ISO/IEC JTC 1 N9775

2009-09-19

Replaces:

ISO/IEC JTC 1
Information Technology

Document Type: other (defined)

Document Title: Report of the 1st ISO/IEC JTC 1 SGDCMP Meeting

Document Source: SGDCMP Secretariat

Project Number:

Document Status: This document is forwarded to JTC 1 National Bodies for review and consideration at the October 2009 JTC 1 Plenary meeting in Tel Aviv.

Action ID: ACT

Due Date:

No. of Pages: 31

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Report of the 1st ISO/IEC JTC 1 SGDCMP Meeting
Beijing, China
July 15 – 17, 2009
SGDCMP N0024

Source: **SGDCMP Convener**
Title: **Report of the 1st ISO/IEC JTC 1 SGDCMP Meeting from Beijing, China**

The 1st ISO/IEC JTC 1 Study Group on Digital Content Management and Protection (SGDCMP) meeting was held at Media Center Hotel, Beijing, China from 15 – 17 July, 2009.

The meeting opened at 09:30AM, Thursday 16 July.

1. Opening Meeting

The SGSN Convener opened the meeting and welcomed all the delegates.

2. Roll call of delegates

The SGDCMP Secretary made a roll call. 40 participants from 6 NBs attended and one NB teleconferenced in to the meeting. The attendants list is in Annex 1 to this report.

3. Adoption of agenda

The agenda in SGDCMP N011 was adopted as appears in Annex 2 to this report.

4. Remarks by Chairman

4.1 Appointment of Resolution Group and Drafting Committee

The Chairman established the Resolution Group with members as follow:

- Linpeng Gao
- Peter Mann
- Toshio Tatsuta
- Ng Tian Tsong
- Paul Jessop
- Wo Chang
- Mick Crouch
- Tangli Liu
- Bin Wu

The Chairman established the following drafting committees and the associated members:
Term of reference part 1 – Definition: adopted from SGDCMP Plenary

Term of reference part 2 – Inventory: Stephen Balogh
Term of reference part 3 – Market/Application: Tangli Liu, Mark Ryland
Term of reference part 4 – Recommendation: adopted from SGDCMP Plenary

4.2 Call for editor

The Chairman appointed Paul Jessop and Wo Chang as editors to prepare the document "Report of the JTC 1 Study Group on Digital Content Management and Protection".

5. Review Terms of Reference

Terms of Reference of SGDCMP approved at the 23rd ISO/IEC JTC 1 Plenary meeting, in 15th November 2008 (SGDCMP N001) were reviewed. As part of its terms of reference, JTC 1 asked the Study Group of DCMP to:

1. Provide a definition for Digital Content Management and Protection
2. Assess, via an inventory, the current state of standardization in DCMP within JTC 1 and in other SDOs and consortia
3. Understand and document market/application segments, user requirements and the challenges to be addressed
4. Deliver recommendations to JTC 1 on possible actions to be taken

Below is the response to the terms of reference.

5.1 Terms of Reference #1: Definition for Digital Content Management and Protection

First of all, digital contents should be defined before defining its management and protection.

5.1.1 Digital Content

"Digital content" refers to any digital information which has value to some party. New digital content can be created from different digital content. That is, the resulting products from various forms of digital manipulation are still classified as digital content. When being used, digital content can have different meanings to different parties, depending on the context, and can be exploited in different ways. Digital content may include essence and/or metadata relating to digital content. The content itself may be hierarchical in a way defined by metadata.

Digital content covers numerous types of information, including text information, visual information (including image and video), audio information, multi-mode information (multi-channel information such as audiovisual information, image information and remote sensing information), data residing a in a database and related sets of such data. Such digital content can be rendered as documents, images and graphs, video, audio, multimedia, hypertext and hypermedia. Digital content can be created directly from digital devices but it can also be converted from analogue signals.

Digital content may be continuous (such as audio or video) or discrete (such as text or image). This distinction affects the nature of its descriptive metadata.

5.1.1.1 Essence

"Essence" is the physical representation of the content. Essence can be generated, changed, stored, exchanged, transferred and displayed. The format used in the representation of essence will vary according to the characteristics of the content and the use to which the essence is to be put. A universal format for essence which can represent different content types and meet different demands does not exist.

