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| A black and white logo  Description automatically generated with low confidence | الاتحـــاد  الدولـــي  للاتصـــالات | | | **TSAG‑TD409‑A** |
| **قطــاع تقييـس الاتصــالات**  فترة الدراسة 2024-2022 | | | **TSAG** |
| **الأصل: بالإنكليزية** |
| **المسألة (المسائل):** | لا توجد | جنيف، 26-22 يناير 2024 | | |
| **وثيقة مؤقتة** | | | | |
| **المصدر:** | مدير مكتب تقييس الاتصالات | | | |
| **العنوان:** | تقرير عن أنشطة قطاع تقييس الاتصالات (من مايو إلى ديسمبر 2023) | | | |
|  |  | |  | |
| **للاتصال:** | ماثيو داليه مكتب تقييس الاتصالات (TSB)؛ مسؤول اتصال | | البريد الإلكتروني: [matthew.dalais@itu.int](mailto:Matthew.Dalais@itu.int) | |

|  |  |
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| **ملخص:** | يلخص هذا التقرير تيسير مكتب تقييس الاتصالات لأنشطة قطاع تقييس الاتصالات في الفترة من مايو إلى ديسمبر 2023. |

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# ملخص تنفيذي

وافق الاتحاد على 200 توصية جديدة ومراجَعة لقطاع تقييس الاتصالات وعلى نصوص ذات صلة بها في الفترة من مايو إلى 18 ديسمبر 2023. ويتضمن تذييل هذا التقرير قائمة بهذه النصوص وكذلك النصوص قيد عملية الموافقة وملخصات محتوياتها. ويمكن الاطلاع على الملخصات التنفيذية لاجتماعات لجان دراسات قطاع تقييس الاتصالات في [الصفحات الرئيسية](https://www.itu.int/en/ITU-T/studygroups/Pages/default.aspx) لكل منها. انظر [القسم 1](#_1_Achievements_in).

وتنشط ستة أفرقة متخصصة تابعة لقطاع تقييس الاتصالات. ويمكن الاطلاع على معلومات عن أنشطة ونواتج الأفرقة المتخصصة التابعة لقطاع تقييس الاتصالات في [الصفحات الرئيسية](https://www.itu.int/en/ITU-T/focusgroups/Pages/default.aspx) لكل منها، ويرد في [القسم 2](#_2_ITU-T_Focus) فهرس لهذه الأفرقة ولجداولها الزمنية.

وتم تنظيم 73 [ورشة عمل وندوة](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/Pages/default.aspx) لقطاع تقييس الاتصالات في الفترة المشمولة بالتقرير، إضافةً إلى البرامج شبه اليومية للمنصة الرقمية بشأن [الذكاء الاصطناعي من أجل الصالح العالم](https://aiforgood.itu.int/) المتاحة على مدار السنة. انظر [القسم 3](#_2.8_IPTV_and). ويسّر مكتب تقييس الاتصالات 4 143 اجتماعاً إلكترونياً في عام 2023، تضمنت 68 734 توصيلة. انظر [القسم 4](#_4_Virtual_meetings).

ويضم قطاع تقييس الاتصالات 272 عضواً من أعضاء القطاع و227 منتسباً إلى القطاع. ويبلغ عدد الأعضاء من الهيئات الأكاديمية المنضمة إلى الاتحاد الآن 169 عضواً. ويشارك حالياً 66 منتسباً إلى قطاع تقييس الاتصالات في إطار هيكل الرسوم المخفضة للشركات الصغيرة والمتوسطة الذي دخل حيز النفاذ في 31 يناير 2020. انظر [القسم 11](#_9_Membership).

وإلى جانب خدمات البنية التحتية للاتحاد، يقوم مكتب تقييس الاتصالات باستمرار بتحسين التطبيقات القائمة مع تطوير تطبيقات جديدة باستخدامه، حيثما أمكن ذلك عملياً، حلول المصدر المفتوح وتعلم الآلة، لزيادة توسيع نطاق التحول الرقمي المستمر. انظر [القسم 15](#_12.2_Official_languages).

وشهدت [القمة العالمية للذكاء الاصطناعي من أجل الصالح العام](https://aiforgood.itu.int/)، التي عُقدت في جنيف يومَي 6 و7 يوليو 2023، مشاركة خبراء مشهورين عالمياً في مجال الذكاء الاصطناعي والعمل الإنساني وأكبر تجمع عالمي للروبوتات الشبيهة بالبشر والمتخصصة. وقد عُقد قبلها، يومَي 4 و5 يوليو، ورش عمل بشأن تعلم الآلة، بحيث يستفاد من الخبرة المكتسبة من برنامج اكتشاف الذكاء الاصطناعي من أجل الصالح العام. وستُعقد [القمة العالمية القادمة للذكاء الاصطناعي من أجل الصالح العام](https://aiforgood.itu.int/summit24/) في جنيف في الفترة يومَي 30 و31 مايو 2024، وتسبقها مناقشات بشأن الإدارة العالمية للذكاء الاصطناعي في 29 مايو. وتأتي قمة 2024 بالتزامن مع اجتماع [القمة العالمية لمجتمع المعلومات (WSIS +20)](https://www.itu.int/en/itu-wsis/Pages/default.aspx) في جنيف، في الفترة من 27 إلى 31 مايو، مما يضمن وجود وجهات نظر تكميلية بشأن التنمية الرقمية. وأنشأ أكثر من 25 000 شخص ملفات شخصية على [الشبكة العصبية للذكاء الاصطناعي من أجل الصالح العام](https://aiforgood.itu.int/neural-network/) منذ إطلاقها في فبراير 2022. انظر [القسم 1.5](#_5.1_Artificial_intelligence).

وكانت [النسخة الرابعة من مسابقة الاتحاد بشأن الذكاء الاصطناعي/تعلم الآلة في مجال تكنولوجيا الجيل الخامس](https://aiforgood.itu.int/about-ai-for-good/aiml-in-5g-challenge/) موضع التركيز طوال عام 2023 (بما في ذلك الفعاليات التي جرت كجزء من [سلسلة الحلقات الدراسة الإلكترونية حول الذكاء الاصطناعي من أجل الصالح العام](https://aiforgood.itu.int/eventcat/ai-ml-in-5g/)) - وبلغت ذروتها بنهائيات المسابقة في أكتوبر وديسمبر 2023. وفي نسخة 2023 من مسابقة الاتحاد بشأن الذكاء الاصطناعي/تعلم الآلة في مجال تكنولوجيا الجيل الخامس، قدم المشاركون في عام 2022 ما مجموعة أكثر من 21 000 مشاركة. وكان أكثر من 70 بالمئة من المشاركين في 2023 من الطلبة، وكانت الغالبية العظمى منهم من إفريقيا. انظر [القسم 1.5](#_5.1_Artificial_intelligence).

وتهدف [المبادرة العالمية الجديدة بشأن الذكاء الاصطناعي من أجل الصحة](https://www.itu.int/hub/2023/07/new-un-initiative-aims-to-step-up-ais-contribution-to-health/)، التي يقودها الاتحاد الدولي للاتصالات ومنظمة الصحة العالمية والمنظمة العالمية للملكية الفكرية، إلى وضع معايير تقنية وتوجيهات سياساتية، وتسهيل تبادل المعارف والبيانات، ودعم القرارات القائمة على الأدلة بشأن إدخال حلول الذكاء الاصطناعي في مجال الصحة. وأُعلن عن إطلاق المبادرة في القمة العالمية للذكاء الاصطناعي من أجل الصالح العام لسنة 2023. وعُقد [اجتماعها الأول](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx) في الرياض، المملكة العربية السعودية، في الفترة من 30 أكتوبر إلى 2 نوفمبر 2023. وتعتمد المبادرة على الزخم الذي أحدثه [الفريق المتخصص المشترك بين الاتحاد الدولي للاتصالات ومنظمة الصحة العالمية المعني بالذكاء الاصطناعي من أجل الصحة](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx). انظر [القسم 5.2](#_5.2_Artificial_intelligence).

وتقدم [الدورات التدريبية الأمنية للاتحاد بشأن الخدمات المالية الرقمية (DFS)](https://figi.itu.int/itu-dfs-security-clinics/) إلى المنظمين وموردي الخدمات المالية الرقمية إرشادات بشأن تبني أفضل الممارسات الأمنية التي تم تطويرها في إطار [المبادرة العالمية للشمول الرقمي (FIGI)](https://figi.itu.int/). ويساعد [مختبر أمن الخدمات المالية الرقمية التابع للاتحاد](https://figi.itu.int/figi-resources/dfs-security-lab/) أصحاب المصلحة للتحقق من اتباع أفضل الممارسات هذه. ويعمل عدد متزايد من البلدان فضلاً عن منظمات إقليمية على تبني التوصيات المتعلقة بأمن الخدمات المالية الرقمية والتي تم إعدادها في إطار مبادرة FIGI، وإنشاء مختبرات لأمن الخدمات المالية الرقمية خاصة بها بدعم من أنشطة نقل المعارف للاتحاد. ونُشرت [مجموعة أدوات جديدة للاتحاد لتقييم مرونة الأمن السيبراني للبنية التحتية الحيوية للخدمات المالية الرقمية (DFS)](https://www.itu.int/en/ITU-T/dfs/Documents/ITU%20Cyber%20Security%20Resilience%20Assessment%20toolkit%20for%20DFS%20Critical%20Infrastructure.pdf) في أكتوبر 2023. انظر [القسم 3.5](#_5.2_Digital_financial).

وتحظى مبادرة [متحدون من أجل مدن ذكية مستدامة (U4SSC)](http://www.itu.int/en/ITU-T/ssc/united/Pages/default.aspx) بالدعم من 19 كياناً من كيانات الأمم المتحدة من أجل تحقيق الهدف 11 من أهداف التنمية المستدامة ("جعل المدن والمستوطنات البشرية شاملة وآمنة ومرنة ومستدامة"). واعتمدت أكثر من 150 مدينة [مؤشرات الأداء الرئيسية لمبادرة U4SSC](https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx) استناداً إلى معايير الاتحاد. وتعرض [لقطات المدن وصحائف الوقائع وتقارير التحقق ودراسات الحالة](https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx) نتائج هذه التقييمات. وعُقد [اجتماع المبادرة U4SSC السابع](https://u4ssc.itu.int/latest-meetings/7th-meeting/) عبر الإنترنت في 20 يونيو 2023. وتضمنت أبرز أحداث الاجتماع تعيين [فريق إدارة جديد للمبادرة U4SSC](https://u4ssc.itu.int/u4ssc-management-team/) والإعلان عن مركز قطري جديد للمبادرة U4SSC في كيبي، غانا. ونُشرت ثلاثة [تقارير للمبادرة U4SSC](https://u4ssc.itu.int/publications/) وأربعة [تقارير للاتحاد الدولي للاتصالات](https://www.itu.int/cities/publications/) بشأن المدن الذكية في عام 2023. وتضمنت [سلسلة الحلقات الدراسية الإلكترونية للاتحاد بشأن التحول الرقمي](https://www.itu.int/cities/standards4dt/) 19 حلقة في عام 2023. انظر [القسم 5.4](#_5.3_Smart_cities).

وعُقدت [ندوة سيارة المستقبل الموصولة شبكياً المشتركة بين الاتحاد الدولي للاتصالات (ITU) ولجنة الأمم المتحدة الاقتصادية لأوروبا (UNECE)](https://fnc.itu.int/) الإقليمية الأولى يوم 6 أكتوبر 2023، في الدوحة، قطر، حيث انطلقت في الدوحة جنباً إلى جنب مع معرض جنيف الدولي للسيارات. وركزت المناقشات على الفرص والتحديات بالنسبة لبلدان مجلس التعاون الخليجي (GCC). وستُعقد النسخة الرئيسية السنوية للندوة عبر الإنترنت في الفترة من 11 إلى 14 مارس 2024. وأطلق [فريق التعاون الذي يقوده الاتحاد الدولي للاتصالات بشأن معايير الاتصالات في أنظمة النقل الذكية (CITS)](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx) [فريق خبراء جديداً معنياً بتكنولوجيا الاتصالات للقيادة الآلية](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/egcomad.aspx). انظر [القسم 5.5](#_3.4_Intelligent_transport).

وعُقدت [مائدة مستديرة لكبار المسؤولين التنفيذيين](https://www.itu.int/en/ITU-T/tsbdir/CxO/Pages/CxO-20221206.aspx) في 5 ديسمبر 2023 في قمة القادة التي نظمتها مجلة Telecom Review في دبي، الإمارات العربية المتحدة، مع مشاركة إضافية عبر الإنترنت. وناقش كبار المسؤولين التنفيذيين دعم الاتصالات المتنقلة الدولية-2030 (6G) المطلوبة من الشبكات البصرية والذكاء الاصطناعي والاتصالات الدلالية. كما تبادلوا وجهات نظرهم بشأن معالجة الفجوة الرقمية، والشبكات غير الأرضية، والتنقل الذكي، والاتصالات عبر خطوط الطاقة، والاستجابة للكوارث، وتكنولوجيا الرؤية الآلية، وسلسلة الكتل، والتخفيف من الاحتيال، وتكنولوجيا المعلومات الكمومية. انظر [البيان الصحفي](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/Communique_ITU_CxO_2023.pdf) للمائدة و[القسم 6.5](#_5.6_CTO_and).

عقد الاتحاد [مسار العمل الرقمي الأخضر في مؤتمر الأطراف الثامن والعشرين](https://www.itu.int/initiatives/green-digital-action-atcop28/about/outcomes/) مع شركاء من الحكومات والشركات والرابطات الصناعية والمجتمع المدني ووكالات الأمم المتحدة الزميلة. وقد تولى مكتب تقييس الاتصالات/قطاع تقييس الاتصالات دوراً قيادياً في تيسير أنشطة العمل الرقمي الأخضر التي تركز على التقييس. وتضمنت [النتائج](https://www.itu.int/initiatives/green-digital-action-atcop28/about/outcomes/) [بياناً مشتركاً](https://www.worldstandardscooperation.org/) صادراً عن الاتحاد والمنظمة الدولية للتوحيد القياسي واللجنة الكهرتقنية الدولية بشأن أهمية إدراج الاستدامة في عملية تطوير المعايير التقنية حسب التصميم و[خطة عمل](http://www.itu.int/initiatives/green-digital-action-atcop28/wp-content/uploads/sites/4/2023/12/Call-to-Action-Pillar4-Green-standards.pdf) تدعم تنفيذ معايير الاستدامة البيئية. كما بلغت مسابقة الاتحاد بشأن [الذكاء الاصطناعي/تعلم الآلة في مجال تغير المناخ](https://aiforgood.itu.int/about-ai-for-good/aiml-solutions-for-climate-change/) نهائياتها في مؤتمر الأطراف الثامن والعشرين. انظر [القسم 7.5](#_5.7_Green_Digital).

وتمثل [عضوية الهيئات الأكاديمية في الاتحاد](https://www.itu.int/hub/membership/)، و[جريدة الاتحاد بشأن التكنولوجيات المستقبلية والمتطورة](https://www.itu.int/en/journal/j-fet/Pages/default.aspx)، و[مؤتمرات كاليدوسكوب التي ينظمها الاتحاد](https://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx)، سبلاً رئيسية للهيئات الأكاديمية للمشاركة في أعمال الاتحاد. وتوفر مجلة الاتحاد - المجانية للقراء والمؤلفين على حد سواء - تغطية شاملة للاتصالات والربط الشبكي. ويتضمن المجلد 4 (2023) من مجلة الاتحاد أربعة أعداد. وتتضمن المجلة أيضاً مناقشات [لحلقات دراسية إلكترونية مسجلة](https://www.itu.int/en/journal/j-fet/webinars/Pages/default.aspx) مع الباحثين وقادة الصناعة، مع إطلاق سلسلة خاصة جديدة من الحلقات الدراسية الإلكترونية للمجلة مع كبار مسؤولي التكنولوجيا في عام 2023. وسيُعقد مؤتمر Kaleidscope لعام 2024 بالتزامن مع الجمعية العالمية لتقييس الاتصالات لعام 2024 في نيودلهي، الهند. انظر [القسم 6](#_4_Academia).

ويتضمن [برنامج سد الفجوة التقييسية (BSG)](https://www.itu.int/en/ITU-T/gap/Pages/default.aspx) للاتحاد المعاد تصوره ركيزتين استراتيجيتين رئيسيتين - *التطوير والتنفيذ* - بدعم من *الموارد والشراكات*. وقامت وزارة الشؤون الداخلية والاتصالات اليابانية بتمويل البرنامج BSG في عام 2023. وعُقدت خمس دورات تدريبية للبرنامج BSG خلال الفترة المشمولة بالتقرير. واجتمع الفريق الإقليمي لآسيا والمحيط الهادئ التابع للجنة الدراسات 20 لقطاع تقييس الاتصالات، وهو أحدث فريق إقليمي لقطاع تقييس الاتصالات، لأول مرة في يوليو 2023. وقُدمت طلبات للحصول على 422 منحة في عام 2023 وتمت الموافقة على 152 منها. انظر [القسم 12](#_10_Virtual_meetings).

ويظل مكتب تقييس الاتصالات ملتزماً بدمج منظور المساواة بين الجنسين في جميع أنشطته وبرامجه، مع الاستفادة من إطار فريق المهام المعني بالمساواة بين الجنسين التابع للاتحاد و[شبكة المرأة في قطاع تقييس الاتصالات (NoW in ITU-T)](https://www.itu.int/en/ITU-T/NoW/Pages/default.aspx). وستُعرض الاختصاصات التي تحدد مهمة الشبكة NoW ونطاقها وخطة عملها على هذا الاجتماع للفريق الاستشاري لتقييس الاتصالات لاستعراضها. وتشجع أهداف التكافؤ بين الجنسين للجمعية العالمية لتقييس الاتصالات لعام 2024، المدعومة بالحملة NOW4WTSA-24، الدول الأعضاء على التعهد بدعم زيادة عدد النساء في المناصب القيادية لقطاع تقييس الاتصالات وتحقيق هدف مشاركة الإناث بنسبة 35 في المائة في الجمعية العالمية لتقييس الاتصالات لعام 2024. انظر [القسم 13](#_12_Publications).

ويمكن الآن لمعامل الاختبار أن تحصل على اعتراف رسمي من الاتحاد بكفاءتها لاختبار مطابقة المنتجات مع توصيات قطاع تقييس الاتصالات. وقد أُدرجت معامل الاختبار الاثنا عشر في [قاعدة بيانات معامل الاختبار للاتحاد](https://itu.int/go/tldb) الخاصة بالمرافق التي يعترف بها الاتحاد. وبالنسبة للمشترين الذين يبحثون عن حلول قائمة على المعايير، فإن [قاعدة بيانات الاتحاد لمطابقة المنتجات](http://www.itu.int/net/itu-t/cdb/ConformityDB.aspx) التكميلية تتضمن قائمة بالمنتجات الممتثلة لتوصيات قطاع تقييس الاتصالات. ويُعتبر نظام الاعتراف بمعامل الاختبار، الذي تدعمه [لجنة التوجيه المعنية بتقييم المطابقة التابعة لقطاع تقييس الاتصالات](https://www.itu.int/en/ITU-T/studygroups/com11/casc/Pages/default.aspx) أحدث مبادرة أُطلقت في إطار [برنامج الاتحاد بشأن المطابقة وقابلية التشغيل البيني](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx). انظر [القسم 8](#_6_Conformity_and).

ونُشر في الفترة المشمولة بالتقرير أكثر من 300 من توصيات قطاع تقييس الاتصالات وإضافاتها. ويواصل مكتب تقييس الاتصالات جمع كل المصطلحات والتعاريف الجديدة التي تقترحها لجان دراسات قطاع تقييس الاتصالات، ويدرجها في [قاعدة بيانات الاتحاد الإلكترونية الخاصة بالمصطلحات والتعاريف](https://www.itu.int/br_tsb_terms/#/). ويواصل مكتب تقييس الاتصالات ترجمة جميع التوصيات الموافَق عليها في إطار عملية الموافقة التقليدية إلى جانب جميع تقارير الفريق الاستشاري لتقييس الاتصالات. وبناءً على الطلب، ترجم المكتب في الفترة المشمولة بالتقرير ست توصيات تمت الموافقة عليها في إطار عملية الموافقة البديلة. انظر [القسم 14](#_14_Publications).

# Annex – Full report of activities in ITU-T in the study period

# 1 ITU-T study groups

## 1.1 Standards approved and study group meetings

ITU approved 200 new and revised ITU-T Recommendations and related texts from to May to 18 December 2023. Annex 1 to this report lists these texts as well as texts undergoing approval and summarizes their contents, as of 18 December 2023. For all ITU-T Recommendations in force, see the [catalogue of ITU-T Recommendations](https://www.itu.int/en/ITU-T/publications/Pages/recs.aspx).

Executive summaries of ITU-T study group (SG) meetings can be found on their respective [homepages](https://www.itu.int/en/ITU-T/studygroups/Pages/default.aspx). ITU-T study group meetings held in the reporting period:

* [SG2](https://www.itu.int/en/ITU-T/studygroups/2022-2024/02/Pages/default.aspx): Geneva, 8-17 November 2023
* [SG3](https://www.itu.int/go/tsg3): Geneva, 10 November 2023
* [SG5](https://www.itu.int/go/tsg5): Geneva, 13-22 November 2023; Sophia Antipolis, France, 13-23 June 2023
* [SG9](https://www.itu.int/go/tsg9): Bogotá, Colombia, 14-23 November 2023; Bangalore, India, 9-18 May 2023
* [SG11](https://www.itu.int/go/tsg11): Geneva, 10-20 October 2023; Geneva, 10-19 May 2023
* [SG12](https://www.itu.int/go/tsg12): Mexico City, Mexico, 19-28 September 2023
* [SG13](https://www.itu.int/go/tsg13): Geneva, 23 October - 3 November 2023; Geneva, 26 July 2023
* [SG16](https://www.itu.int/en/ITU-T/studygroups/2022-2024/16/Pages/default.aspx): Geneva, 10-21 July 2023
* [SG15](https://www.itu.int/go/tsg15): Geneva, 20 November - 1 December 2023
* [SG17](https://www.itu.int/go/tsg17): Goyang, Korea (Rep. of), 29 August - 8 September 2023; online, 8 May 2023
* [SG20](https://www.itu.int/go/tsg20): Arusha, Tanzania, 13-22 September 2023

## 1.2 Non-attendance of chairmen and vice-chairmen

PP Resolution 208 (Rev. Bucharest, 2022) "Appointment and maximum term of office for chairmen and vice-chairmen of Sector advisory groups, study groups and other groups" resolves that a Sector advisory group, study group or other group shall be made aware of the non-attendance of Chairs and Vice-Chairs in their respective groups and raise the issue through the Director of the relevant Bureau with the members concerned in an attempt to encourage and facilitate participation in these roles.

The following table lists Vice-Chairs not in attendance at study group meetings held in the reporting period. No Chairs were absent from meetings in the reporting period. No Vice-Chairs were absent from meetings of SG2, SG15 and SG20 in the reporting period.

|  |  |  |
| --- | --- | --- |
| **Study Group** | **Meeting** | **Non-attendance of** |
| SG3 | Geneva, 10 November 2023 | Karima MAHMOUDI, Tunisia |
| Shailendra Kumar MISHRA, India |
| Marthe UWAMARIYA, Rwanda |
| SG5 | Sophia Antipolis, France, 13-23 June 2023 | Pedro BRISSON, Argentina |
| Vincent Urbain NAMRONA, Central African Rep. |
| Saidiahrol SAIDIAKBAROV, Republic of Uzbekistan |
| Geneva, 13-22 November 2023 | Vincent Urbain NAMRONA, Central African Rep. |
| Saidiahrol SAIDIAKBAROV, Republic of Uzbekistan |
| Kazuhiro TAKAYA, Japan |
| SG9 | Bogotá, Colombia, 14-23 November 2023 | Blaise MAMADOU, Central African Rep. |
| Zhifan SHENG, China |
| SG11 | Geneva, 10-20 October 2023 | Ibrahim Abdalah Mohamed BALA, Sudan |
| Juan Matias CATTANEO, Argentina |
| Arezu OROJLU, Iran |
| SG12 | Mexico City, Mexico, 19-28 September 2023 | Ammar ABDALLAH, Sudan |
| Collins MBULO, Zambia |
| SG13 | Geneva, 23 October – 3 November 2023 | Bülent ARSAL, Turkey |
| Anabel DEL CARMEN CISNEROS, Argentina |
| Yuan ZHANG, China |
| SG16 | Geneva, 10-21 July 2023 | Charles Zoé BANGA, Central African Rep. |
| Akmal SAVURBAEV, Uzbekistan |
| SG17 | Goyang, Korea (Rep. of), 29 August - 8 September 2023 | Laial ALMANSOURY, Kuwait |
| Francisco Javier DÍAZ, Argentina |
| Gökhan EVREN, Turkey |

# 2 ITU-T focus groups

Below lists the ITU-T focus groups (FGs) of the study period, with section 2.1 listing active groups and section 2.2 listing groups that completed activities. Information on the activities and deliverables of each group can be found on their respective homepages. See also the [ITU-T focus groups homepage](https://www.itu.int/en/ITU-T/focusgroups/Pages/default.aspx).

## 2.1 Active groups

| **ITU-T Focus Group** | **Start date** |
| --- | --- |
| [Cost models for affordable data services (FG-CD)](https://www.itu.int/en/ITU-T/focusgroups/cd/Pages/default.aspx) | 2023-03 |
| [Metaverse (FG-MV)](https://www.itu.int/en/ITU-T/focusgroups/mv/Pages/default.aspx) | 2022-12 |
| [Testbeds Federations for IMT-2020 and Beyond (FG-TBFxG)](https://www.itu.int/en/ITU-T/focusgroups/tbfxg/Pages/default.aspx) | 2021-12 |
| [AI and IoT for Digital Agriculture (FG-AI4A)](https://www.itu.int/en/ITU-T/focusgroups/ai4a/Pages/default.aspx) | 2021-10 |
| [AI for Natural Disaster Management (FG-AI4NDM)](https://www.itu.int/en/ITU-T/focusgroups/ai4ndm/Pages/default.aspx) | 2020-12 |
| [Autonomous Networks (FG-AN)](https://www.itu.int/en/ITU-T/focusgroups/an/Pages/default.aspx) | 2020-12 |

## 2.2 Concluded groups

|  |  |  |
| --- | --- | --- |
| **ITU-T Focus Group** | **Start date** | **End date** |
| [AI for Health (FG-AI4H)](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx) | 2018-07 | 2023-09 |
| [Environmental Efficiency for AI and other Emerging Technologies (FG-AI4EE)](https://www.itu.int/en/ITU-T/focusgroups/ai4ee/Pages/default.aspx) | 2019-05 | 2022-12 |
| [AI for Autonomous and Assisted Driving (FG-AI4AD)](https://www.itu.int/en/ITU-T/focusgroups/ai4ad/Pages/default.aspx) | 2019-10 | 2022-09 |
| [Vehicular Multimedia (FG-VM)](https://www.itu.int/en/ITU-T/focusgroups/vm/Pages/default.aspx) | 2018-07 | 2022-09 |

# 3 Workshops, symposia and webinars

73 ITU-T workshops, symposia and webinars were organized in the reporting period, in addition to the weekly programming of the year-round [AI for Good](https://aiforgood.itu.int/) digital platform. A listing of all past and planned events can be found on the [ITU-T events homepage](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/Pages/default.aspx).

ITU-T workshops, symposia and webinars discuss emerging trends in standardization, increase the visibility of ITU-T work, enhance ITU-T collaboration with other bodies, attract and recruit new ITU-T members, and encourage peer-learning relevant to the development and implementation of international standards.

# 4 Virtual meetings

MyMeetings is the main platform for ITU-T statutory meetings. This ITU-T open-source solution for electronic meetings wasa introduced by TSB in January 2019. MyMeetings is also used to host Rapporteur Group Meetings and non-statutory events, such as webinars. MyMeetings features important elements found in ITU-T physical meetings, including lists of participants and their affiliations, multilingual support, moderated floor requests and captioning. Several layers of access control ensure that only registered participants gain access to statutory meetings.

Other electronic meeting tools, such as Zoom, are also provided by TSB for hosting e-meetings and any on-demand ad-hoc meetings.

Statistics on e-meetings since 2018 are shown below.

* 2018: 1,558 e-meetings; 8,353 connections
* 2019: 2,110 e-meetings; 17,657 connections
* 2020: 4,220 e-meetings; 77,693 connections
* 2021: 4,671 e-meetings; 87,302 connections
* 2022: 5,430 e-meetings; 78,270 connections
* 2023: 4,143 e-meetings; 68,734 connections

Figure 1 – Remote participation and e-meetings

# 5 Collaboration initiatives

## 5.1 Artificial intelligence and machine learning

[AI for Good](https://aiforgood.itu.int/) is the United Nations' primary platform for artificial intelligence (AI). It is the world’s premier platform to advance AI’s contribution to sustainable development. AI for Good is supported by 40 UN partners and a range industry sponsors, and co-convened by the government of Switzerland.

**AI for Good Global Summit 2024:** AI innovators will reconnect with investors and humanitarians at the next [AI for Good Global Summit](https://aiforgood.itu.int/summit24/) in Geneva, 30-31 May 2024, preceded by discussions on global AI governance on 29 May. The 2024 edition comes in conjunction with the [World Summit on the Information Society (WSIS) +20 meeting](https://www.itu.int/en/itu-wsis/Pages/default.aspx) in Geneva, 27-31 May, ensuring complementary perspectives on digital development.

**AI for Good Global Summit 2023:** The [AI for Good Global Summit](https://aiforgood.itu.int/summit23/) in Geneva, 6-7 July 2023, welcomed over 2,500 participants in Geneva and over 10,000 online. It featured world-renowned experts in AI and humanitarian action and the world's largest-ever gathering of humanoid and specialized robots. This fourth summit followed summits held in Geneva in 2017, 2018 and 2019. The summit was preceded by expert-oriented ML workshops, 4-5 July, drawing on expertise from the AI for Good Discovery programme.

**All year, always online:** AI for Good is presented as a year-round digital platform where AI innovators and problem owners learn, build, and connect to help identify practical AI solutions to advance the UN Sustainable Development Goals (SDGs). The [AI for Good Neural Network](https://aiforgood.itu.int/neural-network/) features AI-enabled smart matching to help users build connections, link innovative ideas with social impact opportunities, and discuss AI applications for social good. Over 25,000 people have created profiles on the Neural Network since its launch in February 2022.

**Support to focus group activities:** The majority of the ITU-T focus groups addressing AI and machine learning (ML), as well as the Global Initiative on AI and Data Commons and the AI for Road Safety initiative, were first conceptualized during AI for Good activities and the AI for Good digital platform remains integral to the activities of such focus groups and initiatives.

**Programming streams:** AI for Good features near-daily [programming](https://aiforgood.itu.int/programme/) with the following programming streams.

Learn:

* AI for Good Keynotes
* AI for Good Webinars
* AI for Good Discovery
* AI for Good Perspectives
* AI for Good Blog

Build:

* AI for Good Machine Learning 5G Challenge
* AI for Good Innovation Factory
* AI for Good related (Pre-)Standardization Efforts & Initiatives  
  AI for Good Breakthroughs
* AI for Good Gateway

Connect:

* AI for Good Global Summit
* AI for Good Artistic Intelligence
* UN AI Actions
* AI for Good Brain Trust
* AI for Good Neural Network

**ITU AI/ML Challenges:** ITU's AI/ML Challenges are competitions where anyone can participate to solve problem statements related to communication networks or geospatial data analysis. The competitions enable participants to connect with new partners – and new tools and data resources ­– to achieve goals set out by problem statements contributed by industry and academia.

These competitions have welcomed over 7,500 participants since their launch in 2020.

The competitions are stimulating global access to AI/ML expertise and capabilities. The competitions empower participants to create, train, and deploy ML models by offering curated problem statements, data, technical webinars, mentoring, and hands-on training sessions. This enhances participants' skills and global recognition and also supports a more inclusive ITU standardization process by paving the way for participants to make valuable contributions to ITU's specifications.

[The fourth edition of the ITU AI/ML in 5G Challenge](https://aiforgood.itu.int/about-ai-for-good/aiml-in-5g-challenge/) – in focus throughout 2023 (including as part of a [series of AI for Good webinars](https://aiforgood.itu.int/eventcat/ai-ml-in-5g/)) – culminated with Challenge Finales in October and December 2023. In the 2023 edition of the ITU AI/ML in 5G Challenge, participants made a combined total of more than 21,000 submissions.

More than 70 per cent of the participants in 2023 were students, with a large majority from Africa.

To share the solutions with the larger community, solutions submitted are shared as open source in several repositories on the Challenge GitHub: <https://github.com/ITU-AI-ML-in-5G-Challenge>.

In addition, the [ITU Journal on Future and Evolving Technologies](https://www.itu.int/en/journal/j-fet/Pages/default.aspx) has published three special issues on "AI/ML solutions in 5G and future networks" sharing solutions and learnings from participants and Challenge hosts (the originators of the problem statements) in 2020, 2021 and 2022. A fourth special issue is currently accepting submissions ([Call for Papers](https://www.itu.int/en/journal/j-fet/2024/003/Pages/default.aspx)).

## 5.2 Artificial intelligence for health

The new [Global Initiative on AI for Health](https://www.itu.int/hub/2023/07/new-un-initiative-aims-to-step-up-ais-contribution-to-health/) driven by ITU, WHO and WIPO aims to ensure that AI fulfils its potential to support diagnosis and treatment, along with more efficient and inclusive healthcare services. The initiative's launch was announced at the AI for Good Global Summit 2023. Its [first meeting](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx) was held in Riyadh, Saudi Arabia, 30 October - 2 November 2023.

The global initiative aims to develop technical standards and policy guidance, facilitate knowledge and data sharing, and support evidence-based decisions on the introduction of AI solutions for health. It will also promote collaborative mechanisms for AI solutions to reach underserved communities, and its scaling programme will assist low- and middle-income countries in adopting AI solutions for health.

The initiative builds on the momentum of the [ITU-WHO Focus Group on AI for Health](https://www.itu.int/en/ITU-T/focusgroups/ai4h/Pages/default.aspx).

## 5.3 Digital financial inclusion and fintech

For an overview of all TSB/ITU-T activities on digital financial inclusion and fintech, see dedicated [web page](https://www.itu.int/en/ITU-T/dfs/Pages/default.aspx).

**Status of digital financial services (DFS) security recommendations' adoption:** Through the activities of the [ITU DFS Security Lab](https://figi.itu.int/figi-resources/dfs-security-lab/),TSB engages with telecom regulators of emerging economies and regional telecommunication regulatory to present the security recommendations for DFS developed under the [Financial Inclusion Global Initiative (FIGI)](https://figi.itu.int/), inviting them to adopt the recommendations.

To date, the countries in Africa that have implemented the recommended MoU between the telecom regulator and central bank for DFS security are Nigeria, Lesotho, Sierra Leone, Tanzania, Kenya and Zimbabwe.

The East African Communications Organisation (EACO) formally adopted the recommendations during its 25th Congress and 28th Annual Assemblies held in June 2023 in Bujumbura, Burundi.

The Communication Regulators Association of Southern Africa (CRASA) formally adopted the recommendations at its 12th Annual General Meeting (AGM) in March 2023 in Kinshasa, DRC.

Discussions are ongoing with the West Africa Telecommunications Regulators Assembly (WATRA) on its potential adoption of the security recommendations.

**DFS Security Lab:** The [ITU DFS Security Lab](https://figi.itu.int/figi-resources/dfs-security-lab/) set up as part of FIGI activities developed a methodology for conducting security tests for mobile payment apps based on USSD, STK, and Android.

The 2023 activities of the DFS security lab were supported by funding from Deutsche Gesellschaft für Internationale Zusammenarbei (GIZ) and the Republic of Korea's Ministry of Science and ICT.

As part of the activities of the ITU DFS Security Lab, [ITU DFS ​Security Clinics](https://figi.itu.int/itu-dfs-security-clinics/) offer guidance to regulators and DFS providers on adopting the security best practices developed under FIGI. The DFS Security Lab helps stakeholders to verify that these best practices are being followed.

Security clinics conducted by the DFS Security Lab in the reporting period are listed on this [web page](https://www.itu.int/en/ITU-T/webinars/dfs/sc/Pages/default.aspx).

**Knowledge transfer programme:** As part of the activities of the DFS Security Lab, ITU also conducts a knowledge transfer programme to support telecom regulators in emerging economies in establishing their own security labs and to implement the security methodology to conduct security audits of mobile payment applications based on USSD, iOS, and Android.

The programme has benefited Uganda Communications Commission (UCC), Tanzania Communication Regulatory Authority (TCRA) and SBS Peru (financial services regulator for Peru). ITU has also received requests from Rwanda, The Gambia and Zimbabwe to perform knowledge transfer sessions.

**Cybersecurity resilience assessment toolkit for DFS critical infrastructure:** ITU hired the services of Deloitte after a tender exercise to develop a [cybersecurity resilience assessment toolkit for DFS critical infrastructure](https://www.itu.int/en/ITU-T/dfs/Documents/ITU%20Cyber%20Security%20Resilience%20Assessment%20toolkit%20for%20DFS%20Critical%20Infrastructure.pdf). The toolkit was published in October 2023.

This comprehensive toolkit equips DFS regulators with the necessary guidance to evaluate cybersecurity vulnerabilities in digital finance infrastructure and conduct cyber preparedness assessments among stakeholders in the DFS ecosystem.

The toolkit was presented at the ITU Regional Development Forum in Bangkok in September 2023. SBS Peru and TCRA have both expressed interest in the toolkit.

**Knowledge sharing platform for DFS security:** A knowledge sharing platform for DFS security, launched in November 2023, supports collaboration among regulators and other DFS stakeholders, aiding them in the implementation of security guidelines and maintaining up-to-date best practices for DFS security. The platform's enables participants to:

* Collaborate with ITU to keep up to date the DFS security assurance framework security controls and DFS security recommendations.
* Share experiences, challenges, and lessons learned from the implementation of security measures across various jurisdictions.​
* Communicate directly with their peers on issues relating to security of digital financial services.

**Partnership with FNSV on blockchain secure authentication:** ITU entered a one-year collaboration partnership with FNSV Korea in August 2023 to promote passwordless technology in mobile payments using blockchain secure authentication for developing countries.

FNSV is currently participating in ITU-T SG17 with the aim of standardizing their solution on passwordless authentication using blockchain. Under the collaboration agreement with ITU, FNSV is working with the DFS Security Lab to:

* Develop a sandbox/testbed environment for testing passwordless authentication solutions based on blockchain for mobile payment applications.
* Provide technical guidelines/APIs for the deployment of solutions, supporting developers for the activities of the sandbox and the testing of authentication solutions.
* Organize and application challenges on strong authentication using the sandbox environment.
* Guide developing countries on how to implement blockchain passwordless authentication solutions and how regulators can assess the security of such solutions and verify their compliance with regulations in areas such as data protection and privacy.

**ITU-T SG17 work with DFS Security Lab reports:** ITU-T X.1150 " Security assurance framework for digital financial services" was determined in September 2023, developed by ITU-T SG17. A new standard, "Security guidelines for DFS applications based on USSD and STK", and a new supplement, "e-KYC use cases in digital financial services" are under development in ITU-T SG17. These three activities are based on outcomes of FIGI.

**Collaboration with UPU:** Under WTSA Resolution 11, a joint DFS working group between ITU and UPU secretariat meets quarterly to share information about events and activities being implemented by each organization related to DFS and possible collaboration on participation in the events. TSB conducted a DFS Security Clinic for UPU in June 2023 to provide guidance on the DFS security recommendations. For 2024, the DFS Security Lab is planning to conduct security tests on mobile payment applications used by posts and provide guidance on the adoption of the security best practices for mobile payment apps.

