
ISO/IEC JTC 1 "Information technology"

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SC 23 Business Plan 2020

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Description

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BUSINESS PLAN

ISO/IEC JTC 1/SC 23

Digitally Recorded Media for Information Interchange and Storage

Period Covered: October 2019 – September 2020

1.0 Executive Summary

Digitally Recorded Information is an essential element in Information Technology domain, and SC 23 is continuing to provide technically rigorous standards that meet user requirements. During the period from October 2019 to September 2020, SC 23 has been developing a revision of a standard to keep reliability of optical disks, an amendment of a volume and file structure of CD-ROM and four revisions of BD standards, and held the 20th Plenary meeting at August 21st, 2020 as a virtual plenary due to the COVID-19 pandemic.

As the standardization activities above, the first one is the revision of Data migration method for long-term data storage, as 4th Edition of ISO/IEC 29121. The third one is to amend four BD International Standards; ISO/IEC 30190, 30191, 30192 and 30193, originally requested by the Blu-ray Disc Association (BDA) to support 4K/8K broadcast recording on writable BD disks.

In addition to the current activities, SC 23 is seeking to expand its activity to a new work area for potential standardization taking the drastic change of storage environment into account, such as digital data explosion in the near future. In order to contribute to resolve issues in preparation for such serious situation, SC 23 will continue to provide platform across entire domain of digital data storage in collaboration with related Standardization Organizations.

2.0 Chairman's Remarks

2.1 Market Requirements, Innovation

It is predicted that more than 59 zettabytes (ZB) of data will be created, captured, copied, and consumed in the world in 2020, according to the Global DataSphere from International Data Corporation (IDC). The COVID-19 pandemic is contributing to this figure by causing an increase in the number of works from home employees and in the consumption of downloaded and streamed video.

It is also predicted the amount of data created over the next three years will be more than the data created over the past 30 years and the Global DataSphere will grow to 175 ZB by 2025, as shown in Figure 1.

The quantity of data generation will continue to outpace the ability to store the data. It is calculated that storage capacity shipments across all media types (HDD, SSD, NVM-flash/other, tape, and optical) over the recent 4 years (2018–2021) will need to exceed the 6.9ZB shipped across all media types over the past 20 years, and over 22 ZB of storage capacity must ship from 2018 to 2025 to keep up with storage demands.

(Source: Data Age 2025, IDC Global DataSphere, Nov.2018)

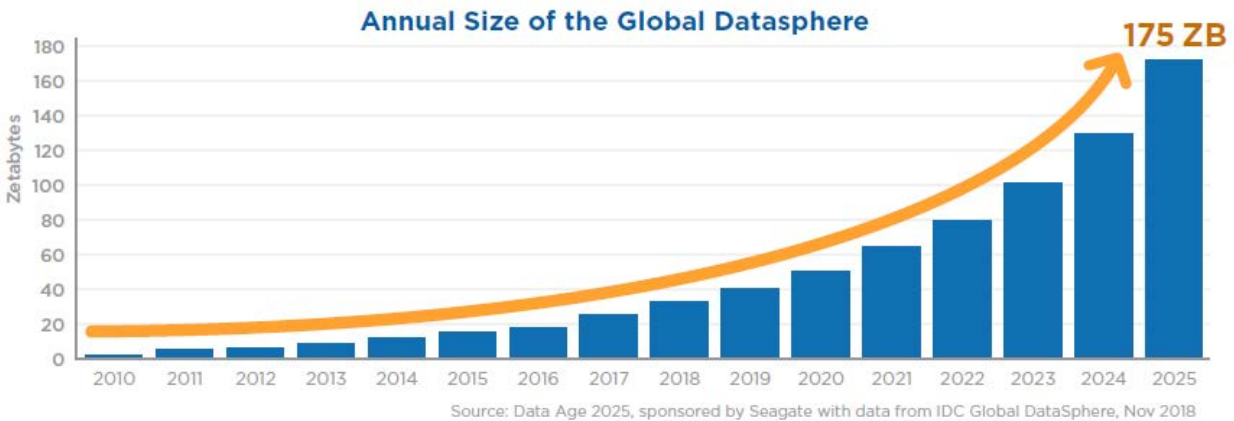


Figure 1: forecast of digital data growth

On the other hand, an energy-consumption forecast introduced by digital-data stored in 2020 was reported, with the assumptions that approximately 40% of the total amount of digital data generated was stored in data centers. (Source: AUSTRALIAN JOURNAL OF TELECOMMUNICATIONS AND THE DIGITAL ECONOMY VOLUME 2 NUMBER 3, OCTOBER 2014)

This report concluded only if significant volumes of data is moved to offline “cold” storage, the realistic energy-consumption forecast is achievable. The common assumption that all useful data will be available instantly online for all time is not sustainable nor realistically achievable.

