



JTC1-SC25/2974/SBP

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ISO/IEC JTC 1: INFORMATION TECHNOLOGY

ISO/IEC JTC 1/SC 25: INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT

ISO/IEC JTC 1/SC 25 Business plan September 2020 to September 2021

This SBP has been reviewed and prepared based on the comments received on JTC1-SC25/2964/DC. It is submitted for approval at the Next JTC 1/SC 25 plenary meeting.

BUSINESS PLAN FOR JTC 1 / SC25: INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT

1 PERIOD COVERED: September 2020 – September 2021

1.0 Scope

Standardization of microprocessor systems, interfaces, protocols, architectures and associated interconnecting media for information technology equipment and networks to support embedded and distributed computing environments, storage systems and other input/output components.

Standards for home and building electronic systems in residential and commercial environments to support interworking devices (IoT-related) and applications such as energy management, environmental control, lighting, and security.

Cabling system standards for information and communication technology (ICT), in all types of residential, commercial and industrial environments for the design, planning and installation, test procedures, automated infrastructure management systems and remote powering.

NOTE: JTC 1/SC 25 standards reference IEC standards for cables, waveguides and connectors.

2.0 CHAIRMAN'S REMARKS

2.1 Market Requirements, Innovation

The market for home and office networking applications among networked devices (often called IoT – Internet of Things) is expanding because of the attention by industry, consumers, and governments to energy management and storage, the effects of greenhouse gas emissions, the growth of renewable energy resources, electric vehicles, and the interconnection with users. Customer concerns for data security, privacy, and safety are being addressed by enhancing the Home Electronic System (HES) gateway standards with cybersecurity features.

Homes are increasingly equipped with home systems conforming to the HES architecture and implementing protocols specified in the ISO/IEC 14543 series. These protocols support competitive markets with products from various sources implementing protocols specified in this series. Standards for remote access and management of home equipment are being developed. Products meeting these specifications have been well received by the market and enable smart grids to interact with intelligent homes.

Extensions of cloud-based services connected to home devices for home applications creating an IoT environment is expanding the market for standards developed by JTC 1/SC 25. SC 25 is also developing standards to address concerns for cybersecurity (data security), privacy, and the safety of connected devices and appliances in homes.

In response to the great market success of generic cabling standards for offices, industrial premises, homes, and data centers, WG 3 continues to keep pace with the technological progress in cabling technology to support the megatrends identified by the IEC Standards Management Board. ISO/IEC 11801 series improves the technical coherence and eases future maintenance; it now includes a standard on distributed building services cabling.

Matrix modelling of channels and links and work on single pair cabling to support emerging applications for Ethernet over one pair has been initiated. The revision of ISO/IEC 14763-2 for the installation of IT cabling introduces additional requirements for remote powering applications requiring up to 90 W.

2.2 Accomplishments

SC 25 energy management standards are being adopted for use in community housing (an apartment building or a campus of apartment buildings). To serve this market, SC 25 is undertaking the development of standards to co-ordinate the allocation of energy from public sources and local sources (wind, solar, and storage) to appliances and electric vehicle chargers. Elements of artificial intelligence (AI) are being incorporated into these standards to provide specifications for energy management that adapt to each customer's preferences and choices of devices attached to the home or building network.

WG 1 is working on a series of standards for a system of interacting Energy Management Agents (EMAs) for demand-response energy management. These standards support the extension of EMAs for homes to community housing with a protocol for communications among distributed EMAs. The EMA, previously standardized by SC 25, acts as an agent for the user with algorithms that incorporate features of AI (artificial intelligence), specialized for effective energy management.

WG 1 is also developing a series of standards specifying a common user interface for operating applications in an integrated fashion even if the application components were supplied by different manufacturers using a variety of home area network (HAN) protocols.

2.3 Resources

The Plenary of SC 25 and the meetings of its working groups continue to be well attended. Resources for current development and maintenance of standards documents in SC 25 are adequate in WG 1, WG 3, WG 4, and PT TT.

2.4 Competition and Co-operation

SC 25 has made a conscious effort to reduce or eliminate competition with other standards groups by establishing an extensive network of liaisons both internal and external to JTC 1.

Recent liaisons have been established with JTC 1/SC 41 IoT, IEC Systems Committee on Smart Cities and AAL.

3. WG's

3.1 WG 1

WG 1 is responsible for the Home Electronic System (HES) family of more than 50 standards. WG 1 develops standards for the interconnection of electrical and electronic equipment and products in homes and small buildings to provide applications such as energy management, comfort control using HVAC (heating, ventilation, and air conditioning) equipment, lighting, security, etc.

The primary markets for WG 1 standards are developers, manufacturers, and installers of these products and related services.