## 5.4 Digital transformation for smart cities and communities

For an overview of initiatives, events and projects on digital transformation, smart cities and metaverse undertaken by TSB in 2023, see [web page](https://www.itu.int/cities/year-in-review-2023/) and [report](https://www.itu.int/cities/wp-content/uploads/2023/12/2023-year-in-review.pdf) covering 2023 activities.

The [ITU webinar series on digital transformation](https://www.itu.int/cities/standards4dt/) featured 19 webinars in 2023 on topics ranging from the digital transformation of urban environments and fashion in the metaverse to the ethical use of technology for animals and the interplay between human rights and technology. Each webinar summary is added to an [outcome document](https://www.itu.int/cities/wp-content/uploads/2023/12/Digital-Transformation-Webinars-Outcome-Document-21-39.pdf) offering an overview of key themes and discussions.

The [United for Smart Sustainable Cities (U4SSC)](http://www.itu.int/en/ITU-T/ssc/united/Pages/default.aspx) initiative is supported by 19 UN bodies with the aim of achieving the SDG11 ("Make cities and human settlements inclusive, safe, resilient and sustainable").

Over 150 cities worldwide are evaluating their progress towards smart city objectives and the SDGs using [U4SSC Key Performance Indicators for Smart Sustainable Cities](https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx) based on ITU standards. The results of the KPI evaluations are shared by [city snapshots, factsheets, verification reports and case studies](https://www.itu.int/en/ITU-T/ssc/united/Pages/publication-U4SSC-KPIs.aspx).

The [seventh U4SSC meeting](https://u4ssc.itu.int/latest-meetings/7th-meeting/) was held online on 20 June 2023, co-organized by ITU, UNECE and UN-Habitat, organizations which together provide the secretariat for U4SSC. Highlights of the meeting included the appointment of the new [U4SSC management team](https://u4ssc.itu.int/u4ssc-management-team/) and the announcement of a new U4SSC Country Hub in Kyebi, Ghana. The new country hub is the first in Africa.

In 2023, U4SSC worked across six thematic groups:

* City platforms
* Building urban economic resilience at the city level
* AI in cities
* Enabling people-centred cities through digital transformation
* Procurement for smart sustainable cities
* Digital wellbeing

[New U4SSC reports](https://u4ssc.itu.int/publications/) published in 2023:

* Reference framework for integrated management of a smart sustainable city: The framework supports cities in identifying strategic, operational and connectivity needs and includes a high-level methodology to implement urban digital infrastructure.
* Procurement guidelines for smart sustainable cities: The guidelines support city officials and their partners in embracing digital commercial approaches that support achieving the SDGs.
* Compendium of practices on innovative financing for smart sustainable cities projects: The compendium provides a practical insight on the types of projects that can improve sustainability and smartness of a city, combined with ideas on how they can be financed.

[New ITU reports](https://www.itu.int/cities/publications/) published in 2023:

* Guide for smart and sustainable city leaders: The guide offers a step by-step approach to help city leaders assess their current situation, set goals, develop strategies and monitor progress towards becoming a smart and sustainable city.
* Enabling digital transformation in smart sustainable cities – Master plan: The report provides a framework for cities to assess their current digital readiness, set goals and develop strategies to enable digital transformation.
* Executive briefing on the metaverse: The briefing provides a concise overview of the technologies that underpin metaverse, as well as the key challenges and opportunities.
* Building a people-centered digital future for cities and communities:The brochure showcases ITU’s commitment to creating an inclusive, accessible and sustainable digital future, offering an overview of ITU initiatives and standards supporting digital transformation.
* The role of digital technologies in aging and health: Developed by ITU and the Pan American Health Organization and International Telecommunication Union, the report describes opportunities to improve the lives of older persons with the help of inclusive technology solutions.

The [ITU toolkit on digital transformation for people-oriented cities and communities](https://toolkit-dt4c.itu.int/) is a comprehensive online guide designed to help cities and communities leverage digital technologies for sustainable development, covering areas such as digital infrastructure, data management and digital services. It provides practical strategies and tools for the digital age, focusing on improving quality of quality of life, promoting inclusivity and enhancing service delivery. 2023 hosted the release of the latest module of the toolkit, addressing digital agriculture, developed by ITU together with FAO.

The [ITU digital transformation resource hub](https://www.itu.int/cities/dt-resource-hub/) launched in 2023 collects the latest reports, studies and guidelines from ITU and across the web. Its resources are organized in eight categories:

* Smart sustainable cities
* Digital health & wellbeing
* AI
* IoT
* Blockchain
* Digital twin
* Metaverse
* Digital transformation trends

## 5.5 Intelligent transport systems

The [ITU-UNECE Future Networked Car Symposium](https://fnc.itu.int/) examines the latest advances in vehicle connectivity, automated mobility and the role of Artificial Intelligence in ​the transport sector, sharing unique insight into associated implications for technology, business and regulation. Its next edition will be held online from 11 to 14 March 2024.

The first regional edition of the symposium was held on 6 October 2023 in Doha, Qatar, moving to Doha together with the Geneva International Motor Show. The symposium was organized by ITU and UNECE with support from the Communications Regulatory Authority of Qatar. Discussions focused on opportunities and challenges for Gulf Cooperation Council (GCC) countries.

The ITU-led [Collaboration on ITS Communication Standards (CITS)](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx) is a forum supporting the coordination of an internationally accepted, globally harmonized set of Intelligent Transportation Systems (ITS) communication standards of the highest quality in the most expeditious manner possible to enable the rapid deployment of fully interoperable ITS communication-related products and services in the global marketplace.

CITS has launched a new [expert group on communications technology for automated driving](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/egcomad.aspx).

CITS meetings are typically held twice a year, in March and September, and often organized back-to-back with other ITS events, e.g., annual ITU-UNECE Future Networked Car Symposia, that also provide opportunities to exchange information and keep experts updated on ITS standardization. The representatives of involved standards bodies are invited to submit status reports on ITS standardization ongoing in their respective organizations to CITS meetings.

CITS maintains the global [ITS Communication Standards Database](https://www.itu.int/net4/ITU-T/landscape#?topic=0.131&workgroup=1&searchValue=&page=1&sort=Revelance). The database is designed to assist the harmonization of ITS standards and includes standards developed by all relevant standards bodies, providing a reference to all standards supporting connected vehicles and automated driving.

See also ITU's new [web portal](https://www.itu.int/en/ITU-T/ITS/Pages/default.aspx) on ITS.

## 5.6 CTO and CxO meetings

[CTO and CxO meetings](http://www.itu.int/en/ITU-T/tsbdir/cto/Pages/default.aspx) bring together high-level industry executives together with the senior management of TSB to exchange views on industry priorities and related standardization activities.

The most recent [CxO Roundtable](https://www.itu.int/en/ITU-T/tsbdir/CxO/Pages/CxO-20231205.aspx) was held on 5 December 2023 at the Telecom Review Leader's Summit in Dubai, UAE, with additional participation online, hosted by Telecom Review with the support of the support of the UAE Telecommunications and Digital Government Regulatory Authority, du, Huawei and TELUS.

CxOs discussed the support for IMT-2030 (6G) required from optical networks, artificial intelligence (AI), and semantic communications. They also shared their outlook on addressing the digital divide, non-terrestrial networks, smart mobility (e.g., vehicle-to-everything communications and their regulatory requirements), powerline communications, disaster response, machine vision technology, blockchain, fraud mitigation, and quantum information technologies. See meeting [communiqué](https://www.itu.int/en/ITU-T/tsbdir/cto/Documents/Communique_ITU_CxO_2023.pdf).

## 5.7 Green digital action at COP28

ITU convened the [Green Digital Action track at COP28](https://www.itu.int/initiatives/green-digital-action-atcop28/) in Dubai, UAE, 30 November - 13 December 2023, together with partners spanning governments, companies, industry associations, civil society and fellow UN agencies.

TSB/ITU-T played a leading role in the facilitation of Green Digital Action activities focused on standardization.

​[Among the outcomes](https://www.itu.int/initiatives/green-digital-action-atcop28/about/outcomes/) of Green Digital Action at COP28 are:

* Corporate agreements on reducing greenhouse gas emissions following science-based targets aligned with the goal of limiting climate warming to 1.5oC, and creating transition plans as well as increasing transparency on emissions data across the tech industry.
* Cross-country collaboration to develop e-waste regulation as a key vehicle to foster a circular tech industry.
* [Joint statement](https://www.worldstandardscooperation.org/) by ITU, ISO and IEC on the importance of sustainability being built into technical standards development by design, and standards helping the world reach net-zero emissions and achieve a resource-efficient circular and low-carbon economy.
* Strengthening of industry and country collaboration on the implementation of environmental sustainability standards through an [action plan](http://www.itu.int/initiatives/green-digital-action-atcop28/wp-content/uploads/sites/4/2023/12/Call-to-Action-Pillar4-Green-standards.pdf).
* Pledge from the mobile telecommunication and satellite industry to support the Early Warnings for All initiative through cell-broadcast and direct-to-device services to protect everyone through life-saving disaster alerts by 2027. A public sector pledge to implement cell-broadcast using a regulatory approach was also made.​

The [AI/ML Solutions for Climate Change challenge](https://aiforgood.itu.int/about-ai-for-good/aiml-solutions-for-climate-change/) also culminated at COP28. The challenge was supported by supported by ITU, the International Atomic Energy Agency (IAEA), the UN Food and Agriculture Organization (FAO), the UN Educational, Scientific and Cultural Organization (UNESCO), and the World Bank. The competitions were facilitated by a stream of the [AI for Good Innovation Factory](https://aiforgood.itu.int/about-ai-for-good/innovation-factory/) led by ITU and IAEA.

# 6 Academia

[ITU Academia membership](https://www.itu.int/hub/membership/), the [ITU Journal on Future and Evolving Technologies](https://www.itu.int/en/journal/j-fet/Pages/default.aspx), and [ITU Kaleidoscope conferences](https://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx) form key avenues for academics to engage in ITU’s work.

## 6.1 ITU Journal

The [ITU Journal on Future and Evolving Technologies (ITU J-FET)](https://www.itu.int/en/journal/j-fet/Pages/default.aspx) – free of charge to both readers and authors – offers comprehensive coverage of communications and networking. The online journal welcomes research submissions on all relevant topics, all year long.

The journal includes [recorded webinar discussions](https://www.itu.int/en/journal/j-fet/webinars/Pages/default.aspx) with researchers and industry leaders. The special series of journal webinars with industry leaders, launched in June 2023, has hosted talks from NTT DOCOMO, O-RAN Alliance, GSMA, Nokia and China Mobile.

The latest issue of the ITU Journal (Volume 4 (2023), Issue 4) focuses on innovations to power the metaverse and AI for accessibility. It also features research on vehicle-to-everything communications, edge computing, and low-earth orbit satellite networking.

Volume 4, Issue 3 features research on network automation and the resulting network dynamism key to 5G and beyond. It also shares insights on solutions developed as part of ITU’s AI/ML in 5G Challenge (third edition).

Volume 4, Issue 2 features research on network orchestration and security for 5G and beyond, sharing insights on advances in network intelligence and automation helping to meet rapidly evolving service demands.

Volume 4, Issue 1 features research on innovative network solutions for future services, intelligent surfaces, and gigahertz-to-terahertz (GHz-to-THz) broadband communications for 6G non-terrestrial networks.

In addition to papers on other topics published in 2023, Volume 4 includes papers from the following special issues​:

* Innovative network solutions for future services
* Intelligent surfaces and their applications towards wide-scale deployment
* AI-driven security in 5G and beyond
* Network virtualization, slicing, orchestration, fog and edge platforms for 5G and 6G wireless systems
* AI and machine learning solutions in 5G and future networks
* AI for accessibility
* Metaverse: Communications, networking and computing

Upcoming issues of the journal in 2024 are set to address:

* Intelligent technologies for future networking and distributed systems
* Satellite constellations and connectivity from space​
* Next-generation computer communications and networks

The journal is currently inviting submissions for two more special issues:

* AI and machine learning solutions in 5G and future networks
* Geospatial AI to advance the United Nations Sustainable Development Goals

## 6.2 ITU Kaleidoscope academic conferences

The [ITU Kaleidoscope](https://www.itu.int/en/ITU-T/academia/kaleidoscope/Pages/default.aspx) series of peer-reviewed academic conferences – organized with the technical co-sponsorship of the Institute of Electrical and Electronics Engineers (IEEE) and the IEEE Communications Society – calls for original research on topics of growing strategic relevance to ITU-T.

The next edition of Kaleidoscope will be held in conjunction with WTSA-24 in New Delhi, India, 15-24 October 2024.

# 7 Cooperation and coordination

Regional Preparatory Meetings for WTSA-24 are listed on this [web page](https://www.itu.int/wtsa/2024/prepmeet/). Memoranda of Understanding and Cooperation Agreements are listed and available on the relevant [web page](https://www.itu.int/en/ITU-T/extcoop/Pages/mou.aspx).

## 7.1 International standardization bodies

[World Standards Cooperation (WSC)](https://www.itu.int/en/ITU-T/extcoop/Pages/wsc.aspx)

The World Standards Cooperation (WSC) was established in 2001 by the International Telecommunication Union (ITU), the International Organization for Standardization (ISO), and the International Electrotechnical Commission (IEC) in order to strengthen and advance the voluntary consensus-based international standards systems of ITU, ISO, and IEC.

* A WSC meeting hosted by ITU in February 2023 discussed the relationship between international standardization and human rights, welcoming the UN High Commissioner for Human Rights, Volker Türk.
* [World Standards Day](https://www.worldstandardsday.org/home.html), 14 October: ITU, ISO and IEC lead the celebrations of World Standards Day. "A Shared Vision for a Better World" is the theme of World Standards Day, continuing a multi-year campaign launched in 2021 aimed at raising awareness of how international standards contribute to the SDGs. [All past editions of World Standards Day](https://www.worldstandardscooperation.org/what-we-do/world-standards-day/).
* [G20 International Standards Summits](https://www.worldstandardscooperation.org/g20/g20-2022/): ITU, ISO and IEC together arrange events as part of G20 activities on the value of international standards to sustainable development. Three such events have been held under the G20 Presidencies of Indonesia (2022), Italy (2021) and Saudi Arabia (2020). The next such summit is under preparation together with Brazil.
* [Joint statement at COP28](https://www.worldstandardscooperation.org/): ITU, ISO and IEC issued a joint statement at COP28 on the importance of sustainability being built into technical standards development by design, and standards helping the world reach net-zero emissions and achieve a resource-efficient circular and low-carbon economy.

[Technical coordination mechanism among IEC, ISO and ITU-T/ITU-R (including ISO/IEC JTC1)](https://www.itu.int/en/ITU-T/extcoop/Pages/WSC-coordination.aspx)

IEC, ISO and ITU-T/ITU-R have agreed that four coordination levels are to be followed when an issue regarding collaboration is identified (source: [TSAG TD138](https://www.itu.int/md/T13-TSAG-140617-TD-GEN-0138/en)).

[Global Standards Collaboration (GSC)](https://www.itu.int/en/ITU-T/gsc/Pages/default.aspx)

GSC is an unincorporated voluntary organization dedicated to enhancing global cooperation and collaboration regarding communications standards and the related standards development environment.

[IEC SMB/ISO TMB/ITU-T TSAG Standardization Programme Coordination Group (SPCG)](https://www.worldstandardscooperation.org/what-we-do/standards-programme-coordination-group-spcg/)

The IEC SMB/ISO TMB/ITU-T TSAG Standardization Programme Coordination Group (SPCG) was established in 2018 by ISO TMB, IEC SMB, and ITU-T TSAG, and conducts strategic coordination of future standardization work, coordination of existing standardization work, short-term related tasks identified by the SPCG and approved by the technical boards of IEC, ISO and ITU-T. The approved SPCG terms of reference are [here](https://www.itu.int/en/ITU-T/extcoop/Documents/tor/ToR_SPCG.pdf).

[IEC-ISO-ITU Joint Smart Cities Task Force (J-SCTF)](https://www.itu.int/hub/2020/10/new-smart-city-standards-joint-task-force-established-by-itu-iso-and-iec/)

J-SCTF was established in 2020 and supports the coordination of IEC, ISO and ITU-T work on smart city standardization. It aims to ensure standardization solutions for smart cities are comprehensive, capitalizing on synergies among IEC, ISO and ITU-T. IEC hosts the J-SCTF document [repository](https://collaborate.iec.ch/#/pages/workspaces/735898/dashboard).

## 7.2 National and regional standardization bodies

ITU-T/TSB has become more visible to national and regional standardization bodies, as well as built on and enhanced good collaboration with ITU Regional and Area Offices.

TSB facilitates an ITU-T presence in the activities of national and regional standardization bodies, as well as encourages national and regional standardization bodies' participation in ITU-T activities.

TSB’s efforts in this regard have strengthened the exchange of information between ITU-T and national and regional standardization bodies, supporting closer cooperation and collaboration.

Standardization bodies with which TSB has expanded cooperation include:

* African Regional Organization for Standardisation (ARSO)
* Pan American Standards Commission (COPANT)
* Pacific Area Standards Congress (PASC)
* Asia-Pacific Telecommunity Standardization Program (ASTAP)
* South Asian Regional Standards Organization (SARSO)
* GCC Standardization Organization (GSO)
* European Committee for Standardization (CEN) and European Committee for Electrotechnical Standardization (CENELEC)
* European Telecommunications Standards Institute (ETSI)

## 7.3 TSB and ITU regional and area offices

ITU Regional Offices regularly share information with the TSB Director on regional activities relevant to standardization and provide regular reports to TSAG.

At the initiative of the TSB Director, regular conference calls and face-to-face meetings are arranged between the ITU Regional and Area Offices and TSB senior management, covering overviews, updates, and briefings on activities organized by each TSB department in the Regions.

These efforts, as well as the establishment of a TSB Focal Point for the Regions, have supported improvements in coordination with ITU Regional and Area Offices with respect to standardization activities, operations, and events across the Regions.

## 7.4 ITU Sectors

TSAG maintains a close relationship with RAG and TDAG to develop synergies with the objective of strengthening coordination and cooperation among the three ITU Sectors on matters of mutual interest.

Three Inter-Sector Rapporteur groups (IRGs) work on items of interest to various ITU-T and ITU-R SGs.

* [IRG-AVA](https://www.itu.int/en/irg/ava): Intersector Rapporteur Group on Audiovisual Media Accessibility, among ITU-T SG9, ITU-T SG16 and ITU-R SG6. Meetings were held on 9 April 2021 and 23 September 2021.
* [IRG-AVQA](https://www.itu.int/en/irg/avqa): Intersector Rapporteur Group on Audiovisual Quality Assessment, among ITU-T SG12 and ITU-R SG6. A meeting was held on 9 June 2021, in conjunction with the Video Quality Expert Group (VQEG).
* [IRG-IBB](https://www.itu.int/en/irg/ibb): Intersector Rapporteur Group on Integrated Broadcast-Broadband, among ITU-T SG9, ITU-T SG16 and ITU-R WP 6B.

The Inter-Sector Coordination Team (ISCT) is composed of representatives of all three advisory groups, working to identify subjects of common interest to the three Sectors. It also seeks to identify the mechanisms necessary to strengthen cooperation and joint activities among the three Sectors, with particular emphasis on the interests of developing countries. In addition, the ITU Inter-Sectoral Coordination Task Force (ISC-TF) is coordinating activities among the three Bureaux. Both ISCT and of ISC-TF regularly report their progress to TSAG.

## 7.5 External cooperation

Memoranda of Understanding and Cooperation Agreements are listed and available on the relevant [web page](https://www.itu.int/en/ITU-T/extcoop/Pages/mou.aspx).

[Collaboration on ITS Communication Standards (CITS)](https://www.itu.int/en/ITU-T/extcoop/cits/Pages/default.aspx)

The intent of the CITS is to provide a globally recognized forum for the creation of an internationally accepted, globally harmonized set of ITS communication standards of the highest quality in the most expeditious manner possible to enable the rapid deployment of fully interoperable ITS communication-related products and services in the global marketplace.

[Digital Currency Global Initiative](https://www.itu.int/en/ITU-T/extcoop/dcgi/Pages/default.aspx)

The Digital Currency Global Initiative (DCGI) is collaboration between ITU and the Future of Digital Currency Program of Stanford University. DCGI continues the dialogue and research initiated by [FG DFC](https://www.itu.int/en/ITU-T/focusgroups/dfc/Pages/default.aspx) on pilot implementations, use cases, applications and developing specifications for technical standards that will foster adoption, universal access and ultimately financial inclusion. The goals of DCGI are to drive the synergistic engagement, innovative use, and standardization of digital currencies, which are the three pillars of the Initiative.

[FIGI resources for strong authentication](https://www.itu.int/en/ITU-T/extcoop/FIGIresources/authentication/Pages/default.aspx)

This is a compendium of resources for developers, provided under the Financial Inclusion Global Initiative (FIGI) to help foster the adoption of strong password-less authentication for user login and transaction confirmation especially for digital financial services. The resources mainly focus on demonstrating how easy and fast it is to eliminate the use of passwords with Recommendation ITU-T X.1277 that describes the Fast Identity Online (FIDO) Universal Authentication Framework.

[Financial Inclusion Global Initiative (FIGI) Symposium](https://www.itu.int/en/ITU-T/extcoop/figisymposium/Pages/default.aspx)

Three FIGI Symposium were held in 2017, 2019 and 2021 to provide a forum for dialogue regulators from telecom and financial services, DFS providers and all concerned stakeholders to share their experience and views on the main challenges to be addressed for scaling up DFS.

[Global Initiative on AI and Data Commons](https://www.itu.int/en/ITU-T/extcoop/ai-data-commons/Pages/default.aspx)

The Global Initiative on AI and Data Commons brings together AI specialists and data owners from industry, academia, member states, UN agencies and civil society to develop knowledge, specifications and guidelines to scale AI solutions with the help of shared datasets, testing and simulation environments, collaborative sandboxes, AI models and associated software, data discoverability and storage and computing resources.

[ITU-T and WSIS](https://www.itu.int/en/ITU-T/wsis/Pages/default.aspx)

As the UN specialized agency for ICTs, ITU was proud to have played the leading role in the organization of the [World Summit on the Information Society (WSIS)](https://www.itu.int/wsis/index.html). The alignment of ITU-T work with the WSIS Action Lines will be reported to this meeting of TSAG as part of the ITU Operational Plan.

ITU-T work relates mainly to WSIS Action Lines C2 (infrastructure) and C5 (security) – where ITU is the lead facilitator – but also to WSIS Action Lines C3 (access to information and knowledge), C4 (capacity building), C6 (enabling environment), C7 (applications), C8 (cultural diversity), and C11 (international and regional cooperation).

ITU-T/TSB facilitated discussions at WSIS Forum 2023 on topics including fibre-optic broadband networks, gender-responsive standards, smart sustainable cities and communities, circular economy and biodiversity.

[ITU/WMO/UNESCO-IOC Joint Task Force on SMART cable systems](https://www.itu.int/en/ITU-T/climatechange/task-force-sc/Pages/default.aspx)

ITU, the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO-IOC), and the World Meteorological Organization (WMO) established the Joint Task Force (JTF) on SMART cable systems in 2012, dedicated to advancing the concept of ‘Science Monitoring And Reliable Telecommunications (SMART) cables’. The minimum set of requirements established by the JTF are now feeding into ITU-T standardization work, with two new work items underway on SMART submarine cable systems ([G.smart](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17089)) and dedicated scientific sensing submarine cable system ([G.dsssc](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=17090)). In addition, the work on “impact assessment framework for evaluating how ICT-based subsea infrastructure could support climate, environmental and biodiversity monitoring in the oceans” started in June 2023 ([L.SMART](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=18961)).

[Recognized standards-developing organizations (SDOs) under Recs. A.4, A.5 and A.6](https://www.itu.int/en/ITU-T/extcoop/Pages/sdo.aspx)

ITU-T's external cooperation is guided by three ITU-T Recommendations: [ITU-T A.4:](https://www.itu.int/rec/T-REC-A.4) procedures for communicating with forums and consortia, [ITU-T A.5:](https://www.itu.int/rec/T-REC-A.5) making reference to documents from other organizations, [ITU-T A.6:](https://www.itu.int/rec/T-REC-A.6) cooperation and exchange of information with national and regional SDOs.

# 8 Conformity and interoperability programme

The [ITU Conformity and Interoperability (C&I) programme](https://www.itu.int/en/ITU-T/C-I/Pages/default.aspx) aims to enhance the conformity and interoperability of ICT products implementing ITU-T Recommendations or part thereof, solicit feedback to improve the quality of ITU-T Recommendations, and reduce the digital divide and standardization gap by assisting developing countries with human resource and infrastructure capacity building.

Testing labs can now obtain official recognition from ITU for their competence to test the conformance of products with ITU-T Recommendations ([TSB Circular 368](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-TSB-CIR-0368)). As of December 2023, 12 testing labs have been listed in the [ITU Testing Laboratories Database](https://itu.int/go/tldb) for ITU-recognized facilities. For buyers seeking standards-based solutions, the complementary [ITU Product Conformity Database](http://www.itu.int/net/itu-t/cdb/ConformityDB.aspx) lists products compliant with ITU-T Recommendations.

ITU-T determined the key criteria and [recognition procedure](https://www.itu.int/en/ITU-T/studygroups/com11/casc/Documents/TL-RP_pub_2022-07-15.pdf) for testing labs.

An earlier [Memorandum of Understanding](https://www.itu.int/en/ITU-T/extcoop/Documents/mou/MoU-ITU-T-IAF-ILAC-20220824.pdf) between ITU-T, the International Laboratory Accreditation Cooperation (ILAC) and the International Accreditation Forum (IAF) facilitates ITU's recognition of labs accredited by signatories to the [ILAC Mutual Recognition Arrangement](https://ilac.org/ilac-mra-and-signatories/).

Testing labs are invited to apply for ITU recognition using this [application form](https://www.itu.int/net/itu-t/cdb/secured/reg-tldb.aspx). Labs successful in their application are announced in the [ITU Operational Bulletin](https://www.itu.int/pub/T-SP). The recognition procedure is supported by the [ITU-T Conformity Assessment Steering Committee](https://www.itu.int/en/ITU-T/studygroups/com11/casc/Pages/default.aspx).

Companies can apply for the inclusion of their products – products tested to applicable ITU-T Recommendations using ITU-T test specifications or procedures adopted by an SDO or forum qualified in accordance with Recommendation ITU-T A.5 – in the ITU Product Conformity Database using this [application form](https://www.itu.int/net/itu-t/cdb/secured/Register16.aspx). All criteria for populating the database are listed [here](https://www.itu.int/en/ITU-T/C-I/conformity/Pages/cdb.aspx).

ITU-T SG11 updated its [C&I Action Plan](https://www.itu.int/md/T22-SG11-230510-TD-GEN-0507/en), indicating that the Reference Table, which is a part of the action plan, provides guidance for populating the ITU Conformity Product Database, especially for ICT products tested against ITU-T Recommendations using test specifications developed by SDOs other than ITU-T. TSB is maintaining the Reference Table and the list of pilot projects for conformity assessment against ITU-T Recommendations based on received inputs. ITU registered GPON ONT end-device (category: optical fibre equipment) in the Product Conformity Database (<https://itu.int/go/tcdb>), which was tested by a recognized testing laboratory.

The testing lab recognition scheme is the latest initiative under ITU’s C&I programme. ITU-T SGs continue developing ITU-T Recommendations defining testing requirements and test suites. Along with conformity assessments, the programme organizes interoperability testing events, offers capacity building, and provides technical assistance in the establishment of testing centres.

# 9 Mainstreaming accessibility

ITU works to increase access to ICTs for persons with disabilities by raising awareness of their right to access ICTs, mainstreaming accessibility in the development of international ICT standards, and providing education and training on key accessibility issues.

For an overview of all ITU activities relevant to accessibility, see [ITU and Accessibility](https://www.itu.int/en/action/accessibility/Pages/hlmdd2013.aspx). For an overview of TSB/ITU-T activities relevant to accessibility, see [ITU-T and Accessibility](https://www.itu.int/en/ITU-T/accessibility/Pages/default.aspx).

# 10 Intellectual property rights

The [TSB Director's Ad Hoc Group on Intellectual Property Rights (IPR AHG)](http://www.itu.int/en/ITU-T/ipr/Pages/adhoc.aspx) continues protects the integrity of the standards-development process by clarifying aspects of the [ITU-R/ITU-T/ISO/IEC Common Patent Policy and related Guidelines](http://www.itu.int/en/ITU-T/ipr/Pages/revpatent.aspx) – the Union's main tool to manage the challenges associated with the incorporation of patents in [ITU-T and ITU-R Recommendations](http://www.itu.int/en/ITU-T/publications/Pages/recs.aspx).

All IPR-related documentation and webpages are now available in the six official languages of the Union.

No meetings were held in the reporting period. Previous meeting reports are available [here](https://www.itu.int/oth/T0402/en).

All patent declarations received are listed on ITU’s website. See the [ITU-T IPR database](https://www.itu.int/net4/ipr/search.aspx).

# 11 Membership

ITU-T hosts 272 Sector Members and 227 Associates. ITU Academia members now total 169. 66 of ITU-T's Associates are participating under the reduced fee structure for small and medium-sized enterprises (SMEs) which came into effect on 31 January 2020.

The data included in this report reflect data available on 20 December 2023.

**New Sector Members welcomed from 1 January to 20 December 2023:**

World's Global Telecom S.A.; China Satellite Network Group Co., Ltd; Vecima Networks Inc.; Ant Group Co., Ltd.; Emirates Integrated Telecommunications Company PJSC; CableLabs; DITO Telecommunity Corporation; Frontier Communications; Guangdong OPPO Mobile Telecommunications Corp., Ltd.; China Tower Corporation Limited; Bahrain Network (BNET); World Federation of Engineering Organization; Open & Agile Smart Cities (OASC); Environmental Coalition on Standards; Communications Regulators Association of Southern Africa; Arab League Educational, Cultural and Scientific Organization; Broadcom Europe Ltd.; Meta Platforms, Inc..

**New Associates welcomed from 1 January to 20 December 2023:**

BBIX Singapore Pte. Ltd. (SG2); Onomondo ApS (SG2); iONLINE Internet solutions provider Ltd. (SG2); Deer Management Systems DBA Tactacam (SG2); ESim Go Limited (SG2); Simwood Group Plc (SG2); NTT Ltd. Group Services Limited (SG2); Telnyx LLC (SG2); 3G Telecommunications Limited (SG2); Datora Mobile Telecomunicações SA (SG2); WMS (SG2); Nauru Telikom Corporation (SG2); Beamlink, Inc. (SG2); Mozilla Corporation (SG3); Resilio (SG5); China Energy Materials Company Limited (SG5); InMobiles (SG11); Bloxtel Inc. (SG13); DNS Research Federation (SG13); InnoLight Technology (Suzhou) Ltd. (SG15); Net Insight AB (SG15); Guodian Nanjing Automation Co., Ltd (SG16); TuringSign Global SA (SG17); Radical Alternativas de Avanzada Altradicalavan Cia Ltda (SG17).

**Total ITU-T Sector Members, Associates and Academia (31 December 2009 – 20 December 2023):**

The following table and figure illustrate the evolution of ITU-T membership from 31 December 2009 to 20 December 2023 (noting that the Academia membership category opened in 2011).

|  | **2009** | **2010** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** | **2023** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sector Members | 286 | 256 | 258 | 263 | 270 | 267 | 262 | 251 | 256 | 256 | 265 | 275 | 269 | 263 | 272 |
| Associates | 101 | 111 | 119 | 128 | 130 | 132 | 131 | 127 | 135 | 153 | 179 | 194 | 216 | 220 | 227 |
| Academia | ‑ | ‑ | 22 | 39 | 56 | 70 | 92 | 104 | 120 | 147 | 156 | 160 | 159 | 170 | 169 |
| TOTAL | 387 | 367 | 399 | 430 | 456 | 469 | 485 | 482 | 511 | 556 | 600 | 629 | 644 | 653 | 668 |

NOTE – Some of the figures in the table above have been subject to retroactive changes.

**Figure 2 – Evolution of ITU-T membership from 31 December 2009 to 20 December 2023**

NOTE – The Academia category was created in 2011.

# 12 Bridging the standardization gap

[ITU's Bridging the Standardization Gap (BSG) Programme](https://www.itu.int/en/ITU-T/gap/Pages/default.aspx), recently re-envisioned, aims to enhance the ability of all countries, in particular developing countries, to participate in thedevelopment and implementation of ITU-T standards.

The new BSG Programme, considering WTSA Resolution 44 *inter alia*, has two main strategic pillars – *Development* and *Implementation –* supported by *Resources* and *Partnership*. Japan's Ministry of Internal Affairs and Communications (MIC) funded the BSG Programme in 2023, encouraging others to join the new BSG Programme.

***Development:*** This pillar focuses on enhancing the standards-formulation capabilities of delegates from all countries, in particular developing countries. Activities under the pillar include:

* Data analytics driven by close coordination and cooperation among TSB departments with respect to PP Resolution 71.
* Physical and remote BSG trainings in close coordination and cooperation with ITU-T study groups and regional groups as well as ITU Regional and Area Offices (e.g., Regional Development Forums).
* Guidelines to create National Standardization Secretariats.
* Fellowships, supported by the systematic coordination and collaboration being established between TSB and BDT.

***Implementation:*** This pillar is oriented towards supporting the implementation of ITU-T standards, including in alignment with national plans, policies and regulations. Activities under the pillar include:

* Identification and outreach of thematic initiatives and priorities (e.g., DFS Security Lab, Cyber Defence Centre 4 Developing Countries, United for Smart Sustainable Cities, C&I Programme, Make Listening Safe initiative, etc.) in close collaboration with ITU-T SGs.
* Regular and continuous coordination with ITU Regional and Area Offices for enhancing cooperation and partnership.

**BSG hands-on training sessions:** TSB continues to conduct "BSG Hands-On effectiveness training for ITU-T SGs" focused on the development of practical skills to maximize the effectiveness of developing countries' participation in the ITU-T standardization process. These training sessions cover topics including strategies for participation in ITU-T SGs, drafting contributions to meetings, presenting proposals, collaborative working methods, building consensus and the utilization of TSB tools and services. Under the new BSG Programme, the trainings will be further streamlined to cater to the different levels of standard-making expertise and experience of ITU-T delegates from the developing countries inter alia.

BSG training sessions were organized in co-location with the following meetings during the reporting period to optimize resources and results:

* SG5RG-AP, Bangkok, Thailand, 11-12 September 2023
* SG11, Geneva, 10-20 October 2023
* SG2RG-AFR, Abidjan, Côte d'Ivoire, 21-22 September 2023
* SG13, Geneva, 23 October - 3 November 2023
* SG17RG-AFR and Regional Cybersecurity Summit for Africa, Kampala, Uganda, 20-23 November 2023

**BSG training on services and tools:** On occasion, TSB also offers trainings on the use of TSB services and tools. These trainings introduce services and tools supporting publications as well as MyWorkspace and its remote-participation tools, for example. Such BSG trainings facilitate more active and efficient accessibility and participation in ITU-T work. For more on TSB services and tools, see [section 15](#_15_Electronic_working).

**Regional groups:** Stimulating effective participation in ITU-T SGs, regional groups play a key role in bridging the standardization gap between developed and developing countries. Regional groups have proven effective mechanisms to coordinate regional contributions to ITU-T and increase the number and quality of technical contributions from developing countries, including least-developed countries. Regional group meetings are also demonstrating slightly better gender balance (35 per cent women) than meetings of ITU SGs (28 per cent women). An overview of regional groups' activities can be found [here](https://www.itu.int/en/ITU-T/regional-groups/Pages/default.aspx).

The following regional group meetings were organized in the reporting period:

* SG20 Regional Group for Africa (SG20RG-AFR), Sharm El-Sheikh, Egypt, 8 June 2023
* SG3 Regional Group for the Arab Region (SG3RG-ARB), E-meeting, 20 June 2023
* SG20 Regional Group for Asia and the Pacific (SG20RG-AP), E-meeting, 25-26 July 2023
* SG20 Regional Group for the Arab Region (SG20 RG-ARB), E-meeting, 1 August 2023
* SG3 Regional Group for Latin America and the Caribbean (SG3RG-LAC), San José, Costa Rica, 28-29 September 2023
* SG3 Regional Group for Asia and Oceania (SG3RG-AO), Bangkok, Thailand 11-12 September 2023
* SG5 Regional Group for Asia and the Pacific (SG5RG-AP), Bangkok, Thailand 11-12 September 2023
* SG11 Regional Group for Africa (SG11RG-AFR), 13-15 September 2023
* SG13 Regional Group for Africa (SG13RG-AFR), Abidjan, Côte d'Ivoire, 21-22 September 2023
* SG2 Regional Group for Africa (SG2RG-AFR), Abidjan, Côte d'Ivoire, 21-22 September 2023
* SG17 Regional Group for Africa (SG17RG-AFR), 23 November 2023

ITU-T hosts 25 regional groups:

* Eight for Africa (SGs 2, 3, 5, 11, 12, 13, 17, and 20)
* Four for the Americas (SGs 2, 3, 5, and 20)
* Five for the Arab States (SGs 2, 3, 5, 17, and 20)
* Three for Asia and the Pacific (SGs 3, 5, and 20)
* One for Europe and the Mediterranean Basin (SG3)
* Four for Eastern Europe, Central Asia and Transcaucasia (SGs 3, 11, 13, and 20)

**Regional Standardization Forums:** [Regional Standardization Forums (RSFs)](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/bsg/Pages/default.aspx) and Inter-regional Standardization Forums provide tutorials on ITU-T working methods as well as more technically-oriented themes. RSFs are being held in conjunction with meetings of regional groups to improve the alignment of RSF discussions and the priorities of ITU-T SGs. RSFs are also raising awareness of ITU standardization activities through the participation of key decision-makers (Prime Ministers, Ministers, Heads of Regulators, CEOs, etc.).

**National Standardization Secretariats:** ITU-T's [Guidelines for National Standardization Secretariats](https://www.itu.int/en/ITU-T/gap/Documents/nss-rep-may.pdf), which will be updated further, sets out a number of options for developing national procedures and processes to support effective participation in the ITU-T standards-development process. A National Standardization Secretariat, as described by the Guidelines, is the full set of arrangements by which participation in and contributions to ITU-T are coordinated within a country.

**e-Learning courses:** The [ITU-T Working Methods and other Mechanisms](https://academy.itu.int/training-courses/full-catalogue/itu-t-working-methods-and-other-mechanisms) course was made available made available from February to September 2023, with 208 participants.

**SG mentoring programme:** In 2011, a mentoring programme for ITU-T SGs was introduced. The objective of the mentoring programme is to provide a contact point to assist new delegates with the working methods of ITU-T. It has since featured as an important part of the work of ITU-T SGs and TSAG.

**Technical papers:** A series of Technical Papers and Technical Reports provide additional information for developing countries on best practices in implementing ITU-T Recommendations. See the Technical Reports [web page](https://www.itu.int/pub/T-TUT).

**Fellowships:** Fellowships provide financial support to ITU-T delegates from eligible developing countries to assist their participation in ITU-T meetings. 422 fellowships were requested in 2023 and 152 were awarded. Statistics on fellowships awarded in 2023 are provided below.

More details on the new BSG Programme, including analytics, are available in [TD422](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T22-TSAG-240122-TD-GEN-0422).

