

# ETSI GS F5G 023 V1.1.1 (2024-09)



## **Fifth Generation Fixed Network (F5G); F5G Advanced Technology Requirements and Gap Analyses; Release 3** (<https://standards.iteh.ai>) Document Preview

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**Reference**

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**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
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# Contents

Intellectual Property Rights .....	7
Foreword.....	7
Modal verbs terminology.....	7
1 Scope .....	8
2 References .....	8
2.1 Normative references .....	8
2.2 Informative references.....	10
3 Definition of terms, symbols and abbreviations.....	11
3.1 Terms.....	11
3.2 Symbols.....	12
3.3 Abbreviations .....	12
4 Technology requirements and landscape.....	14
4.1 Overview .....	14
4.1.1 Introduction.....	14
4.1.2 Document structure overview .....	15
4.2 Premium private line service automation .....	15
4.2.1 Use Case Briefing .....	15
4.2.2 Technology Requirements and Gap Analyses .....	16
4.2.2.1 General.....	16
4.2.2.2 Automatic evaluation of private line SLA before provisioning .....	16
4.2.2.3 Agile service provisioning .....	16
4.2.2.4 CPE plug-and-play .....	16
4.2.2.5 Bandwidth on Demand.....	17
4.2.2.6 Real-time visualization of private line SLAs .....	17
4.2.3 Current related standard specifications .....	17
4.2.3.1 ITU-T .....	17
4.2.3.2 IETF .....	18
4.3 Stable & reliable Wi-Fi® connection over on-premises networking .....	18
4.3.1 Use Case Briefing .....	18
4.3.2 Technology Requirements and Gap Analyses .....	19
4.3.2.1 General.....	19
4.3.2.2 Service type identification and adaptation .....	19
4.3.2.3 Wi-Fi® interference recognition and avoidance .....	19
4.3.2.4 Provide latency sensitive transmission mechanism.....	20
4.3.2.5 Enable seamless connection switching.....	20
4.3.3 Current related standard specifications .....	21
4.3.3.1 ITU-T .....	21
4.3.3.2 IEEE.....	22
4.4 Computing collaboration in PON network.....	22
4.4.1 Use Case Briefing .....	22
4.4.2 Technology Requirements and Gap Analyses .....	23
4.4.2.1 General.....	23
4.4.2.2 Heterogeneous computing capability .....	23
4.4.2.3 Identification of service flow & corresponding demand.....	23
4.4.2.4 Dynamic collaboration between the PON network elements and the computing elements .....	23
4.4.3 Current related standard specifications .....	24
4.4.3.1 ITU-T .....	24
4.4.3.2 BBF.....	25
4.5 Intelligent power grid .....	25
4.5.1 Use Case Briefing .....	25
4.5.2 Technology Requirements and Gap Analyses .....	25
4.5.2.1 General.....	25
4.5.2.2 High capacity optical transport network .....	26
4.5.2.3 Fine grain optical transport network .....	26

4.5.2.4	End-to-end high quality connection .....	27
4.5.3	Current related standard specifications .....	28
4.5.3.1	ITU-T .....	28
4.5.3.2	IEEE .....	30
4.6	Railway perimeter inspection .....	30
4.6.1	Use Case Briefing .....	30
4.6.2	Technology Requirements and Gap Analyses .....	30
4.6.2.1	General .....	30
4.6.2.2	Fibre sensing performance .....	30
4.6.3	Current related standard specifications .....	31
4.6.3.1	ITU-T .....	31
4.7	Naked-eye 3D display .....	31
4.7.1	Use Case Briefing .....	31
4.7.2	Technology Requirements and Gap Analyses .....	31
4.7.2.1	General .....	31
4.7.2.2	Extremely high throughput .....	32
4.7.2.3	Latency restricted transmission .....	32
4.8	Unified access and on-premises network .....	32
4.8.1	Use Case Briefing .....	32
4.8.2	Technology Requirements and Gap Analyses .....	33
4.8.2.1	General .....	33
4.8.2.2	Provide unified control of data transmission .....	33
4.8.2.3	Provide unified management of the whole system .....	33
4.8.3	Current related standard specifications .....	34
4.8.3.1	ITU-T SG15 .....	34
4.8.3.2	ETSI ISG F5G .....	34
4.9	OTN intelligent fault management .....	35
4.9.1	Use Case Briefing .....	35
4.9.2	Technology Requirements and Gap Analyses .....	35
4.9.2.1	General .....	35
4.9.2.2	OTN alarm aggregation .....	35
4.9.2.3	Troubleshooting .....	36
4.9.2.4	Fault impact analysis .....	36
4.9.2.5	Report of incident information .....	36
4.9.3	Current related standard specifications .....	37
4.9.3.1	ITU .....	37
4.9.3.2	IETF .....	37
4.10	Evaluation and assurance of user service experience .....	37
4.10.1	Use Case Briefing .....	37
4.10.2	Technology Requirements and Gap Analyses .....	37
4.10.2.1	General .....	37
4.10.2.2	Evaluation of user's service experience .....	38
4.10.2.3	User experience demarcation and root cause analysis .....	38
4.10.2.4	User experience rectification and audit .....	39
4.10.3	Current related standard specifications .....	40
4.10.3.1	BBF .....	40
4.10.3.2	ETSI .....	40
4.11	Cloud Desktop .....	40
4.11.1	Use Case Briefing .....	40
4.11.2	Technology Requirements and Gap Analyses .....	40
4.11.2.1	General .....	40
4.11.2.2	Edge cloud infrastructure .....	40
4.11.2.3	Enable intelligence in the network .....	41
4.11.2.4	Shallow compression techniques .....	41
4.12	Dynamically digitalized ODN .....	42
4.12.1	Use Case Briefing .....	42
4.12.2	Technology Requirements and Gap Analyses .....	42
4.12.2.1	General .....	42
4.12.2.2	Dynamically visualization of ODN .....	42
4.12.2.3	Proactively diagnostic and remote fault location .....	43
4.12.2.4	ODN resource management .....	43
4.12.3	Current related standard specifications .....	43