The choice of format for a particular application will depend on the way in which it is to be used. This may include the bandwidth needed (some networks such as mobile networks being constrained in this respect), quality or reproduction, time and processing power required to render etc.

Essence may be granular in that different parts of the content are represented separately with the relationships between the different parts defined in metadata (see "structural metadata" below).

Digital content management should be independent from media and format. Digital content management provides files storage information as well as syntactic and semantic of their media structures. When retrieving files, digital content management will provide media index for media streaming.

Generally the media type standing for the specific information is determined in advance, however the coding format of the content is not. Many schemes and standards exist for the coding rules and digital representation modes of different contents. For digital content management and protection, it is necessary to understand the basic principle, function, and characters of the coding scheme. In addition, the requirements and restrictions of digital content must be understood in the specific application fields, so the essence of different media and formats can be successfully accessed.

In the content management, different essence formats can stand for manipulated and managed objects as well as representing the contents. The essence's characters determine whether the function can be identified in advance and how they can be realized. Now different formats are used to generate and represent the essence and purely represent the content. Sometimes the diversity can work well in meeting the specific requirements.

Digital content management should also include acquisition of the additional content information via the automatic retrieval and representation of the newly generated content object. Similarly, digital content can be obtained from conversion of formats. Therefore, digital content management can also include automatic code conversion.

Different Essence Forms

Essence can be extensively defined as the components of the content object and is used to represent the actual information with different coding formats. The corresponding metadata is the data which defines and describes the data of the content object, so the essence can directly represent and convey the information and originality. For different media, the essence includes different formats such as video, audio and text elements. In addition, the essence can compose the structural format or document. In fact, it is very important that the essence format be able to represent the original contents of the digital contents.

In principle, essence can include the basis essence element and organized essences. The basic essence element is elemental components of the essence. The content object is represented as the specific media type such as video, audio, image, graph and text. Different media types can be combined to establish the inherent association, which is not mutual association and is the inherent mutual relation. The essence elements are classified into two types by the media sensing modes of humans, namely continuous and discrete. The continuous type indicates the description of the time-related information unit such as video and audio. The discrete media includes the text, image, and graphics.

The organized essence format is the digital content management object, including for example a webpage, XML document, or multimedia file. The basic essence element or other organized essence elements are combined via reference and constraint in this format. A relation is established between different components of the organized essence format to manage and decide the information representation. The relation between the organized element formats is restricted by the reference and time relation of the different basic elements. Notice that the restriction-based organization mode can take effect in the semantic environment of the specific content objects represented by the organized essence formats. In contrast to continuous media, it is not inherent. The validity and continuity of the represented information should be kept in the organized media essence format management.

Essence Processing

Where essence is processed automatically, it may be transformed into further essence representing the same content type (for instance converting PAL to NTSC video or splitting video into segments), or into essence representing a different content type (for instance extracting thumbnail images from video). It may also generate metadata relating to the content (such as technical information about the representation – bit rate, image size etc. – or descriptive metadata through content recognition and similar processes).

5.1.1.2 Metadata

Digital Content and Its Metadata

Metadata is information about the content and its representation. It may take many different forms and be used for many different purposes. Its value may in some cases exceed the value of the content it describes. Digital content management mainly aims at content processing

optimization during the whole object life cycle. How digital content is stored and represented are very critical to the different applications such as retrieval. However, content representation depends on the contents and application environment.

Metadata is an indispensable part of content management. The metadata describes the contents considering different demands and processing procedures, which is very important for on-demand real-time storage, and content retrieval, and many other uses of the content. In addition, the metadata can also manage the internal organization and external interconnection (interface) of the contents. Digital content management supports description of the creation, rendering of the original essence, also including the allocation and processing of the related work as well as contents. Apart from the direct interaction with the contents, related factors are considered, including statistical computing, right management, and program design. Obviously, whether the content representation can meet the application demand is very important.

Content Description

Although the content substance is essential, sometimes the information related to the content is more important than the content itself from the perspective of its frequency of use during management. For example, the metadata of the content (metadata, abstract and essence version with a low code rate) is used more frequently than the content object when digital contents such as TV program are created.