**Figure 3 – Awarded fellowships by region in 2023**

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**Figure 4 – Awarded fellowships by gender in 2023**

# 13 Gender

TSB remains dedicated to integrating a gender perspective in all of its activities and programmes, leveraging the framework of ITU Gender Task Force and the Network of Women in ITU-T (NoW in ITU-T). TSB’s ongoing efforts to enhance gender equality within TSB and ITU-T underscore ITU's commitment to diversity, gender parity and the empowerment of women, all of which are among TSB’s priorities.

Key highlights:

The outcomes of survey on promoting gender equality in ITU-T [TD 196](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0196/en) were presented to the last meeting TSAG in May 2023 (see [TD 196](https://www.itu.int/md/T22-TSAG-230530-TD-GEN-0196/en)). TSB is actively implementing actions based on the survey's findings as part of the NoW in ITU-T work plan.

[Access the recording of the WSIS Forum 2023 session on Gender Responsible Standards](https://itu.zoom.us/rec/play/b267dXxgU816kf2L-17Bj8kbEGoRE8EyxFlPIcKPNAOTph2mwG1VZQijP-4txHZFWFfr281KefPepqUL.h4G5lYTTPHQLqQd9?canPlayFromShare=true&from=share_recording_detail&continueMode=true&componentName=rec-play&originRequestUrl=https://itu.zoom.us/rec/share/lcQWztDyRUybpoeNkJut_64Yt04ZoGelxORMVEfqbpGK2wTVwPZWpA1Q3IYG2FAK.MwbVvMvBo5Nmzxra). Key recommendations from this session are being fed into the NoW ITU-T work plan.

Updates on the Network of Women in ITU-T, formerly known as WISE, include.

* Terms of Reference outlining the mission, scope and work plan of the network to promote gender equality in ITU-T activities are presented to this meeting of TSAG for review (see [TD 423](https://www.itu.int/md/T22-TSAG-240122-TD-GEN-0423/en)).
* The [NoW in ITU-T webpage](https://www.itu.int/en/ITU-T/NoW/Pages/default.aspx) is now live on ITU's website, aligned with the other ITU Sectors.
* A mailing list ([nowinitut@lists.itu.int](mailto:nowinitut@lists.itu.int)​) has been set up for women to connect and foster the growth of the network. [Joi​n NoW in ITU-T mailing list](file:///D:\2020\08_08_2019\continue%20to%20be%20among%20TSB's%20priorities).
* Special event: A Network of Women Breakfast at TSAG will take place on 23 January 2024 from 08:00 to 09:30 in ITU Room Popov and online. This networking event will mark the launch of NOW4WTSA-24 and will include a panel discussion on gender equality in standardization. [Consult the online programme](https://www.itu.int/en/ITU-T/NoW/events/20240123/Pages/default.aspx).
* Gender parity objectives for WTSA-24, supported by the NOW4WTSA-24 campaign, encourage Member States to pledge support for growth in the number of women in ITU-T leadership positions and the target of 35 per cent female participation at WTSA-24. Figure 5 below provides statistics on women's participation in the past three WTSAs.
* TSB has strengthened collaboration with BR and BDT on NoW to leverage experience and insights gained across ITU and relevant documents and resources. The objective to ensure a "OneITU" approach to gender equality aligns with Council-23 [C23/76 corr.1](https://www.itu.int/md/S23-CL-C-0076/) calling for a new ITU-wide mechanism to coordinate the Network of Women across ITU.

In accordance with the [UNECE Declaration on Gender Responsive Standards](https://unece.org/gender-responsive-standards-initiative), which was endorsed by ITU along with other major standards bodies, TSB is inviting ITU-T members and staff involved in standards-development processes to undertake a [training course](https://learnqi.unece.org/courses/gender-responsive-standards/) on gender-responsive standards development. Members and staff are invited to send certificates of completion to [wise@itu.int](mailto:wise@itu.int).

The figures below provide an overview of TSB/ITU-T activities with respect to participants' gender.

Figure 5 – Women's participation in the past three WTSA

Figure 6 – Women's share of ITU-T leadership position and participation in study groups and regional groups within study groups

Figure 7 – Women's participation in ITU-T statutory meetings by study period

# 14 Publications

## 14.1 Recommendations and supplements

Close to 300 ITU-T Recommendations and Supplements were published in 2023. The figure below illustrates the number of ITU-T Recommendations and Supplements published per year since 2018.

As approved by TSAG, most corrigenda and amendments to ITU-T Recommendations are now integrated into the main edition. The changes introduced by the amendment or corrigendum are shown with revision marks.

**Figure 8 – Number of Recommendations, amendments and Supplements**   
**published per year since 2018**

## 14.1.1 Recommendations deleted between WTSAs

Since March 2022, the following ITU-T Recommendations were deleted in accordance with clause 9.8.2.2 of WTSA Resolution 1 (Rev., Geneva, 2022):

* Recommendation ITU-T P.862 "Perceptual evaluation of speech quality (PESQ): An objective method for end-to-end speech quality assessment of narrow-band telephone networks and speech codecs"
* Recommendation ITU-T D.212 "Charging and accounting principles for the use of Signalling System No. 7"
* Recommendation ITU-T K.43 "Immunity requirements for telecommunication network equipment"
* Recommendation ITU-T K.48 "EMC requirements for telecommunication equipment – Product family Recommendation"
* Recommendation ITU-T K.88 "EMC requirements for next generation network equipment"
* Recommendation ITU-T D.280 "Principles for charging and billing, accounting and reimbursements for universal personal telecommunication"
* Recommendation ITU-T E.168 "Application of E.164 numbering plan for UPT"
* Recommendation ITU-T E.168.1 "Assignment procedures for universal personal telecommunications (UPT) numbers in the provisioning of the international UPT service"
* Recommendation ITU-T E.174 "Routing principles and guidance for Universal Personal Telecommunications (UPT)"
* Recommendation ITU-T E.755 "Reference connections for UPT traffic performance and GOS"
* Recommendation ITU-T E.775 "UPT grade of service concept"
* Recommendation ITU-T E.776 "Network grade of service parameters for UPT"
* Recommendation ITU-T F.850 "Principles of Universal Personal Telecommunication (UPT)"
* Recommendation ITU-T F.851 "Universal Personal Telecommunication (UPT) – Service description (service set 1)"
* Recommendation ITU-T F.852 "Universal Personal Telecommunication (UPT) – Service description (service set 2)"
* Recommendation ITU-T F.853 "Supplementary services in the Universal Personal Telecommunication (UPT) environment"
* Recommendation ITU-T Q.1521 "Requirements on underlying networks and signalling protocols to support UPT"
* Recommendation ITU-T Q.1531 "UPT security requirements for Service Set 1"
* Recommendation ITU-T Q.1541 "UPT stage 2 for Service Set 1 on IN CS-1 – Procedures for universal personal telecommunication: Functional modelling and information flows"
* Recommendation ITU-T Q.1542 "UPT stage 2 for Service Set 1 on IN CS-2 – Procedures for universal personal telecommunication: Functional modelling and information flows"
* Recommendation ITU-T Q.1551 "Application of Intelligent Network Application Protocols (INAP) CS-1 for UPT service set 1"

## 14.2 Official languages on an equal footing

The Standardization Committee for Vocabulary (SCV), composed of ITU-T members expert in all the official languages, serves as focal point to ITU-T SGs in terminology-related matters. SCV guides the adoption of terms and definitions in ITU-T Recommendations in accordance with WTSA Resolution 67.

TSB continues to collect all new terms and definitions proposed by ITU-T SGs, entering them into the online [ITU Terms and Definitions database](https://www.itu.int/br_tsb_terms/#/).

As requested by WTSA Resolution 67, TSB continues to translate all Recommendations approved under the Traditional Approval Process as well as all TSAG reports.

TSB also translated six Recommendations approved under the Alternative Approval Process in 2023, in accordance with requests received from ITU-T SGs and linguistic groups, and within the available budget.

# 15 Electronic working methods and tools

Actions taken since the last meeting of TSAG are outlined below.

## 15.1 ITU-T website

TSB continuously creates and updates web pages to ensure that correct and current information is always available. Below are some of the notable sites that have been created since the last TSAG meeting:

* [WTSA-24](https://www.itu.int/wtsa/2024/)
* [[5th Global Standards Symposium](https://gss.itu.int)](https://gss.itu.int)
* [Inter-regional Meetings for WTSA-24 preparation](https://www.itu.int/wtsa/2024/irm/)

## 15.2 Tools and applications

TSB, ITU IS and C&P Departments continue to develop several applications and further enhance existing facilities to support and improve the electronic working methods of the members. TSB strives to support mobile devices in all new applications developed and follow the ITU design charter. Key achievements include:

**Document Management System for Rapporteur Group Meetings:** The Microsoft SharePoint-based Document Management System for ITU-T Rapporteur Group Meetings (RGMs) has been used extensively by the ITU-T Study Groups, and TSAG. Feedback from Rapporteurs drives the continuous improvement of the RGM system.

Current and past RGM meetings can be accessed at <http://itu.int/go/itu-t/rgm>.

A comprehensive support and FAQ page offering RGM tips and best practices is available at <http://itu.int/go/itu-t/rgm-support>.

A detailed online user guide for the RGM System, including video tutorials, is available at <http://itu.int/go/itu-t/rgm-guide>.

The RGM system is one of several services available in the ITU-T SharePoint collaboration sites. These sites are restricted to ITU-T members and can be accessed using an ITU User Account (TIES).

**ITU-T SharePoint collaboration sites:** The ITU-T SharePoint collaboration sites enable participants in ITU-T working groups to conduct online discussions, work on projects, schedule meetings and manage and store documents in a secure shared environment.

The home of ITU-T SharePoint collaboration sites can be accessed at: <https://extranet.itu.int/sites/ITU-T/>.

A support site that contains a knowledge base of FAQs and user guides on the various SharePoint services is also available at: <https://extranet.itu.int/ITU-T/support/>.

Most of the collaboration sites are restricted to ITU-T Members and may be accessed using an ITU User (TIES) account. Some collaboration sites are open to non-members and may be accessed using non-member ITU User accounts.

## 15.3 Web applications

**MyWorkspace:** [MyWorkspace](https://www.itu.int/myworkspace/) is a user-friendly mobile platform that centralizes a set of applications and services developed to *strengthen electronic working methods for the work of ITU-T*, as stated in WTSA Resolution 32.

This platform has been built as a Progressive Web App (PWA) solution allowing the same user experience regardless of the device used. Access to this platform is restricted to users with an ITU user account.

The following applications and services are available from MyWorkspace:

* [ITU Translate](https://www.itu.int/myworkspace/#/Translate): ITU Translate is a neural machine translation tool developed in-house for ITU documents and websites. Based on an open-source framework, it has been trained using ITU material to ensure greater accuracy for technical content but includes website translation from external cloud-based translation services for general language expressions.  
    
  ITU Translate identifies and applies the best tools available for each language pair to translate general language webpages not currently available in the six official ITU languages. It uses innovative technologies to ensure high quality gist translation services to complement the reach of the work carried out by ITU’s human translation service. This is in line with Plenipotentiary Resolution 154 on the use of the six official languages of the Union on an equal footing.
* [MyMeetings](https://www.itu.int/myworkspace/#/MyMeetings): Remote participation service based on the [BigBlueButton](https://bigbluebutton.org) open-source solution and customized in-house to support requirements – at headquarters and in the regions – of both statutory and non-statutory ITU-T meetings, either accessible to all users, or to a selected number of users, or restricted to registered users.
* Documents:
  + [MyDocuments](https://www.itu.int/myworkspace/#/Documents/MyDocuments/meeting=T22-TSAG-221212): Simplified access to Study Group documents, per meeting, with multiple sorting and selection filters and full-text search, and automatic translation from English into 5 others official ITU languages (available on request).
  + [Suggested documents](https://www.itu.int/myworkspace/#/Documents/Suggested-Documents): A proposed list of documents based on pre-set user interests, with the option to bookmark favourites.
* [SDG Mapping](https://www.itu.int/myworkspace/#/sdg): Automatic mapping of ITU-T activities with UN SDGs by evaluating semantic relevance of texts.
* [Calendar](https://www.itu.int/myworkspace/#/Calendar): Monthly calendar view of all ITU events with filters on ITU sectors and ITU-T working groups, with detailed information.
* [MyEvents](https://www.itu.int/myworkspace/#/Myevents): Events management platform that provides real-time ITU-T events agenda, list of registered participants, speakers and exhibitors, as well as a matchmaking function to enable networking among participants.
* [Mailing list](https://www.itu.int/myworkspace/#/Mailing): Subscription management with search functionality.
* [Community](https://www.itu.int/myworkspace/#/Community): MyWorkspace user directory.
* [Profile and preferences](https://www.itu.int/myworkspace/#/profile): User personal information and interests.

In addition to those integrated applications, MyWorkspace also offers access to an external set of services:

* [Other Apps](https://www.itu.int/myworkspace/#/Other-apps): Direct access to external services such as [ITU-T Cloud](http://tsbcloud.itu.int), [ITU-T Databases](https://www.itu.int/en/ITU-T/publications/Pages/dbase.aspx), a [Meeting documents synchronisation tool](https://www.itu.int/en/ITU-T/ewm/Pages/sync-app.aspx), Extranet collaboration platforms, [ITU Search](http://www.itu.int/search), [Frequently asked questions](https://www.itu.int/net/ITU-T/info/faqs.aspx).

**Alternative Approval Process system:** Online solution to apply the ITU-T A.8 simplified and faster procedure used for seeking the approval of draft new and revised Recommendations: <https://www.itu.int/t/aap/aap-recs>.

**ITU-T Work Programme:** Suite of Windows and [Web applications](https://www.itu.int/itu-t/workprog/) to follow ITU-T Working Groups current and past structure and work items.

**ITU-T Liaison Statements:** Online application to access the [ITU-T Liaison Statements](https://www.itu.int/net4/ITU-T/ls) database.

**ITU-T Recommendations:** Suite of Windows and Web applications to follow and access [ITU-T Recommendations](https://www.itu.int/itu-t/recommendations) publications.

**ICT Standards Landscape:** Online management and research tool across the [ICT standards landscape](https://www.itu.int/itu-t/landscape) covering various high-level topics linked to ITU-T and other SDOs’ standards, under the responsibility of experts in the respective domain, such as:

* [Access Network Transport](https://www.itu.int/itu-t/landscape/?topic=tx356)
* [Cloud Computing](https://www.itu.int/itu-t/landscape/?topic=tx378)
* [Home Network Transport](https://www.itu.int/itu-t/landscape/?topic=tx153)
* [ICT Security](https://www.itu.int/itu-t/landscape/?topic=tx279)
* [IMT-2020 and beyond](https://www.itu.int/itu-t/landscape/?topic=tx379)
* [ITS Communication](https://www.itu.int/itu-t/landscape/?topic=tx21)
* [IoT & Smart Sustainable Cities](https://www.itu.int/itu-t/landscape/?topic=tx380)

**Intellectual Property Rights in ITU-T Recommendations:** Online search of [patents and software copyright declarations](https://www.itu.int/net4/ipr/search.aspx).

**ITU-R/ITU-T Terms & Definitions Database:** Online search on [ITU-R and ITU-T Recommendations terms and definitions](https://www.itu.int/br_tsb_terms/) databases.

This is maintained in close collaboration with the Coordination Committee for Vocabulary ([CCV](https://www.itu.int/en/ITU-R/study-groups/rccv/Pages/default.aspx)).

**ITU National Numbering Plans Repository:** Online access to [ITU National Numbering Plans](https://www.itu.int/itu-t/nnp/#/home) which has been enhanced to allow users to access both the notifications of the administrations' plans in Word format and in dynamic lists, when applicable.

**International Numbering Resources:** The [International Numbering Resources](https://www.itu.int/en/ITU-T/inr/Pages/default.aspx) include databases such as:

* [Universal Numbers applications](https://www.itu.int/en/ITU-T/inr/unum/Pages/default.aspx): Enable the tracking of operators whose numbers have been reclaimed.
* [Issuer Identifier Number](https://www.itu.int/net/itu-t/inrdb/secured/e118iin.aspx) (IIN): Workflow application allowing TSB secretariat to manage IIN registration.

**ITUSearch:** Online search on ITU digital resources, including files that public search engines (e.g., Google) cannot access: meeting documents, publications, web pages, [ITU regulatory texts](https://www.itu.int/search#?target=Base%20text&ex=false&q=&fl=0) in 6 languages and the latest WTDC and WTSA outputs.

**ITU-T Mailing Lists:** The mailing lists continue to be very useful tools in the work of the study groups and other groups. There are **388 active ITU-T mailing lists** with a total of **61519 subscriptions** currently being used as shown in the table below. TSB set up a new mailing list for ITU-T experts to receive an alert for each TSB Circular posting.

|  |  |  |
| --- | --- | --- |
| **Group** | **Mailing lists** | **Subscribers** |
| **TSAG** | 12 | 2516 |
| **SG2** | 17 | 1648 |
| **SG3** | 14 | 3183 |
| **SG5** | 15 | 2286 |
| **SG9** | 3 | 291 |
| **SG11** | 19 | 2291 |
| **SG12** | 25 | 4221 |
| **SG13** | 29 | 6124 |
| **SG15** | 20 | 6141 |
| **SG16** | 19 | 2699 |
| **SG17** | 20 | 4018 |
| **SG20** | 14 | 4195 |
| **Regional Groups** | 26 | 2351 |
| **Focus Groups** | 88 | 12523 |
| **Joint Coordination Activities** | 14 | 1664 |
| **Other Groups** | 53 | 5368 |
| **Total** | **388** | **61519** |

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# Appendix I – List of approved texts and texts undergoing approval

NOTE – Corrigenda are not listed here.