4.12.3.1	Current ODN related standards .....	43
4.13	On-premises Millimetre-Wave (mmWave) WLAN .....	43
4.13.1	Use Case Briefing .....	43
4.13.2	Technology Requirements and Gap Analyses .....	44
4.13.2.1	General .....	44
4.13.2.2	Provide necessary throughput to support F5G-A applications .....	44
4.13.2.3	Well controlled Wi-Fi® signals to support interference free connection .....	44
4.13.2.4	Coordination with sub-6 G Wi-Fi® .....	45
4.13.3	Current related standard specifications .....	45
4.13.3.1	ITU-T SG15 .....	45
4.13.3.2	IEEE 802.11 .....	46
4.14	Wavelength-shared WDM Aggregation Network (AGGN) .....	46
4.14.1	Use Case Briefing .....	46
4.14.2	Technology Requirements and Gap Analyses .....	46
4.14.2.1	Network bandwidth .....	46
4.14.2.2	Multiple-ring network and long-haul transmission distance .....	47
4.14.2.3	Flexible grooming capability .....	47
4.14.2.4	Automatic network O&M .....	48
4.14.3	Current related standard specifications .....	49
4.14.3.1	ITU-T .....	49
4.14.3.2	ETSI .....	49
4.14.3.3	IEEE .....	49
4.14.3.4	OIF .....	49
4.15	Robotics as a Service .....	49
4.15.1	Use Case Briefing .....	49
4.15.2	Technology Requirements and Gap Analyses .....	49
4.15.2.1	General .....	49
4.15.2.2	Latency .....	49
4.15.2.3	Cable Requirements .....	50
4.15.2.4	Ease of Installation .....	51
4.15.2.5	Integration of F5G-A networks with ROS and DDS .....	51
4.15.3	Current related standard specifications .....	51
4.15.3.1	Cable Specifications .....	51
4.15.3.2	Data Distribution Service (DDS) .....	51
4.16	All-optical base for urban rail transit communication network .....	52
4.16.1	Use Case Briefing .....	52
4.16.2	Technology Requirements and Gap Analyses .....	53
4.16.2.1	General .....	53
4.16.2.2	All-optical network base communication network for urban rail transit network .....	54
4.16.3	Current related standard specifications .....	55
4.16.3.1	ITU-T .....	55
4.16.3.2	IEEE .....	55
4.17	Optical Fibre sensing for telecom operators .....	56
4.17.1	Use Case Briefing .....	56
4.17.2	Technology Requirements and Gap Analyses .....	56
4.17.2.1	General .....	56
4.17.3	Current related standard specifications .....	57
4.17.3.1	ITU-T .....	57
4.18	QoD App-Flow service provisioning .....	58
4.18.1	Use Case Briefing .....	58
4.18.2	Technology Requirements and Gap Analyses .....	58
4.18.2.1	General .....	58
4.18.3	Current related standard specifications .....	60
4.18.3.1	CAMARA .....	60
4.18.3.2	ITU-T QoS in PON and G.fin .....	60
4.18.3.3	F5G Telemetry .....	60
5	Technology Landscape Summary .....	60
	History .....	70

