

To: ETSI MEMBERS AND COUNSELLORS

Subject: Participating to ISGs without having to sign an ISG Member Agreement

Dear Madam,
Dear Sir,

Further to the decision taken during the Specially Convened Meeting (SCM) of the ETSI General Assembly (GA#80 / 29-30 Nov. 2022), to allow any ETSI Full or Associate member to participate in the activities of an ETSI Industry Specification Group (ISG) without having to sign an ISG Member Agreement, I am very pleased to invite you to go through the following interim process should your organization or your Corporate Group wishes to immediately join an ISGⁱ:

The Official Contact of the ETSI member organization or Corporate Group wishing to join one or several ISGs, shall send an email to isg_agreements@etsi.org with

- i. **First name, last name of the Official Contact** as recorded in the ETSI database;
- ii. **Acronym of the ISG** of interest,
- iii. **Legal name(s) of the organization(s)** to be added as member(s) of the ISG of interest.

Note: In case of interest for several ISGs, please repeat steps ii. and iii. in the same email.

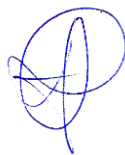
Upon reception of the request, the ETSI Secretariat will add the listed organization(s) to the relevant ISG membership and will notify both the Official Contact and the Technical Officer supporting the relevant ISG(s).

Once the above steps have been completed, any delegate of the said organization(s), already owning a personal EOL account, will be immediately entitled to subscribe to the relevant ISG email exploder list and/or to register to any upcoming meeting of the ISG.

Those delegates who do not own a personal EOL account yet, will be immediately entitled to request one via the [SIGN UP](#) feature available from the [ETSI Portal](#).

NOTE: the above interim process, which currently aims at immediately replacing the administrative burden of signing a Member Agreement to join an ISG, will disappear as soon as the ETSI Portal and the related applications will be adapted by the ETSI IT Department to make the participation of ETSI Full and Associate members to ISGs as transparent and easy as for Technical Bodies.

Yours faithfully,



Luis Jorge Romero Saro
ETSI Director-General

ⁱ No need to go through steps i to iii for the ISG(s) you are already member of.

ETSI Industry Specification Group relating to “5th Generation Fixed network” (ISG F5G)

between

The European Telecommunications Standards Institute (hereinafter referred to as “ETSI”), a French non-profit making association organized under the law of July 1, 1901, located at 650 Route des Lucioles, 06560 Valbonne Sophia Antipolis, France, represented by its Director-General, (hereinafter referred to as the “Director-General”)

and

The ISG Member specifically identified in **Annex 1** hereof (hereinafter referred to as the “Signatory”).

Whereas:

- A. ETSI is a standard-setting organization in the field of telecommunications, officially recognized by the European Union as a European Standards Organisation;
- B. The Signatory is, either i) an ETSI Full or Associate member wishing to participate in the work of the ISG identified in Annex 2 hereof (hereinafter, the “ISG”), or ii) has applied for ETSI Full or Associate membership and has been authorized by the Director-General to participate in the work of the ISG;
- C. The Director-General has approved the creation of the ISG and its Terms of Reference as attached in **Annex 4** hereafter;
- D. The Signatory wishes to participate in the work of the ISG as an ISG Member (as this term is defined in **1.2(e)** below) in accordance with Clause 3.4 of the ETSI Technical Working Procedures and has agreed to enter into and be bound by the terms of the present Agreement.

It is agreed as follows:

1. Incorporation by reference and definitions

1.1. Incorporation by reference

Subject to Discretionary Decisions, the decision-making processes set forth in **Article 8** of the present Agreement and any authorized deviations from the ETSI Technical Working Procedures provided under **Annex 3** of the present Agreement, the parties hereby agree to be bound by and comply with the terms and rules relating to the creation, organization, operation and termination applicable to Industry Specification Groups set forth in the [ETSI Directives](#), including the ETSI Guidelines for Antitrust Compliance which shall be incorporated by reference and form an integral part hereof.