**List of approved texts, as of 18 December 2023**

| **Study group** | **Work item** | **Approval process** | **Subject / Title** | **Summary** | **Approval date** |
| --- | --- | --- | --- | --- | --- |
| SG3 | [D.285](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18790) | TAP | Guiding principles for charging and accounting for intelligent network supported services | This Recommendation outlines general considerations and guiding principles for charging and international accounting for traffic and facilities used to support services that utilize Intelligent Networking (IN) capabilities. | 2023-11-10 |
| SG3 | [DSTR-ROAMREG (ex STUDY\_ROAMREG)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18191) | Agreement | Regional Roaming Initiatives | - | 2023-11-10 |
| SG5 | [K.Suppl.32](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19044) | Agreement | Case studies of radio frequency-electromagnetic field (RF-EMF) assessment | Supplement 32 to ITU-T K-series Recommendations presents results of case studies of radio frequency-electromagnetic field (RF-EMF) exposure levels including fifth generation (5G) systems taken in different conditions and areas. All results of assessment were delivered by ITU-T members and include calculations and measurements of the RF-EMF exposure levels in vicinity of different radio communication systems. RF-EMF exposure levels vary depending on the environment in which they are taken and type of radio communication systems that are in operation. The results included in Supplement 32 to ITU-T K-series Recommendations provide information about RF-EMF exposure levels in real situations. The EMF exposure assessments are included in appendices. Supplement 32 to ITU-T K-series Recommendations aims mainly to solve the problem of EMF compliance assessments of base station systems through typical case studies including computation evaluation and measurement evaluation, and also provides the case support on implementation of ITU-T K-Suppl.16 and IEC 62232. | 2023-06-23 |
| SG5 | [L.Suppl.57 (ex L.Suppl.Scope3Operators)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18396) | Agreement | L.1420 - Scope 3 Guidance for telecommunication operators | Scope 3 emissions from telecommunication operators are the indirect emissions of their value chain, including their supply chain and products used by customers. Estimating Scope 3 emissions is difficult since this refers to emission sources outside a company’s direct control. Scope 3 emissions cover a wide range of economic activities that are divided into 15 Categories. This Supplement establishes guidance to harmonize methods for telecommunication operators to assess and report their Scope 3 Greenhouse Gas (GHG) emissions, and to increase coverage and transparency. This guidance prioritises Categories 1 to 2 and 11 of the GHG Protocol (which addresses the life cycle impact of company portfolios) in particular and Category 3 (which is closely linked to Scope 1 and 2), although all Categories are addressed. | 2023-06-23 |
| SG5 | [K.147](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18401) | AAP | Protection of digital ports connected to balanced pairs of conductors | Recommendation ITU-T K.147 considers overvoltages and overcurrents protection of information technology equipment including the IEEE 802.3 Ethernet. This Recommendation describes how surges are coupled into the system and what surge mitigation measures are used, taking into account the difference of implementations and network configurations. Furthermore, it contains the different surge and power fault test circuit approaches and conditions how the specified tests are applied. Networked equipment can be subject to overvoltage and overcurrent transients. Both data and any powering services should be resistant to the expected environmental transients. Where equipment has multiple independent ports, such as central hubs, switches, or repeaters, then testing is required for inter-port resistibility. Resistibility testing needs to identify lightning transients coupled into a network by magnetic induction, earth potential rise, resistive coupling and transient coupling by a voltage-limiting operation of surge protective functions or flashover. Voltage limitation may convert common-mode surges into differential-mode surges in the signal path. It is also possible for alternating current mains power faults to couple into the network, which can necessitate the use of overcurrent protection. | 2023-07-22 |
| SG5 | [K.143](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18550) | AAP | Guidance on safety relating to the use of surge protective devices and surge protective components in telecommunication terminal equipment | It is necessary to clarify the electrical requirements for SPDs/SPCs in order to realize both resistibility and safety of telecommunication systems. Recommendation ITU-T K.143 analyses the influence on human safety of lightning measures bridging across insulation in equipment by surge suppressors. Recommendation ITU-T K.143 provides guidance for design of lightning protection and requirements on surge suppressor in equipment from the human safety standpoint. Requirements for SPDs/SPCs in multiservice surge protective devices (MSPDs) external to the equipment and SPDs installed on lines in a building lie outside the scope of this Recommendation. | 2023-07-29 |
| SG5 | [K.60](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18547) | AAP | Emission levels and test methods for wireline telecommunication networks to minimize electromagnetic disturbance of radio services | The broadband services have fundamentally changed the utilization of the telecommunication network. First, the transmission is present on the network at all times (i.e., 'always-on'). Second, the transmission frequency range employed by broadband is much greater than that of previous access systems. Hence, the risk of interference with radio services has increased. In the event of interference, the share of responsibility between the network operator and the national responsible body, as well as the levels of the radiated field are not clearly defined. Recommendation ITU-T K.60 proposes a measurement method and target levels to guide administrations in case of interference with radio services. In addition, a methodology for solving the interference is discussed, and under what circumstances the case has to be forwarded to the national responsible body. | 2023-07-29 |
| SG5 | [K.93](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18944) | AAP | Immunity of home network devices to electromagnetic disturbances | The introduction of high-speed data services to customer premises that rapidly adopt new technologies allows the distribution of such data within customer premises. This is leading to a number of different wireless (e.g., wireless local area network, LAN, and digital enhanced cordless telecommunications, DECT) and wireline technologies (e.g., LAN and technologies designed to exploit existing telephone extension and power distribution wiring) to interconnect a variety of in-home electronic and electrical equipment (such as set top box, STB), and PCs. Many types of broadband services are provided on IP networks, such as voice over Internet protocol (VoIP), video on demand (VoD) and broadcasting. Moreover, the electromagnetic environment in the home will change due to this situation. Therefore, new electromagnetic compatibility issues may occur in a home network environment. Recommendation ITU-T K.93 aims to ensure normal operation of home networking devices and to provide a new additional immunity test method for broadband services, especially for devices that are sensitive to broadband interferences. | 2023-07-29 |
| SG5 | [L.1023](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18411) | AAP | Assessment method for circular scoring | Recommendation ITU-T L.1023\_rev outlines an assessment method for circularity scoring of information and communication technology (ICT) goods. The assessment method consists of three steps: 1) Setting the relevance and applicability (R) of each circularity indicator for the ICT goods at hand, 2) Assess the margin of improvement (MI) of each circularity indicator, 3) Calculate the circularity score (score) from 0 to 100% for the ICT good at hand for all three circularity aspects. This includes: – Using a predefined value matrix to identify the % score from 0 to 100 for each combination of R×MI. – Average the included circularity indicators for the ICT good at hand separately for all three circularity aspects: product durability, ability to recycle, repair, reuse, and upgrade from equipment and manufacturer level. | 2023-08-13 |
| SG5 | [L.1027 (ex L.ME\_DIS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17696) | AAP | Assessment of material efficiency of ICT network infrastructure goods (circular economy) part 5- server and data storage product disassembly and disassembly instruction | This Recommendation utilises information compiled from stakeholders which can provide good insights into the specified content. | 2023-08-13 |
| SG5 | [L.1326 (ex L.BBU)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17709) | AAP | Requirements and use cases of liquid cooling solutions and high energy efficiency solutions for 5G BBU in Centralized-RAN mode | Liquid cooling systems are mainly used for processing capability of the high thermal power density, which exceeds the physical limits of air cooling methods, to support more and more application scenarios where manufacturers are creating competitive advantages. Liquid cooling can provide heat transfer capabilities several orders of magnitude higher than that of air cooling, and applications dealing with high heat density in the core and edge computing as well as access network will increasingly require the support of liquid cooling technology. This Recommendation identifies the requirements for liquid cooling and high energy efficiency solutions for 5G BBU in Centralized-RAN mode, including requirements of immersion and spray liquid cooling technology, key indicators of immersion and spray liquid, safety requirements of immersion and spray liquid cooling system, management procedure and energy efficiency measurement method, and use cases of liquid cooling solutions. In this Recommendation a complete infrastructure solution practiced in 5G BBU is proposed that can provide safe and efficient liquid cooling technical support, which can assist in the design of full liquid cooling facilities as well as the successful introduction of liquid cooling solutions into the existing air cooling telecommunication rooms and data centres. | 2023-08-13 |
| SG5 | [L.1471](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17736) | AAP | Guidance and criteria for information and communication technology organizations on setting Net Zero targets and strategies | Currently, the definitions of Net Zero and related concepts such as carbon neutrality and climate neutrality for organizations are still under development. Several initiatives, including, inter alia, the Science Based Target Initiative, the United Nations Framework Convention on Climate Change (UNFCCC) Race to Zero, the UN High-level Expert Group on Credibility and Accountability of Net-Zero Emissions Commitments of Non-State Entities (HLEG), ISO IWA42, ISO TC 207, and the Net Zero Initiative are working on defining or aligning the different views of these concepts to avoid confusion and reduce risks for green washing. Recommendation ITU-T L.1471 seeks to guide information and communication technology (ICT) organizations in clarifying the meaning of Net Zero in the context of the ICT sector and setting Net Zero targets and strategies. It also identifies actions that would lead the sector towards Net Zero according to the trajectories described in Recommendation ITU-T L.1470. | 2023-08-13 |
| SG5 | [K.153 (ex K.Zones)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17667) | AAP | Guidance on Determining the Compliance Boundaries (the exclusion zones) of radio transmitter installations | Exclusion zones are described by the compliance boundaries around radio base station and transmitting stations in which the electromagnetic fields may exceed the RF-EMF exposure limits. The general public shall not have access to those areas. The exclusion zones are also defined for occupational exposure. Those areas are generally positioned on rooftops in urban or suburban locations. Their shape and dimension may be different depending on the regulations. This Recommendation includes information on how the zones should be determined based on the data concerning operating frequencies and EIRP on each of the operating frequencies. It also includes information on cases in which there is no exclusion zones. For example, those on masts, especially in rural areas, do not need any materialization as the general public does not have any access to this zone and the access for the workers is also limited and existing usually in the front of the transmitting antennas. Furthermore, some other transmitters do not need any compliance boundary as the installed power level is too low. | 2023-09-06 |
| SG5 | [L.1241 (ex L.PSU\_for server)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17676) | AAP | Methodologies for evaluating the functionality and performance of power supply unit configured for servers | This Recommendation provides comprehensive evaluation methods of power supply unit configured for servers to evaluate the electrical performances, functionalities and safety aspect. | 2023-09-22 |
| SG5 | [L.1631 (ex L.FIMS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18560) | AAP | Reference model of firefighting infrastructure management system for buildings in sustainable cities | Recommendation ITU-T L.1631 provides an overview of a firefighting infrastructure management system (FIMS), defines the reference model of the FIMS, and provides use cases for the FIMS for buildings in sustainable cities. | 2023-09-22 |
| SG5 | [L.1070 (ex L.GDSPP)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17712) | AAP | Global digital sustainable product passport opportunities to achieve a circular economy | This Recommendation provides an overview of global and common opportunities to represent sustainability, mainly environmental-related, details about digital technology products, either collective ICT product models, batches or individual ICT product items. These product details are intended to be represented in digital format instead of paper-based. The details can represent design-related information, products at the time of manufacturing, including relevant information for product transparency and a potential for a circular lifecycle, such as details related to the origin of materials composition, design, manufacturing, energy consumption, maintenance, repair, preparation for reuse, final recycling, and may include links to related documentation. Product details can include or relate to details that change over the lifespan of a product as a result of reconfiguration events, including repair, upgrade, usage, sale, and final recycling. The details should exclude any personal or business-sensitive information. The Recommendation provides an overview of sustainability opportunities, environmental related, about product-related digital information common to all ICT products, with global scope for harmonisation, i.e. relevant to any region, that can support the development of the circular economy of ICT products. The product-related digital information can be represented under digital technology, such as product identifiers, data formats, linked data, and system architectures. It relates to and can complement regional and global standards. | 2023-11-06 |
| SG5 | [K.44Imp](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18942) | Agreement | Guide on the use of the overvoltage resistibility for Recommendations ITU-T K.20, K.21 and K.45 | The Resistibility Guide assists test laboratories in implementing the correct tests for ITU-T K.20, K.21, and K.45 compliance testing. It will have four definitive sections: 1) introduction with general comments 2) definition of terms 3) general test plan flow charts 4) test circuit schematics This guide will assist the lab engineers and technicians in developing the correct test plans for equipment being submitted for ITU-T K.20, K.21 or K.45 compliance testing. It provides the sequence of testing to be conducted, shows specific test sequence for single pair ports and multiple pair ports with and without primary protection in both internal and external environments: 1) symmetric pair(s) ports including single pair, multiple pairs, and including Ethernet, 2) coaxial ports, 3) power ports and 4) ac mains ports This Guide also provides a practical example as Appendix, using a Home Gateway application that is subject to Recommendation ITU-T K.21. This application example contains ADSL port types, mains power port types, FXO and FXS port types, Ethernet port types, and USB port types. | 2023-11-22 |
| SG5 | [L.Suppl.59 to ITU-T L.1700 (ex L.suppl.1700)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18962) | Agreement | Low-cost sustainable telecommunication solution in rural and remote areas using WLAN/Wi?Fi for conventional telecom services like voice calling using SIP | This Supplement to [ITU-T L.1700] provides a solution on a low-cost sustainable solution in rural and remote areas using WLAN/Wi-Fi for conventional telecom services like voice calling using Session Initiation Protocol (SIP). Access to communication and ICT infrastructure in rural areas of most developing countries is still a challenge. The inadequacy of crucial infrastructure like electricity in rural and remote areas present a significant problem. Deployment of telecommunication solutions which are low-cost and low maintenance and can be deployed easily is an inevitability in such cases. WLAN/Wi-Fi network infrastructure, configured to provide traditional telecom services like voice calling, being an overall low-cost solution can prove to be a viable solution in such cases to provide low-cost sustainable telecommunication. | 2023-11-22 |
| SG9 | [J.1036 (ex J.FSR-REQ)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18511) | AAP | Factual subscriber-base reporting and protected content delivery in conditional access system - Requirements | Most countries have implemented Digital Addressable Systems (DAS) for distribution platforms such as Cable TV, Direct to Home (DTH), Internet Protocol Television (IPTV), and Headend In The Sky (HITS). DAS enables subscribers to have a choice and option to select their channels and packages. Conditional Access System (CAS) and Subscriber Management System (SMS) are integral parts of a DAS environment. While CAS is responsible for encrypting the content and its delivery in a secure and encrypted manner only to authorised subscribers, SMS handles the subscriber management functions. The quality of service depends on the CAS and SMS systems deployed by the Distribution Platform Owner (DPO). Since the content providers and broadcasters have no control over the CAS and SMS, as these are deployed at the DPO end, they often complain about the loss of revenue due to various malpractices, such as under-reporting of subscriber-base, distribution of channels to unauthorised users, and content piracy. Therefore, it is necessary to frame benchmarks for the CAS systems, prescribing technical specifications focusing on functional requirements to ensure factual reporting of subscriber-base and protected delivery of content to authorised subscribers. Creating a framework that prevents the deployment of sub-standard CAS will bring preventive control from potential threats and revenue losses arising due to the vulnerability of such systems, bring economic efficiency, improve quality of service, and improve the end-consumer experience. The objective of the [draft new] Recommendation is to address two major concerns related to CAS, namely, underreporting of subscriber numbers and content piracy, leading to revenue loss to broadcasters, content providers and the governments. This [draft new] Recommendation elaborates the various functional requirements of the CAS such as log requirements, reports requirements, database requirements, security requirements, service requirements, and more. Compliance to these requirements in CAS performance will address the concerns mentioned above. | 2023-07-14 |
| SG9 | [J.1112 (ex J.FSPEC-DVCS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18515) | AAP | Functional Requirements for IP-based Digital Video Convergence Service | As digital broadcasting services have been rapidly deployed, many service operators are considering more effective transmission of digital broadcasting services. Recently, the digital broadcasting services have been changed to use resources efficiently and transmits them to easily accommodate the consideration varying needs and environments of subscribers. Therefore, it is necessary to redefine the advanced IP-based Digital Video Convergence Service for maintaining QoS (Quality of Service) and using bandwidth effectively transmission on broadband network environment. The IP-based Digital Video Convergence Service is a service mechanism for distributing digital video via IP-based broadband networks. It is the service mechanism for providing interfaces and functionalities to enable the service operators to offer quality of service (QoS)-guaranteed broadcasting to subscribers via IP-based converged broadband networks. This Recommendation aims to define the functional specification of IP-based Digital Video Convergence Service considering the convergence environment. | 2023-07-14 |
| SG9 | [J.1305 (ex J.mma-req)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18519) | AAP | Requirements of microservice architecture for audio-visual media in the converged media cloud | This Recommendation specifies the requirements for the architecture and related components of audio-visual media based on microservice technologies. This Recommendation is applicable to the design, development, construction, operation and maintenance of audio-visual media systems based on microservices. This Recommendation bears the characteristics of microservice technology and audio-visual media business, combines the requirements of technology and business, and comes up with an audio-visual media microservice architecture (MMA) that meets the needs of rapid iteration and diversified services of the audio-visual media business. MMA follows the tiered architectural methodology as ITU-T J.1302. Mainly from the perspective of cloud platform, ITU-T J.1301 and J.1302 stipulates the system architecture of cloud-based converged media services (CBCMS) to support Internet Protocol (IP) and broadcast cable television (TV) services. From the perspective of microservice, this recommendation specifies the microservice architecture of integrated media based on container, virtual machine, cloud, and other infrastructures to support the audio-visual media business carried out by microservices on a variety of infrastructures. | 2023-07-14 |
| SG9 | [J.1306 (ex J.mma-spec)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18520) | AAP | Specification of microservice architecture for audio-visual media in the converged media cloud | This Recommendation specifies the specification for the architecture and related components of audio-visual media based on microservice technologies. This Recommendation fulfills the requirements in [ITU-T J.1305]. This Recommendation is applicable to the design, development, construction, operation and maintenance of audio-visual media systems based on microservices. This Recommendation bears the characteristics of microservice technology and audio-visual media business, combines the requirements of technology and business, and comes up with an audio-visual media microservice architecture (MMA) that meets the needs of rapid iteration and diversified services of the audio-visual media business. MMA follows the layered architectural methodology as ITU-T J.1302. Mainly from the perspective of cloud platform, ITU-T J.1302 stipulates the system architecture of cloud-based converged media services (CBCMS) to support Internet Protocol (IP) and broadcast cable television (TV) services. From the perspective of microservice, this Recommendation specifies the microservice architecture of integrated media based on container, virtual machine, cloud, and other infrastructures to support the audio-visual media business carried out by microservices on a variety of infrastructures. From the perspective of microservice governance, this Recommendation realizes the compatibility of various current mainstream microservice frameworks and stipulates the management capabilities of distributed systems. From the perspective of the media business, it defines the microservice components which support the production, broadcasting, transmission, distribution, interaction, and other audio-visual media business. From the perspective of application integration, it stipulates the service orchestration capabilities and the application assembly means. | 2023-07-14 |
| SG9 | [J.152 (ex J.cable-5G-req)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18506) | AAP | Requirements for cable television services to use 5G radio system | IMT-2020 radio system, a.k.a. 5G, is expected to replace the wiring inside apartment buildings in cities, or to extend cable television systems in rural areas. However, to use the available bandwidth of 5G radio, cable television signals have to meet certain requirements to carry cable television service signals over 5G radio system. This Recommendation defines the requirements for cable television systems that use 5G radio system. | 2023-07-14 |
| SG9 | [J.1612](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18514) | AAP | The Architecture for Smart Home Gateway | Smart home is a kind of home automation system in which a wide range of IoT devices in a home cooperate to provide intelligent controlling and monitoring functions for home users. Smart home gateway connects various smart home devices, provides hardware interfaces of various smart home communication protocols, runs communication protocols, performs protocol conversion and bridging, realizes the interaction between user control terminal and Cloud server. Recommendation ITU-T J.1612 aims to define the architecture for a smart home gateway (SHGW) which addresses the functional requirements found in Recommendation ITU-T J.1611. The Recommendation consists of concepts of a virtual device model, dynamic device profile and other important software modules. With the introduction of these important modules, the architecture can dynamically support existing smart home devices and the devices in the future. | 2023-07-14 |
| SG9 | [J.224](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18866) | AAP | Fifth-generation transmission systems for interactive cable television services - IP cable modems | Recommendation ITU-T J.224 specifies the fifth generation of high-speed data-over-cable systems. Fifth generation transmission systems introduce a number of new features that build upon what was present in previous ITU-T Recommendations, namely ITU-T J.112, ITU-T J.122, the ITU-T J.222.x-series and the ITU-T J.223.x-series. Recommendation ITU-T J.224 includes key new features for the physical (PHY) layer and establishes a full duplex data-over-cable service interface specification (DOCSIS) mode of operation, including enhancements to media access control (MAC) layer protocols, as well as requirements for those in the upper layer, e.g., the Internet protocol (IP) and dynamic host configuration protocol (DHCP). Fifth generation cable modem specifications fully incorporate those of the fourth generation. | 2023-07-14 |
| SG9 | [J.225](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18867) | AAP | Fourth-generation transmission systems for interactive cable television services - IP cable modems | Recommendation ITU-T J.225 defines the fourth generation of high-speed data-over-cable systems. The fourth-generation transmission systems introduce a number of new features that build upon what was present in previous Recommendations ITU-T J.112, ITU-T J.122, ITU-T J.222.x-series, and ITU T J.223.x-series. This Recommendation includes key new features for the physical (PHY) layer and enhancements to the media access control (MAC) layer protocols as well as requirements for upper layer protocols such as Internet protocol (IP), dynamic host configuration protocol (DHCP), etc. The fourth-generation cable modem specifications are incorporated fully in this Recommendation. Informative Supplement 10 to the ITU-T J-series Recommendations contains the correspondence between the DOCSIS versions and the ITU-T Recommendations revisions and generations. | 2023-07-14 |
| SG9 | [J.299](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18865) | AAP | Functional requirements for remote management of cable set-top box by auto configuration server | Recommendation ITU-T J.299 describes the functional requirements for auto configuration server (ACS) and set-top box (STB) connected to each other for the purpose of remote maintenance. ACS is usually used to remotely set up and maintain customer premises equipment (CPE) such as an STB. The major purpose of the Recommendation is to specify basic requirements for remote maintenance in the cable TV system. | 2023-07-14 |
| SG9 | [J.484 (ex J.cable-mabr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17752) | AAP | Requirements of multicast adaptive bitrate (M-ABR) IP delivery | The increased use of audio-visual traffic on the Internet forces cable operators to invest in additional facilities each year. Most of the audio-visual traffic is unicast, which, unlike multicast, consumes much bandwidth, but is easy to use, and compatible with consumer devices such as smartphones and tablets. Since some of unicast connections carry linear programming such as news and sports, the traffic on the delivery network can be significantly reduced if such linear programs are transmitted as a multicast. This Recommendation defines the requirements of an IP delivery technology which makes use of multicast to reduce audio-visual traffic in the cable delivery network but uses HTTP based unicast inside the home network, thereby making it compatible with consumer devices such as smartphones. | 2023-11-15 |
| SG9 | [J.Sup 13 (ex J.FSR-TEST)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18897) | Agreement | Factual subscriber-base reporting and protected content delivery in Conditional Access System – Test Methods | Conditional Access System (CAS) having sub-standard solutions can be prone to manipulations and vulnerable to hacking, leading to loss of revenue to the concerned broadcasters and the government. Therefore, it is necessary to use tested and certified CAS systems to ensure factual reporting of subscriber-base and protected delivery of content to authorised subscribers. The purpose of this supplement is to frame the testing methodology against the various technical requirement of CAS. In addition to develop a framework for standardization (i.e. Technical Requirements), some countries have issued the provisions for assuring broadcasters and content providers that each CAS system has to conform to certain technical features and get tested from certified lab before deployment so that piracy and other malpractices can be minimised. The draft new supplement will provide the clause-by-clause test procedures and expected results for each clause of the draft new ITU-T Recommendation J.1036 such as log requirements, reports requirements, database requirements, security requirements, and more. By applying these test procedures on CAS, two major concerns, 'underreporting of subscribers' and 'content piracy', leading to revenue loss to broadcasters, content providers and the governments’, can easily be ascertained. | 2023-11-23 |
| SG9 | [J.Sup.12 (ex J.Sup-HiNoC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18895) | Agreement | Comparison between third-generation HiNoC and second-generation HiNoC | This supplement indicated the main differences between the third-generation HiNoC (HiNoC 3.0) and the second-generation HiNoC (HiNoC 2.0). This supplement is helpful for operators to choose the proper HiNoC for deployment. | 2023-11-23 |
| SG11 | [Q.3063 - Corr 1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18920) | AAP | Signalling procedures of calling line identification authentication | Corrigendum 1 to Recommendation ITU-T Q.3063 (2022) revises the definition of “calling line identification certificate (CLIC)” | 2023-07-14 |
| SG11 | [Q.4140 (ex Q.CPN)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17846) | AAP | Signalling requirements for service deployment in computing power network | This Recommendation provides the signalling procedures and signalling requirements for service deployment in computing power network (CPN) based on Recommendation ITU-T Y.2501. The signalling requirements for service deployment include centralized mode and distributed mode. | 2023-07-14 |
| SG11 | [Q.5006 (ex Q.hns)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17845) | AAP | Signalling requirements for hierarchical network slicing service | This draft Recommendation specifies the signalling requirements for hierarchical network slicing services. This signalling is used for hierarchically and automatically slicing the network for the customers and its applications. | 2023-07-14 |
| SG11 | [Q.5026 (ex Q.DIVS-IMT2020)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17869) | AAP | Signalling Requirements and Protocol for Providing Network-oriented Data Integrity Verification Service based on Blockchain in IMT-2020 network | This Recommendation specifies signalling requirements and protocol for providing network-oriented data integrity verification service (DIVS) based on blockchain in IMT-2020 network. It includes signalling requirements, protocol procedures and message format between DIVS function with the UEs, the service users, the CEF and other DIVS functions. | 2023-07-14 |
| SG11 | [Q.5027 (ex Q.IITSN)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17853) | AAP | Protocol for IMT-2020 network integration with Time Sensitive Network | This recommendation specifies protocol for IMT-2020 network integration with Time Sensitive Network(TSN), and introduces the communication mechanism between IMT-2020 network and TSN system. It also describes parameters, procedures, signalling flow and message format between core network function of IMT-2020 network and TSN Translator. | 2023-07-14 |
| SG11 | [Q Suppl.76 (ex Q.Sup.CEIR-EIR-int)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17871) | Agreement | Common approaches and interfaces for data exchange between CEIR and EIR | As defined on the ITU-T Q.5050 series, CEIR can be used to combat counterfeit ICT devices, to combat the use of stolen ICT devices and for other purposes. However, implementing a CEIR is a complex project that involves and impacts multiple stakeholders, and may require different processes in each country. Therefore, to assist ITU members on implementation, this supplement aims to identify current industry approach on the data exchange between CEIR and EIR and propose common approaches and interfaces on this topic. | 2023-10-20 |
| SG11 | [QSTR-MCM-UC (ex TR-MCM-Use-Cases)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17860) | Agreement | Use Cases on the combat of Multimedia Content Misappropriation | This Technical Report aims to collect use cases from ITU Members that reflects challenges, opportunities, and results on the combat of multimedia content misappropriation and, with this information compendium, assist ITU members in engaging this problem. To facilitate this information collection, this document proposed a template to be used when including information from new sources, that can either be members state engaging the problem or solution providers | 2023-10-20 |
| SG11 | [Q.1902.3 (2001) Amd.6 (ex Q.1902.3.amd)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18709) | AAP | Bearer Independent Call Control protocol (Capability Set 2) and Signalling System No. 7 ISDN user part: Formats and codes. Amendment 6. Extensions for the support for the calling line identification authentication. | Amendment 6 to Recommendation ITU-T Q.1902.3 was produced to meet the need for the implementation of calling line identification authentication (CIDA) as specified in Q.3063 (2022). This amendment contains the modifications to Recommendation ITU-T Q.1902.3 (2001) in order to accommodate these needs. This amendment should be read in connection with the related amendments to Recommendations ITU-T Q.1902.1 and ITU-T Q.1902.2. | 2023-12-14 |
| SG11 | [Q.3962 (ex Q.joint\_tr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17862) | AAP | Requirements and Reference Model for optimized traceroute of joint Internet Protocol/Multi-Protocol Label Switching | This Recommendation aims to solve the problems of wrong failure location and performance information which brought by the traditional isolated traceroute tools in joint Internet Protocol /Multi-Protocol Label Switching (IP/MPLS) scenario. This Recommendation describes the requirements and reference model for optimized traceroute for joint IP/MPLS. | 2023-12-14 |
| SG11 | [Q.4045 (ex Q.N-att-framework)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17870) | AAP | Framework of network function virtualization automated testing | This Recommendation provides overview and framework requirements of Network Function Virtualization (NFV) automated testing. To introduce NFV automated testing framework, this Recommendation also provides an overview of NFV automated testing and design consideration of it. Then, framework and requirements for NFV automated testing are derived based on the use cases. | 2023-12-14 |
| SG11 | [Q.4046 (ex Q.BaaS-iop-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17849) | AAP | Interoperability testing requirements of blockchain as a service | This Recommendation aims to provide blockchain as a service (BaaS) interoperability testing overview and specifies BaaS interoperability testing requirements which are derived from use cases. | 2023-12-14 |
| SG11 | [Q.4071 (ex Q.UHD-T)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18697) | AAP | The testing of 3D ultra high density IoT networks | High density and ultra-high density communication networks are currently being introduced based on the density requirements for IoT devices. For 3D Ultra-high density networks, the density of IoT devices is 100 devices per cubic meter. Such networks have certain design peculiarities and different fractal figures can be used for their planning. Therefore, it is required to develop models and test methods for high density and ultra-high density networks. New models and test methods for three-dimensional ultra-high density IoT networks will be developed and the structure of a model network for testing will be presented in the proposed Recommendation. | 2023-12-14 |
| SG11 | [Q.4141 (ex Q.BNG-INC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17847) | AAP | Requirements and signalling of intelligence control for the border network gateway in computing power network | This Recommendation provides a network solution to dynamically and flexibly schedule computing tasks at the border network gateway based on real-time computing resource performance, network performance, cost and other multi-dimensional factors based on business needs, thereby improving resource utilization, network utilization efficiency, and improving business user experience. This draft Recommendation aims to study the requirements and signalling of intelligence control for the border network gateway in computing power network. | 2023-12-14 |
| SG11 | [Q.4160 (ex Q.QKDN\_profr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17863) | AAP | Quantum key distribution networks - Protocol framework | Recommendation ITU-T Q.4160 specifies a framework for signalling and protocols for quantum key distribution network (QKDN). | 2023-12-14 |
| SG11 | [Q.4161 (ex Q.QKDN\_Ak)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17873) | AAP | Protocols for Ak interface for quantum key distribution network | Recommendation ITU-T Q.4161 specifies protocols for Ak interface in quantum key distribution network (QKDN). | 2023-12-14 |
| SG11 | [Q.4162 (ex Q.QKDN\_Kq-1)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17875) | AAP | Protocols for Kq-1 interface for quantum key distribution network | Recommendation ITU-T Q.4162 specifies protocols for Kq-1 interface in quantum key distribution network (QKDN). | 2023-12-14 |
| SG11 | [Q.4163 (ex Q.QKDN\_Kx)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17874) | AAP | Protocols for Kx interface for quantum key distribution network | Recommendation ITU-T Q.4163 specifies protocols for Kx interface in quantum key distribution network (QKDN). | 2023-12-14 |
| SG11 | [Q.4164 (ex Q.QKDN\_Ck)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17876) | AAP | Protocols for Ck interface for quantum key distribution network | Recommendation ITU-T Q.4164 specifies protocols for Ck interface in quantum key distribution network (QKDN). | 2023-12-14 |
| SG11 | [Q.5007 (ex Q.IEC-PRO)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17839) | AAP | Signalling architecture for microservices based intelligent edge computing | To develop the IEC architecture, there are a couple of software-oriented architectural ways for building a flexible protocol architecture achieved by deploying and operating the architecture. One approach is an unified software-oriented architecture that composes logically modular functions in a tightly coupled way to similar with a monolithic architecture. Another approach is a microservice architecture, which loosely composes logically or physically separated processing functions as individual microservices. Since the IEC has been developed on different hardware specifications and various functionalities desired by each business demands, it has been standardized based on microservices and used as a reference standard for implementation. Adopting a microservices based IEC architecture facilitates continuous development and operation through the updating of individual microservices. This Recommendation specifies the signalling architecture, protocol interfaces, and protocol procedures for microservices based intelligent edge computing. | 2023-12-14 |
| SG11 | [Q.5008 (ex Q.AIS-SRA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17878) | AAP | Signalling requirements and architecture to support AI based vertical services in future network, IMT2020 and beyond | This Recommendation provides the signalling requirements and architecture to support AI based vertical services in future network, IMT2020 and beyond. These requirements include the signalling information over each reference points and service procedures for high-level AI Platform. | 2023-12-14 |
| SG11 | [Q.5028 (ex Q.IEC-SAINF)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18481) | AAP | Data management interfaces for intelligent edge computing-based smart agriculture service | Recommendation ITU-T Q.5028 defines data management interfaces for intelligent edge computing-based smart agriculture service. The data management interface includes data resources and interfaces for data processing. Data resource can be used to decide what data are for. There are a lot of data needed to check environment and crop-growing status. The interfaces for data Agriculture, data management, edge. Processing defines web-based application programming interface (API) including data creation, retrieving, update and deletion. | 2023-12-14 |
| SG11 | [Q.763 (1999) Amd.7 (ex Q.763.amd)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18710) | AAP | Signalling System No. 7 - ISDN User Part formats and codes. Amendment 7. Extensions for the support for the calling line identification authentication. | Amendment 7 to Recommendation ITU-T Q.763 was produced to meet the need for the implementation of calling line identification authentication (CIDA) as specified in ITU-T Q.3063 (2022). This amendment contains the modifications to Recommendation ITU-T Q.763 (1999) in order to accommodate these needs. This amendment should be read in connection with the related amendments to Recommendations ITU-T Q.761 and ITU-T Q.762. | 2023-12-14 |
| SG11 | [Q.931 (1998) Amd.2 (ex Q.931.amd)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18711) | AAP | ISDN user-network interface layer 3 specification for basic call control. Amendment 2. Extensions for the support for the calling line identification authentication. | Amendment 2 to Recommendation ITU-T Q. 931 was produced to meet the need for the implementation of calling line identification authentication (CIDA) as specified in Q.3063 (2022). This amendment contains the modifications to Recommendation ITU-T Q. 931 (1998) in order to accommodate these needs. | 2023-12-14 |
| SG12 | [ESTR-NUI (ex E.NUI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17833) | Agreement | RF level based single-number indicator for mobile network usefulness for a given range of applications | This Technical Report describes a framework and methodology for a spatially resolved single-number indicator expressing mobile network usefulness for a given range of purposes. The spatial resolution can be adjusted, by respective aggregation; practical ranges start at 25 to 50 m depending on the quality of GNSS data. The spectrum of purposes includes single-network assessment (e.g., expected speech quality or call stability) as well as assessment of coverage for emergency calls, where coverage of multiple networks is combined into a single indicator. Single-number indicators are used in QoS and QoE contexts to express an overall assessment of a system or service from a given perspective. Such indicators are used routinely, e.g., in mobile network benchmarking, where a number of QoS KPI is aggregated towards a single rating. This Technical Report describes a methodology which works in the same way, but is using low-level measurement data, i.e., RF level values. The particular instance, i.e., the actual type of input value, depends on the radio network technology, e.g., RxLev for 2G, RSCP for 3G and RSRP for 4G and 5G, respectively. The indicator which is the result of data processing expresses a quantity from the QoS domain, namely the usefulness of the network coverage for a given range of purposes. The algorithm uses mapping relations which link the input quantity to component quantities from the QoS domain, such as telephony call setup success, call stability or call quality, or respective QoS KPI for packet-data services. These mapping relations are typically created from empirical data, e.g. from analysis of sufficiently large amounts of actual measurement data. It is understood that the respective indicator does not assume the same level of accuracy or relevance as a primary QoS quantity from active measurements. The degree of prediction accuracy will depend on input data available for respective characteristic curves, e.g., visualized by a scatter plot, or a heatmap-style density visualization. The indicator is however providing additional value in situations where only data from passive measurements, i.e., measurement of said RF levels, is available, or to create additional insights from data produced otherwise. It is meant to work with diverse data sources, such as RF level values provided from industrial-grade testing tools, apps, RF scanners, and even crowdsourcing. It is important to understand that this Technical Report does not attempt to provide actual fixed numbers, target values, thresholds or concrete mapping functions, as such absolute relations would not reflect the diversity of applications and situations in mobile network operation worldwide. Rather, it provides a solid methodological framework to create such implementations, as well as accompanying guidance and considerations on reliability of data in relation to properties of data sources. | 2023-09-28 |
| SG12 | [GSTR-RQ (ex G.CQoE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17786) | Agreement | Roadmap for QoS and QoE in the ITU-T Study Group 12 context (TR-RQ) | This Technical Report presents a compilation of Quality of Service (QoS), Quality of Experience (QoE) and related terms defined by ITU-T Recommendations, exploring concepts, differences and relationship. The goal is to provide a roadmap for these concepts in the ITU-T Study Group 12 context, identifying possible definitions’ adjustments, clarifying the application of QoE terminology and which aspects characterize QoE assessment methods. | 2023-09-28 |
| SG12 | [P.Sup30 (ex P.Suppl\_DFS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17827) | Agreement | Considerations on the automation of Digital Financial Services testing | When testing Digital Financial Services, a variety of specific aspects have to be considered. On one hand these services are an unprecedented combination of efforts in both the telecommunication and the financial sector. Secondly, and most important, each test carried out is sending real money (which might be retrieved in many cases) and is being charged real fees (which typically cannot be retrieved and are adding to the cost of testing). Once attempts are made towards automation in DFS testing, many more aspects and requirements need to be considered. This Supplement provides guidance on aspects of automation in DFS testing that need to be included in the test conditions as well as specific instructions that experimenters should consider. This Supplement also provides examples of automation which are suitable for DFS testing. It is meant to be a starting point and basis for industry vendors and other stakeholders in the DFS Ecosystem to develop robust environments for automated testing. In all cases, it is assumed that automation is technology neutral and technology agnostic. | 2023-09-28 |
| SG12 | [G.1092 (ex G.TeleMeTax)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17796) | AAP | Taxonomy of telemeetings from a QoE perspective | This recommendation provides a taxonomy on the different possible types of telemeetings, focussing on aspects that are crucial for Quality of Experience (QoE) assessment. The purpose is to facilitate the selection of appropriate quality assessment methods as well as an appropriate reporting and interpretation of results. | 2023-10-29 |
| SG12 | [P.1204](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19054) | AAP | Video quality assessment of streaming services over reliable transport for resolutions up to 4K | Recommendation ITU-T P.1204 is the introductory document for a set of documents that describe model algorithms for monitoring the video quality for streaming using reliable transport (e.g., adaptive streaming based on the hypertext transfer protocol (HTTP) over the transmission control protocol (TCP), quick user datagram protocol internet connections (QUIC)). The ITU-T P.1204 series of Recommendations comprises different variants of models for sequence-related (between 5 and 10?s) and per-1-second video-quality estimation. The variants differ in the type of input information they use: bitstream based, pixel based, and hybrid (using both bitstream and pixel information). In principle, the per-1-second outputs of these video-quality models can be used together with an audio-quality model for integration into audiovisual quality and, together with information about initial loading delay and media playout stalling events, further into a final per-session model output, an estimate of integral per-session quality (see e.g., ITU-T P.1203, ITU-T P.1203.2, ITU-T P.1203.3). Recommendation ITU-T P.1204 was developed in collaboration with the Video Quality Experts Group (VQEG). The structure of the set of Recommendations reflects the different functionality of modules described in each document: –ITU-T P.1204 (2020), Video quality assessment of streaming services over reliable transport for resolutions up to 4K. –ITU-T P.1204.3 (2020), Video quality assessment of streaming services over reliable transport for resolutions up to 4K with access to full bitstream information. –ITU-T P.1204.4 (2020), Video quality assessment of streaming services over reliable transport for resolutions up to 4K with access to full and reduced reference pixel information. –ITU-T P.1204.5 (2020), Video quality assessment of streaming services over reliable transport for resolutions up to 4K with access to transport and received pixel information. The ITU-T P.1204-series of Recommendations addresses three application areas, which are respectively indicated in the module-related ITU-T P.1204.3, ITU-T P.1204.4 and ITUT P.1204.5: –large-screen presentation as with fixed-network video streaming; –mobile streaming on handheld devices such as smartphones; –presentation on tablet-type devices. | 2023-10-29 |
| SG12 | [P.1204.5](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19055) | AAP | Video quality assessment of streaming services over reliable transport for resolutions up to 4K with access to transport and received pixel information | Recommendation ITU-T P.1204.5 describes the hybrid no-reference video quality estimation model for monitoring the video quality for streaming using reliable transport (e.g., hypertext transfer protocol- (HTTP-)based adaptive streaming (HAS) over the transmission control protocol (TCP), quick user datagram protocol internet connections (QUIC)). The estimate is validated for videos encoded with H.264, H.265, video payload type 9 (VP9) or AOMedia Video 1 (AV1) codecs at any resolution up to 4K/ultra-high definition-1 (UHD-1) resolution for personal computer (PC) monitors and television (TV) and up to 2?560?× 1?440 for mobile (MO) and tablet (TA) displays. The ITU-T?P.1204 series of Recommendations provide sequence-related (between 5?s and 10?s) and per-1-second video-quality estimation. In principle, the per-one-second outputs of these video-quality models can be used together with an audio model for integration into audiovisual quality and, together with information about initial loading delay and media playout stalling events, further into a final per-session model output, an estimate of integral per-session quality (see, for example, ITU-T P.1203, ITU-T P.1203.2, ITU-T P.1203.3). Recommendation ITU-T P.1204.5 was developed in collaboration with the Video Quality Experts Group (VQEG). The ITU-T P.1204-series of Recommendations addresses three application areas: –large-screen presentation as with fixed-network video streaming; –mobile streaming on handheld devices such as smartphones; –presentation on tablet-type devices. | 2023-10-29 |
| SG12 | [P.1211 (ex P.DiAQoSE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17808) | AAP | Derivation procedure of contribution values for quality degradation of adaptive audiovisual streaming services | This recommendation provides the derivation procedure of contribution values that provides information about a relationship between quality-influencing factors (e.g., media quality levels and stalling) and the final media session quality score of adaptive audiovisual streaming services. More precisely, contribution values show how much each quality-influencing factor affects (i.e., decreases) the final media session quality score provided by a quality estimation model (e.g., P.1203 or P.1204) using Shapley theory, which is a key concept in cooperative game theory for distributing profits in a game among participants. This derivation procedure can be used to monitor the streaming service since operators can know which quality-influencing factors decrease the final media session quality score. | 2023-10-29 |
| SG12 | [P.910](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18736) | AAP | Subjective video quality assessment methods for multimedia applications | Recommendation ITU-T P.910 describes non-interactive subjective assessment methods for evaluating the one-way overall video quality, audio quality and audiovisual quality for applications such as multimedia and distribution quality television. These methods can be used for several different purposes including, but not limited to, comparing the quality of multiple devices, comparing the performance of a device in multiple environments, and for subjective assessment where the quality impact of the device and the audiovisual material is confounded. | 2023-10-29 |
| SG12 | [Y.1567 (ex Y.LUL)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18726) | AAP | Latency Under Load metrics and methods of measurement | There is considerable industry interest to conduct tests that capture latency of the user’s path while in-use. The traffic load level associated with “while in-use” is widely proportional to the additional latency measured with respect to the minimum latency, and latency increases rapidly near the maximum load level. A user using application traffic will experience latency within measurable bounds: the lower limit of the minimum latency and the upper limit of latency at Maximum Capacity. Although many measurement applications assess different metrics of latency today, they mostly employ the TCP protocol. Therefore, a clear gap is UDP-based Latency under Load/Responsiveness. This gap is significant, because: 1. User applications/traffic with strict response time requirements will use UDP. 2. The percentage of UDP traffic is significant and continues to grow in proportion to TCP traffic. This Recommendation specifies metrics of latency under simultaneous traffic load, and defines methods of measurement to increase the specificity and repeatability of metric assessment. | 2023-10-29 |
| SG13 | [Y.3656 (ex Y.bDDN-NSMec)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18083) | AAP | Big Data Driven Networking-Mechanism of network service provisioning | The bDDN can provide a better integration and more intelligent capabilities, such as the capability of self-optimization, self-configuration, and intelligent fault management, based on big data plane and its machine learning capabilities. It can provide significantly enhancement to the network service provisioning by using big data intelligence. This recommendation specifies the network service provisioning mechanism in bDDN. | 2023-06-22 |
| SG13 | [Y.2249 (ex Y.arsm)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18109) | AAP | Service model for human-centric touring guide with augmented reality | Recommendation ITU-T Y.arsm specifies a service model for a human-centric touring guide with augmented reality(AR), including the concept, reference architecture, service requirements, and specific application scenarios of the service model. This Recommendation can be used to guide AR-based cultural tourism service providers to develop a service model for human-centric touring guide with AR. | 2023-09-29 |
| SG13 | [Y.3058 (ex Y.trust-arch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18049) | AAP | Functional architecture for trust enabled service provisioning | A trust enabled service is a reliable service which satisfies service and trust requirements, by applying additional functions for trust provisioning capabilities to conventional ICT service entities (including resources, stakeholders, and users), that is able to develop better quality of services and experience. In order to provide trust enabled features to existing ICT services, relevant architectures with key components are required. Therefore, this draft Recommendation provides a functional architecture for trust enabled service provisioning. It describes the concept and requirements and specifies related functional blocks, reference points and trust enabled service provisioning procedures between related functional blocks to support trust provisioning processes. | 2023-09-29 |