Media objects can be described. This representation focuses on the specific features and can represent the specific view or visual specific attribute, making it is easily accessible. This description can be regarded as the agent of the media object. The audiovisual content can be represented with the multimedia agent. Other agents include the abstract, edit decision list, and database record. The agent can be divided into the multimedia agent, database agent, and pure text agent. The copyright is an agent as well.

Metadata and Content Description

Metadata is used to describe the content and represents the content in the management system and its components. It exists through the whole digital content lifecycle, including archiving. Metadata is created in the planning phase and continuously adjusted in the whole lifecycle of digital content. Metadata is involved in the production, delivery, media management and other development event. Metadata is used for planning design, editing preparation during the content creation, and also used in document writing, intellectual property, license, data analysis and location-related data. In addition, metadata can be used for content use and dissemination. This type of metadata describes transfer history, program exchange, program material and destroying information. The other type of metadata is data of contents used in Internet. This type of data records the information such as the accessing history and maintainers.

Because the metadata is the data which defines and describes data, metadata standardization facilitates convenient and express search of target resources. For example, a series of metadata

standards have been established according to the demands of electronic publication to share and trade. Terms such as electronic book author, publication date, title, content, and reference are used to describe the standard metadata in the metadata standardization of the electronic book, so electronic books can be successfully exchanged. The metadata of the electronic book can meet the publication, delivery, and transaction requirement of the electronic book to some extent.

Types of Metadata

The following types of metadata are not intended to be exclusive: information intended as one type may be used as another (for example the name of the author may be regarded as descriptive but may also be used as administrative if a user wants to know if copyright still subsists in the content).

Descriptive metadata is information about the content represented in the essence. This may include the names of participants (for example the author, performers etc.), places (the Royal Opera House, Covent Garden for instance) and dates.

Technical metadata is information about how the content has been represented in the essence (for example "jpeg, 1200x800 pixels").

Structural metadata is information about how different parts of the essence relate to each other (such as a page description language) and how they should be presented to a user (for example an "edit decision list"). It also describes how the content relates to other, external, content (for example "is a translation of").

Administrative metadata describes how the content is to be managed and used, including access permissions, copyright restrictions and archiving information. It may also describe how the content has been used in the past.

Sources of Metadata

Metadata may precede the creation of content and be used to manage its generation (for instance the choreography of a ballet – though this might be regarded as content in its own right).

Metadata may be captured as the content is created (for instance the list of orchestra members may be generated from recording records).

Metadata may also be generated after the content, either manually or automatically. Descriptive metadata may be associated with content from which it has become detached by content recognition technologies. Administrative metadata in the form of usage records will be updated over time and licensing information will change according to circumstances. Structural metadata will be updated as new derivative works are created (for example "has been translated into French as").

Uses of Metadata

Metadata may be used during content creation, for management of copies of content by creators and distributors and end users, management of payments for content between value chain participants, for content discovery, for archiving, for statistical analysis and other forms of research.

5.1.2 Digital Content Management and Protection

Digital Content Management (DCM) describes the life-cycle of digital content, including content creation, recording, distribution, processing, preservation, retrieval, delivery, analysis, evaluation, utilization and destruction. The lifecycle can be conveniently divided into three phases.

The **creation phase** is where content is created and basic metadata such as content identifiers is associated.

The **survival phase** is where content is managed and exploited.

The **destruction phase** is where content which is no longer required is destroyed and resources associated with it are reclaimed.

If digital content includes the management protection information such as the identifier, it should complete the initialization in this phase. Once the relatively complete digital contents are formed, the digital contents enter the survival phase in which all applications and management of the digital contents should be classified into DCMP scope. If the digital contents are no longer being disseminated and used, they will be destroyed to reclaim the resources. The application requirements of the digital contents should be determined in the destruction phase for complete or partial destruction.

Digital Content Protection (DCP) describes the steps taken to ensure that while under DCM, content use permissions are respected and integrity of the content is retained. If successful, this means that DCP will:

- Ensure that essence is reasonably and legally used.
- Ensure that essence can be obtained for an appropriate period.
- Ensure the collection and saving of the original essence.
- Ensure that the use and dissemination history of essence can be tracked
- Ensure that essence can be easily and conveniently disseminated in a complicated network environment.