In the sense of “cold” storage, Optical disc has fundamental features superior for data archive applications, such as water-proof function, long lifetime, low power-consumption, and so on. Those unique characteristics will help users to recover important data from damage on disasters and to make easier the constructions and managements of data-archive system under ultra-low power consumption. Therefore, new optical (or hybrid) storage system with more capacity, efficient space-factor and lower latency is expected to achieve sustainable and realistic energy-consumption growth in the near future.

2.2 Accomplishments

SC23 is directly responsible for 135 published International Standards in the field of its scope;

- Removable digital storage media utilizing optical, holographic and magnetic recording technologies, and flash memory technologies for digital information interchange, including;
 - algorithms for the lossless compression of data,
 - volume and file structure,
 - methods for determining the life expectancy of digital storage media, and
 - methods for error monitoring of digital storage media.

2.3 Resources

SC 23 has 7 Participating-member countries, China, Japan, Kazakhstan, Korea, Netherlands, Russia, Switzerland, and 21 Observing-member countries. Although development and manufacturing facilities of storage industry have recently concentrated to a few countries, adequate resources for development of standards are still available for all current and anticipated projects, such as physical specifications of conventional storage media, data archive applications and file system specifications.

On the other hand, SC 23 is seeking to expand its activity to a new work area considering the drastic change of storage environment in the near future. To address innovative technology domains leading to IoT, AI and Cloud service, etc., SC 23 needs to invite experts not only for current technology domain but also for logical and system domains.

2.4 Competition and Cooperation

The full SC 23 membership list can be found at [“SC 23 Member Listing”](#). SC 23 is always making a conscious effort to reduce and eliminate competition with other standardization committees by establishing extensive liaison-network for both internal and external to JTC 1. The list of liaisons can also be found at the web-site link above.

Noteworthy liaisons are;

ISO/TC 42:	Photography,
ISO/TC 171/SC 1:	Document Management Applications – Quality, preservation and integrity of information,
IEC/TC 100/TA 6:	Audio, video and multimedia equipment and systems – Storage media, data structures, equipment and systems, and
Ecma TC31:	Information Storage.

Especially, the Category A liaison with Ecma International has resulted in numerous additions to the SC 23 standards catalogue by adopting the Fast-Track Procedure. In normal cases, SC 23 plenary meeting is held in conjunction with Ecma TC31 meeting to encourage cross-fertilization of each membership. SC 23 is investigating possible joint activities with Ecma TC31 for future standardization items.

3.0 Standardization Projects

3.1 Standardization of Optical disk reliability;

Data migration method for optical disks: ISO/IEC 29121 (Ed.4)

In March 2018, International Standards for Data migration method for optical disks: ISO/IEC 29121 (Ed.3) was published. This revision intended to incorporate BD Recordable, BD Rewritable, CD-R and CD-RW disks in addition to the existing writable DVD disks. By this revision, secure data migration to the newer BD disks with higher data capacities can be addressed for professional and/or enterprise usage.

After that, SC 23 JNB discussed how to spread the use of this standard across end users and confirmed that a number of technical amendments should be required to clarify operation

circumstances especially for general users. Accordingly, SC 23 JNB proposed to establish a project for a revision of ISO/IEC 29121: 2018 and it was approved in August 2019. The current status is ISO/IEC DIS 29121 (Ed. 4) under 40.20 stage.

3.2 Activities of Optical-disk file-format

Volume and file structure of CD-ROM: ISO 9660 (Amd.2)

The amendment of ISO 9660 had been planned to append JOLIET specification, which is the extended version of ISO 9660 and widely implemented in the existing Windows OS.