| SG13 | [Y.3060 (ex Y.trust-an)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18165) | AAP | Autonomous networks - overview on trust | This Recommendation provides an overview on trust for autonomous networks. It introduces the background and necessities of trust study in areas of network autonomy and network intelligence. The concepts of trust for autonomous networks are explained and defined in the context of trusted autonomous network. Basing on the concepts of trust for autonomous networks, basic principles are also be explained and described in detail. In addition, an overall workflow model for trusted autonomous network is introduced. | 2023-09-29 |
| SG13 | [Y.3083 (ex Y.ICN-SEAN)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18116) | AAP | Information-centric networking in networks beyond IMT-2020: Reference model of on-site, elastic, and autonomous network | This Recommendation describes the elastic and autonomous information-centric networking (ICN), which can meet all the requirements of look-up-based forwarding in ICN described in [ITU-T Y.3075], and its capabilities of on-site forwarding and processing, elastic managing, and autonomous name mapping and resolving to support instant re-addressing and routing efficiently. It describes the reference model, interaction mechanism of different components, and the deployment considerations. | 2023-09-29 |
| SG13 | [Y.3124 (ex Y.IMT-2020.qos-mon)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18046) | AAP | Quality of service monitoring requirements and framework for IMT-2020 and beyond | This Recommendation specifies the quality of service (QoS) monitoring requirements and framework for IMT-2020 and beyond. It first provides an introduction of QoS monitoring for IMT-2020 and beyond. The QoS monitoring requirements and framework are specified accordingly. | 2023-09-29 |
| SG13 | [Y.3125 (ex Y.IMT2020-qos-req-cg)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18084) | AAP | QoS assurance requirements and framework for cloud gaming supported by IMT-2020 network | This Recommendation specifies the QoS assurance aspects for cloud gaming supported by the international mobile telecommunications 2020 (IMT-2020) network. It first provides an overview of the cloud gaming supported by IMT-2020 network. It then specifies the high level requirements, functional requirements, and framework for cloud gaming supported by IMT-2020 network . | 2023-09-29 |
| SG13 | [Y.3204 (ex Y.FMSC-SC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18126) | AAP | Fixed, mobile and satellite convergence - Service continuity for IMT-2020 networks and beyond | The service continuity is the ability for a moving object to maintain ongoing service over including current states, such as user's network environment and session for a service. Fixed, mobile and satellite convergence (FMSC) is the capability that provides services and applications to end users regardless of the fixed, mobile or satellite access technologies. This Recommendation specifies the scenarios, requirements, enablers, network function enhancements, procedures and security considerations of service continuity for FMSC, in the context of IMT-2020 networks and beyond. | 2023-09-29 |
| SG13 | [Y.3815 (ex Y.QKDN-rsfr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18147) | AAP | Quantum key distribution networks - overview of resilience | For seamless key supply even in the case of network failures, this Recommendation describes an overview of resilience and conceptual models of protection and recovery for Quantum key distribution network (QKDN). | 2023-09-29 |
| SG13 | [Y.3816 (ex Y.QKDN-qos-ml-fa)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18676) | AAP | Quantum key distribution networks - Functional architecture enhancement of machine learning based quality of service assurance | This recommendation specifies functional architecture enhancement of machine learning based QoS assurance for the quantum key distribution networks (QKDN). This Recommendation first provides an overview of functional architecture enhancement of machine learning based QoS assurance for the QKDN. It then describes a functional architecture enhancement of QoS assurance which includes functional components such as QoS data collection, data processing, data storage, data analytics, QoS anomaly detection and prediction, QoS policy decision making, enforcement and reporting. Based on the capabilities described in the functional architecture enhancement, this recommendation specifies an operational procedure of QoS assurance for the QKDN. | 2023-09-29 |
| SG13 | [Y.3817 (ex Y.QKDN-qos-iw-req)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18149) | AAP | Quantum key distribution networks interworking - Requirements of quality of service assurance | This Recommendation specifies the high-level and functional requirements of quality of service (QoS) assurance for quantum key distribution networks (QKDN) interworking. The functional requirements include QoS information transfer, QoS negotiation, QoS management and QoS routing. | 2023-09-29 |
| SG13 | [Y.3818 (ex Y.QKDN- iwac)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18422) | AAP | Quantum key distribution networks interworking - architecture | For quantum key distribution networks (QKDN), Recommendation ITU-T Y.QKDN\_iwac specifies functional architecture models for QKDN interworking (QKDNi), i.e., functional architecture with GateWay Nodes (GWNs) and functional architecture with InterWorking Nodes (IWNs). In order realize these two models, it specifies detailed functional elements, basic operational procedures, and architectural configurations for QKDNi. | 2023-09-29 |
| SG13 | [Y.3540 (ex Y.ec-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18101) | AAP | Edge computing - Overview and high-level requirements | This Recommendation provides overview and high-level requirements of edge computing. This Recommendation defines terms related to the edge computing, describes overview of edge computing including concept, common characteristics, ecosystem with operations by edge computing main roles. Also, this Recommendation provides orchestration aspects for edge computing and relationship with other technologies. This Recommendation provides high-level requirements through various use cases. | 2023-10-22 |
| SG13 | [Y.3159 (ex Y.IMT-2020-NSL-fra)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18076) | AAP | Framework for classifying network slice level in future networks including IMT-2020 | The objective of this Recommendation is to specify a framework for classifying network slice level in future networks including IMT-2020. This framework guides the network slice deployment and management. A method for classifying network slice level of future networks including IMT-2020 is introduced. | 2023-10-23 |
| SG13 | [Suppl.40 to ITU-T Y-3600 series (ex Y.sup.bdsr2)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18065) | Agreement | Big data and data handling standardization roadmap | Supplement 40 to ITU-T Y-3600 series Recommendations provides the standardization roadmap for big data and data handling in the telecommunication sector. It describes the landscape and conceptual ecosystem of big data and data handling from an ITU-T perspective, related technical areas, activities in standards development organizations (SDOs) and gap analysis. | 2023-11-03 |
| SG13 | [Suppl.59 to ITU-T Y.3100-series (ex roadmap)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18943) | Agreement | IMT-2020 standardization roadmap | This document provides the standardization roadmap for IMT-2020 and beyond in the information and communication technologies area. This revised Supplement 59 to ITU-T Y.3100-series Recommendations IMT-2020 and beyond standardization roadmap has been developed to assist in the development of IMT-2020 and beyond related standards in the ICT fields by providing information about existing and under developing standards in key standards development organizations (SDOs). | 2023-11-03 |
| SG13 | [Supplement 79 to ITU-T Y.3800-series (ex TR.QKDN-nq)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18831) | Agreement | Quantum key distribution networks - Role in end-to-end cryptographic services with non-quantum cryptography | Based on ITU-T Recommendation Y.3800, many study items are successfully developed and developing so far. However, in case that mobile objects (i.e., autonomous car, mobile phone, etc.) are to be supplied QKD service, there is a difficulty to establish and maintain a quantum channel stably with them. KSA-keys are not able to be supported on this situation. For the purpose of delivery of KSA-keys generated from QKD network into the mobile objects, the keys can be delivered through user network using PKI technology (especially key exchange protocol) with PQC algorithm. Therefore, the integration of QKD network with non-quantum cryptography will enable the QKD network/service providers, bringing its cryptography service to a much wider range of business opportunity. For this purpose, the relationship between QKDN and E2E cryptography service will be introduced. Then, relative examples for the integration of QKD network with non-quantum cryptography will be described. Finally, based on the analysis of the detailed attributes of examples, implications in terms of further study issue will be identified. QKDN’s relation to end-to-end cryptography service Examples for the integration with non-quantum cryptography (e.g., PKI architecture) Implications for standardization activity on Study Group 13 | 2023-11-03 |
| SG13 | [Supplement 80 to ITU-T Y.3800-series (ex Y.Supp.QKDN-UC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18658) | Agreement | Quantum key distribution networks use cases | This Supplement consolidates the QKDN use cases in the context of networking technologies as the mandate of ITU-T SG13. Through a comprehensive analysis, the QKDN uses cases are classified into several classes and this Supplement highlights the competitive advantage of the use cases brought by QKDN and provides suggestions for future standardization efforts in ITU-T SG13. | 2023-11-03 |
| SG13 | [TR.Reqts-SAN](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18431) | Agreement | Requirements of semantic-aware networking for future networks | Semantic-aware network (SAN) adopts machine and human-shared semantic terms and syntax to represent, annotate, analyse, and interpret network and user generated data, and is a promising candidate to support automatic data analysing, processing, and learning for future networks including IMT-2020. This Technical Report identifies potential requirements of SAN for future networks. | 2023-11-03 |
| SG13 | [Y.TR-QN-UC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18657) | Agreement | Use cases of quantum networks beyond QKDN | This Technical Report analyses use cases of quantum networks beyond quantum key distribution network (QKDN) in the context of networking technologies as the mandate of ITU-T SG13. The uses cases which are only applied by quantum networks beyond QKDN are collected, investigated and summarized; all use cases are analysed by problem statement, technical considerations along with a short description of each use case. This Technical Report also provides analyses for future applications and potential standardization considerations. | 2023-11-03 |
| SG13 | [Y.3802 (2020) Amd1 (ex Y.3802)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18975) | AAP | Quantum key distribution networks - Functional architecture | This Amendment aligns Recommendation Y.3802 with Recommendation Y.3810 “Quantum key distribution network interworking – framework”, Figure 2, of which describes a reference model with reference point of Mx. Mx is responsible for the QKDN manager to communicate management information with other QKDN manager. This amendment intends the following: - to add a reference point of Mx in clause 8.4 Reference points on a QKDN manager; - to revise Figure 1 – A functional architecture model of QKDN in clause 6 Functional architecture model to include the Mx reference point and an editorial correction on key | 2023-11-29 |
| SG13 | [Y.3803 (2020) Amd1 (ex Y.3803)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18976) | AAP | Quantum key distribution networks - Key management | Amendment includes the additional reference point Mx into the Y.3810 “Quantum key distribution network interworking – framework”, Figure 2, that describes a reference model. Mx is responsible for the QKDN manager to communicate management information with other QKDN manager. So Amendment includes the following changes: Revision of Figure 2 of Y.3803 – A functional architecture model of QKDN in clause 7 Functional elements of key management to include the Mx reference point and an editorial correction on key relay. | 2023-11-29 |
| SG13 | [Y.3804 (2020) Amd1 (ex Y.3804)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18977) | AAP | Quantum key distribution networks - Control and management | In ITU-T Y.3810 “Quantum key distribution network interworking – framework”, Figure 2 describes a reference model with reference point of Mx. But it is not defined in any Recommendation. Therefore, there needs to be specified the additional reference point, which is Mx for connecting two QKDN managers in ITU-T Y.3802. Mx is responsible for the QKDN manager to communicate management information with other QKDN manager. Since Y.3804 refers the functional architecture model in Y.3802, Figure 1 – Functional elements and reference points relevant to QKDN control and management and relevant texts need to be revised for alignment with the amendment of Y.3802. This amendment intends the following: to revise texts and Figure 1 – Functional elements and reference points relevant to QKDN control and management in clause 7 to include the Mx reference point. to revise texts in clause 9.3.2 Orchestration for external management. to correct an editorial error in Appendix I.7.1. to add descriptions in Appendix I.8 Reference point Mx. | 2023-11-29 |
| SG13 | [Y.3805 (2021) Amd1 (ex Y.3805)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18978) | AAP | Quantum key distribution networks - Software-defined networking control | In ITU-T Y.3810 “Quantum key distribution network interworking – framework”, Figure 2 describes a reference model with reference point of Mx. But it is not defined in any Recommendation. Therefore, there needs to be specified the additional reference point, which is Mx for connecting two QKDN managers in ITU-T Y.3802. Mx is responsible for the QKDN manager to communicate management information with other QKDN manager. Since Y.3805 refers the functional architecture model in Y.3802, Figure 1 of Y.3805 – Functional architecture for SDN control in QKDN needs to be revised for alignment with the amendment of Y.3802. This amendment revises Figure 1 of Y.3805 – Functional architecture for SDN control in QKDN in clause 8 Functional architecture for SDN control in QKDN to include the Mx reference point and captures editorial correction on key relay. | 2023-11-29 |
| SG13 | [Y.3811 (2022) Amd1 (ex Y.3811)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18979) | AAP | Quantum key distribution networks - Functional architecture for quality of service assurance | In ITU-T Y.3810 “Quantum key distribution network interworking – framework”, Figure 2 describes a reference model with reference point of Mx. But it is not defined in any Recommendations. Therefore, there needs to be specified the additional reference point, which is Mx for connecting two QKDN managers in ITU-T Y.3802. Mx is responsible for the QKDN manager to communicate management information with other QKDN manager. Since Y.3811 refers the functional architecture model in Y.3802, Figure 1 – Functional architecture of QoS assurance for QKDN needs to be revised for alignment with the amendment of Y.3802. This amendment revises Figure 1 – Functional architecture of QoS assurance for QKDN to include the Mx reference point and makes few editorial corrections. | 2023-11-29 |
| SG13 | [Y.3814 (2023)Amd1 (ex Y.3814)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18980) | AAP | Quantum key distribution networks - Functional requirements and architecture for machine learning enablement | In ITU-T Y.3810 “Quantum key distribution network interworking – framework”, Figure 2 describes a reference model with reference point of Mx. But it is not defined in any Recommendations. Therefore, there needs to be specified the additional reference point, which is Mx for connecting two QKDN managers in ITU-T Y.3802. Mx is responsible for the QKDN manager to communicate management information with other QKDN manager. Since Y.3814 refers the functional architecture model in Y.3802, Figure 1 – Functional architecture of QoS assurance for QKDN needs to be revised for alignment with the amendment of Y.3802. This amendment revises Figure 8-1 – Functional architecture model of QKDNml to include the Mx reference point and makes an editorial correction. | 2023-11-29 |
| SG13 | [Y.2325 (ex Y.Arch\_NGNe\_ncp)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18654) | AAP | Architectural evolution for Next Generation Network control plane by applying Software-Defined Networking technology | This recommendation aims to standardize an evolved NGN control plane architecture which is scalable, simplified and flexible by decoupling the end-user signalling handling functionality and the user plane control functionality and also treating the signalling as a user service (data) leading to uniform handling of services. This recommendation includes the description of information flow for services such as network attachment, session establishment and registration etc. for the recommended architecture. | 2023-12-14 |
| SG13 | [Y.2346 (ex Y.SFO)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18164) | AAP | Requirements and framework of Service Function Orchestration based on service function chaining | This Recommendation provides the scenarios, requirements and framework of service function orchestration based on service function chaining. Based on user requirement, service function orchestration can realize function services deployment and dynamically adjustment on demand, and based on resource situation, it can realize the resource optimization and load balance of service functions | 2023-12-14 |
| SG13 | [Y.3061 (ex Y.AN-Arch-fw)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18587) | AAP | Autonomous Networks - Architecture framework | This Recommendation provides requirements, architecture, components and related sequence diagrams which together comprise an architecture framework for autonomous networks. The scope of this Recommendation includes: Requirements for the architecture; Description of the architecture and its components; Sequence diagrams explaining the interactions between the architecture components. | 2023-12-14 |
| SG13 | [Y.3091 (ex Y.DTN-CapLevel)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18157) | AAP | Digital twin network - Capability levels and evaluation methods | Digital twin network is a virtual representation of the physical network. It is useful for analyzing, diagnosing, simulating and controlling the physical network, and can help the physical network achieve intelligent decision-making and predictive maintenance. This Recommendation specifies the capability levels and evaluation methods of DTN system to help the telecommunication industry reach a consensus on indicating DTN’s capability levels, as well as DTN’s technical maturity levels. | 2023-12-14 |
| SG13 | [Y.3126 (ex Y.det-qos-rf-intwk-lan)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18675) | AAP | QoS requirements and framework of interworking capability for supporting deterministic communication services in local area network for IMT-2020 and beyond | Interworking capability is an essential function to support QoS-guaranteed data transmission across heterogeneous networks. The data transmission of deterministic communication service in local network usually involves in multiple technology domains. In order to provide efficient QoS guarantee for deterministic communication services in heterogeneous technology domains, this Recommendation defines three types of interworking capability and specifies QoS assurance requirements, framework instances and operational procedures of interworking capabilities, based on the models defined in [ITU-T Y.3121]. | 2023-12-14 |
| SG13 | [Y.3127 (ex Y.IMT2020-SOCN-req-frame)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18114) | AAP | Future networks including IMT-2020 - Requirements and framework for self-organizing core network | The self-organizing core network is a core network constituted by a group of self-organized network entities cooperating to provide core network functions based on the available network capabilities and resources. It may reduce the Capital Expenditure and Operating Expense of core network by efficiently utilizing available network capabilities and resources. This Recommendation specifies overview, requirements, framework and general procedures of self-organizing core network, in the context of future networks including IMT-2020. | 2023-12-14 |
| SG13 | [Y.3128 (ex Y.IMT2020-NFC-req)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18432) | AAP | Requirements for network function communication between Public Networks and public network integrated Non-Public Networks in IMT-2020 | This Recommendation specifies requirements for network function communication between public networks (PNs) and public network integrated non-public networks (NPNs) in IMT-2020. These requirements build on the analysis of relevant use cases and related network problems. There are two types of NPN: public network integrated non-public network; and stand-alone non-public network. The requirements specified in this Recommendation concern the first type. | 2023-12-14 |
| SG13 | [Y.3141 (ex Y.IMT2020-REEM)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18155) | AAP | Energy efficiency management of virtual resources in IMT-2020 networks and beyond | The objective of this Recommendation is to provide AI-assisted intelligent energy efficiency management of virtual resources in IMT-2020 networks and beyond, including functional requirements, architectural model, reference points and service procedures. This Recommendation specifies AI-assisted energy efficiency management of virtual resources in IMT-2020 networks and beyond. This recommendation covers the following aspects: Functional requirements of energy efficiency management of virtual resources in IMT-2020 networks and beyond; Architectural model of energy efficiency management of virtual resources in IMT-2020 networks and beyond; Reference points of energy efficiency management of virtual resources in IMT-2020 networks and beyond; Procedures of energy efficiency management of virtual resources in IMT-2020 networks and beyond. | 2023-12-14 |
| SG13 | [Y.3161 (ex Y.IMT2020-IBNMO)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18124) | AAP | Intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond | The objective of this Recommendation is to specify a intent-based network management and orchestration for network slicing in IMT-2020 networks and beyond. This architecture guides the network slice deployment and management based on intent-based network. | 2023-12-14 |
| SG13 | [Y.3185 (ex Y.Arch-INRA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18082) | AAP | Functional architecture for intelligent awareness of network requirements | What the network can do is meeting various requirements. It is very important to make network operator or network service providers to be aware various network requirements timely and accurately based on artificial intelligence and machine learning related technologies. This Recommendation specifies the functional architecture of intelligent awareness of network requirements. The scope of this Recommendation includes the following aspects related to intelligent awareness of network requirement: introduction of intelligent awareness of network requirement; general functional architecture; network service data based functional architecture; crowd sourcing based functional architecture; functional architecture of requirement descriptor; functional architecture of requirement broker; functional architecture of requirement evaluator. Keywords | 2023-12-14 |
| SG13 | [Y.3205 (ex Y.FMSC-IUSU-req)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18158) | AAP | Fixed, mobile and satellite convergence - Requirements of integrated user-centric service units | An integrated user-centric service unit (IUSU) supports end users to define network and service capability profiles according to their own necessities. Fixed, mobile and satellite convergence (FMSC) is the capability of IUSU in supporting multiple access technologies used by various devices. This Recommendation specifies the scenarios, general characteristics, requirements, framework and security considerations of IUSU for FMSC, in the context of IMT-2020 networks and beyond. | 2023-12-14 |
| SG13 | [Y.3206 (ex Y.FMSC-CE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18133) | AAP | Fixed, mobile and satellite convergence - Capability exposure for IMT-2020 networks and beyond | The capability exposure provides functionalities for network functions to expose their capabilities to third parties (e.g. users or other operators). Fixed, mobile and satellite convergence (FMSC) is the capability that provides services and applications to end users regardless of the fixed, mobile or satellite access technologies. This Recommendation specifies the scenarios, requirements, reference points, network function enhancements, procedures and security considerations of capability exposure for FMSC, in the context of IMT-2020 networks and beyond. | 2023-12-14 |
| SG13 | [Y.3400 (ex Y.IMT2020-CNC-req)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18152) | AAP | Coordination of networking and computing in IMT-2020 networks and beyond - Requirements | The emergence of new services puts forward the need for the support of critical service requirements on computing, networking and storage resources at the same time. The coordination among resources of the same or different types (computing, networking and storage resource types) is necessary. By the application of the coordination of utilization, control and management of computing, storage, and networking resources for the purpose of provisioning and optimization, satisfaction of requirements of resources' users and improvement of resource utilization may be achieved. This Recommendation specifies the requirements for coordination of networking and computing in IMT-2020 networks and beyond (CNC). | 2023-12-14 |
| SG13 | [Y.3533 (ex Y.RaaS-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18102) | AAP | Cloud computing - Functional requirements for robotics as a service | Robotics as a Service (RaaS) is a cloud service category aimed at supporting the development, operation, and management of robots in a cloud computing environment. This Recommendation provides overview of robotics, robotics as a service, and functional requirements through various use cases of robotics in cloud computing. Also, this Recommendation align with the cloud computing reference architecture of ITU-T Y.3502. | 2023-12-14 |
| SG13 | [Y.3550 (ex Y.ccabom-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18142) | AAP | Cloud computing - Requirements for AI based cloud service development and operation management | Recommendation ITU-T Y.3550 aims to provide the overview of AI based cloud service development and operation management based on Recommendation ITU-T Y.3525. It impacts four lifecycle stages of cloud service development and operation management with AI capabilities to improve software development and operation management efficiency. Additionally, this Recommendation also specifies the functional requirements of AI based cloud service development and operation management derived from the corresponding use cases. | 2023-12-14 |
| SG13 | [Y.3657 (ex Y.bDDN-NVReqCap)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18122) | AAP | Big data driven networking- requirements and capabilities of network visibility | This Recommendation specifies requirements and capabilities of network visibility for big-data-driven networking (bDDN). It focuses on the scenario where network infrastructure layer of bDDN corresponds to IP bearer network. The scope of this Recommendation includes the following aspects of network visibility of bDDN: overview for network visibility of big-data-driven networking, requirements and capabilities for network visibility of control aspect, requirements and capabilities for network visibility of forwarding aspect, requirements and capabilities for network visibility of management aspect, interface requirements for network visibility and security considerations. | 2023-12-14 |
| SG13 | [Y.3819 (ex Y.QKDN-amc)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18659) | AAP | Quantum key distribution networks Requirements and architectural model for autonomic management and control enablement | As the number and diversity of devices and other resources that make up the individual QKDNs continue to grow, automating QKDN control and management tasks becomes ever-more important to avoid the untimely actions and improve the quality of service (QoS). To cope with the challenges of QKDN control and management, while minimizing human intervention towards full automation of QKDN services, this draft Recommendation specifies requirements and a possible architectural model for autonomic management and control (AMC)enabled QKDN (QKDNamc) including an overview, requirements, considerations for cognition process, an architectural model, and example procedures. | 2023-12-14 |
| SG15 | [G.698.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18221) | AAP | Multichannel DWDM applications with single-channel optical interfaces | Recommendation ITU-T G.698.1 provides optical parameter values for physical layer interfaces of dense wavelength division multiplexing (DWDM) systems primarily intended for metro applications. Applications are defined using optical interface parameters at the single-channel connection points between optical transmitters and the optical multiplexer, as well as between optical receivers and the optical demultiplexer in the DWDM system. This Recommendation uses a methodology which fixes the maximum attenuation of the multiplexer/demultiplexer and fibre together and, therefore, does not specify the maximum fibre-link length explicitly. This Recommendation includes unidirectional DWDM applications at 2.5 and 10 Gbit/s with 100 GHz channel frequency spacing, as well as applications at 10 Gbit/s with 50 GHz channel frequency spacing. This latest revision of Recommendation ITU-T G.698.1 includes DWDM applications at 25 Gbit/s with 100 GHz channel frequency spacing. | 2023-06-13 |
| SG15 | [G.698.4](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18225) | AAP | Multichannel bi-directional DWDM applications with port agnostic single-channel optical interfaces | Recommendation ITU-T G.698.4 provides optical parameter values for physical layer interfaces of dense wavelength division multiplexing (DWDM) systems primarily intended for metro applications, where the tail-end transmitters have the capability to automatically adapt their DWDM channel frequency to the optical demultiplexer/optical multiplexer (OD/OM) or optical add-drop multiplexer (OADM) port. Applications are defined using optical interface parameters and values for single-channel and multichannel interfaces of multichannel DWDM optical systems in point-to-point applications. This Recommendation uses a system architecture comprising a head-end, connecting to the tail-end equipment (TEE) through a black link. The head end houses a set of transmitters and receivers and an OD/OM. A single bidirectional fibre is used to connect the head-end to the black link OD/OM or OADM. The connection between the OD/OM/OADM and the TEE is also bidirectional. This version of the Recommendation includes DWDM applications at 10 Gbit/s and 25 Gbit/s with minimum channel frequency spacing of 50 GHz and 100 GHz, respectively. | 2023-06-13 |
| SG15 | [G.8013/Y.1731](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18589) | AAP | Operation, administration and maintenance (OAM) functions and mechanisms for Ethernet-based networks | Recommendation ITU-T G.8013/Y.1731 provides mechanisms for user-plane OAM functionality in Ethernet networks according to the requirements and principles given in Recommendation ITU-T Y.1730. This Recommendation is designed specifically to support point-to-point connections and multipoint connectivity in the ETH layer as identified in Recommendation ITU-T G.8010/Y.1306. The OAM mechanisms defined in this Recommendation offer capabilities to operate and maintain network and service aspects of the ETH layer. | 2023-06-13 |
| SG15 | [G.8051/Y.1345 (2020) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18310) | AAP | Management aspects of the Ethernet transport (ET) capable network element - Amendment 1 | Recommendation ITU-T G.8051/Y.1345 addresses management aspects of the Ethernet transport (ET) capable network element containing transport functions of one or more of the layer networks of the Ethernet transport network. The management of the Ethernet layer networks is separable from that of its client layer networks so that the same means of management can be used regardless of the client. The management functions for fault management, configuration management, performance monitoring and security management are specified. The 2009 revision of this Recommendation added the management of additional transport functions that were introduced in the 2009 revision of Recommendation ITU-T G.8021/Y.1341. The 2013 revision of this Recommendation added the management of additional functions, including: client signal fail (CSF); proactive loss measurement using loss measurement message (LMM)/loss measurement reply (LMR); proactive delay measurement using delay measurement message (DMM)/delay measurement reply (DMR) and one-way delay measurement (1DM); synthetic loss measurement using synthetic loss message (SLM)/synthetic loss reply (SLR) and one-way synthetic loss measurement (1SL) (proactive and on-demand); performance management (PM) requirements on protocol data unit (PDU) generation type, message period, measurement interval, repetition period, start time, stop time and session duration; and PM data collection requirements. The 2015 revision of this Recommendation updated the management information (MI) signals for the ETHx\_FT function in clause 8.5, the MI signals for the ETHx/MCC function in clause 8.6, the one-way synthetic loss measurement (1SL) management information (MI) signal for the ETHDe\_FT\_Sk function in clause 8.8 and the on-demand and proactive loss measurement requirements in clause 10.2. The 2018 revision of this Recommendation updated the fault cause persistency function at the ETH connection (ETH-C) function for ring protection, the configuration management for protection switching and connection functions. Finally, in alignment with Recommendation ITU-T G.8021/Y.1341, this revision removed both fault management functions and the management information (MI) signals that are related to ETYn\_TT, ODUkP-X-L/MT\_A and ETYn/ETH\_A. This revision also removed the MI signals to activate processes in adaptation functions (i.e., MI\_Active). The 2020 revision of this Recommendation has updated clause 6 to clause 8 by referring to Recommendation ITU-T G.7710/Y.1701; the fault cause persistency function, and the provisioning and reporting for adaptation functions for FlexE related functions as defined in Recommendation ITU-T G.8023; and transferring ODU related adaptation functions in some tables to Recommendation ITU-T G.874. The 2023 amendment 1 of this Recommendation has updated the Fault cause persistency function; Alarm reporting control function; Operational state function in clause 7; the provisioning and reporting for flow termination and adaptation functions in clause 8 in alignment with ITU-T G.8021 and G.8023. Also this amendment created clause 8.14 "Administrative state” in alignment with G.7710. | 2023-06-13 |
| SG15 | [G.8271.1/Y.1366.1 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18633) | AAP | Network limits for time synchronization in packet networks with full timing support from the network - Amendment 1 | Recommendation ITU-T G.8271.1/Y.1366.1 specifies the maximum network limits of phase and time error that shall not be exceeded. It specifies the minimum equipment tolerance to phase and time error that shall be provided at the boundary of packet networks at phase and time synchronization interfaces. It also outlines the minimum requirements for the synchronization function of network elements. This Recommendation addresses the case of time and phase distribution across a network by a packet-based method with full timing support to the protocol level from the network. Amendment 1 to Recommendation G.8271.1 provides the following updates: Clarifications and improvements in clause XI, Measurement of maximum relative time error limits. Editorial changes replacing the term calibration with compensation that better reflect what is meant throughout this document. Enhanced network limits at reference point C have been added as clause 7.3.3, then for clarity old clause 7.3 text is moved into new clause 7.3.1 and old clause 7.5 is moved to new clause 7.3.2. Change non-inclusive language in line with IEEE1588g | 2023-06-13 |
| SG15 | [G.8273.2/Y.1368.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18635) | AAP | Timing characteristics of telecom boundary clocks and telecom time synchronous clocks for use with full timing support from the network | Recommendation ITU-T G.8273.2/Y.1368.2 specifies minimum requirements for time and phase for telecom boundary clocks and telecom time synchronous clocks used in synchronization network equipment that operates in the network architecture as defined in Recommendations ITU-T G.8271, ITU-T G.8271.1, ITU-T G.8275 and ITU-T G.8275.1. It supports time and/or phase synchronization distribution for packet-based networks. This version of the Recommendation only applies to full timing support from the network. These requirements apply under the normal environmental conditions specified for the equipment. | 2023-06-13 |
| SG15 | [G.8273/Y.1368](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18634) | AAP | Framework of phase and time clocks | Recommendation ITU-T G.8273/Y.1368 is a framework Recommendation for phase and time clocks for devices used in synchronizing network equipment that operate in the network architecture defined in Recommendations ITU-T G.8271, ITU-T G.8275 and the ITU-T G.8271.x-series of Recommendations. | 2023-06-13 |
| SG15 | [G.9805 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18586) | AAP | Coexistence of Passive Optical Network Systems -Amendment 1 | Recommendation ITU-T G.9805 presents three methods for the coexistence of multiple PON generations on a common ODN: Coexistence element (CE), multi-PON module (MPM), and splitter-based. These allow the reuse of already deployed fibre and splitters when evolving a legacy PON to a higher capacity. Methods for calculating required isolation for Coexistence element, filter considerations for HSP and XG(S)-PON OLT, and optical interface parameters for GPON/XG(S)-PON MPM supporting Class B+, C+ and D OPL are also described. Amendment 1 includes additional 3-gen PON systems coexistence methods, and Crosstalk analysis between PON systems. | 2023-06-13 |
| SG15 | [G.987.2 (2023) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18835) | AAP | 10-Gigabit-capable passive optical networks (XG-PON): Physical media dependent (PMD) layer specification - Amendment 1 | Recommendation ITU-T G.987.2 describes the physical layer requirements and specifications for the XG-PON physical media dependent (PMD) layer. Wavelength enhancement bands are described in Recommendation ITU-T G.987.1. The transmission convergence (TC) layer is described in Recommendation ITU-T G.987.3. The ONU management and control interface (OMCI) specifications are described in Recommendation ITU-T G.988. Recommendation ITU-T G.987.2 describes a flexible optical fibre access network capable of supporting the bandwidth requirements of business and residential services. The G.987 series of standards allows for multiple upstream and downstream line rates. This Recommendation currently defines one type of 10-Gigabit-capable passive optical network (XG-PON) system with asymmetric nominal line rate of 9.95328 Gbit/s in the downstream direction and 2.48832 Gbit/s in the upstream direction. This Recommendation describes a system that represents an evolutionary development from the systems described in the ITU-T G.984 series. To the greatest extent possible, this Recommendation maintains the requirements of Recommendation ITU-T G.984.1 to ensure maximal continuity with existing systems and optical fibre infrastructure. Amendment 2 continues the maintenance and evolution of physical media dependent (PMD) layer specifications for XG-PON as defined in this Recommendation. It includes technical updates and corrections for changing references to XG-PON1 to XG-PON, replacing the mask of the eye diagram for ONU transmitter, updating the DD40 downstream specification, correcting the X/S tolerance mask for ONU and updating the X/S tolerance mask for OLT. This revision adds a new Annex specifying out of band noise limits on XG-PON ONUs to reduce the impact on other systems coexisting on the same PON. Amendment 1 restores the X/S figure (Figure 10-1). | 2023-06-13 |
| SG15 | [G.989.3 (2021) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18553) | AAP | 40-Gigabit-capable passive optical networks (NG-PON2): Transmission convergence layer specification - Amendment 1 | Amendment 1 to ITU-T Recommendation G.989.3 Rev 2 (2021) incorporates regular maintenance items, supplying new Appendix XI describing the behavior of an NG-PON2 ONU in the Emeregency Stop state, introducing the deactivation reason code reported downstream for offline troubleshooting purposes, and fixing the inconsistency in handling of the Forgotten ONU timer TO6. | 2023-06-13 |
| SG15 | [G.9960](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18838) | AAP | Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification | Recommendation ITU-T G.9960 belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9960 specifies the system architecture and physical (PHY) layer for wireline-based home networking transceivers which are capable of operating over premises' wiring, including inside telephone wiring, coaxial cable, and power-line wiring. It complements the data link layer (DLL) specification in Recommendation ITU-T G.9961, and the power spectral density (PSD) specification in Recommendation ITU-T G.9964. This revision comprises ITU-T G.9960 (2018) plus its Corrigendum 1, Amendment 1, Amendment 2, Corrigendum 2, and Amendment 3, along with the specification of a new PHY frame type for use by ITU-T G.9991. | 2023-06-13 |
| SG15 | [G.9963](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18836) | AAP | Unified high-speed wireline-based home networking transceivers - Multiple input/multiple output specification | Recommendation ITU-T G.9963 belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9963 specifies the additions and modifications to Recommendations ITU-T G.9960 and ITU-T G.9961 that are needed for a multiple input multiple output (MIMO) home networking transceiver capable of operating over premises power-line wiring. MIMO transceivers are able to transmit and receive over three power-line conductors (phase, neutral and ground). This Recommendation also specifies the means by which transceivers that comply with ITU-T G.9960, ITU-T G.9961 and ITU-T G.9963 interoperate when used on the same wires. | 2023-06-13 |
| SG15 | [L.340](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18263) | AAP | Maintenance of telecommunication underground facilities | Underground facilities such as tunnels, maintenance holes and handholes are deteriorating continuously as time go by. For example, cracks and water leakages occur and these phenomena degrade the safety and serviceability of the underground facilities. If the deterioration is neglected, large-scale repair and reinforcement measures may be required, which will further increase the cost in the future. Therefore, it is highly recommended that periodic inspection and timely maintenance are performed. Safety management of telecommunication infrastructure facilities is generally described in ITU-T Recommendation L.330, but the detailed technologies and countermeasures for each facility are left for other Recommendations. This Recommendation describes the inspection procedures, technologies and countermeasures for maintenance of underground facilities defined in L.330. | 2023-06-13 |
| SG15 | [G.9802.2 (ex G.WDMPON.pmd&tc)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18233) | AAP | Wavelength division multiplexed passive optical networks (WDM PON): physical media dependent (PMD) layer and transmission convergence (TC) layer specification | This Recommendation describes a Wavelength Routed Optical Distribution Network (WR-ODN) based Wavelength Division Multiplexed Passive Optical Network (WDM PON). This Recommendation, as part of the multi-wavelength passive optical network (MW-PON) G.9802 series Recommendation, specifies a PON system utilising a wavelength multiplexer in the Optical Distribution Network (ODN). The specifications of both the physical media dependent (PMD) and transmission convergence (TC) layers of WR-ODN based WDM PON are captured in this Recommendation. The PMD layer specification includes aspects such as the reference logical architecture, wavelength plan, optical path loss, transmitter and receiver specifications, compatible ODN, etc. The TC layer specification includes the details of the Forward Error Correction (FEC) code, implementation methods of the management channel, management functions, a set of processes and messages, etc. to provide similar operation experience as legacy PON systems, e.g., silent start and capability to map a local Physical Layer Operation, Administration and Maintenance (PLOAM) channel. | 2023-07-22 |
| SG15 | [G.709.1/Y.1331 (2018) Amd.4](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18591) | AAP | Flexible OTN short-reach interfaces - Amendment 4 | Amendment 4 adds definitions for FlexO frames using 800 Gb/s physical interfaces, including mapping of Ethernet directly to FlexO (without defining an associated FEC frame), modifications related to 100 Gb/s per lane signalling for FlexO-1 and FlexO-4, (i.e., FOIC1.1, FOIC4.4), editorial clarifications related to renaming Pad overhead as Extended overhead, reorganization of the FlexO frame description to enable potential use of different types of FEC frames for beyond 400G interfaces, and additional overhead to support new FlexO applications. | 2023-08-22 |
| SG15 | [G.798](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18592) | AAP | Characteristics of optical transport network hierarchy equipment functional blocks | Recommendation ITU-T G.798 specifies both the components and the methodology that should be used in order to specify the optical transport network (OTN) functionality of network elements; it does not specify individual optical transport network equipment. Edition 7.0 of this Recommendation includes the text of Amendments 1, 2, 3 and 4, as well as Corrigenda 1 and 2 to Edition 6.0 of this Recommendation, the addition of the ODUkP to ETH adaptation function using Idle Mapping Procedure (IMP) and a number of editorial enhancements. | 2023-09-06 |
| SG15 | [G.9940 (ex G.fin-SA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18226) | AAP | High speed fibre-based in-premises transceivers - system architecture | Recommendation ITU-T G.fin-SA belongs to the family of ITU-T G.fin Recommendations. Recommendation G.fin-SA specifies the system architecture and requirements for high speed fibre-based in-premises transceivers. | 2023-12-02 |
| SG15 | [G.9961](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18837) | AAP | Unified high-speed wireline-based home networking transceivers - Data link layer specification | Recommendation ITU-T G.9961 belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9961 specifies the data link layer (DLL) for wireline-based home networking transceivers capable of operating over premises wiring including inside telephone wiring, coaxial cable, and power-line wiring. It complements the system architecture and physical (PHY) layer specification in Recommendation ITU-T G.9960, and the power spectral density (PSD) specification in Recommendation ITU-T G.9964. This revision comprises ITU-T G.9961 (2018) plus its Amendments 1, 2 and 3, and Corrigenda 1 and 2, along with a new Annex B on authentication to a domain using external authentication for smart grid applications. | 2023-12-02 |
| SG15 | [G.9964](https://www.itu.int/ITU-T/workprog/wp_item.aspx?isn=18859) | TAP | Unified high-speed wireline-based home networking transceivers – Power spectral density specification | Recommendation ITU-T G.9964 specifies the control parameters that determine spectral content, power spectral density (PSD) mask requirements, a set of tools to support reduction of the transmit PSD, means to measure this PSD for transmission over telephone wiring, power line wiring and coaxial cable, as well as the allowable total transmit power into a specified termination impedance. It complements the system architecture and physical layer (PHY) specification in Recommendation ITU T G.9960, and the data link layer (DLL) specification in Recommendation ITU-T G.9961, as well as the modifications and additions to these Recommendations specifying the multiple input/multiple output (MIMO) home networking transceiver in Recommendation ITU-T G.9963.  This revision comprises ITU-T G.9964 (2011) plus its Amendments 1, 2 and 3, along with the addition of a narrower subcarrier spacing (12.20703125 kHz) for scenarios where the channel is very narrow (e.g., power line communication for smart grid applications). |  |
| SG16 | [F.749.16 (ex F.CUAV-LX)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17496) | TAP | Requirements for logistics express delivery based on civilian unmanned aerial vehicles | At present, logistics express delivery based on civilian unmanned aerial vehicle (CUAV) is developing rapidly all over the world. Compared with general water transportation and land transportation, CUAV transportation has the advantages of low cost, flexible scheduling, and can make up for the shortcomings of traditional air transportation. It will change people's consumption mode. This Recommendation provides the requirements for service system and management of CUAV logistics express delivery. | 2023-07-10 |
| SG16 | [F.751.8 (ex H.DLT-TFR)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17522) | TAP | Technical framework for DLT to cope with regulation | This Recommendation defines the technical framework for DLT to cope with regulation, including the regulatory challenges and the technical capacities. The design of the technical framework of DLT in this Recommendation is closely related to the DLT properties including decentralization, immutability and openness. This Recommendation can be used as a guidance of DLT system when facing regulation for DLT service providers and DLT system developers. | 2023-07-10 |
| SG16 | [FSTP-ACC-Rural](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18622) | Agreement | Use cases of accessibility to multimedia systems in rural and out-of-home environments | This document describes the use cases of Interactive Mobile Digital Unit in rural and out of home environments, especially in developing countries. The purpose of this Technical Paper is to describe the architecture and use cases of such a unit, which is to be used for overcoming the barriers that are a common denominator in developing countries, such as lack of infrastructures, connectivity and electricity. Such a unit is expected to provide inclusion of persons with disabilities, with auditory processing disorder and visual impairment, while promoting faster comprehension of the content delivered. | 2023-07-21 |
| SG16 | [T.801 (V3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17650) | AAP | Information technology - JPEG 2000 image coding system: Extensions | Rec. ITU-T T.801 | ISO/IEC 15444-2 extends the capabilities of Rec. ITU-T T.800 | ISO/IEC 15444-1 ("JPEG 2000"). The 1st edition of this Recommendation | International Standard dates to 2004. It has since then been supplemented by amendments and corrigenda, several of its normative references have been obsoleted, and industry practices have evolved. The 2nd edition has addressed these shortcomings without modifying its scope. This 3rd edition introduces an additional entry into the SGcod and Ppoc parameters for supporting a new progression order. In comparison with the second edition of this Recommendation | International Standard, this edition introduces the following changes: – Support for progression order extensions This third edition cancels and replaces the second edition (ITU-T T.801 (2021) | ISO/IEC 15444-2:2021), which has been technically revised. This Recommendation was developed jointly with ISO/IEC JTC 1/SC 29/WG 1 (JPEG), and is common text with ISO/IEC 15444-2. | 2023-08-29 |
| SG16 | [F.740.3 (ex F.ARMSMeta)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17514) | AAP | Metadata for digital representation of cultural relics/artworks using augmented reality | Augmented reality cultural service system (ARCSS) is a kind of digital interpretation system based on augmented reality (AR), it is able to present a story or history behind the cultural relics/artworks in a dynamic and actual fusion way. This Recommendation describes the information flows of Augmented reality cultural service, including AR content creation information flow and AR content display information flow. Based on the information flows, this Recommendation specifies the metadata for digital representation of cultural relics/artworks using augmented reality. | 2023-09-13 |
| SG16 | [F.740.4 (ex F.DC-IAA-Meta)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17606) | AAP | Metadata for image aesthetics assessment with aesthetic attributes in mobile terminal computational photography systems | Image aesthetics assessment (IAA) aims to evaluate whether an image conforms to the aesthetic preferences of a potential audience. This Recommendation defines metadata for image aesthetics assessment with aesthetic attributes in a mobile terminal computational photography system. The metadata is divided into three dimensions according to the key roles: photographer, camera and viewer, and provides non-redundant, fundamental and representative aesthetic attributes of each dimension. The role-based metadata defined in this Recommendation can be used to guide the construction of IAA datasets, and to provide multiple aesthetic attributes evaluation for IAA. Moreover, sample collection requirements and qualifications for annotators are recommended to guide high quality data construction. | 2023-09-13 |
| SG16 | [F.740.5 (ex F.DC-AWBE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17605) | AAP | Data collection and annotation requirements for automatic white balance (AWB) enhancement in mobile terminal for digital culture | This Recommendation provides the collection procedure of data for automatic white balance (AWB) enhancement and describes the requirements for all steps, which includes the requirements for scene selecting, shooting setting, data capturing and illumination uniformity detecting. The requirements of data annotation are also described in this Recommendation, including the illumination colour, illumination indicator and device. The goal of this Recommendation is to improve the user experience during image data transmission, which is the most popular cultural behaviour. | 2023-09-13 |
| SG16 | [F.740.6 (ex F.DC-EMES-RAS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17581) | AAP | Reference framework and requirements for Internet protocol multimedia subsystem early media and extension service systems | Since 2017, traditional audio ring tone services have gradually entered the end of their life cycle, and the global market space including the Chinese and Korean markets has been declining year by year. From 2017 to 2019, China Mobile and Huawei, EASTCOM-BUPT, ZTE and other platform vendors, as well as Samsung, Qualcomm, OPPO, vivo and other chip and terminal manufacturers, have comprehensively innovated the video ring tone service. At present, the video ring tone has been applied in the Chinese market (including China Mobile, China Unicom, China Telecom), and the cumulative number of users has exceeded 200 million. In addition, other European and Asian countries are also introducing and deploying video ring tone services. However, we also encountered some industry obstacles, including obstacles on UEs, contents, and networks. We need to consider the solution on some key industry obstacles in this work item. The scope of Specifying the technical requirements and extended application scenarios of the Early Media is the primary task of standardization based on which this proposal proposes the application scenarios and requirements of Early Media service. | 2023-09-13 |
| SG16 | [F.740.7 (ex F.DC-MTCPS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17545) | AAP | Reference architecture and requirements for mobile terminal computational photography systems | This Recommendation specifies a reference architecture for mobile terminal computational photography system, which includes three functional blocks, namely optical imaging block, image processing block and application block. This recommendation also describes requirements for the mobile terminal computational photography system. This Recommendation can facilitate cooperation between manufactures, and enhance developing efficiency, so as to provide end users better photography experiences. The aim is to define the reference architecture and requirements for the mobile terminal photography system. | 2023-09-13 |
| SG16 | [F.744.5 (ex F.CDN-P2P)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17481) | AAP | Requirements for content delivery networks based on P2P technology | This Recommendation describes the requirement for a peer-to-peer content delivery network (P2P CDN). It specifies the overall functional architecture, domains and functional role relationships, functional blocks and their mutual relationships, service provision requirement, availability requirement, scalability requirement and security considerations. P2P CDN provides a scalable and elastic CDN function pool of shareable terminal devices computing resources, storage resources and uplink bandwidth to save loads of current CDN and improve user experience. | 2023-09-13 |
| SG16 | [F.747.13 (ex F.CEC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17635) | AAP | Requirements and reference framework of cloud-edge collaboration in industrial machine vision systems | This Recommendation specifies requirements and reference framework of cloud-edge collaboration in industrial machine vision systems, and provides use cases. The cloud-edge collaboration is a process (or method) that coordinates cloud computing and edge computing, dynamically allocates required computing, algorithm models, data, or other resources, and jointly completes the same tasks (or objectives) agreed in advance. In industrial machine vision systems, the cloud-edge collaboration includes resource collaboration (computing, network, and storage), service collaboration (data, intelligence, and task), and application collaboration (capability and management). This Recommendation is intended to guide the design and development of industrial machine vision systems. | 2023-09-13 |