5.2 Terms of Reference #2: Inventory for Digital Content Management and Protection

An inventory and associated information on Digital Content Management and Protection technologies was commissioned by a member company of the SGDCMP. A copy of the resulting

report be found here:
http://www.giantstepsmts.com/DRM%20Reference%20Table_docmetrics.pdf

Below is a list of the various technologies identified by the report as available in the market today:

Internet and Mobile
Flash Media Rights Manager
RTMPE
FairPlay
Fasoo Secure Media
Netsync
Marlin
Windows Media DRM 10
Zune DRM
PlayReady
OMA DRM 1.0
OMA DRM 2.0
Helix DRM
DeviceWall, ContentWall
SDC (Secure Digital Container)
Physical Media
CPRM/CPPM
AACS
BD+
DivX DRM
CSS
ACP-DVD
RipGuard
Home Networking
DTCP
HDCP
ACP-VOD
Conditional Access, IPTV, Mobile TV
Conax CAS7
CoreCrypt
Irdeto Conditional Access
Latens CAS
Nagravision
VideoGuard
Encryptonite ONE
VCAS
Widevine Cipher
E-Books

Adobe Content Server
Mobipocket DRM
Games and Software
ByteShield
ActiveMARK
SecuROM

5.3 Terms of Reference #3: Market/Application for Digital Content Management and Protection

The third term of reference was to "[u]derstand and document market/application segments, user requirements and the challenges to be addressed." This part of the report responds to that request. We analyze the broad scope of this technology area into six categories:

1. Content Management and Protection for Consumer-Oriented Digital Content
2. Content Management and Protection for Enterprise-Oriented Digital Content
3. Content Management and Protection for Institution-Oriented Digital Content
4. Content Management and Protection for Public Access Digital Content
5. Content Management and Protection for Preserved Digital Content
6. Long-term Digital Preservation

5.3.1 Content Management and Protection for Consumer-Oriented Digital Content

5.3.1.1 Digital Television

The conditional access system (CAS) of digital television (TV) is one of the content authorization and protection technologies with the longest history and largest deployment scale. In a typical usage, a CAS prescribes the content scrambling method (using a form of encryption) and the method of transmitting access keys to authorized users.

In practice, the CAS of digital television systems is tied to a particular form of digital TV technology. That means, along with other aspects of digital TV, the CAS is interoperable within a given country or region, but not across countries or regions. Even within a given technology family, there may not be fully interoperable standards for key distribution and usage. For example, Japan adopts uniform cryptographic technology, so interoperability can be conducted in Japan. European digital TV standard organization (DVB) requires that the audio and video data stream protection must adopt Common Scrambling Algorithm (CSA) in the CAS, which makes the integration chip for relieving scrambling and decoding audio &video have a uniform standard. However, the keys used to scramble or encrypt content need to be further protected, and various aspects of key management and distribution have not been unified by DVB. Therefore, the IC cards of DVB-compatible digital devices are not interoperable across all front-end systems in Europe. Although additional methods such as simulcrypt or multicrypt have been adopted to ease such problems to a certain extent, differences among CASs still have a negative impact on off-the-shelf marketing of digital TV terminals.

At present, most of the digital TV systems made in China are based on DVB standards. With the huge market in China, terminals such as set-top boxes do not interoperate with all back-end DVB systems. This lack of interoperability has become the biggest technical problem impacting the development of the China digital TV industry. In order to solve the problem, China has proposed three machine-card separation solutions. These have not been adopted widely at present. As more open and interoperable standard for CAS is still sought and expected by China's digital TV industry.

5.3.1.2 Internet Protocol Television

The Internet Protocol Television (IPTV) is an IP-based video service; it is a relatively-new technology utilizing broadband IP networks and multicast routing technologies. IPTV integrates technologies such as Internet, multimedia, and other forms of digital communication together, providing family users with several interactive services including digital TV. The international organizations that focus on the standardization working of IPTV include ITU-T(FG IPTV/ IPTV-GSI), TISPAN, DVB, ATIS and OPEN IPTV Forum, etc. Furthermore, research groups, such as IETF, ISO/IEC and DSL Forum, are undertaking research on specific technical fields in the area of IPTV.

An IPTV system is a complex business system involving many technologies across different industries including telecom, computers, Internet, broadcast, and TV. Therefore, the technologies related to DCMP in IPTV include video decoding, storage, media asset management, digital copyright management, content dissemination and streaming media services. Many of these technologies are equally applicable to standard digital TV systems, but some are unique to digital TV deployments that use IP to deliver digital content to the home.

