

ISO/IEC JTC 1 "Information technology"

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SC 23 Business Plan 2021

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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 2020 – September 2021

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 2020 to September 2021, SC 23 has been developing a revision of a standard to keep reliability of optical disks, a revision of volume and file structure of CD-ROM and four revisions of BD standards.

The first one is the revision of Data migration method for long-term data storage, 4th Edition of ISO/IEC 29121. The second is a minor revision of ISO/IEC 9660 consolidating ISO 9660: 1988, its Amd.1: 2013 and Amd.2: 2020. The last one is to revise 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

In 2020, a total of 64.2 ZB (zettabytes) of data was created and replicated at an unusually high pace due to the pandemic and the drastic increase in the number of people working, learning, and entertaining themselves from home. It is predicted that global data creation and replication will result a compound annual growth rate (CAGR) of 23% over the 2020-2025 forecast period as shown in Figure 1.

The other hand, the global installed base of storage capacity reached 6.7 ZB in 2020, and its expansion is forecast to result in a CAGR of 19.2% in the worldwide data storage capacity. While it is growing, its growth is slower than data generation growth, and the world is saving less data than it creates.

The difference of the growth-speed between data generation and storage capacity is reasonable (not all data needs to be stored or retained), but it has become too big, and more attention for data storage is required. Organizations should consider preparing now to store and retain more data for business purposes such as innovation, resiliency, and customer experience optimization with positive and clear ROI.

(Source: IDC Global DataSphere and StorageSphere Forecasts, Mar.2021)

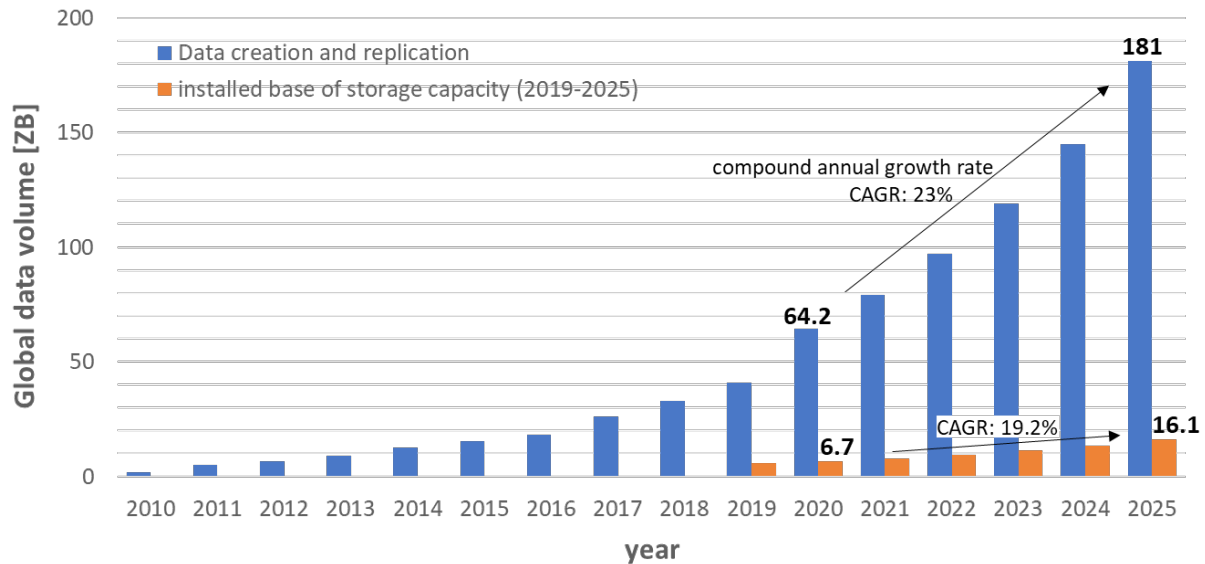


Figure 1: forecast of digital data growth

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. This report concluded that 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. (Source: AUSTRALIAN JOURNAL OF TELECOMMUNICATIONS AND THE DIGITAL ECONOMY VOLUME 2 NUMBER 3, OCTOBER 2014)

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 132 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 6 Participating-member countries, China, Japan, Korea, Netherlands, Russia, Switzerland, and 22 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:	Document Management Applications,
ISO/TC 171/SC 1:	Quality, preservation and integrity of information,
IEC/TC 100:	Audio, video and multimedia equipment and systems,
Ecma TC31:	Information Storage.