WG 1 standards for HES enable home and building occupants:

- to live more comfortably in the home,
- to be more protected and feel safe in the home,
- to work productively in smart buildings, and
- to live and work more economically with minimal environmental impact by reducing energy consumption and/or producing and storing or selling excess energy.

WG 1 standards facilitate consumer electronic products, devices, and services to interoperate or to operate, where feasible, as a single coherent system with a common user interface. This system benefits all stakeholders including product developers, manufacturers, service providers, installers, utilities, and consumers. HES consists of a network of networks that enables interoperation among consumer products, sensors, actuators, controllers, and user interfaces in homes and buildings.

WG 1 is pursuing projects that foster seamless delivery of applications linking homes, apartments, enterprises, and public networks. Standards for remote access and management of home equipment are being developed. A common user interface among heterogeneous home systems is under development. Applications of AI to energy management are being specified to create an environment responsive automatically to user preferences for comfort and economy

Homes are made intelligent with interconnected sensors, actuators, user interfaces, and controllers, which may be embedded in smart consumer appliances. The interconnection of public networks with home networks poses cybersecurity risks for consumer privacy, safety, and security, which are being addressed.

3.1.1 WG 1 Accomplishments

WG 1 completed standards in the following areas. Please note that the term “series” refers to a group of related standards.

- Home Electronic System architecture (ISO/IEC 14543-2, ISO/IEC 15044)
- Numeric keyboard for Home Electronic Systems (IEC 60948)
- Home and building automation in a mixed-use building (ISO/IEC TR 14543-4)
- Energy management demand response (DR) including distributed energy resources (DER) (ISO/IEC 15067-3)
- Distributed EMAs for an apartment complex (ISO/IEC 15067-3-3)
- GridWise Architecture Council (GWAC) Interoperability Context-Setting Framework (ISO/IEC TR 15067-3-2)
- GridWise Transactive Energy systems research, development and deployment roadmap (ISO/IEC TR 15067-3-7)
- GridWise Transactive Energy framework (ISO/IEC 15067-3-8)
- Modular Communication Interface (MCI) for energy management (ISO/IEC 10192-3)
- Simple Interfaces (ISO/IEC TR 10192-2)
- Universal Interface Class 1 (ISO/IEC 10192-1)
- Residential gateway (ISO/IEC 15045 series)
- Product interoperability (ISO/IEC 18012 series)
- Communications protocol based on KNX (ISO/IEC 14543-3 series)
- Communications protocol based on Echonet (ISO/IEC 14543-4 series)
- Intelligent grouping and resource sharing (IGRS) (ISO/IEC 14543-5 series)
- Wireless short-packet protocol applicable for energy harvesting devices (ISO/IEC 14543-3-10 for AM signals, ISO/IEC 14543-3-11 for FM signals)

- Wireless Beacon-enabled Energy Efficient Mesh (WiBEEM) network (ISO/IEC 29145 series) for devices that communicate using radios conforming to IEEE 802.15.4-2011
- Security requirements and services (ISO/IEC 24767 series)
- Functional safety (ISO/IEC 14762)
- Home network resource management (ISO/IEC 30100 series)
- Lighting model for HES (ISO/IEC TR 15067-2)

3.1.2 WG 1 Deliverables

WG 1 is continuing work on:

- A common user interface and interoperability among home systems (ISO/IEC 10192-4 series)
- Cybersecurity, safety, and privacy for the HES gateway (ISO/IEC 15045 series)
- Model of interacting Energy Management Agents (EMAs) for demand-response energy management (ISO/IEC 15067-3-3x series)
- On-premises narrow AI engine for an energy management system using Energy Management Agents (ISO/IEC 15067-3-5x series)

WG 1 is considering new proposals on:

- Application protocols for storage batteries and controllers using the Echonet communications protocol (ISO/IEC 14543-4-302)
- An extension to the IGRS series of standards for audio remote access (ISO/IEC 14543-5-103), remote access to smart locks (ISO/IEC 14543-5-104 and ISO/IEC 14543-5-105), access using voice control (ISO/IEC 14543-5-13), and blockchain application protocols (ISO/IEC 14543-5-141)
- Lighting control user interface (ISO/IEC 15067-2-1)
- Reference architecture for energy management in a residential community (ISO/IEC 15067-3-1)
- Extensions of the product interoperability series for lexicon (ISO/IEC 18012-3) and event encoding (ISO/IEC 18012-4)

3.1.3 WG 1 Risks, Opportunities and Issues

None

3.2 WG 3

WG 3 is working on generic cabling system and related standards. The ISO/IEC 11801 series supersedes the previously independent standards and covers cabling for offices, industrial areas, homes and data centers as well as distributed building services.

Related to this activity, the upgrade of ISO/IEC TR 11801-9903 on matrix modelling of channels and links into a TS has been initiated. Several TRs have been initiated to provide further guidance to ISO/IEC 11801 series of cabling standards and supported applications.