1.2. Definitions

In the present Agreement, all capitalized terms and expressions not otherwise defined herein shall have the meaning ascribed to them in the [ETSI Directives](#), and, unless otherwise required by the context:

- (a) “Discretionary Decisions” shall have the meaning ascribed to it in Article 8.1 of the present Agreement;
- (b) “ETSI Directives” shall mean the set of documents ruling ETSI available at <http://portal.etsi.org/directives/home.asp> and applicable on the date set forth in **Annex 2** hereof as well as their subsequent versions and evolutions adopted during the lifetime of the ISG;
- (c) “ETSI IPR Policy” shall have the meaning ascribed to it in **Article 2** of the present Agreement;
- (d) “ETSI Technical Working Procedures” shall mean the document in the [ETSI Directives](#) which apply to the present Agreement;
- (e) “ISG Member” shall mean, when used in relation to the ISG, either an ETSI Full or Associate member or an applicant to ETSI Full or Associate membership which has been authorized by the Director-General to participate in the work of the ISG and which has signed the ISG Member Agreement;
- (f) “ISG Participant” shall mean, when in relation to the ISG, either an ETSI Observer or a legal entity which, even though it is not an ETSI Full or Associate member or an applicant to ETSI Full or Associate membership, has been authorized by the Director-General to participate in the work of the ISG and which has signed the ISG Participant Agreement;
- (g) “Terms of Reference” shall mean those Terms of Reference approved by the Director-General on the date set forth in Annex 2 hereof as well as their subsequent versions and evolutions adopted during the lifetime of the ISG, setting out, inter alia, the scope of the ISG, the planned deliverables and delivery dates, and the planned collaboration with other bodies;
- (h) “Attendee” shall mean any individual

- participating face-to-face or remotely in an ISG meeting; or
 - participating in an online ISG meeting; or
 - participating in the work of the ISG by using (non-real-time) electronic working methods;
- (i) "Counsellor" shall mean the representatives of the European Commission (EC) as well as representatives of the Secretariat of the European Free Trade Association (EFTA). ETSI Counsellors may attend ISG meetings without signing any ISG Agreements or paying any participation fees;
- (j) "Observer" shall mean a legal person fulfilling the conditions for ETSI Full member or Associate member status but choosing not to have the right to participate fully in the proceedings of the Institute;
- (k) "Group Specification" (GS) shall mean an ETSI deliverable, containing normative provisions, approved for publication by an ISG;
- (l) "Group Report" (GR) shall mean an ETSI deliverable, containing only informative elements, approved for publication by an ISG;
- (m) "Business Day" shall be considered as every French official working day of the week.

2. Intellectual Property

The Signatory agrees to the terms of, and shall abide by, the ETSI IPR Policy set forth in Annex 6 of the [ETSI Rules of Procedure](#) and their subsequent versions and evolutions (hereinafter, the "ETSI IPR Policy").

3. ISG membership: duties and rights

The ISG membership comprises ISG Members and ISG Participants.

ISG Members and ISG Participants have the duty to constructively cooperate in compliance with all applicable competition law rules on the development of ISG Group Reports and/or ISG Group Specifications within the scope of the ISG as described in its Terms of Reference.

The ISG Chair is responsible for both external communication and internal reporting obligations to ETSI.

Any communication outside the ISG itself by the ISG Chair and/or by the ISG Members and ISG Participants shall be made in coordination with the Director-General.

It is accepted that an ISG can have its own valuable opinion which can differ from ETSI's opinion. Therefore in case of external communication, the ISG Chair shall ensure that such communication is clearly made by the ISG and marked as such for avoiding any confusion of representation with ETSI. In the case of a public consultation, the ISG Chair shall beforehand coordinate with the Director-General.

When a response to such public consultation is envisaged, if the response is addressing technical matters the ISG Chair shall ensure that such response is clearly specified as coming from the ISG and differentiated from ETSI's answer.

If the response is addressing non-technical matters, such response shall be reviewed by the Director-General.

ISG Members have the right to cast their vote on the approval of an ISG Group Report or Group Specification when necessary, and in other instances when decisions by the ISG Members are required.

ISG Members have the right to appeal directly to the Director-General to challenge an ISG Chair's decision and shall inform the ISG Chair beforehand.

4. ISG participation fee

ISG Members are not required to pay an individual participation fee for attending ISG meetings.

For information of the ISG Members, ISG Participants are required to pay an individual participation fee for attending ISG face-to-face meetings as described in **Annex 5** of the ISG Participant Agreement.