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## Table of Figures

Figure 1: Centralized fibre and wireless coordination architecture (Source: Recommendation ITU-T G.9940 [7]) .....	21
Figure 2: Protocol stack of G.fin DLL (Source: Recommendation ITU-T G.9942 [9]).....	22
Figure 3: An example of management scheme of FTTR (Source: Recommendation ITU-T G.9940 [7]).....	25
Figure 4: Overview of the OTN structure .....	28
Figure 5: Overview of the fgOTN layer network inside OTN .....	29
Figure 6: The information structure of the fgOTN layer network.....	29
Figure 7: Incident-based fault management (Source: ETSI GR F5G 020 [i.1]).....	35
Figure 8: Overview of the F5G-A Residential broadband QoE evaluation and assurance (Source: ETSI GR F5G 020 [i.1]).....	38
Figure 9: An example of mmWave WLAN network .....	44
Figure 10: Wavelength-shared AGGN configuration.....	47
Figure 11: Overview of urban rail transit communication system (Source: ETSI GR F5G 020 [i.1]).....	53
Figure 12: ITU-T G.dfos scope .....	57

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## Table of Tables

Table 1: Summary of Requirements and Gaps.....	60
Table 2: Suggested actions for identified gaps.....	66

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# Foreword

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# 1 Scope

The present document specifies the technology requirements for F5G-A use cases release 3 and explores existing technologies from related SDOs. The present document performs gap analyses between the technologies required by the use cases and those that are available. The identification of the relevant SDOs is based on their existing projects.

## 2 References

### 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

- [1] [Recommendation ITU-T G.709/Y.1331](#): "Interfaces for the optical transport network".
- [2] [Recommendation ITU-T G.709.20](#): "Overview of fine grain OTN".
- [3] [ETSI GS F5G 014](#): "Fifth Generation Fixed Network (F5G); F5G Network Architecture Release 2".
- [4] [IEEE 802.11k™](#): "IEEE Standard for Information technology -- Local and metropolitan area networks-- Specific requirements-- Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 1: Radio Resource Measurement of Wireless LANs".
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## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

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- [i.33] Object Management Group (OMG): "[Data Distribution Service \(DDS\) Version 1.4](#)", April 2014.
- [i.34] The Linux® Foundation Projects [CAMARA website](#).
- NOTE: Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.
- [i.35] ETSI GS F5G 011 (V1.1.1): "Fifth Generation Fixed Network (F5G); Telemetry Framework and Requirements for Access Networks".
- [i.36] Recommendation ITU-T G.808.4: "Linear protection for fine grain Metro Transport Network (fgMTN) and fine grain Optical Transport Network (fgOTN)".
- [i.37] ITU-T Recommendation G.798 Amendment 1: "Characteristics of optical transport network hierarchy equipment functional blocks".
- [i.38] ITU-T Recommendation G.8251 Amendment 1: "The control of jitter and wander within the optical transport network (OTN)".

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## 3 Definition of terms, symbols and abbreviations

### 3.1 Terms

Void.

## 3.2 Symbols

Void.

## 3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACTN	Abstraction and Control of Traffic Engineering Networks
AFC	Automatic Fare Collection
AGGN	Aggregation Network
AI	Artificial Intelligence
AP	Access Point
API	Application Programming Interface
BBF	BroadBand Forum
BE	Best Effort
BK	Background
BSS	Basic Service Set
BSSID	Basic Service Set ID
CBR	Constant Bit Rate
CCSA	China Communications Standards Association
CPE	Customer Premise Equipment
CPN	Customer Premise Network
CPU	Central Processing Unit
DBA	Dynamic Bandwidth Allocation
DC	Data Centre
DCI	Data Centre Interconnect
DCPS	Data-Centric Publish-Subscribe
DDS	Data Distribution Service
DFOS	Distributed Fibre Optic Sensing
DL	Data Link
DLL	Data Link Layer
DR	Disaster Recovery
DWDM	Dense Wavelength Division Multiplexing
E2E	End To End
EMF	Equipment Management Function
EML	Element Management Layer
E-ONU	Edge ONU
FCAPS	Fault, Configuration, Accounting, Performance and Security
fgODU	fine grain Optical Data Unit
fgOTN	fine grain Optical Transport Network
FMCi	Fibre Management & Control Interface
FOADM	Fixed Optical Add/Drop Multiplexer
FTTR	Fibre to the Room
FTTx	Fibre To The (x = Room, Home, Machine, Office)
GE	Gigabit Ethernet
GIS	Geographic Information System
GMP	Generic Mapping Procedure
GMPLS	Generalized Multi-Protocol Label Switching
GPON	Gigabit Passive Optical Network
GPU	Graphics Processing Unit
HDMI	High-Definition Multimedia Interface
ID	Identification
IMMW	Integrate mmWave
IMP	Idle Mapping Procedure
IoT	Internet of Things
IP	Internet Protocol
IPTV	Internet Protocol Television
KQI	Key Quality Indicators
L2	Layer 2
LAN	Local Area Network