Especially, the Category A liaison with Ecma International has been 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 Optical disk reliability standard

- 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 Japan National Body (JNB) discussed how to spread the use of this standard across end users and proposed to establish a project for a revision to introduce a number of technical amendments to clarify the operation circumstances especially for general users. The development of this revision was successfully completed, and ISO/IEC DIS 29121 (Ed. 4) was

published in January 2021.

*ISO/IEC 29121:2021, Information technology – Digitally recorded media for information interchange and storage – Data migration method for optical disks for long-term data storage

3.2 Optical-disk file-format standard

- Volume and file structure of CD-ROM: ISO/IEC 9660

In April 2020, the amendment on Volume and file structure of CD-ROM: ISO 9660: 1988 /Amd.2 was published to incorporate the JOLIET specification, which is the extended version of ISO 9660 developed by Microsoft Corporation and even now widely implemented in the existing Windows OS. The aim of this amendment was to prevent user and market from confusion due to the likely loss of JOLIET specification document in business field.

At its DAM2 ballot, ITTF suggested to create a minor revision of ISO/IEC 9660 consolidating ISO 9660: 1988, its Amd.1: 2013 and Amd.2: 2020 for users' benefit and also ISO 9660 is rather old standard. Consequently, SC 23 is now developing consolidated edition of ISO/IEC 9660 and the current status is under 40.99 (Final text preparation).

*ISO/IEC DIS 9660, Information processing — Volume and file structure of CD-ROM for information interchange

3.3 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, and requested SC 23 to develop the amendments of the corresponding International Standards: ISO/IEC 30190, 30191, 30192 and 30193 reflecting those updates of BD format.

According to the BDA's request, ISO/IEC 30190:2016/Amd.1, ISO/IEC 30191: 2015/Amd.1 and ISO/IEC 30192: 2016/Amd.1 were published in June 2019. However, it was found that the amendments were technically insufficient and as a result of consultation with ITTF, the consolidated new editions were developed to fix the technical issues in those published amendments. Finally, ISO/IEC 30190 (Ed.3), ISO/IEC 30191 (Ed.3) and ISO/IEC 30192 (Ed.3) were published in January 2021.

On the other hand, as for the amendment of ISO/IEC 30193 (triple layer Rewritable BD disk), ITTF suggested to publish the consolidated new edition from the beginning to avoid user confusion, since the number of technical amendments is rather large compared with the other three standards due to the addition of the additional higher playback speed. Then, ISO/IEC 30193 (Ed. 3) was published in March 2020 (the corrected version in July 2020) incorporating the additional amendment as well as the other three standards.

Furthermore, ISO/IEC 30193 (Ed.4) is under developing to deal with the other technical error and the form issues, and the current status is under 50.00 (FDIS registered).

*ISO/IEC 30190:2021, Information technology – Digitally recorded media for information interchange and storage – 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Recordable disk

*ISO/IEC 30191:2021, Information technology – Digitally recorded media for information interchange and storage – 120 mm Triple Layer (100,0 Gbytes single sided disk and 200,0 Gbytes double sided disk) and Quadruple Layer (128,0 Gbytes single sided disk) BD Recordable disk

*ISO/IEC 30192:2021, Information technology – Digitally recorded media for information interchange and storage – 120 mm Single Layer (25,0 Gbytes per disk) and Dual Layer (50,0 Gbytes per disk) BD Rewritable disk

*ISO/IEC FDIS 30193, Information technology – Digitally recorded media for information interchange and storage – 120 mm Triple Layer (100,0 Gbytes per disk) BD Rewritable disk

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 (181 ZB in 2025). Since the growth speed of data storage capacity is 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, a new optical storage medium with higher capacity and higher data transfer-rate, a new file format specialized for higher speed access, a new hybrid system for data archival 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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