This individual participation fee may be modified by a decision of the Director-General. Such a

decision shall be notified by the Director-General to the ISG Chair and becomes effective as from the date of the notification by the ISG Chair to the ISG.

5. ETSI Secretariat resources

Basic administrative support will be provided by the ETSI Secretariat at no additional cost to the ISG Members and ISG Participants e.g.:

- info/meeting/document handling area on the ETSI Portal;
- document storage area on the ETSI Docbox server;
- e-mail lists provision;
- entry of the Work Items into the ETSI Work Program Management (WPM) database;
- processing/publication of ISG Group Reports and/or Group Specifications, provided they have respected the ETSI Drafting Rules;
- a support officer will be allocated to provide guidance and assistance to the ISG;
- support for meetings will be provided when the meeting is held at the ETSI Headquarters, e.g.
 - meeting rooms in ETSI premises;
 - meeting support for invitations, badges, etc in ETSI premises;
 - refreshments in ETSI premises.

ISG meetings held outside of the ETSI Headquarters shall be supported by the hosting organization.

In addition, the ETSI Secretariat may support the ISG in organizing workshops and possible interoperability events.

5.1. Additional administrative support

The ISG Chair may request that the ISG receive additional administrative support from the ETSI Secretariat, provided that the Director-General agrees and

- either the ISG Members and ISG Participants agree to provide voluntary contributions to cover the costs of such additional support and the ETSI Secretariat shall only provide the requested additional administrative support after receipt by ETSI of all payments corresponding to such contributions,
- or resources corresponding to such additional support are approved by the ETSI Board upon petition by the ISG Chair.

5.2. Resources requirements

No resource requirements, beyond the “Basic Administrative Support” provided by the ETSI Secretariat to ISGs have been identified.

6. Convening an ISG meeting

6.1. Invitation to an ISG meeting

The Director-General will announce the first face-to-face meeting (“Kick-off Meeting”) of the ISG in a Collective Letter to the ETSI members, providing at least thirty (30) days’ notice.

The invitation to an ISG face-to-face meeting and the necessary logistical information shall be disseminated by the hosting organization at least thirty (30) days before the meeting to all on the ISG membership list.

6.2. Agenda for an ISG meeting

The Director-General will announce the draft agenda for the Kick-off Meeting (KoM) of the ISG in a Collective Letter to the ETSI members, providing at least thirty (30) days’ notice.

The draft agenda for face-to-face meetings shall be disseminated by the ISG Chair to all on the ISG membership list at least thirty (30) days before a face-to-face meeting.

The draft agenda shall include details of draft ISG Group Reports and/or Group Specifications for approval and ISG Chair/Vice-Chairs and/or Working Group Chairs for appointment.

Any other subject matters where voting may be required shall also be included and indicated in the draft agenda.

ISG Group Reports and Group Specifications will only be approved within ISG face-to-face meetings, or over a period which may extend beyond the end of the ISG face-to-face meeting whereby the ISG Members use electronic voting.

6.3. Documentation for an ISG meeting

All contributions for an ISG meeting shall be uploaded on the ETSI Portal according to the minimum delay decided by the ISG Chair.

Late contributions shall be deferred to the next meeting unless there is a Consensus to make an exception.

Meeting documents shall follow a consistent numbering system as shown in the following example:

ISG(nn)x_filename

This numbering system has the following logical elements:

ISG: the name of the ISG or related Working Group;
(nn): to indicate the year, e.g. (18);
x: to indicate a unique n° of the document, appended with a revision n° if applicable;
filename: filename of the document.

6.4. Registration for an ISG meeting

Every Attendee shall register prior to a face-to-face or online ISG meeting using the Meeting Application on the ETSI Portal or on arrival at the meeting.

Where registration is made on arrival at the meeting each Attendee representing an ISG Member or an ISG Participant shall declare the precise name of that ISG Member or ISG Participant organization.

An Attendee may only represent one (1) ISG Member or one (1) ISG Participant.

6.5. Maintaining an ISG membership list

The ISG shall maintain an ISG membership list within an email exploder list established specifically for that purpose.

Any individual may join this email exploder list if he/she is a representative of a legal entity that has signed the ISG Member Agreement or the ISG Participant Agreement and has an ETSI-On-Line (EOL) user account, and those who join this email exploder list will be considered as being on the ISG membership list.

