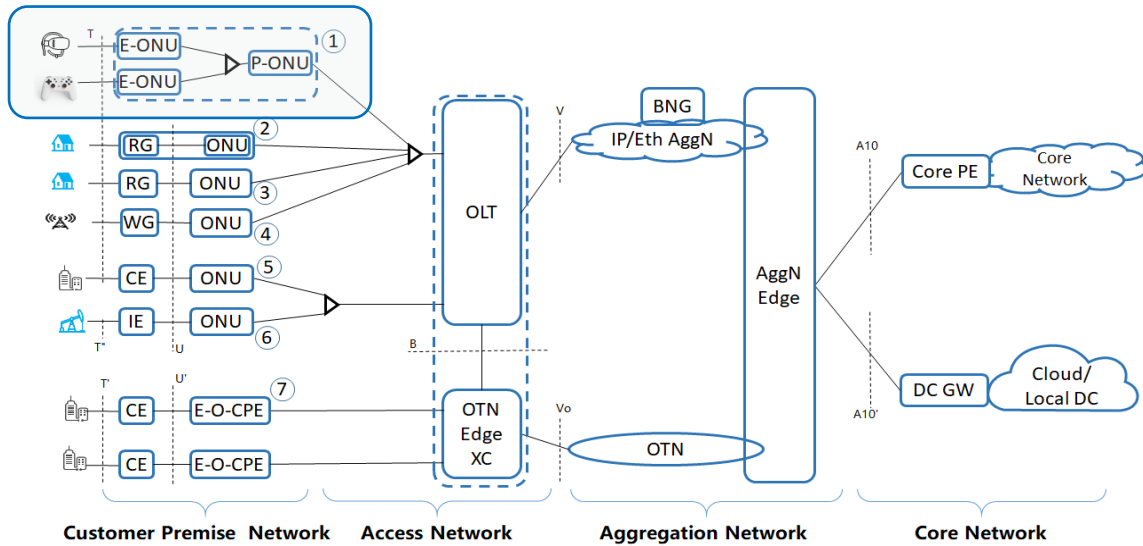


# Inside the home: from a general view...

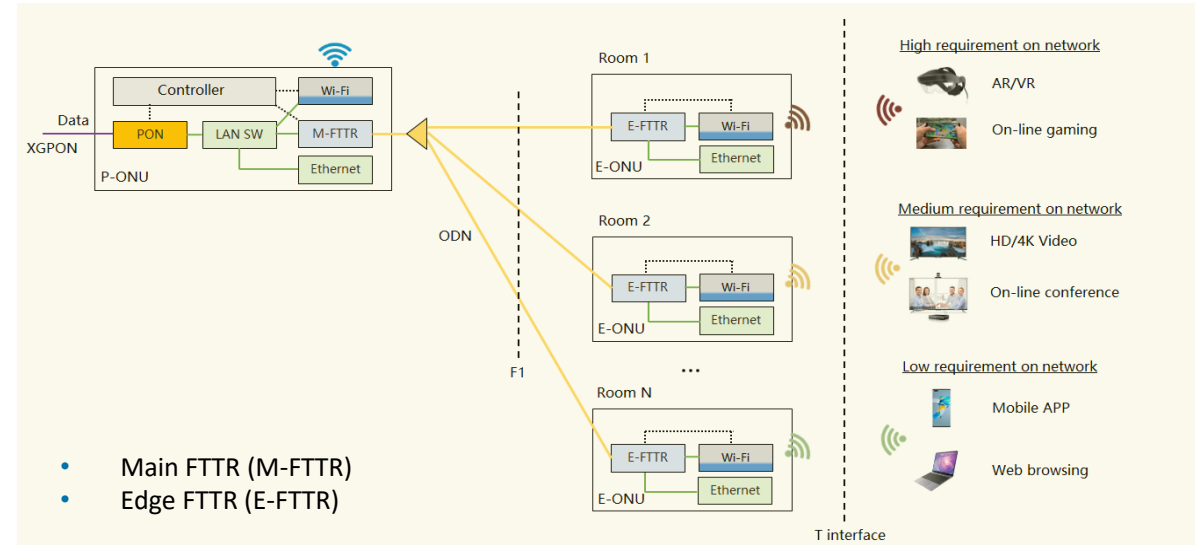


New interfaces are needed on the gateway to enable FTTR, changing the requirements for the ONU

# ... to FTTR details: centralized fibre-wireless co-ordination for better QoE (work in progress)



F5G E2E network topology



Centralized control framework for FTTR

FTTR is based on a CPN Agent labelled P-ONU and customer edge devices labelled E-ONU. The link between P-ONU and E-ONU is through P2MP passive optical network

- **Controller:** collects the Wi-Fi status from the Wi-Fi module on one hand and send the coordination strategy to the Wi-Fi module directly on the other hand.
- **F1 interface:** between the main FTTR (M-FTTR in the P-ONU ) entity and the edge FTTR (E-FTTR in the E-ONU), enabling message transmission for data and control message transmission for coordination.

**Thank you !**  
**Any further questions?**

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