LR/ZR	Long Range / Data Rate optic series
M&C	Management and Control
MAC	Medium Access Control
MD-ROADM	Multi-Dimensional Reconfigurable Optical Add/Drop Multiplexer
ME	Management Entities
M-FTR	G. fin transceiver in the Main Fibre Unit
MFU	Main FTTR Unit
MGWS	Multiple Gigabit Wireless System
MIMO	Multiple Input Multiple Output
MMW	mmWave
MOS	Mean Opinion Score
MPEG	Moving Pictures Experts Group
MSOTN	Multi-Service OTN
MSTP	Multi-Service Transport Platform
NaaS	Network as a Service
NAS	Network Attached Storage
NE	Network Element
NPU	Network Processing Unit
NTP	Network Time Protocol
O&M	Operation and Maintenance
OADM	Optical Add/Drop Multiplexer
OAM	Operation Administration and Maintenance
ODN	Optical Distribution Network
ODUk	Optical Data Unit k =0, 1, 2, 3, 4, flex
OFDM	Orthogonal Frequency Division Multiplexing
OIF	Optical Internetworking Forum
OLT	Optical Line Termination
OMCI	Optical Management and Control Interface
ONU	Optical Network Unit
ONU/AP	Optical Network Unit / Access Point
OPEX	Operational expense
OPGW	Optical Ground Wire
OS	Operating System
OSNR	Optical Signal to Noise Ratio
OSPF	Open Short Path First
OSU	Optical Service Unit
OSUFlex	Flexible Optical Service Unit
OTN	Optical Transport Network
OXC	Optical Cross Connect
P2MP	Point to MultiPoint
P2P	Peer-to-Peer
PCM	Pulse Code Modulation
PCS	Physical Coding Sublayer
PDH	Plesiochronous Digital Hierarchy
PHY	PHYsical (as in physical layer of a protocol)
PIS	Passenger Information System
PKT	Packet
PLOAM	Physical Layer Operation Administration and Maintenance
PMA	Physical Medium Attachment sublayer
PMD	Physical Medium Dependent sublayer
PON	Passive Optical Network
P-ONU	Primary ONU
QAM	Quadrature Amplitude Modulation
QoD	Quality on Demand
QoE	Quality of Experience
QoS	Quality of Service
RaaS	Robotics as a Service
RF	Radio Frequency
ROADM	Reconfigurable Optical Add/Drop Multiplexer
ROS	Robotics Operating System
RTT	Round Trip Time
RUC	Requirement Use csae

SA	Standards Association
SDH	Synchronous Digital Hierarchy
SDN	Software Defined Networking
SDO	Standards Development Organisation
S-FTR	G.fin transceiver in an Sub Fibre Unit
SFU	Sub FTTR Unit
SG	Study Group
SINR	Signal to Interference and Noise Ratio
SLA	Service Level Agreement
SME	Small Medium Enterprise
SNR	Signal to Noise Ratio
SOP	State Of Polarization
SR/DR	Short Range / Data Rate optic series
STA	Station
STM	Synchronous Transport Module
SU	Single User
TDM	Tine Division Multiplexing
TE	Traffic Engineering
TV	TeleVision
UC	Use Case
UHD	Ultra-High Definition
UHV	Ultra-High Voltage
VBR	Variable Bit Rate
VC	Virtual Container
VI	Video
VO	Voice
VoIP	Voice over Internet Protocol
VR	Virtual Reality
WDM	Wavelength Division Multiplexing
WFA	Wi-Fi® Alliance
WLAN	Wireless Local Area Network
WMCI	WLAN Management & Control Interface
WP3	Working party 3 (ITU-T - Study Group 15)
WT	Working Text
XGS	10 G Symmetric
XGSPON	10 Gigabit Symmetric Passive Optical Network
YANG	Yet Another Next Generation data modelling language

## 4 Technology requirements and landscape

### 4.1 Overview

#### 4.1.1 Introduction

This clause is reliant on the use cases as defined in ETSI GR F5G 020 [i.1] and specifies per use case the technology requirements, describes the gaps in technology to implement those use cases and the current available related standards.

**NOTE:** Some clauses define requirements, standards, and gaps for several similar use cases together.

The following use cases are included in the present document, refer to ETSI GR F5G 020 [i.1] for a detailed description of the use cases. In the following, only use case titles are given for reference:

- UC#1: Premium private line service automation: clause 4.2.
- UC#2: Stable & reliable Wi-Fi® connection over on-premises networking: clause 4.3.
- UC#3: Computing collaboration in PON network: clause 4.4.
- UC#4: Intelligent power grid: clause 4.5.