Failure to reconfirm the intention to remain on the email exploder list at regular intervals (lists are normally reviewed every six (6) months) will result in removal from this email exploder list and thus from the ISG membership list.

The ISG membership list shall be used for the dissemination of information and for decision-making within the ISG.

7. Preparation of ISG Group Reports (GR) and Group Specifications (GS)

ISG Group Reports and Group Specifications are prepared within the ISG or within specific ISG Working Groups. The ISG Working Groups are chaired by ISG Working Group Chairs, who are appointed according to the rules of operation of the ISG.

All draft ISG Group Reports and ISG Group Specifications should be approved by the ISG Members and ISG Participants according to the ETSI Technical Working Procedures and deviations in **Annex 3** of the present document.

If an ISG Group Report or Group Specification is prepared in an ISG Working Group and fails to be approved by the ISG Members and ISG Participants, it shall be referred back to the ISG Working Group.

8. Decision-making

The Signatory undertakes to comply with all applicable laws and regulations, including European and national competition laws and regulations, and to refrain from implementing any discriminatory decision-making process in the context of the ISG.

8.1. Discretionary Decisions

The ISG shall be operated pursuant to the rules set forth in the ETSI Technical Working Procedures, except any matter which is left at their discretion under the [ETSI Directives](#) (hereafter, the "Discretionary Decisions").

Such decisions will be binding upon the ISG Members and ISG Participants.

8.2. General decision-making process

In accordance with Clause 3.7 of the ETSI Technical Working Procedures, and subject to the provisions of **Article 1.1** of the present Agreement, the Signatory agrees that the Discretionary Decisions taken by the ISG Members and ISG Participants shall be binding upon the Signatory when taken according to the rules laid down in Clause 1.7 of the ETSI Technical Working Procedures, except for any variations provided for in **Annex 3** hereof.

9. Authorized deviations from the ETSI Technical Working Procedures

The ISG shall operate pursuant to the rules set forth in the ETSI Technical Working Procedures, with the exceptions provided in **Annex 3** hereof.

10. No assignment

Except by written Agreement by the Director-General, the rights and obligations of the Signatory under the present Agreement are personal to the Signatory and shall not be assigned (whether absolutely or by way of security and whether in whole or in part), sub-contracted, delegated, transferred, pledged, declared in trust for a third party, or otherwise disposed of in any manner whatsoever (each of the above an "assignment") and any such purported assignment in contravention of this Article shall be ineffective.

11. Limitation of liability

ETSI, its officers, employees and agents shall have no liability to the Signatory in respect of any actual or expected loss of profits, loss of revenue, loss of goodwill, loss of opportunity, loss of business, or increased costs or expenses.

The ISG Member shall have no liability to the other signatories in respect of an indirect loss of profits, loss of revenue, loss of goodwill, loss of opportunity, loss of business, or increased costs or expenses.

12. Term and termination

12.1. Date of termination

The present Agreement shall enter into force as from the date of its execution by the parties and shall remain effective until the earlier of

- (i) the date of termination of the ISG,
- (ii) the date of the Signatory's resignation from the ISG,
- (iii) the date of the Signatory's resignation or expulsion from ETSI,
- (iv) the date of the Signatory's revocation from the ISG if the Signatory commits a material breach of any of its obligations under the present Agreement (including the ETSI Directives incorporated by reference pursuant to Article 1.1 of the present Agreement and the ISG Terms of Reference) and fails to remedy the same within thirty (30) days after receiving notice to do so (hereinafter, the "date of termination").

For the purpose of determining the date of termination:

- (a) the date and conditions of termination of the ISG shall be decided by the Director-General pursuant to Article 8.3.9 of the [ETSI Rules of Procedure](#) and Clause 3.2 of the ETSI Technical Working Procedures;
- (b) the Signatory may resign as ISG Member at any time by sending a resignation notice to the Director-General, copy to the ISG Chair, and the date of the Signatory's resignation from the ISG shall be deemed to be the date of receipt of the resignation notice by the Director-General;
- (c) the date of the Signatory's resignation or expulsion from ETSI shall be determined pursuant to Article 1.4 of the [ETSI Rules of Procedure](#);
- (d) the Director-General may revoke at any time the invitation or authorization to attend meetings of the ISG in the event the Signatory commits a material breach of its obligations under the present Agreement by sending a revocation notice to the Signatory, copy to the ISG Chair, and the date of revocation of the Signatory from the ISG shall be deemed to be the date of receipt of the revocation notice by the Signatory.