| SG16 | [F.748.22 (ex H.FDISarch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18528) | AAP | Functional architecture for feature-based distributed intelligent systems | This Recommendation defines the architecture, the functional entities, and the reference points for feature-based distributed intelligent systems. | 2023-09-13 |
| SG16 | [F.748.25 (ex F.AI-SCS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17531) | AAP | Requirements for speech interaction of intelligent customer services | This Recommendation describes the scenarios, high-layer level architecture, functional requirements and performance requirements for speech interaction of intelligent customer service. Some detailed use cases and reference process of the creation of the knowledge base are described in the appendix. | 2023-09-13 |
| SG16 | [F.751.10 (ex H.DLT-DCS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17641) | AAP | Framework and requirements for DLT-based digital collection services | DLT-based digital collection services are provided by DLT system to perform different operations towards digital collections, including issuance, sale, purchase, auction, transaction, transfer etc. This Recommendation specifies framework and requirements for DLT-based digital collection services, and it may be used to guide the DLT-based digital collection services. | 2023-09-13 |
| SG16 | [F.751.11 (ex H.DLT-PTS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18613) | AAP | Performance test suite for distributed ledger technology systems | This Recommendation provides a performance test suite for DLT system based on assessment criteria proposed in ITU-T F.751.1 and ITU-T F.751.6. This Recommendation specifies the basic principles and main dimensions of the performance testing for DLT system, and provides a suit of test cases, which can help users quantitatively and objectively analyses the performance of DLT system with different test environment comprehensively, and find the most suitable path to improve the performance. | 2023-09-13 |
| SG16 | [F.751.12 (ex H.DLT-VERI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17520) | AAP | Formal verification framework for smart contract on distributed ledger technology | Smart contracts can be used to reduce complex business contracts by directly enforcing the contract's payment methods and paybacks, and by automating the process of contract execution and verification into the network, without the intervention and cost of the person checking the contract's performance. However, smart contracts are a series of program codes generated on distributed ledger technology (DLT) and problems may occur in the process of executing the smart contract. As a method to solve problems that occur in the program execution environment, there is a formal verification. This Recommendation specifies formal verification framework for smart contract on distributed ledger technology (DLT), its overview, requirement and architecture in its framework, as well as the main technical direction of its formal method component. This Recommendation can be used as a guideline for smart contract developer to build systems. | 2023-09-13 |
| SG16 | [F.751.13 (ex F.DLT-DPT)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17578) | AAP | Framework and requirements for distributed ledger technology-based distributed power trading systems | This document proposes a distributed power transaction reference architecture based on DLT, so that the distributed power DLT can be built on the framework of common technology, so that it can be developed and expanded in a sustainable manner and reduce the cost of enterprise access. This document divides the roles and activities of participating subjects, clarify the responsibilities and obligations of each participating subject, and avoid unclear rights and responsibilities. This document provides contract templates for different transaction modes, standardize contract objects and data structures, and avoid repeated design and development. This Recommendation specifies the framework and requirements for the distributed power trading (DPT) system based on distributed ledger technology (DLT). The framework includes the infrastructure layer, the interface layer, and the application layer. | 2023-09-13 |
| SG16 | [F.751.9 (ex H.DLT-TEE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17579) | AAP | Trusted execution environment based confidential computing on distributed ledger technology systems | This Recommendation specifies a trusted execution environment based confidential computing on distributed ledger technology system: decomposes user’s confidentiality demand into concrete requirements of each step during DLT service utilization; analyses detailed security requirements and technical requirements of trusted execution environment based confidential computing to guarantee the confidentiality in the life cycle of a transaction from end to end; addresses the framework of trusted execution environment based confidential computing, as well as detailed procedures to realize security requirements and technical requirements. | 2023-09-13 |
| SG16 | [F.780.4 (ex F.TELM)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17529) | AAP | Reference framework, requirements and scenarios for telemedicine systems | This Recommendation describes the reference framework, requirements and scenarios of telemedicine system. Telemedicine system is an important application of ICT in medical field, under the background of unbalanced medical resources, which can realize the optimal allocation of medical resources and benefit people in areas with less developed medical resources. It recommends the framework, functional requirements, and scenarios of telemedicine system which are the necessary hardware and software foundations for telemedicine. The Recommendation is suitable for the development, construction and evaluation of telemedicine system in different countries and regions. | 2023-09-13 |
| SG16 | [H.265 (V9)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17601) | AAP | High efficiency video coding | Recommendation ITU-T H.265 | International Standard ISO/IEC 23008-2 represents an evolution of the existing video coding Recommendations (ITU-T H.261, ITU-T H.262, ITU-T H.263 and ITU-T H.264) and was developed in response to the growing need for higher compression of moving pictures for various applications such as Internet streaming, communication, videoconferencing, digital storage media and television broadcasting. It is also designed to enable the use of the coded video representation in a flexible manner for a wide variety of network environments. The use of this Recommendation | International Standard allows motion video to be manipulated as a form of computer data and to be stored on various storage media, transmitted and received over existing and future networks and distributed on existing and future broadcasting channels. This revision adds the specification of additional levels (levels 6.3, 7, 7.1, and 7.2), the specification of level 8.5 for the video profiles, and also includes corrections to various minor defects in the prior content of the Specification. This Recommendation | International Standard was developed jointly with ISO/IEC JTC 1/SC 29 and corresponds in a technically aligned manner to ISO/IEC 23008-2. | 2023-09-13 |
| SG16 | [H.266.1 (V2)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17536) | AAP | Conformance specification for ITU-T H.266 versatile video coding | Recommendation ITU?T H.266.1 "Conformance specification for ITU-T H.266 versatile video coding" specifies tests for (non-exhaustive) testing to verify whether bitstreams and decoders meet the normative requirements specified in ITU?T H.266 | ISO/IEC 23090-3 versatile video coding (VVC). The bitstreams provided with this document correspond to the 04/2022 (V2) edition of Rec. ITU-T H.266. Relative to the previous edition, this version adds bitstreams for the 12-bit and 16-bit profiles that were added in the second edition of Rec. ITU-T H.266. This draft new Recommendation was developed collaboratively with ISO/IEC JTC 1/SC 29, and corresponds with ISO/IEC 23090-15 as technically aligned twin text. The conformance bitstreams needed for this Recommendation are available at the following link: https://www.itu.int/wftp3/av-arch/jvet-site/bitstream\_exchange/VVC2ndEd/FDIS.zip | 2023-09-13 |
| SG16 | [H.430.3 (V2)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17599) | AAP | Service scenario of immersive live experience (ILE) | Recommendation ITU-T H.430.3 identifies service scenarios by analysing several use cases on immersive live experience (ILE) services, in order to classify ILE services and to clarify a reference model of ILE. The new edition of Recommendation H.430.3 appended service scenarios and use cases of interactive immersive services (IIS) as the part of ILE. This Recommendation also summarises several use cases and identifies candidate technologies for implementing ILE, including standards gap analysis related to ILE technologies. | 2023-09-13 |
| SG16 | [H.430.6 (ex H.ILE-Haptic)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17647) | AAP | Media transport protocols, signalling information of haptic transmission for immersive live experience (ILE) systems | ILE systems may handle haptic information, such as vibrotactile and kinaesthetic actions, for increasing more immersiveness in addition to audio and video. Haptic information should be transmitted synchronously with audio, video and lighting information. This draft Recommendation identifies media transport protocol and signalling information of haptic transmission for immersive live experience (ILE) systems, in order to transmit haptic information synchronously for provide ILE services. | 2023-09-13 |
| SG16 | [H.430.7 (ex H.IIS-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17607) | AAP | Requirements of interactive immersive services | This Recommendation provides the definition and requirements of interactive immersive services (IIS). Based on the overview of IIS, the requirements which include interactive capabilities, synchronous transmission of concurrent streams, intelligent distribution of massive multimedia data, media processing for immersive interactive information, and network status awareness with QoE scheduling, are specified in this Recommendation. | 2023-09-13 |
| SG16 | [H.644.6 (ex H.VDSSArch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17518) | AAP | Architecture for video distribution systems | This Recommendation specifies the architecture for video distribution systems. The video distribution system described in this Recommendation is an over-the-top video application system, which has the capabilities of video access, distribution, transcoding, processing, management, and presentation, and can provide the live video streaming service, video on demand service, and other related value-added services to users on the Internet. Users can directly use the video distribution functions through the system without complex system development, deployment and maintenance processes. | 2023-09-13 |
| SG16 | [H.644.7 (ex H.MPSArch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17517) | AAP | Functional architecture for media processing services | This Recommendation specifies the functional architecture for the media processing services. In particular, the scope of this Recommendation includes domains and functional roles relationship, functional architecture and reference points. Media processing services utilize a set of techniques including cloud computing, computing resource virtualization, and job queue processing to dynamically control and manage all kinds of computing resources, which improves scalability, flexibility, and availability. | 2023-09-13 |
| SG16 | [H.705.1 (ex H.IPTV-LSFA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17477) | AAP | Layered specification for the IPTV service platform functional architecture based on open service capabilities | This recommendation describes a layered architecture of IPTV service platform intended to provide open service capabilities for diversified IPTV services. In comparison with the high-level IPTV functional architecture defined in Recommendation ITU-T Y.1910, the layered architecture decouples service logic from data resource and decompose the functions of IPTV service platform into more granular modules. This recommendation specifies the fine-grained functional modules and reference points, by considering the aspects of service offering and operational management. It also defines typical procedural flows on content preparation, service presentation and content consumption in appendices. This recommendation provides reference for IPTV service providers to construct the open platform of IPTV services and enables automatic deployment and fast iteration of multimedia applications in the platform. It’s of benefit to promote service capability of IPTV and further enhance user experience on using diversified IPTV services. | 2023-09-13 |
| SG16 | [H.705.2 (ex H.IPTV-QUICReq)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17591) | AAP | Requirements for live streaming systems based on QUIC | This Recommendation specifies the requirements of a live streaming system to utilize QUIC transport protocol to improve its delivery performance and security. It also describes the procedures and framework for QUIC-based live streaming system to provide unicast or multicast service encapsulating in QUIC protocol. With this Recommendation, a live streaming service provider can gain understanding of how to utilize QUIC protocol to provide unicast or multicast live streaming media service. With QUIC transport protocol, the services will have lower connection establishment and delivery delay, enhanced delivery performance, and security insurance. | 2023-09-13 |
| SG16 | [H.862.6 (ex F.CS-AEI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17627) | AAP | Functional requirements for counselling services based on artificial emotional intelligence | This Recommendation proposes service requirements and functional specifications for counselling services based on artificial emotional intelligence technologies. This Recommendation proposes a service model in counselling services using several scenarios. At a time when artificial intelligence (AI) technologies are widely proposed and used, the relevant standards can be an important opportunity to facilitate the development of the technology in the industry. | 2023-09-13 |
| SG16 | [T.873 (V3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18692) | AAP | Information technology - Digital compression and coding of continuous-tone still images: Reference software | To simplify the use of the JPEG format (Rec. ITU-T T.81 | ISO/IEC 10918-1), this Recommendation | International Standard provides two reference software implementations that provide guidance how to implement Rec. ITU-T T.81 | ISO/IEC 10918-1. Rec. ITU-T T.81 | ISO/IEC 10918-1 is in wide use worldwide. It provides a compressed representation of continuous tone digital images. This Recommendation was developed jointly with ISO/IEC JTC 1/SC 29/WG 1 (JPEG), and corresponds as common text with ISO/IEC 10918-7. This third edition cancels and replaces the second edition, which has been technically revised. The main changes compared to the previous edition are as follows: This second edition updates Reference Software A to release 1.65, and Reference Software B to release 3.0.0. This version of Reference Software A corrects implementation errors and improves the overall stability of the software. This version of Reference Software B now also includes support for 8-bit and 12­-bit codestreams in one single integrated code. | 2023-09-13 |
| SG16 | [H.266 (V3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17648) | AAP | Versatile video coding | Recommendation ITU-T H.266 specifies a video coding technology known as Versatile Video Coding and it has been designed with two primary goals. The first of these is to specify a video coding technology with a compression capability that is substantially beyond that of the prior generations of such standards, and the second is for this technology to be highly versatile for effective use in a broadened range of applications than that addressed by prior standards. Some key application areas for the use of this standard particularly include ultra-high-definition video (e.g., with 3840×2160 or 7620×4320 picture resolution and bit depth of 10 bits as specified in Rec. ITU-R BT.2100), video with a high dynamic range and wide colour gamut (e.g., with the perceptual quantization or hybrid log-gamma transfer characteristics specified in Rec. ITU-R BT.2100), and video for immersive media applications such as 360° omnidirectional video projected using a common projection format such as the equirectangular or cubemap projection formats, in addition to the applications that have commonly been addressed by prior video coding standards.  This revision adds the specification of a new level (level 15.5) for the video profiles to provide a suitable label for bitstreams that can exceed the limits of all other specified levels, additional supplement enhancement information, and corrections to various minor defects in the prior content of the Recommendation.  This Recommendation was developed collaboratively with ISO/IEC JTC 1/SC 29, and corresponds with ISO/IEC 23090?3 as technically aligned twin text. | 2023-09-29 |
| SG16 | [H.273 (V3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18689) | AAP | Coding-independent code points for video signal type identification | This revised Rec. ITU-T H.273 adds the specification of code point identifiers for YCgCo-R colour representation with equal luma and chroma bit depths and for the colour representation specified in SMPTE ST 2128. The new code points for YCgCo-R are referred to as YCgCo-Re and YCgCo-Ro, where the number of bits added to a source RGB bit depth is 2 (i.e., even) and 1 (i.e., odd), respectively. SMPTE ST 2128 specifies a colour representation referred to as IPT-PQ-C2 This Recommendation was developed jointly with ISO/IEC JTC 1, Information technology, Subcommittee SC 29, Coding of audio, picture, multimedia and hypermedia information, and Rec. ITU-T H.273 is maintained as technically aligned twin text with ISO/IEC 23091-2. The changes specified in this version correspond to the technical content of a not-yet-published future (third) edition of ISO/IEC 23091-2. | 2023-09-29 |
| SG16 | [H.274 (V3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17602) | AAP | Versatile supplemental enhancement information messages for coded video bitstreams | Recommendation ITU-T H.274 specifies the syntax and semantics of video usability information (VUI) parameters and supplemental enhancement information (SEI) messages for use with coded video bitstreams. The VUI parameters and SEI messages defined in this Recommendation may be conveyed within coded video bitstreams in a manner specified in a video coding specification or may be conveyed by other means as determined by the specifications for systems that make use of such coded video bitstreams. This Recommendation is particularly intended for use with coded video bitstreams as specified by Rec. ITU-T H.266 | ISO/IEC 23090-3, although it is drafted in a manner intended to be sufficiently versatile and generic that it may also be used with other types of coded video bitstreams.  This revision adds four new versatile supplemental enhancement information (VSEI) messages for coded video bitstreams, and also includes corrections and editorial improvements to various minor defects in the prior content of this Recommendation. Changes are included as modifications to the sections of text that were previously present in H.274 V2.  This Recommendation was developed collaboratively with ISO/IEC JTC 1/SC 29 and corresponds with ISO/IEC 23002 7 as technically aligned twin text. | 2023-09-29 |
| SG16 | [F.743.23 (ex F.VSSReqs)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17590) | AAP | Security requirements for video surveillance systems | This Recommendation defines premises unit (PU) device security classification, functional requirements, typical use case and scenario for video surveillance systems. The Recommendation specifies the functional requirements, including PU access security requirements, transmission security requirements, platform security requirements, application security requirements, network security and security management centre in video surveillance systems. | 2023-10-29 |
| SG17 | [X.1051](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17998) | AAP | Information security, cybersecurity and privacy protection - Information security controls based on ISO/IEC 27002 for telecommunications organizations | This Recommendation is to establishes guidelines and general principles for initiating, implementing, maintaining and improving information security controls in telecommunications organizations based on ISO/IEC 27002. It also provides an implementation baseline of information security controls within telecommunications organizations to ensure the confidentiality, integrity and availability of telecommunications facilities, services and information handled, processed or stored by the facilities and services. | 2023-06-13 |
| SG17 | [TR.ba-iot](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18347) | Agreement | Broadcast authentication scheme for Internet of Things (IoT) system | To specify the broadcast authentication (BA) schemes for IoT system, this Technical Report provides a conceptual model of the target BA system and clarifies the security characteristics and requirements required therein. In addition, it specifies a Message Authentication Code (MAC)-based BA authentication scheme and a digital signature (DS)-based BA authentication scheme as methods to achieve the security requirements and show the convenience and usage of each method. | 2023-09-08 |
| SG17 | [TR.cpn-col-sec](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18342) | Agreement | Security considerations of collaboration of multiple computing power networks | Computing power network (CPN) is one type of networks that realizes optimized computing resource allocation, networking, computing service dealmaking and provision, by distributing computing, storage, and network resources [ITU-T Y.2501]. CPN ecosystem is composed of a variety of business players which are distributed in different areas and in different security environments. A CPN usually includes a communication network and a transaction provider, and connects computing service consumers, computing service providers and computing resources providers. Multiple CPNs may include multiple communication networks and transaction providers provided by different operators. Therefore, there are many security issues of collaboration of multiple CPNs to be considered, such as that in CPN data transportation planes, in CPN control planes, in CPN transaction planes, in CPN service consumer parts, in CPN service provider parts, and when interacting among them, etc. This Technical Report analyses concept, business roles, use cases and security risks of collaboration of multiple computing power networks, as well as relevant general security characteristics and requirements, and specifies a security reference framework and capabilities. | 2023-09-08 |
| SG17 | [TR.qs-dlt](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18016) | Agreement | Guidelines for Quantum-Safe DLT System | The accelerating development of quantum computing has a subversive impact on the field of traditional cryptography. Distributed ledger technology (DLT) systems will be greatly affected by quantum computing as cryptography is one of the core technologies used in DLT systems. This technical report assesses the security threats to DLT systems when large-scale quantum computers are available. The methods to construct a quantum-safe DLT system are presented. Moreover, the measures to transit from the current DLT system to the quantum-safe one are suggested. | 2023-09-08 |
| SG17 | [TR.sgfdm (ex TR.sgfdcml)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17999) | Agreement | Fully Homomorphic Encryption (FHE) - based data aggregation in machine learning | This Technical Report provides a guideline for secure data aggregation in machine learning (ML) while protecting input data. It focuses how Fully Homomorphic Encryption (FHE) works on data aggregations in machine learning. It first describes a general workflow on secure aggregation in ML and explains how FHE-based data aggregation in ML could satisfy a certain requirement. A general workflow is then given on FHE-based ML supporting data aggregation between more than two parties. | 2023-09-08 |
| SG17 | [TR.x509ac4sc](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18500) | Agreement | A use case of X.509 Attribute Certificate for Supply Chain | These have been several threats targeting supply chains. These threats can compromise security of supply chain and can affect quality and/or safety of the product. A framework for mitigating supply chain threats has been proposed where all organizations in the supply chain self-assess their compliance to regulations/requirements. The results of the assessment will be shared to other organizations. In this report, we propose the information sharing platform using X.509 attribute certificate [8] [X.509-1997] [9] [X509-2000] [10] [RFC5755]. The attribute certificate is issued in order to prove that a certain requirement is satisfied and share that among the supply chain. We can use established framework for issue, deployment, and revocation. Another benefit of using X.509 is that we can use existing software library for the implementation of the platform | 2023-09-08 |
| SG17 | [X.1454 (ex X.sles)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17993) | TAP | Security measures for location enabled smart office services | The smart office services combining multiple smart applications aim to improve the quality of official businesses and enhance efficiency management. Since information and communication technologies (ICTs) serve as the basis for technologies in smart office services, the telecommunication operator plays an important role among the stakeholders in smart office services. Typical smart office services include smart parking, smart driving, smart retail shop, smart office, smart meeting room management, smart water, smart energy consumption management, etc. Among these typical smart office services, the location data provided by the operator is one of the key elements in most smart office service implementations. In order to ensure the security of location enabled smart office services, security threats and relevant security requirements specific to location enabled services need to be analyzed and the overall security measures established. This Recommendation analyzes the typical application scenarios of location enabled smart office services, specifies their security threats and requirements and establishes security measures for the operator and key stakeholders in a smart office to safeguard location enabled services. | 2023-09-08 |
| SG17 | [X.1645 (ex X.nssa-cc)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17995) | TAP | Requirements of network security situational awareness platform for cloud computing | Network security situational awareness (NSSA) is derived from “situational awareness”. It usually includes four processes: data acquisition, security situation analysis, security situation assessment and security situational tendency projection, and generally has the following capabilities: 1) the capability of detection and persistent monitoring various attack threats, abnormal behaviour and their scope of influence; 2) the capability of data mining, threat analysis, and the traceability of abnormal behaviour; 3) the capability of security prediction and early warning; 4) the capability of visualization of security situation. For cloud computing service providers, NSSA platform plays an important role in improving cloud computing's security protection, the ability to detect security breaches or anomalous behaviours, security decision-making and emergency response ability, and even it can help improve the early warning mechanism for cloud computing. This recommendation will first introduce the concept and development of network security situational awareness, analyze the advantages of NSSA coping with the security challenges of cloud computing, then aim to document the requirements for network security situational awareness platform for cloud computing. | 2023-09-08 |
| SG17 | [X.1817 (ex X.5Gsec-message)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18018) | TAP | Security requirements for IMT-2020/5G messaging service | This Recommendation provides the security requirements for 5G messaging service, including use security requirements, management security requirements and control security requirements for 5G messaging service. | 2023-09-08 |
| SG17 | [X.suppl.39 (ex X.rdda)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17979) | Agreement | ITU-T X.1148 - Supplement on requirements for data de-identification assurance | De-identified data incurs the risk of re-identifying individuals. So, it is important to assess the threat that de-identified data is used to identify individuals through re-identification methods. De-identification methods, which can be used for re-identification risk assessment, may be selected accordingly based on the following considerations: Data risk assessment: Data composition, data distribution, possession of other data, Data use environment risk assessment: Confidence level of data recipient, impact during re-identification, inadvertent re-identification, Using and managing de-identification data: Security measures for de-identification data, monitoring of re-identification possibilities, compliance with de-identification data provision or consignment contracts. This Supplement defines data de-identification assurance. It also provides a set of requirements for managing data de-identification assurance, including data risk assessment, risk assessment of the data use environment, and using and managing de-identified data. | 2023-09-08 |
| SG17 | [X.510](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18013) | AAP | Information Technology - Open systems Interconnection - The Directory - Protocol specifications for secure operations | Recommendation ITU-T X.510 | ISO/IEC 9594-11 provides tools and specification for how to design of protocol specifications having built-in cybersecurity. It provides tools for cryptographic algorithms pluck-in features and for cryptographic algorithm migration; it provides formal specification for cryptographic algorithms not provided by other specifications; and it defines some specific protocols. Finally, it provides an annex giving guidance in cryptographic algorithm migration. Recommendation ITU-T X.510 | ISO/IEC 9594-11 includes tools for specifications for specifying secure protocols using a cryptographic algorithm pluck-in principle allowing communication protocols to be specified without "hard coding" the types of algorithms but allowing different areas to supplement Recommendation ITU-T X.510 | ISO/IEC 9594-11 with the types of cryptographic algorithms that are relevant for specific areas. The cryptographic algorithm pluck-in feature is dependent on at algorithms are specified as described in Recommendation ITU-T X.509 | ISO/IEC 9594-8, Recommendation ITU-T X.510 | ISO/IEC 9594-11 add formal algorithm specifications where they otherwise do not exist and it restructure existing formal specification where they rules established in Recommendation ITU-T X.509 | ISO/IEC 9594-8. Tools are provided for include cryptographic algorithm migration capabilities in communications protocols and an annex provides guidance in use of these tools. Recommendation ITU-T X.510 | ISO/IEC 9594-11 specifies a general protocol, called the wrapper protocol, that provides cybersecurity for protocols designed for its protection. The wrapper protocol provides authentication, integrity and optionally confidentiality (encryption). The wrapper protocol allows cybersecurity to be provided independently of the protected protocols, which means that security may be enhanced without affecting protected protocol specifications. The wrapper protocol makes use of all the capabilities for cryptographic algorithm pluck-in and migration capabilities. Recommendation ITU-T X.510 | ISO/IEC 9594-11 also specifies three protocols that make use of the wrapper protocol protection. This includes a protocol for maintenance of authorization and validation lists (AVLs), a protocol for subscribing of public-key certificate status and a protocol for accessing a trust broker. | 2023-10-29 |
| SG17 | [X.590 (ex X.jss)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18776) | AAP | JSON Signature Scheme (JSS) | This Recommendation defines a method called JSON Signature Scheme (JSS) which enables JSON objects to be signed and/or countersigned while leaving the original JSON objects themselves in JSON format. This process enables a consistent data format that simplifies the use, documentation, debugging, and logging of the JSON data while still allowing it to be digitally signed. Further, with this method, signed JSON objects can be used and processed just like standard JSON objects which simplifies their use for application developers and systems. | 2023-10-29 |
| SG17 | [Z.161](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18951) | AAP | Testing and Test Control Notation version 3: TTCN-3 core language | Recommendation ITU-T Z.161 defines Testing and Test Control Notation 3 (TTCN-3) intended for specification of test suites that are independent of platforms, test methods, protocol layers and protocols. TTCN-3 can be used for specification of all types of reactive system tests over a variety of communication ports. Typical areas of application are protocol testing (including mobile and Internet protocols), service testing (including supplementary services), module testing, testing of Common Object Request Broker Architecture (CORBA) based platforms and application programming interfaces (APIs). The specification of test suites for physical layer protocols is outside the scope of this Recommendation. The core language of TTCN-3 can be expressed in a variety of presentation formats. While this Recommendation defines the core language, Recommendation ITU-T Z.162 defines the tabular format for TTCN (TFT) and Recommendation ITU-T Z.163 defines the graphical format for TTCN (GFT). The specification of these formats is outside the scope of this Recommendation. The core language serves the following three purposes: a) as a generalized text-based test language; b) as a standardized interchange format of TTCN test suites between TTCN tools; c) as the semantic basis (and where relevant, the syntactical basis) for the various presentation formats. The core language may be used independently of the presentation formats. However, neither the tabular format nor the graphical format can be used without the core language. Use and implementation of these presentation formats shall be done on the basis of the core language. This revision of the Recommendation contains amendments, clarifications, corrigenda and editorial corrections. | 2023-10-29 |
| SG17 | [Z.166](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18952) | AAP | Testing and Test Control Notation version 3: TTCN-3 control interface (TCI) | Recommendation ITU-T Z.166 specifies the control interfaces for Testing and Test Control Notation 3 (TTCN-3) test system implementations. The TTCN-3 control interfaces (TCIs) provide a standardized adaptation for management, test component handling and encoding/decoding of a test system to a particular test platform. This Recommendation defines the interfaces as a set of operations independent of a target language. The interfaces are defined to be compatible with the TTCN-3 standards (see clause 2 of ETSI ES 201 873-6 V4.9.1). The interface definition uses the Common Object Request Broker Architecture (CORBA) Interface Definition Language (IDL) to specify the TCI completely. Clauses 8, 9 and 9.7 of ETSI ES 201 873-6 V4.9.1 present language mappings for this abstract specification to the target languages Java and ANSI C. This revision of the Recommendation contains amendments, clarifications, corrigenda and editorial corrections. | 2023-10-29 |
| SG17 | [Z.171](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18954) | AAP | Testing and Test Control Notation version 3: Using JSON with TTCN-3 | Recommendation ITU-T Z.171 specifies the rules to define schemas for JSON data structures in TTCN 3, to enable testing of JSON-based systems, interfaces and protocols, and the conversion rules between TTCN-3 and JSON to enable exchanging TTCN 3 data in JSON format between different systems. | 2023-10-29 |
| SG17 | [X.1095 (ex X.pet\_auth)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18003) | AAP | Entity authentication service for pet animals using telebiometrics | This Recommendation defines an entity authentication infrastructure for pet animals using telebiometrics. It specifies multimodal telebiometrics which uses nose patterns and faces of pet animals. This Recommendation is applicable in various pet animal services such as registration, insurance, and e-healthcare for pet animals. The entity authentication for pet animals is always performed in a non-cooperative environment, therefore it is necessary to define criteria for acquiring suitable multimodal telebiometrics for pet entity authentication. And there are requirements for devices that acquire multimodal telebiometrics, and architecture in the operating platform for stable multimodal telebiometric applications for pet animals. This Recommendation specifies functional requirements on biometric capture devices and data acquisition of biometrics for pet entity authentication. A platform architecture, performance testing methodology, and privacy issues are also defined. The following topics are addressed in the scope of this Recommendation: Pet animals cover dogs and cats; Multimodal telebiometrics cover nose patterns and faces; Biometric capture devices cover digital cameras, mobile cameras, specific cameras such as infrared cameras, high-speed cameras, and optical scanners. | 2023-11-13 |
| SG17 | [X.1220 (ex X.spmoh)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18345) | AAP | Security framework for storage protection against malware attacks on hosts | This Recommendation provides a framework for the protection of storage against malware attacks on hosts, which bypass network protection and endpoint protection. The framework also considers attacks caused by human errors or social engineering. The framework consists of a host and a storage protection server. The storage protection server works separately from the host, stores data in the storage, and provides a network drive to the host. When an application on the host requests data, the storage protection server provides real data or fake data depending on whether the application is listed or not in a pre-registered application list that is managed on the storage protection server with the objective of protecting data in the storage against malware attacks that encrypt, tamper, or steal data. The storage protection server allows pre-registered applications to create, modify or delete data in the storage while preventing other applications from performing those operations. It provides pre-registered applications with read-write access to real data from the storage, and non-registered applications with read-only access to fake data. In addition, there is synergy if the framework is applied together with network protection and endpoint protection, as they provide different types of protection. | 2023-11-13 |
| SG17 | [X.1236 (ex X.sr-ctea)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18346) | AAP | Security requirements and countermeasures for targeted email attacks | Targeted email attacks are designed to damage or compromise target entities’ information assets by establishing a connection with the targets after gathering sufficient resources to conduct an attack and then enticing them to take certain actions that eventually create a security loophole. These targeted attacks used in inbound and outbound emails are evolving into more sophisticated and unknown types, such as using unknown malicious files or capitalising on the target’s social relationships. However, so far there are no security requirements proposed to effectively prevent or block them. This Recommendation specifies the requirements for security features to block inbound and outbound email attacks in the form of multilevel management that includes countermeasures against targeted email attacks. This approach is necessary to integrate or deploy a new framework to improve internet users’ defence against such attacks. This Recommendation will form a reference on the direction and objectives of designing an email security diagnostic framework or developing email security solutions with those security functional requirements for IT security managers, especially in those countries beginning to be actively engaged in IT development and implementation. | 2023-11-13 |
| SG17 | [X.1282 (ex X.scpa)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17992) | AAP | Security measures for countering password related online attacks | This Recommendation is intended to analyze the security risks of password related online attacks in service systems, and to provides security measures that could mitigate the security threats and challenges. Based on the features of password related online attacks, the security measures could include CAPTCHA, multi-factor certification, session control, log audit, security design of registration interface, security design of retrieving password interface, security design of login interface, security policy of login password, anomaly pattern analysis, data analysis, policy optimization, hierarchical services, risk early warning, user reminders and other related technical requirements This Recommendation provides security risks analysis and security considerations that will help mitigate password related security risks into each phase of the service life cycle, thus advancing the business application and security requirements together to ensure a balanced approach during the life cycle of service systems. It provides a baseline to all service systems that provide password login mechanisms, and additional filters for critical applications. | 2023-11-13 |
| SG20 | [Y.4604 (ex Y.IoT-MCSI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17956) | TAP | Metadata for camera sensing information of autonomous mobile IoT devices | In the case of low-cost and low-resolution Internet of things (IoT) camera sensor devices, it is not possible to support full-featured camera sensing information due to resource-limited IoT device capabilities. Traditional full-performance digital camera devices provide complex metadata such as camera settings (stimulus, sensitivity, shutter speed, etc.), time, location information, camera model, etc. There is no guidance for compliant and compromised IoT camera sensing metadata from different manufacturers. This causes problems related to interchangeable metadata. It is essential therefore to provide basic and minimal camera sensing metadata to enable interoperability between IoT applications and services. Recommendation ITU-T Y.4604 defines metadata for camera sensing information (MCSI) and describes characteristics and features of individual MCSI working on autonomous mobile IoT devices (AMIDs). | 2023-09-13 |
| SG20 | [YSTP.AIoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18471) | Agreement | Challenges of and Guidelines to Standardization on Artificial Intelligence of Things | The Artificial Intelligence of Things (AIoT) is the combination of artificial intelligence (AI) technologies with the Internet of Things (IoT) infrastructure to achieve more efficient IoT operations, improve human-machine interactions and enhance data management and analytics, but not limited to. From a comprehensive review of existing standardization efforts on AI and IoT, this Technical Paper describes concepts, characteristics, technical features and approaches of AIoT. Then, it presents challenges and guidelines for standardization on AIoT. It aims to provide technical insight and a clear direction for AIoT standardization from an ITU-T SG20 perspective. | 2023-09-20 |
| SG20 | [Y.4223 (ex Y.SCC-Reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17889) | TAP | Common requirements and capabilities of smart cities and communities from IoT and ICT perspectives | Smart cities and communities (SC&C) share the goal of achieving urban sustainability without sacrificing the quality of life (QoL) of their citizens. SC&C strive to create a sustainable living environment for citizens using Internet of things (IoT) technologies and information communication technologies (ICTs). SC&C standardization is ongoing in ITU-T and other relevant standards developing organizations, related to aspects including, but not limited to, SC&C framework, infrastructure, integrated sensing and management system, platform, data processing and services and applications (e.g., smart water management, smart buildings, smart residential community, smart tourism and smart parking lots, amongst many others). Based on the fundamental characteristics of smart cities and communities, this Recommendation specifies common requirements and capabilities of SC&C from IoT and ICT perspectives. The specified common requirements and capabilities are intended to be generally applicable in SC&C. | 2023-09-22 |
| SG20 | [Y.Suppl.76 (ex Y.Sup.SmartAgri-usecases)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17912) | Agreement | ITU-T Y.4000-series – Use cases of IoT based smart agriculture | Globally, difficulties in food supply and demand are expected due to problems such as climate change, water shortage, rapid urbanization, reduction of agricultural land, and an aging population. Smart agriculture is based on accurate data on the growth and environmental information of crops and livestock, and monitors the growth environment of crops and livestock anytime, anywhere, and prescribes them in a timely manner, even if less labor, energy, and nutrients are introduced than before. It means agriculture that can greatly improve the quality and quantity of products. In general, smart agriculture can remotely or automatically perform the maintenance and management of the growth environment of crops and livestock by using IoT, big-data, AI, automation systems, and robot technologies in greenhouses, vertical plant farms, open field farms, or livestock barns. Because there are a number of IoT devices applied to smart agriculture, it is very important to know their interaction for interoperability. In this reason, it is necessary to survey existing smart agriculture technologies as well as forthcoming and then based on the survey results, meaningful standardization work items may be developed. This Supplement surveys use cases related to smart agriculture in the perspective of, but not limited to: 1) smart greenhouse, 2) smart open field, 3) smart hydroponics, 4) smart livestock barn, and 5) smart agriculture data service. | 2023-09-22 |
| SG20 | [Y.Suppl.77 (ex Y.Sup.DT-definition)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18472) | Agreement | Digital transformation for people-centred smart cities and communities: an analysis of definitions | This supplement to the ITU-T Y.4051 aims to comprehend the multiple dimensional definitions of digital transformation for people-centred smart cities and communities from open literature. It used keywords and attributes analytical methodology to developing a new definition. The process for developing a new definition will not only give a clear definition of the term but also help in understanding the relevant works and tasks for digital transformation in people-centred smart cities and communities. | 2023-09-22 |
| SG20 | [Y.Suppl.78 (ex Y.Sup-SSC-UCE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17910) | Agreement | Use Cases on implemented or evaluated SSC solutions based on ITU-T Y.4900 Recommendation Series | This Supplement aims to collect use cases from ITU Members that have implemented or evaluated Smart Sustainable Cities (SSC) based on the ITU-T Y.4900 Recommendation series. The expected result is to provide information, identify challenges and opportunities on the implementation and evaluation of SSC solutions, based on the Y.4900 Recommendation series, across a wide spectrum of realities (such as varied infrastructure maturity, city size, financial conditions, among others). It is expected that the use cases collected in this Supplement will allow ITU members to evaluate scenarios similar to their own and, therefore, have a higher probability of success by avoiding improper practices, enriching the experience, optimizing investments and improving the scope and complexity of the solutions adopted. | 2023-09-22 |
| SG20 | [YSTR.HTSA-overview](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18477) | Agreement | Overview of ICT based highway traffic safety assessment | A lot of information and communication technologies have been widely used in the traffic field, especially in the highway industry, and have made remarkable achievements. There is no scientific and effective index system for evaluating ICT-based highway traffic safety. In other words, there is a lack of uniform capability methodologies for ICT based highway traffic safety assessment. This Technical report presents an overview and covers the process of ICT based highway traffic safety assessment. | 2023-09-22 |
| SG20 | [Y.4224 (ex Y.dtf-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17951) | AAP | Requirements for digital twin federation in smart cities and communities | A digital twin is the digital representation of an object of interest with data connections that enable convergence between the physical and digital states at an appropriate rate of synchronization. Also, a digital twin has the capabilities of connection, integration, analysis, simulation, visualization, optimization and provides an integrated view throughout the life-cycle of the objects of interest. The digital twin can provide real-time monitoring and proactive control, predictive maintenance by data analytics, cost and downtime reduction, and so on. Due to these benefits, various industries have adopted the digital twin technology. The smart cities and communities may have many kinds of cross domain problems, such as manufacturing, transportation, energy and safety, and it is difficult to resolve these problems by individual digital twin. To solve them, the digital twins in various domains can be federated. The federated digital twins collect and analyse the information from various domains, provide the solution for the problems, and simulate the effects. For this, some components and functions are needed to support for digital twin federation. First, registration of information for each digital twin is performed. And the discovery, connection, and utilization for the adequate digital twins are carried out for digital twin federation. This Recommendation defines the requirements for digital twin federation. | 2023-11-29 |
| SG20 | [Y.4489 (ex Y.dtf-rach)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18455) | AAP | Reference architecture of digital twin federation in smart cities and communities | As the digital representation of an object of interest with data connections that enable convergence between the physical and digital states at an appropriate rate of synchronization. Digital twin federation is operations among one or more digital twin initiated to solve the problem crossing the boundaries of multiple domains. Recommendation ITU-T Y.4224 defines the requirements for digital twin federation. Based on the requirements, this Recommendation addresses the reference architecture of digital twin federation. This Recommendation defines the functionalities of each entity and the interfaces among the entities. In addition, this Recommendation also addresses operational flows of digital twin federation in different scenarios. | 2023-11-29 |
| SG20 | [Y.4490 (ex Y.water-SFP)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17907) | AAP | Framework of monitoring of water system for smart fire protection | Smart fire protection is important in smart cities. It ensures the safety of people's life and property. Water supply system is the most commonly used in firefighting systems. The smart fire protection facilities based on IoT technologies are developed to monitor the water supply status in real time. It is required to accurately obtain the key data of natural water sources, municipal water supplies and fire pools. They will realize the digital management of fire extinguishing water sources, providing reliable information for firefighting and rescue operations. They will also enhance the availability of fire control information, and enable the on-site fire brigade to quickly develop targeted water supply plans. This Recommendation addresses the monitoring of water system (MWS) for smart fire protection. It specifies the reference model of MWS, as well as requirements and framework of MWS. | 2023-11-29 |
| SG20 | [Y.4491 (ex Y.BC-SON)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17903) | AAP | Framework of blockchain-based self-organization networking in IoT environments | Self-organization networking (SON) is responsible for automatically planning, configuring, managing, optimizing, and remedying networking. When building SON in IoT environment, an IoT device moves frequently, and IoT service requirements change from time to time. In such an environment, it is difficult to manage IoT services and devices in a centralized manner. Blockchain supports dynamic trusted SON management and secure network resource sharing by using smart contract and consensus protocols. This Recommendation describes a framework for the support of SON in IoT environment using blockchain. | 2023-11-29 |
| SG20 | [Y.4492 (ex Y.dec-IoT-arch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17893) | AAP | Decentralized IoT communication architecture based on information centric networking and blockchain | Recommendation ITU-T Y.4492 introduces the overview of the decentralized IoT communication, and the decentralized IoT communication requirements. It also includes the functional architecture of the decentralized IoT communication based on ICN and blockchain and the implementation view of the decentralized IoT communication architecture based on ICN and blockchain. | 2023-11-29 |
| SG20 | [Y.4493 (ex Y.IoT-AOS-prot)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17901) | AAP | Autonomic operations support protocols in the Internet of things | This Recommendation provides a description of the autonomic operations support protocols in the Internet of things (IoT) based on the architecture of the IoT specified in Recommendation ITU-T Y.4416, in order to support provisioning of autonomic operation capabilities specified in Recommendation ITU-T Y.4401. It describes architecture of autonomic operations support protocols in the IoT, autonomic event management support protocol, autonomic control support protocol, and autonomic policy management support protocol in the IoT. Possible deployment and relevant use cases of these autonomic operations support protocols in the IoT are described. | 2023-11-29 |
| SG20 | [Y.4494 (ex Y.CDML-arc)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17938) | AAP | Reference architecture of collaborative decentralized machine learning for intelligent IoT services | A collaborative decentralized machine learning (CDML) architecture can support ML model distributed training and inference across highly heterogeneous and resource-constrained IoT devices, which results in less latency, higher reliability, lower energy consumption, and saving bandwidth resources. With using CDML, spare resources across decentralized IoT devices can be fully used to perform computation-intensive ML tasks collaboratively with high performance. This Recommendation introduces collaborative decentralized machine learning (CDML) for intelligent IoT services, and provides the characteristics and reference architecture of CDML for intelligent IoT services. | 2023-11-29 |
| SG20 | [Y.4495 (ex Y.DSGS-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17957) | AAP | Requirements and a reference model of data for smart greenhouse service | Smart greenhouses have improved productivity by controlling the growing environment of crops. The demand for data-based smart greenhouse services has been increasing, as the importance of converged agricultural services (autonomous farm control, pest control, etc.) based on big data is emphasized. Accordingly, the data generated and consumed by IoT devices in the smart greenhouse have been increasing continuously. In order to efficiently manage and analyze vast amounts of data and to create various services based on the analyzed data, a standardized data model for data collection and management system is required. In particular, compatibility of data generated and consumed by heterogeneous devices must be guaranteed to ensure interoperability between devices of heterogeneous vendors. For data interoperability, this Recommendation defines requirements and a reference model of data for smart greenhouse service. | 2023-11-29 |
| SG20 | [Y.4605 (ex Y.dtf-infoex)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18456) | AAP | Information exchange model for digital twin federation in smart cities and communities | A digital twin is the digital representation of an object of interest with data connection that enables convergence between the physical state and digital state at an appropriate rate of synchronization. The digital twin has been applied in various industry domains including manufacturing, transportation, energy, firefighting, medical and safety. Digital twin federation is the act of sharing data and functions among two or more digital twins to solve the problems related to multiple domains. The Recommendation ITU-T Y.4489 defines the reference architecture of digital twin federation. The information exchange model among the components, which are the digital twins, the registry and the communication adaptor, is required to define for digital twin federation based on the reference architecture. The exchangeable information is the data and functions used for digital twin federation. The information exchange model provides the overview and defines the message structure with actions and objects. Actions are performed on objects through information exchange among the components. This Recommendation addresses information exchange model for digital twin federation in smart cities and communities. | 2023-11-29 |
| SG20 | [Y.4606 (ex Y.DSGS-dms)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18464) | AAP | Requirements and functional model of data management system for smart greenhouse service | The data analysis technologies can evolve IoT-based smart greenhouse services more intelligently. To enable those service, a huge size of data related to environmental condition as well as farm configuration is required to be analyzed; to enable the data to be well analyzed, a well-defined data management system that has functionalities of data collection, data storage, data disposal, data process, and data use is required. This Recommendation defines requirements and functional model of data management system in the perspective of smart greenhouse service. The general requirements and functional model of the data management system are not under scope of this Recommendation. | 2023-11-29 |