For example, Technical Report ISO/IEC TR 11801-9906 was developed to provide initial guidelines for single pair cabling applications in support of related IEEE 802.3 activities. Furthermore, WG 3 has initiated work on a 1-pair cabling project to service emerging applications for Ethernet over one pair cabling.

Testing of optical fibre channels and visual inspection and cleaning of optical fibre interfaces is covered by ISO/IEC 14763-3; the standard will be revised to better support the cabling installer in verifying that installed optical fibre cabling meets the specified performance requirements. Other new projects cover sustainability of cabling and physical network security of cabling installations.

(New) aspects to be considered include:

- Energy efficiency
- Reinstate the reference to safety and local codes
- Balanced cabling up to 100 Gbit/s
- Impact of mode conversion for balanced cabling
- Verify the performance of installed cabling
- Operating temperature of balanced channels and components beyond 60 °C
- Impact of 1 pair cabling to other standards committees
- Sensor and IoT networks
- Consider offshore application of generic cabling (such as cruise ships, commercial vessels, floating platforms, drilling rigs)
- Impact of new wireless communication technologies such as lighting, mobile internet via light on cabling standards
- Multidrop cabling

3.2.1 Publications since 2019 plenary meeting of SC 25

The following documents were published since 2019-09:

- ISO/IEC 14763-2 “Information technology – Implementation and operation of customer premises cabling - Part 2: Planning and installation“
- ISO/IEC/TR 11801-9906 “Information technology – Generic cabling for customer premises – Part 9906: Balanced 1-pair cabling channels up to 600 MHz for single pair Ethernet (SPE)”
- ISO/IEC TR 11801-9908 „Information technology – Generic cabling for customer premises – Part 9908: Guidance for the support of higher speed applications over optical fibre channels“
- ISO/IEC TR 11801-9909, Information technology - Generic cabling for customer premises – Part 9909: Evaluation of balanced cabling in support of 25 Gbit/s for reach greater than 30 metres
- ISO/IEC TR 11801-9910, Information technology - Generic cabling for customer premises – Part 9910: Specifications for modular plug terminated link cabling
- ISO/IEC TS 29125:2017/AMD1:2020, Amendment 1 - Information technology –Telecommunications cabling requirements for remote powering of terminal equipment

3.2.2 Ongoing work

Amendment 1 of ISO/IEC 18598 “Automated Infrastructure Management Systems” is under development.

The revision of ISO/IEC 14763-4 was started to be completed by 2021 at the latest.

The revision of ISO/IEC 30129:2015 “Bonding” will be started in 2020.

Amendment to ISO/IEC 11801-1, -3 and -6 for generic 1 pair cabling to support applications such as (but not limited to) Internet of Things (IoT), Industry 4.0, Smart Home/Smart Building, sensor networks.

Additional areas for consideration in the ISO/IEC 11801 series include

- healthcare, supported living and assisted living
- Education, presentation

ISO/IEC DTS 11801-9903 “Information technology – Generic cabling for customer premises - Part 9903: Matrix modelling of channels and links” has been submitted for formal vote.

Revision of ISO/IEC 14763-3 to align with technical developments (fibre naming, connectors etc.) has been decided.

A standard on Physical Network Security (ISO/IEC 24383), i.e. physical security of in structure, is under development.

A standard on Sustainability (ISO/IEC 14763-5), including cabling installation skills, training, administration, quality control, usability and accountability, is under development.

3.2.3 WG 3 Risks, Opportunities and Issues

Based on the very dynamic technology situation in IT and IoT/IIoT markets there are several new aspects to consider in our work as there is also sustainability.

3.3 WG 4

WG4 standards are used in almost every computing platform around the world. However, standardization work relies heavily on work done within the US national body with the support and involvement of multinational corporations.

WG 4 is responsible for:

- continuing to enhance the SCSI architecture (SAM), command set standards (SBC, SCC, SFSC, SPC, SSC, MMC, SMC, SES, ADT, ADC, OSD, RBC, and ZBC), transports (Parallel SCSI (SPI), SAS, SBP, SPL, iSCSI, SCSI Express (SOP and PQI), UAS, FCP, SSA, ADI, SAT, SRP and IEEE 1394), and enhancing SAS speeds;
- continuing to enhance the ATA command set and the SATA command set (ACS). Also included, are the Enhanced Disk Drive services (EDD), the Zoned Device ATA Command set (ZAC), the ATA Architecture model (AAM), the ATA Parallel transport model (APT), and the ATA Serial transport model (AST);
- continuing to enhance the Standards related to the Fibre Channel transport (FC-PI, FC-BB, FC-SB, FC-SP, FC-FS, FC-LS, FC-GS, FC-SW, FC-NVMe, and FC-RDMA);
- and maintaining several stable standards.