12.2. Effect of termination

Upon occurrence of the date of termination, the present Agreement shall automatically terminate, and the Signatory shall cease to participate in the work of the ISG and shall no longer receive any benefit or information as an ISG Participant, it being provided however that termination of the present Agreement for any reason:

- (a) shall be without prejudice to any rights or obligations which shall have accrued or become due prior to the date of termination and the Signatory shall remain bound to duly perform and complete any and all obligations which shall have arisen out of or in connection with the present Agreement prior to the date of termination, including any transfer or license of intellectual property rights (or undertakings to transfer or license intellectual property rights) pursuant to the [ETSI IPR Policy](#) and **Article 2** of the present Agreement;
- (b) shall not affect any right or obligation of any party under the ETSI Directives, which shall continue into force after the termination of the present Agreement (except in the event of the Signatory's resignation or expulsion from ETSI, in which case the provisions of Article 1.4 of the ETSI Rules of Procedure shall apply); and
- (c) shall not prejudice the rights or remedies which any party may have in respect of any breach of the terms of the present Agreement prior to the date of termination.

12.3. Termination of the ISG

In the event of termination of the ISG, the parties agree that the ISG shall, prior to the date of termination of the ISG (as determined pursuant to **Article 12.1(a)** of the present Agreement), submit to the Director-General recommendations concerning the maintenance of Group Reports(s) and/or Group Specification(s) produced by the ISG.

13. Notice

Unless otherwise specified by the Director-General, a notice in connection with the present Agreement shall be in writing, in English, and sent by registered letter with return receipt requested to the address of the addressee, and marked for the attention of the person hereunder. For the avoidance of doubt, such notice shall not be sent by e-mail.

The relevant details of the Signatory are set forth in **Annex 1** hereof and the relevant details of ETSI are as follows:

Addressee: **ETSI, Director-General, 650 route des Lucioles
06921 Sophia Antipolis Cedex, France**

In the absence of evidence of earlier receipt, a notice shall take effect and be deemed received the seventh day after posting.

A notice received or deemed to be received on a day which is not a Business Day or after 5pm on any Business Day according to local time in the place of receipt, shall be deemed to be received on the next following Business Day.

14. Severance/unenforceable provisions

If any provision or part of the present Agreement is deemed void or unenforceable due to applicable law, it shall be deemed to be deleted and the remaining provisions of the present Agreement shall continue in full force and effect.

15. Variation and waiver

15.1. Variation

Subject to the [ETSI Directives](#) and the ISG Terms of Reference, this Agreement sets forth the entire agreement of the parties with respect to the subject matter hereof. No variation (including any supplement, deletion or replacement, however effected) of the present Agreement shall be effective unless it is in writing.

No sustainable opposition by any ISG Member or ISG Participant will be considered as agreed to said variations which will then be materialized in writing.

15.2. Waiver

The rights and remedies of the parties shall not be affected by any failure to exercise or delay in exercising any right or remedy or by the giving of any indulgence by any party or by anything whatsoever except a specific waiver or release in writing and any such waiver or release shall not prejudice or affect any other rights or remedies of the parties.

No single or partial exercise of any right or remedy prevents any further or other exercise thereof or the exercise of any other right or remedy.

16. Third party beneficiary (“stipulation pour autrui”)

The Signatory shall have sight of and shall accept the terms and conditions provided for the benefit of the ISG Members in any ISG Participant Agreement entered into between ETSI and an ISG Participant. As a result of such acceptance, all provisions of such an ISG Participant Agreement provided for the benefit of the ISG Members, acting individually or collectively, shall be binding upon the ISG Members and may be enforced by the Signatory pursuant to Article 1205 of the French Civil Code.

17. Governing law, jurisdiction and service of process

17.1. Governing law

This Agreement shall be governed by and interpreted in accordance with French law.