**List of texts under approval process, as of 18 December 2023**

| **Study group** | **Work item** | **Approval process** | **Subject / Title** | **Summary** | **Consent/ Determ. date** |
| --- | --- | --- | --- | --- | --- |
| SG3 | [D.700R (ex D7\_R\_OTT)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18780) | TAP | Draft new regional Recommendation ITU-T D.700R “Principles for dealing with OTTs” | The scope of this Recommendation are over-the-top (OTT) services that can be regarded as potentially competing with or substituting for traditional telecommunications and audio-visual services such as voice telephony, SMS, and video calling. This Recommendation seeks to provide guidance to Arab States in relation to the global growth of OTTs in view of ensuring fair competition, consumer protection, dynamic innovation, sustainable investment and infrastructure development, accessibility and affordability of services to the largest part of population. | 2023-06-20 |
| SG3 | [D.212](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19160) | TAP | Charging and Accounting Principles for The Use of Signalling System No. 7 | This Recommendation defines charging and accounting principles for the use of Signalling System No. 7. | 2023-11-10 |
| SG5 | [K.154 (ex K.lp)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17656) | AAP | Operating telecommunication facilities using lightning strikes data obtained from Lightning Location Systems | This Recommendation mainly include how to use data of Lightning Location System (LLS), which commonly uses to determine the cause of the malfunctions, damages in maintenance stage of telecommunication facilities, and is meaningful to promote the research and formulation of guidance for operating telecommunication facilities using data related to lightning strikes. Lightning strikes data obtained by other systems (typically refer to Lightning Monitoring System in telecommunication facilities (LMS)) are also introduced in Appendix IV. The data usage strategy can also refer to this Recommendation. | 2023-11-22 |
| SG5 | [K.37](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18949) | AAP | Low and high frequency EMC mitigation techniques for telecommunication installations and systems - Basic EMC Recommendation | This Recommendation defines mitigation techniques which the telecommunication operators may use to avoid disturbances, interference and damages caused by power and electrified railway plants, radio transmitters, both intentional and unintentional, and electrostatic discharges. This Recommendation contains guidance for the telecommunications system normal operation: – use of telecommunications equipment fulfilling relevant EMC requirements; – proper installation practices such as well-controlled earthing and bonding networks and a.c. power distribution networks in buildings, avoidance of disturbing equipment close to telecommunications equipment, environmental control and well?designed cabling; – proper working practices such as avoiding use of hand-held radios close to telecommunications equipment and applying special precautions when handling electrostatic discharge sensitive devices; – proper working practices in areas subject to high levels of low-frequency induction. Special mitigation methods like shielding and filtering are discussed for cases where EMC problems arise. This Recommendation does not include circuit or equipment design rules or guidelines for manufacturing – it is noted that this information is already widely available. | 2023-11-22 |
| SG5 | [K.38](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18950) | AAP | Radiated emission test procedure for physically large systems | This Recommendation specifies the technical requirements for the radiated emission measurement procedure for physically large systems used within the public telecommunication network. A minimum representative system is defined, which is used for compliance testing of physically large telecommunication systems. | 2023-11-22 |
| SG5 | [K.83](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19182) | AAP | Monitoring of electromagnetic field levels | Recommendation ITU-T K.83 gives guidance on how to make long-term measurements for the monitoring of electromagnetic fields (EMF) in the selected areas that are under public concern, in order to show that EMFs are under control and under the limits. The purpose of this Recommendation is to provide the general public, clear and easily available data concerning electromagnetic field levels in the form of results of continuous measurement. | 2023-11-22 |
| SG5 | [K.91](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19183) | AAP | Guidance for assessment, evaluation and monitoring of human exposure to radio frequency electromagnetic fields | There are many possible methods of exposure assessment and each of them has its own advantages and disadvantages. Recommendation ITU-T K.91 gives guidance on how to assess and monitor human exposure to radio frequency (RF) electromagnetic fields (EMFs) in areas with surrounding radiocommunication installations based on existing exposure and compliance standards in the 8.3 kHz to 300 GHz range. This includes procedures for evaluating exposure and how to show compliance with exposure limits with reference to existing standards. Recommendation ITU-T K.91 is oriented to the examination of the area accessible to people in the real environment of currently operated services with many different sources of RF EMF, but also gives references to standards and Recommendations related to EMF compliance of products. Recommendation ITU-T K.91 includes an electronic attachment containing an uncertainty calculator and the Watt guard modules. | 2023-11-22 |
| SG5 | [L.1031](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17733) | AAP | Guideline for the development of an e-waste management system and achieving the e-waste targets of the Connect 2030 Agenda | Recommendation ITU-T L.1031 describes a three-step approach to achieve the e-waste targets set in the Connect 2030 Agenda. These steps consist of guidance on developing an e-waste inventory, approaches to design e-waste prevention and reduction programmes and the supportive measures required for successfully implementing the Connect 2030 e-waste targets. This Recommendation is intended to be utilized by relevant stakeholders, for example: national authorities in charge of ICTs and communications, e-waste and waste management authorities, ministries of the environment, local authorities and entities involved in e-waste management, to take their first step in addressing Target 3.2 of the Connect 2030 Agenda that is to increase the global e?waste recycling rate to 30% and Target 3.3 that is to raise the percentage of countries with e-waste legislation to 50%. | 2023-11-22 |
| SG5 | [L.1307 (ex L.EEMDC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17702) | AAP | Energy Efficiency in Micro Data Centre for Edge Computing | With the advent of the Artificial Intelligence era, the demands for edge computing to provide ultra-low latency for various services that require high computation power continue to grow. The demand for micro data centres, an essential equipment for delivering edge computing services near users, is also growing. This Recommendation presents considerations on micro data centres for edge computing services in energy efficiency aspects. In addition, it presents the management information needed to manage micro data centres' energy efficiently and provides a metric for evaluating the energy performance of micro data centres. Finally, it presents the energy efficiency issues in the operation of edge computing services and methods to solve them. | 2023-11-22 |
| SG5 | [L.1362 (ex L.GAL\_3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17688) | AAP | Power management capabilities of the future energy telecommunication network nodes. Enhanced interface for power management in Network Function Virtualization (NFV) environments | Recommendation ITU-T L.1362 specifies a data model for energy discrete states within virtualized networks, and operations to interact on this model. In virtualized networks, establishing a mapping between the energy discrete states of logical entities (e.g., virtualized network functions) and the energy consumption of the hardware hosting the virtual machines that execute these logical entities is a challenging task. Recommendation ITU-T L.1362 adapts the green abstraction layer specification (GALv1) to virtualized networks. | 2023-11-22 |
| SG5 | [L.1391 (ex L.5G\_sharing)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18387) | AAP | Specification of 5G network sharing and co-construction adapting to climate change mitigation | The Mobile Network Operators (MNOs) around the world are facing unprecedented difficulties in 5G deployment. Restricted by the expensive spectrum resources, high investment, and high energy consumption of 5G, the profit gap between operators and equipment manufacturers is growing, and a large number of “business increment with no revenue increasing” problems are arising. How to reduce the cost of network construction and operation and how to adapt to climate change mitigation and enable the rapid benefits of 5G especially in the underdeveloped communications regions, imposes a major challenge to the global industry and operators. This Recommendation identifies the specification of 5G network sharing and co-construction and the contribution of 5G network sharing and co-construction to climate change mitigation, provides the key technologies of 5G network sharing and co-construction and explain how to make assessment of these technologies to adapt to the climate change. It also addresses the cost-benefit analysis and best practice of 5G network sharing and co-construction. | 2023-11-22 |
| SG5 | [L.1508 (ex L.CAcoast)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18390) | AAP | Framework for climate change adaptation in coastal cities using ICT and digital technologies | Coastal cities and areas are particularly vulnerable to the impacts of climate change, including flooding, rising sea level, storm surge, precipitation, and more. The frequency and intensity of these impacts continue to deepen, as a result of climate change. It is, therefore, imperative that coastal cities and areas are proactively taking climate adaptation actions to minimize these impacts. Information and Communication Technologies, as well as digital transformation, are providing innovative solutions for accelerating climate adaptation. The objective of this Recommendation is to support coastal cities and areas to adopt these technologies and enhance climate resilience. | 2023-11-22 |
| SG5 | [L.1640 (ex L.DMA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18397) | AAP | Methodology for dynamic monitoring and analysis of greenhouse gas emissions in city | In 2015, the UN approved the 2030 Agenda for Sustainable Development, which contains global sustainable development goals (SDGs), including sustainable cities and communities (SDG11) and climate action (SDG13). In the era of economic globalization, cities consume a large amount of raw materials and energy, resulting in negative environmental effects such as greenhouse effect and ozone depletion. Therefore, low-carbon development and analysis of greenhouse gas (GHG) emissions have gradually become an important factor for strategy and policy making. This document proposes a methodology for dynamic monitoring and analysis for low-carbon development of cities through multivariate data, data collection, data processing, data fusion and application methods. This Recommendation presents the necessary conditions for implementing near-real-time greenhouse gas monitoring in cities, to support the sustainable development strategy and planning of the city. Compared to existing research or standards, near-real-time greenhouse gas data in cities can present high temporal resolution characteristics of urban emissions (hourly or daily), enabling better identification of spatial and temporal hotspots. This can help city managers formulate more effective emission reduction policies. Recommendation ITU-T L.1640 presents the general principles on data collection, data processing, data fusion, and monitoring and analyzing GHG emissions of cities and outlines the different methodologies that are being developed: – Sources for near-real-time city data collection, and its processing and fusing. – Key steps for city near-real-time GHG calculation and attribution analysis. – Optimization strategy for city sustainable planning. | 2023-11-22 |
| SG9 | [J.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18901) | AAP | Terms, definitions and acronyms for television and sound transmission and integrated broadband cable networks | Recommendation ITU-T J.1 compiles all the definitions related to television and sound transmission, and integrated broadband cable networks, and which are in force in J-series and N-series Recommendations developed under the responsibility of SG9. The Recommendation is regularly updated to reflect newly-approved terms and definitions. | 2023-11-23 |
| SG9 | [J.1206 (ex J.stvos-api)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18898) | AAP | The application programming interface of smart TV operating system | Recommendation ITU-T J.1206 specifies the application programming interface of a smart TV operating system over integrated broadcast and broadband cable networks. A smart TV operating system is intended to be installed in an integrated broadcast and broadband (IBB)?capable cable set-top box (STB) and TV and to enable broadcasting and IP-based interactive services provided by cable television operators and third?party providers. By running a smart TV operating system, the IBB-capable cable STB and TV will be able to intelligently provide subscribers with advanced and personalized services by downloading and installing advanced and personalized apps from cable operators' platforms and third?party platforms, which are interconnected with the related cable operators' platforms. Recommendation ITU-T J.1206 intends to specify the application programming interface of a smart TV operating system over integrated broadcast and broadband cable networks, including Java application programming interface and Web application programming interface, and conforms to the requirements of [ITU-T J.1201] and [ITU-T J.1202]. More information can be found in the Recommendations about the specification [b-ITU-T J.1203], security framework [b-ITU-T J.1204] and HAL interface [b-ITU-T J.1205] of smart TV operating system. | 2023-11-23 |
| SG9 | [J.198.2 (ex J.HiNoC3-PHY)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18508) | AAP | Physical layer specification for third-generation HiNoC | This Recommendation aims to define the physical (PHY) layer specification of third generation high performance network over coax (HiNoC 3.0) which provides 10 Gbit/s data transmission over coaxial networks in the cable industry. The HiNoC network consists of a HiNoC bridge (HB) and HiNoC modems (HMs). The HiNoC protocol stack includes Media Access Control (MAC) layer and Physical (PHY) layer. This Recommendation contains descriptions for the signal transmission mechanism of the HiNoC 3.0 PHY layer, including frame structure, channel coding and modulation techniques. The HiNoC 3.0 protocol supports channel bonding which refers to the scheduling of the MAC layer frames over multiple PHY layer channels. | 2023-11-23 |
| SG9 | [J.198.3 (ex J.HiNoC3-MAC)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18516) | AAP | MAC layer specification for third-generation HiNoC | This draft new Recommendation aims to define the MAC layer specification of third generation high performance network over coax (HiNoC 3.0) which provides 10 Gbit/s data transmission over coaxial networks in the cable industry. HiNoC consists of HiNoC Bridge (HB) and HiNoC Modem (HM) in terms of architectural functional entity and is layered as Media Access Control (MAC) layer and Physical (PHY) layer. HiNoC 3.0 MAC layer selects the Time Division Duplexing (TDD) mode to adjust the bandwidth for upstream and downstream feasibly. HiNoC 3.0 MAC layer adopts Time Division Multiple Access (TDMA) and optional Orthogonal Frequency Division Multiple Access (OFDMA). HiNoC 3.0 MAC layer supports channel bonding mechanism. The HiNoC 3.0 MAC layer is composed of the Convergence Sublayer (CS), the Common Part Sublayer (CPS) and the optional Security Sublayer (SS). This draft new Recommendation contains descriptions for HiNoC 3.0 MAC frame types, functions and mechanisms of CS and CPS. | 2023-11-23 |
| SG13 | [Y.2086 (ex Y.DNI-fr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18055) | AAP | Framework and Requirements of Decentralized Trustworthy Network Infrastructure | This Recommendation specifies the framework and requirements of Decentralized Network Infrastructure. The Decentralized Network Infrastructure is expected to enhance the trustworthiness of the network infrastructure via a universal basic framework for different kinds of high-level network services. This Recommendation includes the framework, requirements, and use cases of the Decentralized Network Infrastructure. | 2021-07-16 |
| SG13 | [Y.2344 (ex Y.IBN-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18111) | AAP | Scenarios and requirements of Intent-Based Network for network evolution | This Recommendation aims to provide the scenarios and requirements of Intent-Based Network for network evolution. The scope of this Recommendation includes: Scenarios and workflow of Intent-Based Network for network evolution. Capability requirements of Intent-Based Network for network evolution. General framework of Intent-Based Network for network evolution. | 2022-07-15 |
| SG13 | [Y.3059 (ex Y.Trust-Registry)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18423) | AAP | Trust Registry for Devices: requirements, architectural framework | The world is witnessing a massive proliferation of connected devices and services that affect every walk of life. The security threats from this vast, distributed and often unregulated emerging ecosystem of providers of devices and applications are also clear to the world. This recommendation defines the requirements that is required to be fulfilled by a trust registry that, when supported by the various stakeholders, is likely to create an environment for sustainable and orderly proliferation of secure devices. Requirements, an architectural framework for a hierarchy of registries, functional architecture and flows for the registration, interrogation and notification throughout the lifecycle of devices is proposed, with the objective that the trustworthiness of a device can be established at any point in time. | 2023-11-03 |
| SG15 | [G.650.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18292) | AAP | Definitions and test methods for linear, deterministic attributes of single-mode fibre and cable | Recommendation ITU-T G.650.1 contains definitions of the linear, deterministic parameters of single?mode optical fibres and cables. It also contains both reference test methods and alternative test methods for characterizing these parameters. These test methods are suitable mainly for factory measurements of the linear, deterministic attributes of single-mode fibres and cables. Some of the test methods may also be used to characterize discrete optical components. The history of this Recommendation is as follows: 1993 Definitions and test methods were removed from single mode fibre Recommendations such as Recommendation ITU-T G.652 and used to create the initial version of Recommendation ITU T G.650. 1997 The second version of Recommendation ITU-T G.650 added definitions and test methods for polarization mode dispersion and appendices I, II and III. The improved determination of cut-off wavelength (clause 5.3.1.3.4) was also added. 2000 The third version established reference and alternative test methods for polarization mode dispersion, modified the definitions and test methods for core concentricity error (clauses 3.4 and 5.2), and added clause 5.1.4 and appendices IV, V and VI. 2002 In order to facilitate maintenance, Recommendation ITU-T G.650 was divided into smaller Recommendations. Recommendation ITU-T G.650.2 contains definitions and test methods for statistical and non-linear attributes of single-mode fibre and cable. 2004 The second version of Recommendation ITU-T G.650.1 added a third alternative test method "Spectral attenuation modelling" (clause 5.4.4) and new Appendix III "Example of a matrix model". This material has been moved from the single-mode fibre Recommendations into this Recommendation ITU-T G.650.1. In addition, chromatic dispersion fitting procedures have been added (Annex A). 2010 The third version of Recommendation ITU-T G.650.1 added the test method "Test methods for the macrobend loss" (clause 5.6). Jumper cut-off wavelength has been deleted from clause 5.3. An additional description has been added in cut-off wavelength test method (clause 5.3.1.3.2). Equation 5-1 has been corrected. A detailed description has been added in proof test method (clause 5.7). Appendix II has been updated. 2018 The fourth version of Recommendation ITU-T G.650.1 added Appendix IV (from Amendment 1 published in 2012) to provide measurement procedures for coherent multipath interference (MPI). The interferometric technique for chromatic dispersion measurement has been deleted from clause 6.5 and moved to Appendix V. The description of measurement details for ITU-T G.657 fibre on MFD, cut-off wavelength and spectral attenuation tests has been improved. The RTM and ATM of cable cut-off wavelength measurement has been modified. An example of the interpolation method has been added in clause I.3. Equation 6 1 has been corrected. 2020 The fifth version of Recommendation ITU-T G.650.1 revised third alternative test method "Spectral attenuation modelling" (clause 6.4.4) to cover the applicability of fewer predictor wavelengths for the modelling of much narrower wavelength range. In Appendix III, "Example of a matrix model", existing example matrix for ITU-T G.652 fibre was replaced with a new matrix using four predictor wavelengths, and added a new matrix for ITU-T G.654.E fibre using three predictor wavelengths. Wavelength dependence of modelling error as a function of the number of predictor wavelengths was explained. 2023 The sixth version of Recommendation ITU-T G.650.1 revised reference test method "The far-field scan" (clause 6.1.1). The resolution factor K has been introduced as the relation between the active area of the detector and the distance from fibre end. The minimum dynamic range has been generalized. The description of the detector for the far-field scan has been modified. In addition, a maximum numerical aperture of 0.4 is recommended for ITU-T G.655 and G.656 fibres in addition to ITU-T G.653 fibre in first alternative test method "The variable aperture technique" (clause 6.1.2). | 2023-12-01 |
| SG15 | [G.698.5 (ex G.owdm)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18237) | AAP | Multichannel DWDM applications with single-channel optical interfaces in the O-band | Recommendation ITU-T G.698.5 provides optical parameter values for physical layer interfaces of dense wavelength division multiplexing (DWDM) systems primarily intended for mobile fronthaul and metro applications in the O-band, optimized for 10-km and 20-km transmission distances. Applications are defined using optical interface parameters and values for single-channel interfaces of multichannel wavelength division multiplexing (WDM) optical systems in point-to-point applications. This Recommendation uses a system architecture comprising a head-end equipment (HEE) connecting to the tail-end equipment (TEE) through a black link. For mobile fronthaul applications, the HEE is in a central office while the TEE is in a remote antenna site. A single bidirectional transmission fibre is used in the black link to connect the HEE to the TEE. This version of the Recommendation includes bidirectional single-fibre WDM applications at 25 Gbit/s per channel with a nominal optical channel frequency spacing of 800 GHz. | 2023-12-01 |
| SG15 | [G.698.6 (ex G.owdm2)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18295) | AAP | Multichannel WDM applications with single-channel optical interfaces in the O-band | Recommendation ITU-T G.698.6 provides optical parameter values for physical layer interfaces of wavelength division multiplexing (WDM) systems primarily intended for mobile fronthaul and metro applications in the O-band, optimized for 5-km transmission distances. Applications are defined using optical interface parameters and values for single-channel interfaces of multichannel WDM optical systems in point-to-point applications. This Recommendation uses a system architecture comprising a head-end equipment (HEE) connecting to the tail-end equipment (TEE) through a black link. For mobile fronthaul applications, the HEE is in a central office while the TEE is in a remote antenna site. A single bidirectional transmission fibre or a pair of unidirectional transmission fibres is used in the black link to connect the HEE to the TEE. This version of the Recommendation includes unidirectional and bidirectional WDM applications at 25 Gbit/s per channel with alternating channel wavelength spacing of 7 nm and 13 nm in the O-band. | 2023-12-01 |
| SG15 | [G.709.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18869) | AAP | Flexible OTN common elements | Recommendation ITU-T G.709.1 specifies common elements and signal structures used by various types of FlexO interfaces. Edition 3.0 removes short-reach interfaces which are moved to [ITU-T G.709.5]. This Recommendation is renamed and focuses on common FlexO elements. | 2023-12-01 |
| SG15 | [G.709.20](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18873) | AAP | Overview of fine grain OTN | This Recommendation provides an overview of functions provided by the fine grain OTN (fgOTN) layer network and identifies Recommendations where the functions are defined. | 2023-12-01 |
| SG15 | [G.709.3](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18870) | AAP | Flexible OTN B100G long-reach interfaces | Recommendation ITU-T G.709.3 specifies 100G, 200G and 400G FlexO Beyond 100G (B100G) long-reach interfaces. The Recommendation specifies the structure using forward error correction codes with a higher coding gain suitable for longer reach applications, and references common elements from [ITU-T G.709.1] and FEC structures from [ITU-T G.709.2]. Edition 3 contains the following extensions to Edition 2.1: – Removal of FlexO-1-SC and FOIC1.k-SC interface – Move of OTUCn GMP mapping procedure to G.709.1 | 2023-12-01 |
| SG15 | [G.709.5 (ex G.709.sr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18871) | AAP | Flexible OTN short-reach interfaces | Recommendation ITU-T G.709.5 specifies 100G, 200G, 400G and 800G FlexO short-reach interfaces. The Recommendation specifies the structure using forward error correction code with a coding gain suitable for short-reach applications, and references common elements from [ITU-T G.709.1]. | 2023-12-01 |
| SG15 | [G.709.6 (ex G.709.b400glr)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18872) | AAP | Flexible OTN B400G long-reach interfaces | Recommendation ITU-T G.709.6 specifies 400G and 800G FlexO Beyond 400G (B400G) long-reach interfaces. The Recommendation specifies the structure using forward error correction codes with a higher coding gain suitable for longer reach applications, and references common elements from [ITU?T G.709.1] and FEC structures from [ITU-T G.709.3]. | 2023-12-01 |
| SG15 | [G.709/Y.1331 (2020) Amd.3](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18868) | AAP | Interfaces for the optical transport network - Amendment 3 | Recommendation ITU-T G.709/Y.1331 defines the requirements for the optical transport network (OTN) interface signals of the optical transport network, in terms of: – OTN hierarchy – functionality of the overhead in support of multi-wavelength optical networks – frame structures – bit rates – formats for mapping client signals. Edition 6.5 (Amendment 3) of this Recommendation adds mapping of 800GBASE-R clients, clarifications to the description of GMP, and a new fine-grained path layer and tributary slot structure. | 2023-12-01 |
| SG15 | [G.781](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18631) | AAP | Synchronization layer functions for frequency synchronization based on the physical layer | Recommendation ITU-T G.781 defines the atomic functions that are part of the two synchronization layers, the synchronization distribution (SD) layer and the network synchronization (NS) layer. It also defines some atomic functions, part of the transport layer, which are related to synchronization. These functions describe the synchronization of SDH, Ethernet, and OTN NEs and how these NEs are involved in network synchronization. The specifications in this Recommendation are the superset of functionality of three regional standards bodies. Care should be taken when selecting from this Recommendation. Not every atomic function defined in this Recommendation is required for every application. Different subsets of atomic functions may be assembled in different ways according to the combination rules given in Recommendations ITU-T G.783, ITU-T G.705, ITU-T G.8021, ITU-T G.8121, and ITU?T G.798 to provide a variety of different capabilities. Network operators and equipment suppliers may choose which functions must be implemented for each application. | 2023-12-01 |
| SG15 | [G.798 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18874) | AAP | Characteristics of optical transport network hierarchy equipment functional blocks - Amendment 1 | Recommendation ITU-T G.798 specifies both the components and the methodology that should be used in order to specify the optical transport network (OTN) functionality of network elements; it does not specify individual optical transport network equipment. Amendment 1 to Recommendation ITU-T G.798 (2023) includes changes to align with the restructuring of the Recommendation ITU-T G.709.x series. | 2023-12-01 |
| SG15 | [G.8021/Y.1341 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18590) | AAP | Characteristics of Ethernet transport network equipment functional blocks - Amendment 1 | Recommendation ITU-T G.8021/Y.1341 specifies both the functional components and the methodology that should be used in order to specify the Ethernet transport network functionality of network elements; it does not specify individual Ethernet transport network equipment. This Recommendation, together with Recommendation ITU-T G.8012/Y.1308, supersedes Recommendation ITU-T G.8021.1/Y.1341.1 (10/2012). This Recommendation also removes items formerly considered for further study and incorporates terms formerly defined in Recommendation ITU-T G.8001/Y.1354 (04/2016). Amendment 1 to Recommendation ITU-T G.8021/Y.1341 (2022) updates clause 11.1, specifying support for the ODUflexP to ETH adaptation function using IMP by reference to Recommendation ITU-T G.798 (2023), and incorporates Implementer's guide 1 for G.8021/Y.1341 (2022). | 2023-12-01 |
| SG15 | [G.8023 (2018) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18875) | AAP | Characteristics of equipment functional blocks supporting Ethernet physical layer and Flex Ethernet interfaces - Amendment 2 | Recommendation ITU-T G.8023 specifies both the functional components and the methodology that should be used in order to specify the Ethernet physical layer and Flex Ethernet interfaces. Amendment 2 contains text modifications to clauses 2, 3, and 6.3: – to update references to align with 802.3-2022; – to add 800G PHYs from 802.3df. | 2023-12-01 |
| SG15 | [G.8052](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18211) | AAP | Protocol-neutral management information model for the Ethernet transport capable network element | Recommendation ITU-T G.8052 contains the protocol neutral UML information model for Ethernet transport network (NE) management. The model is based on the Ethernet equipment functions specified in Recommendation ITU-T G.8021, generic management requirements in Recommendation ITU-T G.7710, and Ethernet specific management requirements in Recommendation ITU?T G.8051. The 2016 revision of this Recommendation changes the UML modelling tool from RSA to open source Papyrus tool, updates the Recommendation ITU-T G.8052 information model to align it with the Recommendation ITU-T G.7711 v2.0 Core information model, drops subclassing of the TP classes from Recommendation ITU-T M.3160, and supports the additional management requirements in Recommendation ITU-T G.8051. The 2018 revision of this Recommendation up-versions the UML model tool to Papyrus v3.2.0 and the profile to v0.2.13, deletes ODUkP-X-L (from the CsfRdiFdiEnableSink\_Pac, CsfRdiFdiEnableSource\_Pac, and CsfReportSink\_Pac), replaces ETY termination points with ETHnull termination points, removes ODUkp/ETH\_A and ODU2P/ETHPP-OS\_A, adds Annex A for the Ethernet Spec model. Edition 4.0 of this Recommendation adds the FlexE UML model and updates the ETH model to prune and refactor the TTP, CTP, Connectivity, Auxiliary MEP and MIP object classes from the G.7711 core model object classes, and up-versions the modeling tool to Eclipse 2020-06 (4.16) & Papyrus 4.8. | 2023-12-01 |
| SG15 | [G.8052.1/Y.1346.1 (2021) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18574) | AAP | Operation, administration, maintenance (OAM) management information and data models for the Ethernet-transport network element - Amendment 2 | Recommendation ITU-T G.8052.1/Y.1346.1 specifies the management information model and data models for Ethernet transport network element (NE) to support specific interface protocols and specific management control (MC) functions. The information model is interface protocol neutral and specified using the unified modelling language (UML). The information model of this Recommendation is derived through pruning and refactoring from Recommendation ITU?T G.7711/Y.1702 core information model and Recommendation ITU-T G.8052/Y.1346 foundation Ethernet transport NE information model. The data models are interface protocol specific and translated from the information model with the assistance of automated translation tooling. The specific data models considered in this Recommendation include, but are not limited to, YANG data models. The specific MC functions covered by this Recommendation are the ITU-T defined Ethernet operation, administration, and maintenance (OAM) functions, with the set of op codes assigned to the ITU-T and the corresponding OAM protocol data units (PDU) and behaviours specified in Recommendation ITU-T G.8013/Y.1731 and the equipment characteristics in Recommendation ITU-T G.8021/Y.1341. These OAM functions complement the IEEE 802.1 defined connectivity fault management (CFM) functions; and the YANG module defined in this Recommendation augments the IEEE 802.1Q CFM YANG module. Amendment 1 updates the UML model to support on-demand measurement and proactive measurement. Edition 1.2 updates the UML model to advance the preliminary UML artifacts to maturity, including the measurement jobs, bandwidth notification and CSF OAM functions. The corresponding YANG model is also updated. | 2023-12-01 |
| SG15 | [G.8121/Y.1381 (2018) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18242) | AAP | Characteristics of MPLS-TP equipment functional blocks - Amendment 1 | Recommendation ITU-T G.8121/Y.1381 specifies both the functional components and the methodology that should be used in order to specify multi-protocol label switching – transport profile (MPLS-TP) layer network functionality of network elements; it does not specify individual MPLS-TP network equipment as such. Amendment 1: Provides new Annex A “Mapping MPLS-TP packets to OTN using IMP” Replaces Maintenance Communication Channel (MCC) by Management Communication Channel (MCC) Makes editorial corrections in Figure 11-37 to Figure 11-40 (replacing ETH\_FP by ETH\_AP) and Table 11-17 Updates the publication dates in References | 2023-12-01 |
| SG15 | [G.8151/Y.1374 (2020) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18575) | AAP | Management aspects of the MPLS-TP network element - Amendment 1 | Recommendation ITU-T G.8151/Y.1374 addresses management aspects of the multi-protocol label switching (MPLS) transport profile (MPLS-TP) capable network element containing transport functions of one or more of the layer networks of the MPLS-TP network. The management of the MPLS-TP layer networks is separable from that of its client layer networks so that the same means of management can be used regardless of the client. The management functions for fault management, configuration management, performance monitoring and security management are specified. This Recommendation aligns with the MPLS-TP architecture and requirements jointly developed by IETF and ITU-T and provides the specification for managing MPLS-TP network elements (NEs) that support the operations, administration, maintenance (OAM) protocol neutral equipment functionality as defined in Recommendations ITU?T G.8121/Y.1381, G.8121.1/Y.1381.1 and G.8121.2/Y.1381.2. Amendment 1 to this Recommendation updates the Administrative state requirements and Table 7-2. | 2023-12-01 |
| SG15 | [G.8152](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18212) | AAP | Protocol-neutral management information model for the MPLS-TP network element | Recommendation ITU-T G.8152 contains the protocol neutral unified modelling language (UML) model for multi-protocol label switching – transport profile (MPLS-TP) network element (NE) management. This Recommendation provides a representation of the MPLS-TP technology using the methodologies that have been used for other transport technologies (e.g., SDH, OTN and Ethernet). The 2018 revision of this Recommendation up-versions the UML model tool to Papyrus v3.2.0 and the profile to v0.2.13, updates the model to add the MEP proactive measurement MI, MEP configuration MI and MIP configuration MI, adds the Spec model for MPLS-TP model, replaces the G.8152NE and MT\_NE with the MMPLS-TP constraint domain, and MT\_SubnetworkProtectionGroup specifies the FcSwitch, and MT\_CrossConnection specifies the ForwardingConstruct. Edition 3.0 of this Recommendation updates the MPLS-TP model to prune and refactor the TTP, CTP, Connectivity, Auxiliary MEP and MIP object classes from the G.7711 core model object classes, and up-versions the modelling tool to Eclipse 2020-06 (4.16) & Papyrus 4.8. | 2023-12-01 |
| SG15 | [G.8260 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18884) | AAP | Definitions and terminology for synchronization in packet networks - Amendment 1 | Recommendation ITU-T G.8260 provides the definitions, terminology and abbreviations used in ITU?T Recommendations on timing and synchronization in packet networks. Amendment 1 to ITU-T G.8260 (11/2022) provides the following updates: - Updated definitions with consideration given to the use of this terminology in metrology - New Appendix II “Time scales” added - New Appendix III “Clarifications on the term traceability” added - New references added to Bibliography - Revised terminology based on inclusive language | 2023-12-01 |
| SG15 | [G.8264/Y.1364 (2017) Amd. 2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18207) | AAP | Distribution of timing information through packet networks - Amendment 2 | Recommendation ITU-T G.8264/Y.1364 outlines aspects of distribution of timing information through packet networks and initially focuses on Ethernet networks. A number of methods may be used to transfer frequency which may be physical-layer based or protocol-layer based. This Recommendation provides information on architectural aspects of timing flows in Ethernet networks which will form the basis for future work related to time and phase transfer. This Recommendation specifies the synchronization status message (SSM) protocol and formats for use with synchronous Ethernet. Adherence to the SSM formats specified in this Recommendation is required in order to ensure interoperability between synchronous Ethernet equipment involved in frequency transfer. Amendment 2 to ITU-T G.8264 (08/2017) includes the following changes: Add explanation on the use of the terms ETH and ETY in the conventions Correction of references to tables 11-8 and 11-9 to refer to 11-7 and 11-8, respectively Clarification of wording of the processing of SSM code with enhanced SSM code in 11.3.2.1 Change non-inclusive terms | 2023-12-01 |
| SG15 | [G.8271.1/Y.1366.1 (2022) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18887) | AAP | Network limits for time synchronization in packet networks with full timing support from the network - Amendment 2 | Recommendation ITU-T G.8271.1/Y.1366.1 specifies the maximum network limits of phase and time error that shall not be exceeded. It specifies the minimum equipment tolerance to phase and time error that shall be provided at the boundary of packet networks at phase and time synchronization interfaces. It also outlines the minimum requirements for the synchronization function of network elements. This Recommendation addresses the case of time and phase distribution across a network by a packet-based method with full timing support to the protocol level from the network. Amendment 2 to Recommendation ITU-T G.8271.1/Y.1366.1 provides the following updates: • Enhanced network limits at reference point C have been added as clause 7.3.3, then for clarity old clause 7.3 text is moved into new clause 7.3.1 and old clause 7.5 is moved to new clause 7.3.2. • Updates to Appendix V. • Updated Figure 7-4. | 2023-12-01 |
| SG15 | [G.8272.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18223) | AAP | Timing characteristics of enhanced primary reference time clocks | Recommendation ITU-T G.8272.1 specifies the requirements for enhanced primary reference time clocks (ePRTCs) suitable for time and phase synchronization in packet networks. It defines the error allowed at the time output of the ePRTC. These requirements apply under the normal environmental conditions specified for the equipment. | 2023-12-01 |
| SG15 | [G.8272.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18308) | AAP | Timing characteristics of coherent network primary reference time clocks | This Recommendation specifies the requirements for coherent network primary reference time clocks (cnPRTCs) suitable for time, phase and frequency synchronization in networks. These requirements apply under the normal environmental conditions specified for the equipment. | 2023-12-01 |
| SG15 | [G.8275](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18636) | AAP | Architecture and requirements for packet-based time and phase distribution | Recommendation ITU-T G.8275 describes the architecture and requirements for packet-based time and phase distribution in telecom networks. The architecture described is mainly applicable to the use of IEEE 1588. Details necessary to utilize IEEE 1588 in a manner consistent with the architecture are defined in other Recommendations. | 2023-12-01 |
| SG15 | [G.8275.1/Y.1369.1 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18637) | AAP | Precision time protocol telecom profile for phase/time synchronization with full timing support from the network - Amendment 1 | Recommendation ITU-T G.8275.1/Y.1369.1 contains the ITU-T precision time protocol (PTP) profile for phase and time distribution with full timing support from the network. It provides the necessary details to utilize [IEEE 1588] in a manner consistent with the architecture described in Recommendation [ITU?T G.8275]. Amendment 1 incorporates the following updates: Clarifications on some dataset members use in the dataset comparison algorithm, Update PTSF functionality to include monitoring ports, Clarify the setting of the frequencyTraceable flag, Clarify defaultDS.deviceType, Add performance monitoring Annex F of [ITU?T G.8275]. as an optional feature of this profile, Add clarification to Annex G and Annex K, Revised terminology based on inclusive language, Add new dataset members into Table A.1 and Table A.5, Add new profileVersion 2.6 and 2.7 in A.1 and A.11, Added Appendix XVI and XVII. | 2023-12-01 |
| SG15 | [G.8275.2/Y.1369.2 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18638) | AAP | Precision time protocol telecom profile for phase/time synchronization with partial timing support from the network - Amendment 1 | This Recommendation specifies a profile for telecommunication applications based on [IEEE 1588] precision time protocol (PTP). The profile specifies the IEEE 1588 functions that are necessary to ensure network element interoperability for the delivery of accurate phase/time (and frequency) synchronization. The profile is based on the use of partial timing support (PTS) or assisted partial timing support (APTS) from the network architecture as described in [ITU-T G.8275] and definitions described in [ITU?T G.8260]. Amendment 1 to Recommendation ITU-T G.8275.2 (2022/11) provides the following updates: Added notes to clause 6.7.9 “Data set comparison algorithm” with references to [IEEE 1588] on defaultDS.timeReceiverOnly, portDS.masterOnly, and portDS.notMaster. Added a note to “Table 3 – Applicable clockClass values” on T-BC-A holdover Added performance monitoring Annex F of [ITU-T G.8275] as an optional feature of this profile Clarified defaultDS.deviceType with a note added to Table A.1 Revised terminology based on inclusive language Incremented profileVersion to 2.4 and 2.5 in clauses A.1 and A.11 | 2023-12-01 |
| SG15 | [G.8310 (2020) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18883) | AAP | Architecture of the metro transport network - Amendment 1 | Recommendation ITU-T G.8310 describes the functional architecture of the metro transport network (MTN) using the modelling methodology described in Recommendations ITU?T G.800 and ITU?T G.805. MTN is primarily intended to support transport of distributed radio access network (D?RAN) and cloud radio access network (C?RAN) traffic. The MTN functionality is described from a network level viewpoint, taking into account the client characteristic information, client/server layer associations, networking topology, and layer network functionality that provide multiplexing, routing and supervision of the digital clients. MTN consists of two non?recursive layers, the MTN path layer, and the MTN section layer. The MTN path layer uses the MTN section layer as its server layer. The MTN path layer provides configurable connection-oriented connectivity. The server layer for the MTN section layer is provided by 50GBASE?R, 100GBASE?R, 200GBASE?R, and 400GBASE?R Ethernet interfaces. Amendment 1 adds the architecture of fine-grain MTN layer which uses the MTN Path as its server layer. It also incorporates Corrigendum 1. | 2023-12-01 |
| SG15 | [G.8312 (2020) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18877) | AAP | Interfaces for metro transport networks - Amendment 2 | Recommendation ITU-T G.8312 describes a transport technology for metro networks (MTNs), including transport of distributed radio access network (D-RAN) and centralized radio access network (C-RAN) traffic. This technology leverages existing and emerging pluggable Ethernet modules and reuses flex Ethernet (FlexE) implementation logic. Amendment one adds several clarifications and also provides test vectors. Amendment two adds an annex to describe the fine grain MTN path and the associate elements. | 2023-12-01 |
| SG15 | [G.8312.20](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18876) | AAP | Overview of fine-grain MTN | This Recommendation provides an overview of the functions provided by the fine-grain MTN (fgMTN) layer network and identifies the Recommendations where the functions are defined. | 2023-12-01 |
| SG15 | [G.8350 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18578) | AAP | Management and Control of metro transport networks - Amendment 1 | Recommendation ITU-T G.8350 specifies management and control requirements and a protocol-neutral management information model for managing metro transport networks and their elements. Amendment 1 contains the modifications: - to update the information model on MTNP and MTNS layer network in clause 13 and model file in clause 14. - to remove cLOBA related requirements in clause 7 to align with G.8321 (11/2022) . - to remove the power monitoring and control in clause 8.14 to align with G.7710 (2020) Amd.1 (11/2022). | 2023-12-01 |
| SG15 | [G.872](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18882) | AAP | Architecture of the optical transport network | Recommendation ITU?T G.872 describes the functional architecture of the optical transport network (OTN) using the modelling methodology described in Recommendations ITU?T G.800, ITU?T G.805 and ITU?T G.807. The OTN functionality is described from a network level viewpoint, taking into account, the characteristic information of clients of OTN, client/server layer associations, networking topology, layer network functionality and optical media network structure, which provide multiplexing, routing and supervision of digital clients. The digital layers of the OTN use the frame formats defined in ITU?T G.709. The media portion of the network is described in terms of media constructs, media elements and optical signal maintenance entities. Revision 6.0 adds description of fgOTN. The description of FlexO is enhanced to reflect additional functionality in the 2024 suite of ITU?T G.709.x Recommendations. | 2023-12-01 |
| SG15 | [G.874 (2020) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18891) | AAP | Management aspects of optical transport network elements - Amendment 2 | Recommendation ITU-T G.874 addresses management aspects of optical transport network (OTN) elements containing transport functions of one or more of the layer networks of the OTN. The management of optical layer networks is separable from that of its client layer networks so that the same means of management can be used regardless of the client. The management functions for fault management, configuration management (CM) and performance monitoring are specified. Recommendation ITU-T G.874 (2008) updated the management information (MI) to align with Recommendation ITU-T G.798, reorganized the sections to align with the structure of Recommendation ITU?T G.7710/Y.1701, and replaced the generic text with pointers to Recommendation ITU-T G.7710/Y.1701. Recommendation ITU-T G.874 (2010) added the management of new transport functions that were introduced in ITU-T G.798 (2010), including OPSMnk\_TT, OPSM/OTUk a\_A, and ODUk for k=0, 2e, 4, and flex. Recommendation ITU-T G.874 (2013) added the management of hitless adjustment of ODUflex(GFP) (HAO), automatic protection switching (APS), application codes and performance management (PM) data collection. Recommendation ITU-T G.874 (2017) added a description to cover OTUCn GCC0, added the application code related MI signals, updated the MI signals for ODU2eP/FC-1200\_A, OSM256.4/CBRx\_A, OSx/CBRx-b\_A\_Sk and OSx/CBRx-c\_A\_Sk, removed the nDelay, nES, and fES primitives, moved the description of O.MN, O.MSN, and O.NE to the convention clause, updated the default values of DEGThr and DEGM, updated Appendix III to align with Table 15-9 of ITU-T G.709/Y.1331 (2016), and removed the adaptation function activation and MI\_Active to align with ITU-T G.798. Recommendation ITU-T G.874 (2020) aligns with the latest editions of ITU-T G.709 and ITU-T G.798, and harmonizes generic requirements with clauses 8 and 10 of ITU-T G.7710/Y.1701. Recommendation ITU-T G.874 Amendment 1 (2022) aligns with the latest editions of ITU-T G.709 and ITU-T G.798, including their amendments. Recommendation ITU-T G.874 Amendment 2 (2023) aligns with the latest editions of ITU-T G.709 and ITU-T G.798 Edition 7, including their amendments. | 2023-12-01 |