In November 2018, Microsoft Corporation sent its permission letter to SC 23 chairman, so that JOLIET can be incorporated in ISO 9660. Accordingly, SC 23 JNB proposed to establish a project on ISO 9660: 1998/Amd.2, and it was approved in January 2019.

However, ITTF suggested that the form of the permission letter shall strictly follow Directives Part1 to register this project, and in response, Microsoft submitted the revised permission letter in April 2019. Thanks to the Microsoft's thoughtful cooperation, PDAM2 was approved in June 2019, and ISO 9660:1998/Amd.2:2020 has been published in April 2020.

Meanwhile, ITTF suggested to create a consolidated version for users' benefit at the DAM 2 ballot. Consequently, at the SC 23 plenary meeting in August 2020, it has been approved to establish a project for a minor revision of ISO/IEC 9660 consolidating ISO 9660: 1988, its Amd.1: 2013 and Amd.2: 2020.

3.3 Amendment/Revision of BD standards

BD Recordable and BD Rewritable disks: ISO/IEC 30190, 30191, 30192 and 30193

In November of 2017, the Blu-ray Disc Association (BDA) updated the Blu-ray Disc™ Part1 physical formats to support 4K/8K broadcast recording. The outline of those updates is to achieve 4x-speed playback capability for the triple layer Rewritable disk format and to secure additional reserved areas for content protection to all four disk formats.

In March of 2018, the BDA requested SC 23 JNB to develop the amendments of the corresponding International Standards: ISO/IEC 30190, 30191, 30192 and 30193 reflecting those BD format updates. In response, SC 23 JNB proposed to develop those IS amendments and SC 23 approved it at the 19th SC 23 plenary meeting in June 2018.

In June 2019, ISO/IEC 30190:2016/Amd.1, ISO/IEC 30191: 2015/Amd.1 and ISO/IEC 30192: 2016/Amd.1 were published. With respect to ISO/IEC 30193 (triple layer Rewritable BD disk), Project editors accepted the ITTF suggestion to publish the amendment as the consolidated new edition to avoid user confusion, since the number of technical amendments is rather larger compared with the other three standards to specify the additional playback speed.

Meanwhile, BDA informed SC 23 JNB that the amendment texts submitted by BDA were technically insufficient and requested to fix the issue included in three amendments already published. As a result of consultation with ITTF, it was decided to develop the consolidated new editions as well as ISO/IEC 30193, to fix the problems in those amendments.

ISO/IEC 30193:2020 (Ed. 3) has been published in March 2020 (the corrected version in July 2020), and the current status of the other standards are ISO/IEC DIS 30190 (Ed. 3), ISO/IEC DIS

30191 (Ed. 3) and ISO/IEC DIS 30192 (Ed. 3) under 40.60 stage, respectively.

In addition, at the SC 23 plenary meeting in August 2020, it has been approved to establish a project for Amendment 1 to ISO/IEC 30193: 2020 to correct a technical error which was not reflected in the published third edition.

3.4 Expansion of standardization activities

For the past many years, optical disk industries have facilitated the related standardization based on the established and well-recognized technologies. SC 23 will continue to monitor the activities of disk format creation parties, such as the BDA, Ecma TC31 and others, and encourage them to contribute their specifications to International Standardization.

On the other hand, as the expansion of IoT, AI and Cloud computing services, it is predicted that an enormous quantity of digital data will be created, distributed and stored in the near future (175ZB in 2025). Since the growth speed of data storage capacity is rather slower than that of data creation and distribution, it is obvious that users will face serious storage capacity problems. To resolve such potential problems, simultaneously to realize sustainable and realistic energy consumption growth, further innovation and standardization activities for new data storage systems will be important and worthwhile, not only for SC 23 but also for the other standardization committees toward digital data explosion era.

In preparation for such circumstances, SC 23 is looking into potential future standardizations, for instance as likely candidates, high capacity and high data transfer-rate optical storage medium, a new file format specialized for high speed access, Interface specifications for huge optical-storage libraries and so on.

In order to contribute to the sustainable future, SC 23 will continue to provide platform across entire domain of digital data storage, hopefully in collaboration with related Standardization Organizations.

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