17.2. Jurisdiction

Each party irrevocably agrees for the benefit of ETSI that any claim, dispute or difference concerning the present Agreement and any matter arising therefrom shall be handled exclusively under the competent Tribunal in the jurisdiction of ETSI's registered head of office in Grasse (France).

The submission to this specific jurisdiction shall not (and shall not be construed so as to) limit the right of ETSI to bring legal proceedings in any other court of competent jurisdiction including without limitation the courts having jurisdiction by reason of the Signatory's domicile.

Legal proceedings by ETSI in any one or more jurisdictions shall not preclude legal proceedings by it in any other jurisdiction, whether by way of substantive action on the merits, emergency or provisional relief, injunction, enforcement or otherwise.

17.3. Service of process

Each party agrees that without preventing any other mode of service, any document in an action (including, but not limited to, a claim form or any other document to be served pursuant to the provisions of the French Code of Civil Procedure) may be served on any party at its address for service of notices under the present Agreement and each party undertakes to notify the other party in advance of any change from time to time of the details of such address in accordance with the manner prescribed for service of notices in the present Agreement.

ISG RULES FOR INFORMATION

ANNEX 2**Identification of the ISG****ETSI ISG “5th Generation Fixed network” (ISG F5G)**

Names of the ISG Founding Members:

- CAICT (China Academy of Information and Communications Technology)
- CATT (China Academy of Telecommunications Technology)
- China Telecommunications
- Association eG4U
- Fraunhofer HHI
- Huawei Tech. (UK) Co., Ltd
- Post Luxembourg
- Telecom Italia S.p.A
- Turk Telecom
- PT Portugal SGPS SA

Date of approval of the creation of the ISG by the Director-General: **10 December 2019**

Date of approval of the extension of the ISG by the Director-General: **3 Decembre 2021**

ISG RULES FOR INFORMATION

ANNEX 3**Authorized deviations from the ETSI Technical Working Procedures**

The ISG Founding Members agreed on the following deviations from the applicable ETSI Technical Working Procedures (TWP). The present deviations are based on version 40 (April 2019) of the ETSI Directives.

Deviation #1: Chair/Vice-Chairs and /or WG Chair mandate duration

Source ref: TWP Clauses 3.3.1 and 3.3.2

The ISG Chair, Vice-Chairs and Working Group Chairs shall be appointed by ISG Members for a period of two (2) years.

Deviation #2: Kick-off-Period

Source ref: TWP Clauses 3.7 and 1.7

The Kick-off Period (KoP) shall start at the Kick-off Meeting (KoM) and shall finish after two (2) face-to-face plenary meetings following the KoM.

Deviation #3: Voting weight

Source ref: TWP Clauses 3.7 and 1.7.1

Where voting is used, vote results shall be evaluated by the ISG Chair on the basis of one (1) vote per ISG Member, with a voting weight of one (1).

Deviation #4: Voting during an ISG meeting

Source ref: TWP Clause 3.7 and 1.7.1.1

- ISG Members are eligible for voting (voting Members) if they have physically attended at least two (2) of the previous three (3) face-to-face plenary meetings (KoM is included in plenary count).
- ISG Founding Members as identified in the present Agreement are eligible for voting during and up to the end of the KoP. Thereafter they are subject to the same participation requirements as all other ISG Members.
- To cast their vote, voting Members shall be physically present at the meeting.

Deviation #5: Voting by correspondence

Source ref: TWP Clauses 3.7 and 1.7.1.2

- Electronic voting only shall be used for voting by correspondence (e.g. ETSI tool <https://portal.etsi.org/webapp/tbdecision3/Help/voting.asp>).
- The vote shall be announced to everybody on the ISG membership list at least thirty (30) days before the vote.
- ISG Members are eligible for voting (voting Members) if they have physically attended at least two (2) of the previous three (3) plenary meetings.
- ISG Founding Members as identified in the present Agreement are eligible for voting during and up to the end of the KoP. Thereafter they are subject to the same participation requirements as all other ISG Members.

Deviation #6 "Appealing against an ISG Chair's decision"

Source ref: TWP Clauses 3.7 and 1.7.2

Any ISG Member or ISG Participant who is against an ISG Chair's decision may submit its case to the Director-General for arbitration. In such cases the ISG Member or ISG Participant shall also inform the ISG Chair. When the ISG Chair has made a ruling, his decision shall be taken as the basis for future operations, unless overturned by the Director-General.