| SG15 | [G.876 (2021) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18271) | AAP | Management Requirements and Information Model for the optical media network - Amendment 1 | Amendment 1 to G.876 specifies the management architecture, the management of OTN optical media layer and the management of Ethernet media layer. | 2023-12-01 |
| SG15 | [G.959.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18623) | AAP | Optical transport network physical layer interfaces | Recommendation ITU-T G.959.1 provides physical layer inter-domain interface (IrDI) specifications for optical networks which may employ wavelength division multiplexing (WDM). The IrDIs within the optical transport network (OTN) are provided by unidirectional, point-to-point, single and multichannel line systems. Their primary purpose is to enable transversely compatible interfaces to span the boundary between two administrative domains. The IrDI specifications include intra-office, short-haul and long-haul applications, without line amplifiers. This version of this Recommendation includes single-channel interfaces suitable for FOIC1.1-RS with PAM4 100G. | 2023-12-01 |
| SG15 | [G.9804.1 (2019) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18279) | AAP | Higher Speed Passive Optical Networks: Requirements - Amendment 2 | Recommendation ITU-T G.9804.1 serves as a guide for the development of higher speed passive optical network (PON) systems, by identifying sets of applications that can be addressed by a particular system and defining the requirements for each of those systems. It is anticipated that they may have several distinct systems, such as higher speed single channel (TDMA PON), higher speed multi-channel (TWDM PON), and higher speed point to point overlay PONs. Amendment 1 to Recommendation ITU-T G.9804.1 includes additional requirements for higher speed PON, including slicing requirements for higher speed PON, optional Flexible FEC requirement in the upstream direction, and elimination of 10 Gbit/s upstream rate requirement. Amendment 2 to Recommendation ITU-T G.9804.1 includes additional requirements for higher speed PON, including complementary for co-existence scenario of three generation PON systems. | 2023-12-01 |
| SG15 | [G.9804.3 (2021) Amd 2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18855) | AAP | 50-Gigabit-capable passive optical networks (50G-PON): Physical media dependent (PMD) layer specification - Amendment 2 | Recommendation ITU-T G.9804.3 describes a 50-Gigabit-capable passive optical network (50G PON) system in an optical access network for residential, business, mobile backhaul and other applications. This system operates over a point-to-multipoint optical access infrastructure at the nominal line rate of 50 Gbit/s in the downstream direction. In the upstream direction, 12.5 Gbit/s, 25 Gbit/s and 50 Gbit/s nominal line rates are defined. This Recommendation contains the references, the common definitions, acronyms, abbreviations and the specifications of the physical media dependent layer of the 50G-PON system. Amendment 1 defines a third upstream wavelength "option 3" to support triple WDM coexistence with both GPON and XG(S)-PON, optical interface parameters of 50 Gbit/s upstream direction, optical interface parameters for non-MPM use cases, and the ONU out-of-band power spectral density requirements. Amendment 2 defines the optical interface parameters of 50 Gbit/s upstream direction on further power budget classes besides N1 class. | 2023-12-01 |
| SG15 | [G.9806 (2020) Amd.3](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18250) | AAP | Higher-speed bidirectional, single fibre, point-to-point optical access system (HS-PtP) - Amendment 3 | Recommendation ITU-T G.9806 describes a higher speed bidirectional single fibre point-to-point optical access system than the data rate in existing ITU-T point-to-point access systems. It supports 10 Gbit/s for the optical access services including the optical distribution network (ODN) specification, the physical layer specification, services requirements and the operation, administration and maintenance (OAM) specification. Amendment 1 added support for 25 Gbit/s. Amendment 2 added support for 50 Gbit/s. Amendment 3 adds support for 100 Gbit/s, Optical Path Loss budget Classes SL (0-10 dB), SU (5-15 dB) and BL (10-20 dB). | 2023-12-01 |
| SG15 | [G.988 (2022) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18857) | AAP | ONU management and control interface (OMCI) specification - Amendment 1 | Recommendation ITU-T G.988 specifies the optical network unit (ONU) management and control interface (OMCI) for optical access networks. Recommendation ITU-T G.988 specifies the managed entities (MEs) of a protocol-independent management information base (MIB) that models the exchange of information between an optical line termination (OLT) and an ONU. In addition, it covers the ONU management and control channel, protocol and detailed messages. Amendment 1 to ITU-T Recommendation G.988 (2022) incorporates regular maintenance items including: Clarifications to the use of Enhanced FEC PM and Forward error correct PM MEs on PON systems that use LDPC (e.g., HSP PON). Modifications to Power over Ethernet Control to manage PoE, PoE+ and PoE++ devices as defined in IEEE 802.3. Modification to VoIP application service profile ME to add GR-1188 Absence of Calling Name support | 2023-12-01 |
| SG15 | [G.9930 (ex G.p2pf)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18860) | AAP | Point-to-Point Fibre in the Premises | Recommendation ITU-T G.9930 belongs to the family of ITU-T Recommendations addressing Fibre-in-the-Premises. This Recommendation specifically addresses the network topology consisting of multiple point-to-point fibres between a Residential Gateway (RG) and Customer Premises Equipment (CPE), e.g., Wireless Access Points (WAP). This Recommendation G.p2pf specifies the system architecture and requirements for high-speed point-to-point-fibre-based in-premises transceivers. | 2023-12-01 |
| SG15 | [G.9941 (ex G.fin-PHY)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18256) | AAP | High speed fibre-based in-premises transceivers - physical layer specification | Recommendation ITU-T G.fin-PHY belongs to the family of ITU-T G.fin Recommendations. Recommendation G.fin-PHY specifies the physical layer of high speed fibre-based in-premises (G.fin) transceivers for applications in home and SME. | 2023-12-01 |
| SG15 | [G.9960 (2023) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19225) | AAP | Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification - Amendment 1 | Recommendation ITU-T G.9960 belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9960 specifies the system architecture and physical (PHY) layer for wireline-based home networking transceivers which are capable of operating over premises' wiring, including inside telephone wiring, coaxial cable, and power-line wiring. It complements the data link layer (DLL) specification in Recommendation ITU?T G.9961, and the power spectral density (PSD) specification in Recommendation ITU-T G.9964. G.9960 (2023) comprises ITU-T G.9960 (2018) plus its Corrigendum 1, Amendment 1, Amendment 2, Corrigendum 2 and Amendment 3, along with the specification of a new PHY frame type for use by ITU-T G.9991. Amendment 1 to G.9960 (2023) adds the new feature HBMSG/HBACK. | 2023-12-01 |
| SG15 | [G.9961 (2023) Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19226) | AAP | Unified high-speed wireline-based home networking transceivers - Data link layer specification - Amendment 1 | Recommendation ITU-T G.9961 belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9961 specifies the data link layer (DLL) for wireline-based home networking transceivers capable of operating over premises wiring including inside telephone wiring, coaxial cable, and power-line wiring. It complements the system architecture and physical (PHY) layer specification in Recommendation ITU-T G.9960, and the power spectral density (PSD) specification in Recommendation ITU-T G.9964. G.9961 (2023) comprises ITU-T G.9961 (2018) plus its Amendments 1, 2 and 3, and Corrigenda 1 and 2, along with a new Annex B on authentication to a domain using external authentication for smart grid applications. Amendment 1 to G.9961 (2023) adds the new feature HBMSG/HBACK. Recommendation ITU-T G.9961 belongs to the family of ITU-T G.996x Recommendations. Recommendation ITU-T G.9961 specifies the data link layer (DLL) for wireline-based home networking transceivers capable of operating over premises wiring including inside telephone wiring, coaxial cable, and power-line wiring. It complements the system architecture and physical (PHY) layer specification in Recommendation ITU-T G.9960, and the power spectral density (PSD) specification in Recommendation ITU-T G.9964. G.9961 (2023) comprises ITU-T G.9961 (2018) plus its Amendments 1, 2 and 3, and Corrigenda 1 and 2, along with a new Annex B on authentication to a domain using external authentication for smart grid applications. Amendment 1 to G.9961 (2023) adds the new feature HBMSG/HBACK. | 2023-12-01 |
| SG15 | [L.100](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19227) | AAP | Optical fibre cables for duct and tunnel application | Recommendation ITU-T L.100/L.10 describes characteristics, construction, test methods and performance criteria of optical fibre cables installed by pulling method for duct and tunnel application. Note that Recommendation ITU-T L.10, Ed 3.0, was redesignated as ITU-T L.100/L.10, Ed 3.0, in February 2016. First, in order to demonstrate sufficient performance of an optical fibre cable, the characteristics that a cable should possess are described in this recommendation. Then, the methods of examining if whether a cable has the required characteristics are described in this recommendation. Therein, detailed performance criteria for a cable are recommended. Recommended technical requirements are detailed by reference to IEC 60794-3-11 on outdoor optical fibre cables for duct, directly buried, and lashed aerial applications. Changes and additions to these requirements suitable to the duct and tunnel cable application are recommended herein. Required conditions may differ from the installation environment. Therefore, instances where agreement on detailed conditions should be determined between customer and manufacturer are stated. This version of Recommendation L.100 adds the electrical continuity test for continuous metallic elements. Scope, References, Fibre dimensions, Annex A, and Bibliography are updated. | 2023-12-01 |
| SG15 | [L.109](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18294) | AAP | Construction of optical/metallic hybrid cables | Recommendation ITU-T L.109 describes cable construction and provides guidance for the use of optical/metallic hybrid cable, which contains both optical fibres and metallic wires for telecommunication and/or power feeding. Technical requirements may differ according to the installation environment. Environmental issues and test methods for cable characteristics are described in other L-series Recommendations. | 2023-12-01 |
| SG15 | [L.250](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18264) | AAP | Topologies for optical access network | Recommendation ITU-T L.250 (ex L.90) describes the optical access network to be used in the design and construction of fibre to the x (FTTx), centralized- radio access networks (C-RAN) for mobile communications, and other network services. It deals mainly with access network architectures and the upgrading or new deployment of optical fibre to optical access networks. | 2023-12-01 |
| SG15 | [L.312](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18624) | AAP | Optical fibre cable maintenance support, monitoring and testing system for optical fibre cable networks carrying high total optical power | ITU-T Recommendation L.312 describes the functional requirements for optical fibre cable maintenance systems for optical fibre cable carrying a high total optical power. It also considers safety procedures and guidelines for the maintenance of outside optical fibre plant carrying a high total optical power. | 2023-12-01 |
| SG16 | [F.748.23 (ex F.ML-ICSMIReqs)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17629) | TAP | Requirements and framework for intelligent crowd sensing multimedia interaction based on deep learning | AI techniques can greatly improve the efficiency and effectiveness of crowd sensing tasks execution and enable intelligent multimedia interaction in crowd sensing. This recommendation outlines specific scenarios for crowd sensing multimedia interaction that leverage AI techniques, and subsequently defines the corresponding requirements and framework in detail. | 2023-07-21 |
| SG16 | [F.748.24 (ex F.TCEF-FML)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17619) | TAP | Trusted contribution evaluation framework on federated machine learning services | Federated machine learning (FML) is an emerging distributed framework that enables collaborative machine learning (ML) and model construction across distributed and decentralized datasets. FML service has distinctive features, such as where is the data where is the calculation, and data is available but not visible. It allows participants to jointly training ML models without sharing raw data, which can technically break data isolation and promote cooperation among the data owners. FML service involves multiple participants who usually perform different contributions to ML model training tasks due to many impact factors of the participants. An effective and trusted contribution evaluation mechanism for FML service is essential to increase participation of the parties involved and can promote the sustainable development of FML services. This Recommendation introduces a trusted contribution evaluation service on federated machine learning service which converges and takes advantage the technologies of FML and DLT, and provides relevant concept, characteristics, and requirements and use cases, and specifies relevant reference framework and common capabilities. | 2023-07-21 |
| SG16 | [F.749.17 (ex F.CUAV-MVAreqs)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17592) | TAP | Requirements for machine vision-based civilian unmanned aerial vehicle applications | At present, civilian unmanned aerial vehicles (CUAV) are widely used in many fields such as agriculture and plant protection, power line and petroleum pipeline inspection, traffic security monitoring, etc. Machine vision is to use machines instead of human eyes to measure and judge. Machine vision applied to CUAV is a type of signal processing to acquire, process and interpret the image / video for supporting visual analysis to provide applications and flight control of CUAV such as automatic inspection and monitoring, flight guidance and obstacle avoidance. This Recommendation provides the requirements for CUAV application and flight control based on machine vision. | 2023-07-21 |
| SG16 | [F.760.2 (ex F.FR-ERSS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17646) | TAP | Requirements for user interface of first responders in emergency response support systems | This Recommendation provides requirements for the user interface for first responders in emergency response support systems, which facilitates the use of information and devices supporting the activities of first responders at the scene of an emergency. This Recommendation identifies the human factors in emergency response services and the user interface requirement in emergency response support systems based on the characteristics of first response activities. These user interface requirements are specified to support the functional modules and usability of emergency response support systems for first responders. By meeting these requirements, developers can create user interfaces that are optimized to support the needs and tasks of first responders, resulting in more effective and efficient use of the system. | 2023-07-21 |
| SG16 | [H.741.5 (ex H.IPTV-PS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17478) | TAP | Application event handling: Overall aspects of personalized IPTV services | A personalized IPTV service is an example of application event handling. With the end-user’s permission, service providers are allowed to provide personalized service, such as contents recommendation, personalized user interface, personalized advertisement and some interactive services. Application can be realized based on the existing IPTV architecture to help in providing various kinds of IPTV personalized services. This work item is intended to study the requirement of personalized IPTV service and describe some use cases. | 2023-07-21 |
| SG16 | [F.742.2 (ex H.DLFrm)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17556) | AAP | Functional architecture for distance learning services | This Recommendation specifies the functional architecture for distance learning services. | 2023-11-16 |
| SG16 | [F.748.27 (ex F.3DIDH-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18604) | AAP | Framework and requirements for the construction of 3D intelligent driven digital human application systems | With the advancement of modelling, driving, rendering and interactive technologies, an increasing number of new services and applications involving 3D intelligent driven digital humans are emerging. This Recommendation outlines the framework and requirements for the construction of 3D intelligent driven digital human application systems. It defines the concept, related terms and fundamental functions of 3D intelligent driven digital human to specify the framework of 3D intelligent driven digital human application systems, including image generation, speech generation, animation generation, interaction processing, multimodal input and output modules with its specified functions and construction requirements. In addition, the appendix presents some use cases of workflow of 3D intelligent driven digital human. | 2023-11-16 |
| SG16 | [F.749.7 (ex F.VGP-RDSreqs)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17610) | TAP | Requirements for remote driving service based on vehicle gateway platform | At present, based on the high bandwidth, low latency, high reliability IMT-2020 networks, the remote driving can solve the road conditions that the automated driving system has not solved or has not encountered before. Remote driving service involves communication networks, road infrastructure, remote cockpit, perception devices carried by motor vehicles and service, and application processing platform. Remote driving will greatly reduce the cost of manned driving, and improve the driving efficiency of human drivers. This document provides the requirements for remote driving service based on vehicle gateway platform. | 2023-11-16 |
| SG16 | [F.749.8 (ex H.VMMA-FCR)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17611) | AAP | In-vehicle multimedia applets: Framework and functional requirements | This Recommendation describes the VMMA concept, the VMMA framework, the functional requirements, the functional APIs and the reference parameters. Some detailed use cases and reference APIs are described in the appendix. | 2023-11-16 |
| SG16 | [H.431.1 (ex H.CVR-FA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17637) | AAP | Functional architecture for cloud virtual reality systems | This Recommendation is as the subsequent Recommendation of ITU-T F.746.14, specifies the functional architecture of cloud virtual reality systems. It describes the overall functional architecture including control layer, resource layer, network layer, terminal layer, OA&M and security. This Recommendation also describes the basic functions of each layer, such as by unified scheduling/technology integration/content distribution of the control layer, cloud-based operation on the resource layer and high-quality transmission by the network layer, the cloud VR content can be run concurrently based on the cloud and is distributed to the terminal for presentation. | 2023-11-16 |
| SG16 | [H.552 (ex H.VM-VMIA)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18498) | TAP | Implementation of vehicular multimedia systems | This ITU Recommendation defines essential requirements to implement Vehicular Multimedia Systems, with requirements, provided in the clause 6, addressing four main aspects of vehicular multimedia systems: The connectivity aspect in the clause 6.1, providing essential standard references and specific performance requirement for the vehicular environment, the HMI aspects in clause 6.2, dealing with voice assistant and auditory interaction requirements, the media format and control aspects in clause 6.3, providing standard references for different types of media for Vehicular Multimedia Systems, and the Smartphone infotainment assistant aspects are provided in clause 6.4, with requirement related to the interface architecture between Smartphones and the Vehicular Multimedia Systems, as well as performance requirements to provide a fair level of User Experience Two appendixes provide additional informative recommendations to implement Vehicular Multimedia Systems: Appendix I provides RF performance criteria for WLAN and user performance testing scenarios for WLAN and WPAN connectivity, Appendix II provides recommendation for implementing a Diagnostic Interface for tuning the Voice Assistant functionalities. | 2023-11-16 |
| SG16 | [F.780.5 (ex F.TMonRDH)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17614) | AAP | Requirements, reference framework and use cases for telemonitoring systems in rapid deployment hospitals | The Recommendation describes the application scenarios, functional requirements, and reference architecture of telemonitoring systems in RDHs and applies them into their planning and designing in RDHs. The appendix to this Recommendation includes some use cases of the proposed reference system. | 2023-11-22 |
| SG16 | [H.861.0 (V2)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17486) | AAP | Requirements on communication platform for multimedia brain information | Recommendation ITU-T H.861.0 describes a conceptual ecosystem intended to exchange brain data based on communication platform requirements and definitions. Starting from a background of brain data exchange in the context of e-health, a functional framework model for a multimedia brain information platform (MBI-PF) is outlined. This model is then developed into a set of communication platforms which enable not only experts but also non-experts to utilize brain data for monitoring and maintaining health status of the brain. | 2023-11-22 |
| SG16 | [H.862.7 (ex F.IF-SLM)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18529) | AAP | Interoperability framework for sleep management services | Sleep occupies a third of our lives and helps to relieve the physical and mental fatigue of daily life and lead a smooth daily life. Therefore, it is possible to obtain an improvement effect that can enhance the quality of life based on the understanding of sleep time and quality through sleep monitoring. With the growth of the sleep market, various sleep monitoring products combined with ICT technology are being launched, and these products are mainly composed of dedicated apps and sensors. The use of products composed of such dedicated software for each sensor is a major limitation in service operation because it is difficult to integrate with existing service data and difficult to share data with other services when changing the product or using it with other services. This Recommendation introduces a way to provide an open, interoperable API for smart sleep management devices and sleep services. In order to provide an individual with optimal sleep, data collection, analysis, and customized services on individual sleep are required. For this, interoperability between IoT-based sleep management devices and services must be secured. Interoperability of services covered by this Recommendation includes interoperability of data and interoperability at the API level. | 2023-11-22 |
| SG16 | [F.743.24 (ex F.BVSSI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17510) | AAP | Scenarios and requirements for DLT in video surveillance system interworking | This Recommendation provides the overview of the video surveillance system interworking based on distributed ledger technology, and defines the application scenarios and capability requirements for DLT in video surveillance system interworking, to realize interoperability, high-reliability and high-efficiency of identity authentication and authorization of video surveillance system interworking (VSSI). | 2023-12-14 |
| SG16 | [H.626.6 (ex H.VSBD)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17475) | AAP | Architecture for big data application in video surveillance systems | As the amount of video data is growing in the video surveillance systems, the suitable architecture is needed to support the requirements for big data application in video surveillance systems to deal with the structured and unstructured data, and to enhance the efficiency for the huge data retrieval and the data mining across time and space range. This Recommendation is to define an architecture for big data application in video surveillance systems, including the functional architecture and reference points. This Recommendation is based on Recommendation ITU-T F.743.7 "Requirements for big data-enhanced visual surveillance services". | 2023-12-14 |
| SG16 | [T.803 (V3)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18691) | AAP | Information technology – JPEG 2000 image coding system: Conformance testing | Rec. ITU-T T.800 | ISO/IEC 15444-1 describes an image compression system that allows great flexibility, not only for the compression of images but also for access into the codestream. The codestream provides a number of mechanisms for locating and extracting portions of the compressed image data for the purpose of retransmission, storage, display, or editing. This access allows storage and retrieval of compressed image data appropriate for a given application without decoding. This Recommendation | International Standard provides the framework, concepts, and methodology for testing and the criteria to be achieved to claim compliance to Rec. ITU-T T.800 | ISO/IEC 15444-1 or Rec. ITU-T T.814 | ISO/IEC 15444-15. The objective of standardization in this field is to promote interoperability between JPEG 2000 encoders and decoders and to test these systems for compliance to this Recommendation | International Standard. Compliance testing is the testing of a candidate product for the existence of specific characteristics required by a standard. It involves testing the capabilities of an implementation against both the compliance requirements in the relevant standard and the statement of the implementation's capability. The purpose of this Recommendation | International Standard is to define a common test methodology, to provide a framework for specifying abstract test suites (ATSs), and to define the procedures to be followed during compliance testing. Any organization contemplating the use of test methods defined in this Recommendation | International Standard should carefully consider the constraints on their applicability. Compliance testing does not include robustness testing, acceptance testing, and performance testing. NOTE – This Recommendation | International Standard is in its third edition from the International Telecommunication Union (ITU) and in its fourth edition from the International Organization for Standardization /International Electrotechnical Commission (ISO/IEC). This edition cancels and replaces the previous edition which has been technically revised. The main changes compared to the previous edition are as follows: ? the maximum allowable errors associated with compliance Class 1, for both Rec. ITU-T T.800 | ISO/IEC 15444-1 and Rec. ITU-T T.814 | ISO/IEC 15444-15 codestreams, have been relaxed in a few cases to ensure that well designed 16-bit fixed-point implementations of the inverse discrete wavelet transform should be able to pass all compliance tests for Class 1. ? two additional test codestreams have been added along with conformance bounds, to facilitate testing of inverse wavelet and component decorrelating transform accuracy. ? a number of codestreams and files conforming to Rec. ITU-T T.801 | ISO/IEC 15444-2 have been included for informative purposes only, to facilitate the development of decoders and file format readers that are able to support features beyond the core capabilities found in Rec. ITU-T T.800 | ISO/IEC 15444-1 and Rec. ITU-T T.814 | ISO/IEC 15444-15. This Recommendation | International Standard contains a normative electronic attachment with the codestreams used in the application of the procedures described herein that is available from ITU at https://www.itu.int/net/itu-t/sigdb/speimage/ImageForm-s.aspx?val=10100803† or from ISO at https://standards.iso.org/iso-iec/15444/-4/ed-4/en. | 2023-12-14 |
| SG16 | [T.86 (V2)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18690) | AAP | Information technology – Digital compression and coding of continuous-tone still images: APPn Markers | This Recommendation | International Standard provides definitions for JPEG application specific markers (APPn) found in Rec. ITU-T T.81 | ISO/IEC 10918-1 and Rec. ITU-T T.84 | ISO/IEC 10918-3. This 2nd edition integrates the provisions of Amendment 1 of ITU-T T.86 (2012) | ISO/IEC 10918-4 (2013) and cancels the provisions concerning the registration authority processes originally defined in the 1st edition. ITU-T T.86 is a common text with ISO/IEC 10918-4. | 2023-12-14 |
| SG17 | [X.1150 (ex X.saf-dfs)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18035) | TAP | Security assurance framework for digital financial services | This work item is based on FIGI deliverable for security assurance framework. The provision of digital finance services (DFS) involves a complex ecosystem with the participation of different stakeholders such as banks, DFS provider, mobile network operators (MNOs), DFS platform providers, regulators, agents, merchants, payment service providers, device manufacturers, application developers, token service providers, OEMs, and clients. The DFS Security Assurance Framework provides an overview of the security threats and vulnerabilities facing the DFS providers (banks, non-banks providing mobile money services), mobile network operators, customers, payment system providers, merchants, and technology services/third-party service providers. Regulators including telecom authorities, banking, and payment regulators could also make use of the DFS Security Assurance Framework for establishing security baselines for the DFS providers as well. The DFS Security Assurance Framework recommends a structured methodology for managing security risks that the DFS providers offering digital financial services could implement to: Enhance customer trust and confidence in digital financial services. Clarify the role and responsibilities of each of the stakeholders in the ecosystem. Identify security vulnerabilities and related threats within the ecosystem. Establish security controls to provide end to end security. Strengthen management practices with respect to security risk management that is inclusive of all DFS stakeholders. | 2023-09-08 |
| SG17 | [X.1221 (ex X.stie)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18496) | TAP | Structured Threat Information Expression (STIE) | For real-time response to cyber threats, global cyber threat intelligence (CTI) is an important component of an organization's security program and can be obtained internally and from external sources. The Recommendation is intended to specify the data formats for sharing cyber threat information. | 2023-09-08 |
| SG17 | [X.1222 (ex X.taeii)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18497) | TAP | Trusted Automated Exchange of Intelligence Information (TAEII) | For real-time response to cyber threats, global cyber threat intelligence (CTI) is an important component of an organization's security program and can be obtained internally and from external sources The Recommendation is intended to specify the application protocol for sharing cyber threat information. | 2023-09-08 |
| SG17 | [X.1280 (ex X.oob-sa)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18036) | TAP | Framework for out-of-band server authentication using mobile devices | This Recommendation provides a framework for out-of-band server authentication using mobile devices including the following: • defines the out-of-band server authentication model and authentication procedure; • defines security threats and security requirements in the out-of-band server authentication model; • defines criteria and guidelines for generating server verification information using mobile devices; and • decribes use cases of the out-of-band server authentication model. This Recommendation does not address issues related to user authentication, regulation, and privacy considerations. | 2023-09-08 |
| SG17 | [X.1281 (ex X.osia)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18778) | TAP | APIs for interoperability of identity management systems | This Recommendation describes a set of standardized application program interfaces (APIs) needed to connect the multiple building blocks of an identity management solution. Note: This Recommendation is technically equivalent to the OSIA specifications [b-OSIA]. | 2023-09-08 |
| SG17 | [X.1352 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19045) | TAP | Amendments to ITU-T X.1352: Security Requirements for Internet of things (IoT) devices and gateway | This Recommendation establishes detailed requirements for five security dimensions applicable to Internet of things (IoT) device and gateway: authentication, cryptography, data security, device platform security, and physical security, based on the IoT reference model specified in [ITU-T Y.4100] and the IoT security framework in [ITU-T X.1361]. The authentication dimension includes user authentication, secure use of authentication credentials and device authentication. The cryptography dimension includes the use of secure cryptography, secure key management and secure random number generation. The data security dimension includes secure transmission and storage, information flow control, secure session management and personally identifiable information (PII) management. The device platform security dimension includes five elements: software security; secure update; security management; logging; and timestamp. Likewise, the physical security dimension includes a secure physical interface and tamper-proofing. | 2023-09-08 |
| SG17 | [X.1373](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17976) | TAP | Secure software update capability for intelligent transportation system communication devices | In the context of updates of software modules in the electric devices of vehicles in the intelligent transportation system (ITS) communication environment, this Recommendation aims to provide a procedure of secure software updating for ITS communication devices for the application layer in order to prevent threats such as tampering of and malicious intrusion to communication devices in vehicles. This includes a basic model of software update, security controls for software update and a specification of abstract data format of update software module. The procedure is intended to be applied to communication devices on ITS vehicles under vehicle to infrastructure (V2I) communication by means of the Internet and/or ITS dedicated networks. The procedure provides a technical guideline without compliance requirements and can be practically utilized by car manufactures and ITS-related industries as a set of secure procedures and security controls. | 2023-09-08 |
| SG17 | [X.1818 (ex X.5Gsec-ctrl)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18494) | TAP | Security controls for operation and maintenance of IMT-2020/5G network systems | This Recommendation provides recommended security controls for operation and maintenance of 5G networks systems including NFV (Network Functions Virtualization), RAN (Radio Access Network), network slicing, and MEC (Multi-access Edge Computing). This Recommendation covers: - Security threats for 5G network systems, categorized in the high-level threats. - Recommended security controls, categorized in the major control domains. | 2023-09-08 |
| SG2 | [E.1120 (ex E.gap)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17430) | TAP | Global ITU-T Naming, Numbering, Addressing and Identification assignment processes | Recommendation ITU-T E.1120 specifies processes to be used by an applicant, the Telecommunication Standardization Bureau (TSB), and ITU-T Study Group 2 (SG2), for assignment of: – ITU-T E.164 identification codes (ICs) associated within the shared country codes (CCs) for networks category of ITU-T E.164, whose combination is designated CC + IC. – ITU-T E.212 shared mobile country codes for networks and their respective mobile network codes. – [ITU-T E.118 global issuer identifier numbers (IINs). – ITU-T E.118.1 ITU-T management of the allocation of globally assigned Issuer Identifier Numbers (IINs]– ITU-T E.218 shared terrestrial trunk radio access mobile network codes. The naming, numbering, addressing and identification (NNAI) resources identified in the preceding list can be described as “global”. | 2023-03-22 |
| SG2 | [E.164.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19100) | TAP | ITU-T E.164 numbering resources for trials | Recommendation ITU-T E.164.2 contains the criteria and procedures for an applicant to be temporarily assigned a three-digit identification code within the shared ITU-T E.164 country code 991 for the purpose of conducting an international non-commercial trial. The purpose of the trial will be to determine the viability of a proposed new international public correspondence service. The 2023 revision of this Recommendation clarifies the conditions for reclamation in the case of non-payment of membership fees. | 2023-11-17 |
| SG2 | [E.212](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19101) | TAP | The international identification plan for public networks and subscriptions | Recommendation ITU-T E.212 defines a unique international identification plan for public fixed and mobile networks providing users with access to public telecommunication services. The ITU-T E.212 identification plan was originally developed for use in public land mobile networks (PLMNs). The plan is hierarchical and identifies geographic areas, networks and subscriptions. The main body of this Recommendation describes the pure identification plan. Amendment 3 introduces Annex H, which provides the criteria for the assignment of shared E.212 resources for specific use cases to applicants that are regional and other international organizations (ROIO)/standard development organization (SDO)-specified networks. The 2023 revision of this Recommendation clarifies the conditions for reclamation in the case of non-payment of membership fees. | 2023-11-17 |
| SG2 | [E.218](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=19102) | TAP | Management of the allocation of terrestrial trunk radio Mobile Country Codes | This Recommendation specifies the structure of the terrestrial trunk radio ITSI, and describes the manner by which the ITU-TSB shall allocate and manage the (T)MCC. The administration of the (T)MNC by a National Administration is a national matter and is therefore outside of the scope of this Recommendation. The 2023 revision of this Recommendation clarifies the conditions for reclamation in the case of non-payment of membership fees as well as amending Clause 2. | 2023-11-17 |
| SG2 | [M.3173.1 (ex M.smcsn-ir)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18337) | AAP | Interface for synergy management of cloud and SDN-based networks - Protocol neutral requirements | Recommendation ITU-T M.3173.1 provides the interface requirements for the synergy management of cloud and SDN-based networks. It describes the interface position for the synergy management system, and the synergy management scenarios of cloud and SDN-based networks. It also specifies the management interface requirements and the related use cases for the synergy management interface at a technology-independent level (protocol-neutral). | 2023-11-17 |
| SG2 | [M.3386 (ex M.rmnoc-AI)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17426) | AAP | Requirements for the management of network operation cost within AI enhanced Telecom Operation and Management (AITOM) in telecommunication operational aspects | Recommendation ITU-T M.3386 focuses on network operation cost management within AITOM in telecommunication operational aspects. This Recommendation provides the classification standard, functional requirements of network operation cost management. | 2023-11-17 |
| SG2 | [M.3387 (ex M.rfmls)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17427) | TAP | Management requirements for federated machine learning systems | Data privacy and information security pose significant challenges to the big data and artificial intelligence (AI) community as these communities are increasingly under pressure to adhere to regulatory requirements. Many routine operations in big data systems and applications, such as merging user data from various sources to build a machine learning model, are considered to be illegal under current regulatory frameworks. The purpose of federated machine learning (FML) is to provide a viable solution that empowers machine learning applications to utilize data in a distributed manner. In an FML framework, the data owners do not exchange raw data directly and do not allow any party to infer the private information of other parties. In order to facilitatepromote the construction and use of federated machine learning models (FMLMs) and improve the quality of FML service, this draft Recommendation specifies the management requirements for federated machine learning systems (FMLSs), including the functional architecture of FMLSs, as well as the requirements of the basic management domain, model management domain, and data management domain. This draft Recommendation is applicable to the architecture design, research, and development of FMLSs. | 2023-11-17 |
| SG20 | [Y.4222 (ex Y.smart-evacuation)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17886) | TAP | Framework of smart evacuation in a disaster or emergency in smart cities and communities | Smart evacuation facilitates effective and efficient solutions for people inside a disaster or emergency zone and for people that need to enter such a zone as part of the response. Internet of things (IoT) and smart cities and communities could be used to provide smart evacuation during a disaster or an emergency. This Recommendation describes concepts and features of smart evacuation control in disaster and emergency situations. It identifies high-level requirements and ICT infrastructure for smart evacuation along with use cases in disaster and emergency situations. The introduction of a smart evacuation service will allow the maintenance of the level of comfort for the population achieved in a smart city even in the event of an emergency of natural or man-made origin. This is fundamental to justify the enormous material costs for the rapid development of smart cities around the world against the background of natural and man-made emergencies that have become more frequent throughout the world. | 2023-02-10 |
| SG20 | [Y.4487 (ex Y.RMDFS-arch)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17950) | TAP | A functional architecture of roadside multi-sensor data fusion systems for autonomous vehicles | With the development of autonomous driving, perception methods relying solely on the vehicle's own sensors or on traditional roadside sensing systems that lack sufficient collaboration between devices are no longer sufficient to support higher-level autonomous driving applications. A higher requirement for roadside perception capabilities is therefore proposed. The roadside multi-sensor data fusion system (RMDFS) can provide new functionalities which will contribute to enhancing roadside perception capabilities by combining different types of roadside sensing devices such as cameras, lidars, millimetre wave radars, etc. according to their characteristics, and perform unified management and coordination so as to achieve accurate perception of road information, and support for autonomous driving applications. Recommendation ITU-T Y.4487 defines a reference functional architecture of roadside multi-sensor data fusion systems. It clarifies the concept and components of the systems, and specifies the key functional entities of the systems and the reference points between the functional entities. Use cases based on roadside multi-sensor data fusion systems are also provided in the appendix. | 2023-02-10 |
| SG20 | [Y.4221 (ex Y.ElecMon-Reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17933) | TAP | Requirements of IoT-based electric power infrastructure monitoring system | An IoT-based electric power infrastructure monitoring system is an effective means to obtain the operational health status of electric power infrastructures. It provides advanced and efficient auxiliary monitoring and diagnosis methods for maintaining the safe and stable operation of an electric power system. This Recommendation specifies the requirements for an IoT-based electric power infrastructure monitoring system for the purposes of maintaining electric power infrastructure. | 2023-09-22 |
| SG20 | [Y.4225 (ex Y.dt-ITS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17947) | TAP | Requirements and capability framework of digital twin for intelligent transport system | Digital twin for intelligent transport system can provide digital representation of physical transportation world. With the meaningful and full-scale understanding of historical, real-time and statistical traffic related data in digital twin for intelligent transport system, the awareness of physical transportation is significantly enhanced, problems of transportation system can be discovered earlier, various traffic situations can be simulated, different long term, medium, short term strategies can be properly decided, and a lot of applications supported by intelligent transport system can be provided better and more intelligent. This Recommendation specifies the requirements and capability framework of digital twin for intelligent transport system. | 2023-09-22 |
| SG20 | [Y.4488 (ex Y.IoT-SPWE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17945) | TAP | Requirements and functional architecture of data services provided via IoT-based technologies for safety protection of working environments | This Recommendation specifies the requirements and functional architecture of data services provided via Internet of things (IoT)-based technologies for the safety protection of three typical working environments, including working environment with high temperature, high dust and harmful gases. By deploying data services provided via IoT-based technologies, these working environment make use of the IoT technologies to collect information remotely, identify risky behaviour, control equipments remotely, etc. These technologies could support intelligent services such as safety protection information monitoring including workers and environment, predictive maintenance, etc., which can help to reduce incidents and casualties and improve the safety level of working environments. | 2023-09-22 |
| SG20 | [Y.4496 (ex Y.RA-PHE)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17921) | TAP | Requirements and reference architecture of smart service for public health emergency | This Recommendation is aimed at giving the requirements and architecture of a system for public health emergency, named “smart service system for public health emergency”, that is implemented to address current and future potential public health risks. | 2023-09-22 |
| SG20 | [Y.4497 (ex Y.Smart-SBS)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17923) | TAP | Requirements and functional architecture of smart sharing bicycle service | This Recommendation describes the requirements and functional architecture of smart sharing bicycle (SSB) service to meet people's daily travel needs, supply good user experience, and create a huge market opportunity. It includes service requirements and the functional architecture of smart sharing bicycle service. | 2023-09-22 |
| SG20 | [Y.4498 (ex Y.energy-data)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17946) | TAP | Framework of city-level energy data sharing and analytics among buildings | As the building sector accounts for a significant portion of total energy consumption, efforts are being made to increase energy efficiency in buildings through solutions like smart home, smart building, and smart factory. To effectively support this in smart cities, it is crucial to have city-level energy data sharing and analytics for city energy services and intelligent energy applications. This allows energy consumption and production information to be shared among buildings with different energy consumption patterns or renewable energy production to increase energy efficiency. To enable the city-level energy data sharing and analytics, standardized specifications for energy data types and exchange methods are essential. This draft Recommendation specifies requirements and architectural models for city-level energy management that facilitate data exchange, sharing and analytics among buildings in smart cities. It also provides use cases to support energy planning, management and energy data sharing through city energy services for smart sustainable cities. | 2023-09-22 |
| SG20 | [Y.4499 (ex Y.UIM-cs-framework)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17944) | TAP | Framework of urban infrastructure monitoring based on crowdsourcing | Urban infrastructure refers to the fundamental facilities and systems that a city must have for its operation and development. It has the characteristics of large quantity, wide distribution and high management difficulty. Crowdsourcing is the practice for a common goal by engaging a group of people. It can provide a scalable and financially viable way to monitor urban infrastructure. This Recommendation addresses the framework of urban infrastructure monitoring based on crowdsourcing, including introduction of urban infrastructure monitoring based on crowdsourcing, requirements, functional architecture, common procedures and security and privacy considerations. | 2023-09-22 |
| SG20 | [Y.4607 (ex Y.DRI-reqts)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18457) | TAP | Requirements for autonomous urban delivery robots interworking | This Recommendation specifies the requirements for autonomous delivery robots that interwork with delivery robot service provider, user device and urban infrastructure to facilitate delivery goods without human intervention. | 2023-09-22 |
| SG20 | [Y.4703 (ex Y.TM.SM-API)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17919) | AAP | IoT Service Management API REST Specification | The following document is the specification of the IoT Service Management API User Guide. It includes the model definition as well as all available operations. | 2023-09-22 |
| SG20 | [Y.4704 (ex Y.TM.DM-API)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17920) | AAP | IoT Device Management API REST Specification | The following document is the specification of the REST API for the management of any IoT Device. It includes the model definition as well as all available operations. | 2023-09-22 |
| TSAG | [A.8-rev](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18923) | TAP | Alternative approval process for new and revised ITU T Recommendations | Recommendation ITU-T A.8 provides working methods and procedures for approving draft new and revised ITU-T Recommendations using the alternative approval process. | 2023-06-02 |

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