3.3.1 WG 4 Achievements

WG 4 Review and select new storage network standards to submit as new work item proposals

Published the following standards:

- ISO/IEC 14776-224 Edition 1.0 (2019-10-22) Information technology - Small computer system interface (SCSI) - Part 224: Fibre Channel Protocol, fourth version (FCP-4)
- ISO/IEC 14776-263 (SPL-3) Edition 1.0 (2018-10-29) Information technology - Small Computer System Interface (SCSI) - Part 263: SAS Protocol Layer - 3 (SPL-3)
- ISO/IEC 14776-415 Edition 1.0 (2019-12-13) Information technology - Small Computer System Interface (SCSI) - Part 415: SCSI Architecture Model - 5 (SAM-5)
- ISO/IEC 14776-454 Edition 1.0 (2018-04-18) Information technology - Small Computer System Interface (SCSI) - Part 454: SCSI Primary Commands - 4 (SPC-4)
- ISO/IEC 14776-481 Edition 1.0 (2019-12-13) Information technology - Small computer system interface (SCSI) - Part 481: Security features for SCSI commands (SFSC)

Existing SC25/WG4 items (9 items):

- FC-SP-2 14165-432: Security Protocol – CD in process
- ACS-3 17760-103: ATA/ATAPI Command Set - 3 (ACS-3) FDIS in process

3.4.2 WG 4 Deliverables

Items under development for possible future submission as SC25/WG4 items (30 items):

- Automation Device Commands - 4 (ADC-4)
- Automation Device Transport - 3 (ADT-3)
- Fibre Channel Protocol for SCSI - 5 (FCP-5)
- SCSI Architecture Model - 6 (SAM-6)
- Serial Attach SCSI - 4.1 (SAS-4.1)
- Serial Attached SCSI - 4 (SAS-4)
- Serial Attached SCSI - 5 (SAS-5)
- SAS Protocol Layer - 4 (SPL-4)
- SAS Protocol Layer - 5 (SPL-5)
- SCSI / ATA Translation - 4 (SAT-4)
- SCSI / ATA Translation - 5 (SAT-5)
- SCSI Block Commands - 4 (SBC-4)
- SCSI Enclosure Services - 4 (SES-4)
- SCSI Primary Commands - 5 (SPC-5)
- SCSI RDMA Protocol - 2 (SRP-2)
- SCSI Stream Commands - 5 (SSC-5)
- Zoned Block Commands - 2 (ZBC-2)
- FC-PI-7p – Physical Interfaces – multi-lane 256GFC
- FC-PI-8 – Physical Interfaces – single-lane 128GFC
- FC-FS-6 – Framing and Signaling
- FC-GS-8 – Generic Services
- FC-LS-4 – Link Services
- FC-NVMe-2 – NVMe over Fibre Channel
- FC-SW-7 – Switch Fabric

- FC-RDMA – RDMA over Fibre Channel
- AT Attachment Command Set – 4 (ACS-4) Planned to become 17760-104
- AT Attachment Command Set – 5 (ACS-5) Planned to become 17760-105
- Zoned Device ATA Command Set (ZAC) (INCITS 537-2016)
- ZAC Amendment (INCITS 537-2016/AM1-2018)
- Zoned Device ATA Command Set – 2 (ZAC-2)

3.4.3 WG 4 Strategies/Opportunities/Risks

New storage interconnects provide new opportunities for international standardization within WG4.

3.5 PT TT (project team)

3.5.1 Programme

The project team PT TT was established after JTC 1 asked SC 25 to take the lead in coordinating the standardization activities for intelligent homes and held its first meeting in the year 2007.

PT TT Plans for the years 2020 – 2021

PT TT has two projects, one on taxonomy (Information technology – Intelligent homes – Taxonomy of specifications) and the other on terminology (Information technology – Terminology for intelligent homes).

These are expected to greatly help SC 25 in their co-ordination activities. The Taxonomy project consists of two parts.

The first part (ISO/IEC TR 29107-1 Information technology – Intelligent homes – Taxonomy of specifications – Part 1: The taxonomy method) describes the taxonomy scheme by which specifications are characterized, and the second provides tables listing the specifications according to this scheme.

The Terminology project handles terms and definitions for intelligent homes. It collects terms and definitions from specifications not only from JTC 1 but also from other standards. When a term has more than one definition, these definitions are sorted according to quality, and for terms with no appropriate definition found; new definitions are created.

3.5.2 Accomplishments and Deliverables

The ongoing progress on the terminology project has started the process of developing an extended version of ISO/IEC TR 29108 (Information technology – Terminology for intelligent homes). It is expected to be completed in the next two to three years.