ANNEX 4**Terms of Reference (ToR) for
ETSI ISG “5th Generation Fixed network” (ISG F5G)**

Approved by the Director-General on **3 December 2021**, following ETSI Board consultation

Scope

ISG F5G studies and develops the 5th generation fixed network fostering the evolution to a “fibre to everywhere” ecosystem that enables new and enhanced services leveraging, in a framework of growing network capabilities, better performance, intelligent E2E management, network security and enhanced energy efficiency.

F5G aims to work as a hub for the development of fibre based networks standardization in an E2E perspective, identifying major use cases and requirements and interacting with all relevant SDOs and industry stakeholders to produce new standards, where required, or enhancements to existing standards that may be needed to fulfil the identified use cases.

The work to be performed includes:

- identifying and developing the overall characteristics of the 5th generation fixed network,
- exploring all relevant F5G scenarios and related use cases and services including (*but not limited to*) home, business, multiple vertical industries and mobile/ wireless x-haul,
- performing a gap analysis to identify the necessity for both enhancements to existing technology specifications and/or developments of new technology specifications where required to fulfil the identified use cases,
- studying the overall framework, outlining the complete F5G technology landscape,
- developing an E2E reference architecture for F5G networks,
- specifying flexible and agile E2E management, enhancing QoE and QoS,
- establishing a Proof-of-Concept framework, defining a set of rules and procedures for PoC activities that validate F5G specifications, services or architecture options developed throughout the work on F5G,
- evaluating security threats and vulnerabilities and classifying the risk they present, then identifying requirements for mitigating countermeasures in order to manage the risk,
- leveraging the synergies between fixed networks (Transport, Aggregation, Access) and wireless communications to foster convergence in residential, enterprise and vertical services,
- studying migration path scenarios to reach the fifth-Generation Fixed network and evaluating possible evolution to future generations.

Evolution of Fixed Networks

The further evolution of the fixed network creates a new era of opportunities by extending fibre to the home to fibre to other scenarios, such as to new services for business, vertical industries and extended support to wireless networks.

- Home scenarios where emerging cloud-oriented services such as Cloud VR (virtual reality) and AR (augmented reality) video streaming, online gaming, etc., introduce the necessity for ultra-broadband, extremely low latency and zero packet loss.
- Business scenarios such as enterprise Cloudification, leased line services, Passive Optical LAN (POL), etc., requiring enhanced network capabilities, high reliability and high security.
- Vertical industry scenarios with demanding requirements for the deployment of fibre infrastructures in hard environmental conditions (e.g. humidity, temperature, electromagnetic), interoperable with industry specific protocols and enabled for edge computing scenarios.
- The massive deployment of wireless networks, primarily in 5G, bringing growing needs for an efficient optical infrastructure that can deliver the bandwidth, latency and dense distribution required to support those networks.

Various use cases of these different scenarios are investigated by F5G, and the relevant requirements clearly documented.

In order to fulfil the business requirements for 5th generation of fixed network, ISG F5G will define the corresponding framework that includes F5G network capabilities, performance indices and the corresponding technology landscape F5G targets a full fibre network to maximize the value of utilizing common transport, access

and on-premises network technologies such as OTN, XG(S)-PON and supplementary technologies such as Ethernet and Wi-Fi 6.

Throughout the F5G work, new technologies or extensions to existing technologies for transport, aggregation, access and customer premises network will be identified through gap analysis, which may include new ODN technologies, XG(S) PON and Wi-Fi6 enhancements. Furthermore, several aspects will be developed in alignment with F5G E2E network architecture evolution, including (but not limited to) control plane and user plane separation, autonomous operation and management, end-to-end full stack slicing and security framework. Artificial Intelligence will be used to optimize network management and traffic steering as well as in support of consumer and industry services and applications. The synergies of Transport, Aggregation and Access Networks will be further explored as well as the convergence with 5G core network. Smart energy efficiency, telemetry, mobile network x-hauling are part of ISG F5G area of interest. F5G support of the specific requirements of industrial scenarios and applications is considered. Back-compatibility with legacy network and SDN-based network will be addressed.

ISG F5G also ensures a framework for PoC activities that enables to test and demonstrate F5G valuable features and use cases, gathering additional information on requirements and leveraging the creation of a F5G Open ecosystem

ISG F5G considers a wide range of technologies, and therefore seeks to actively cooperate, with the most efficient possible methods, with a number of relevant standardization groups, both inside and outside of ETSI, as well as vertical industrial organizations.

ISG F5G's work will be oriented towards the identification of technology and standards gaps. These gaps will be referenced to the appropriate standardization group/body (either inside or outside of ETSI) and may trigger enhancements to existing technology specifications or the developments of new technology specifications where required.

On top of these activities, F5G will also look to the future and will help to build an evolution path for the fixed network that can provide a solution for future needs and requirements.

Areas of activity

ISG F5G will focus on following activities:

- Revision/maintenance of already published GR and GS
- Definition of additional use cases and related gap analysis, with extended focus to verticals and optical transport, identifying enhancements/developments of existing/new specifications
- Architecture framework – to further develop the Architecture framework from F5G, namely:
 - Enhance the specifications on F5G slicing, to support differentiated and guaranteed SLA
 - Work on Application Aware Traffic Steering based on AI functionalities embedded in the Management and Control layer
 - Refine and expand the details of the service plane, namely on the signalling/routing network protocol and data plane technologies
 - Add the security related features identified in the security framework study
 - Include the mobile mid-haul and mobile front-haul specifications, complementing the mobile backhaul defined in previous releases
 - Study convergence of access and transport/aggregation for a simpler and lower latency/jitter network
 - Expand the fixed-mobile convergence requirements in the defined architecture
 - Study enhancements and synergies with CPN (Customer Premise Networks)
- Security framework
 - Revise and enhance the threat vulnerability risk analysis and make recommendations for the definition of countermeasures
 - Define a security model and security architecture for management of risk in F5G, in close cooperation with TC CYBER, to be included in F5G Architecture
- QoE
 - Identify the major factors impacting the QoE of the various services delivered by F5G and study appropriate mechanisms for improving end-to-end QoE
- Management and control layer
 - Further develop the End-to-End management specifications to ensure flexible and agile management, meeting the end-to-end QoE and the QoS requirements for services and applications in the network

- Embed Autonomous network features in close alignment with the work developed in ISG ENI and ISG ZSM
- Develop the telemetry specifications required to leverage management efficiency and enable QoE and QoS enhancements in F5G networks
- Industrial scenarios
 - Development of an optical ecosystem for the very demanding requirements of industrial environments with respect to quality, reliability, robustness, bandwidth and latency
 - Evaluate the interaction with industry protocols, interfaces and management requirements as well as interaction with edge computing scenarios
 - Develop specifications for optical networking in Industrial environments
- PoC framework
 - Manage the PoC framework and supervise the application of rules and procedures defined by ISG F5G for PoC
 - Evaluate the feedback from PoCs executed to drive the improvement of F5G specifications
- Migration path to F5G
 - Establish a Global Fibre Development Index specification that can guide in the evaluation of the level of development of fibre services for geographical areas, countries or players in the market
 - Define clusters of entities sharing a similar level of fibre development, evaluate requirements for efficient migration paths to F5G and identify possible gaps in standardization
- Next fixed network generation
 - Contribute to build the vision for next fixed network generation and evaluate possible evolution paths from F5G

Annex (informative): collaboration with other bodies

ISG F5G will seek to actively coordinate and cooperate with the following groups both inside and outside of ETSI:

ETSI Groups

- ETSI PP 3GPP
- ETSI TC ATTM
- ETSI TC BRAN
- ETSI TC CABLE
- ETSI TC CYBER
- ETSI TC EE
- ETSI ISG ENI
- ETSI ISG MEC
- ETSI ISG NFV
- ETSI TC STQ
- ETSI ISG ZSM

and others as identified during the progression of the work.

External groups

- ITU-T ITU Telecommunication Standardization Sector
- BBF The Broadband Forum
- IEEE Institute of Electrical and Electronics Engineers
- IETF Internet Engineering Task Force
- WFA Wi-Fi Alliance
- TM Forum
- CCSA China Communications Standards Association
- IEC International Electrotechnical Commission

and others as identified during the progression of the work.