From the global market business model, major international telecom suppliers have high expectations for the development of the IPTV business. With rapid product development over the years, IPTV companies including AT&T (the largest cable communication enterprise in USA), Verizon (integration communication enterprise) , European telecom suppliers (Britain Telecom, France Telecom, Italy FastWeb company, etc.) and Asian telecom suppliers (Singapore Telecom, Hong Kong PCCW company, etc.) have launched IPTV services through broadband Internet.

IPTV technology utilizes a single unified IP-based service to support voice, data, and video – the so-called "triple-play" service. For infrastructure where IPTV services are widely deployed, the IP network must support quality-of-service (QoS) features, which traditionally are not found in IP networks. In addition, certain common TV features such as "channel surfing" (rapidly changing channels) are difficult to support in an IP multicast network, and therefore, some proprietary techniques have been developed to address this issue (some of which are currently being standardized). Since IPTV is a relatively new technology, inter-connectivity and interoperability between devices and terminals of different manufacturers are sometimes flawed, and various issues of existing IP multicast technology and network business security need to be perfected. Furthermore, a series of newer technologies, such as peer-to-peer (P2P) networking, will likely have an impact on future IPTV technical standards.

5.3.1.3 Digital Medium

In the analog era, medium control has played a major role in protecting digital content. This approach has prohibited consumers from duplicating phonograph records, for example. In some cases, the "make it difficult to copy" approach has also helped protect digital content.

Today, the use of multimedia card (MMC) and secure digital card (SD) have been used to control the dissemination and usage of digital content. For example, Nokia uses MMC to protect its gaming platform through their unique card serial numbers. This method verifies players' identities and ensures legal game usage. A more advanced memory card like SD can provide capabilities such as being linked to credit card services.

Moreover, the dissemination and usage of digital content can further be controlled through high cost and advanced medium technology. For example, in 2000, Sony PlayStation 2 adopted a new DVD technology for their gaming distribution while DVD medium and recorder were expensive and not widely available, to restrict duplication. In 2005, Sony embraced Blu-ray ROM (BDROM) medium for PlayStation 3 where the media format is much harder to replicates. In the same year, Sony PlayStation Portable (PSP) deployed a more sophisticated Universal Media Disc (UMD) for video gaming storage. In doing so, Sony protects its copyrighted digital content through advanced hardware technology instead of software-based protection mechanism. Hardware protection may work well for physical medium distribution, but with high speed Internet, and advanced encryption and streaming technology over the Web, specific hardware-base solutions may become less effective over time.

5.3.2 Content Management and Protection for Enterprise-Oriented Digital Content

5.3.2.1 Electronic Publication

Many digital content operations are involved in the electronic publication industry. The entire process of editing, display, and publication of digital resources is related to digital content and its protection.

Collecting, editing and typesetting digital resources involve many digital content management demands. Different content resources are formulating different digital repositories via unified collection uniform management. For example, collection of E-newsletter contents (news, images, advertisements and audio/video), can be effectively classified and managed. The collected texts, images and various multimedia digital resources are generally editorially processed via editing functions. Various kinds of project management techniques are involved in those tasks, including workflow control and management, editor authentication and administrative authority, so that the process can guarantee a reliable and suitable final digital content. Generally, a fairly complex workflow will occur in the editing and typesetting process. To meet the requirements of knowledge-based applications, digital content should provide knowledge mining and support the full-text retrieval technology, which involves knowledge organization, knowledge management and knowledge database query and retrieval technology.

The distribution and display of digital works published in hardcopy will involve management and protection demands in different aspects. A unique identifier should be allocated for publication enabling effective distribution and marketing via uniformly managed resources in the warehouse and throughout the supply chain. There are also requirements of publishing on different platforms such as the traditional cross-media publication, where physical publication is accompanied by online publication and possibly by on-demand publication. Meanwhile, timely and effective dissemination of content should be considered, personalized requirements of different users should be met, and different requirements of copyright protection should be supported in different fields.

In addition, digital content protection requires uniform management various resources in both digital and physical embodiments, including copyright reuse, copyright protection, version management, resource retrieval, browsing, upload/download, filtering, auditing, storage, and deletion. It should especially accurately record modifications of the document and those specific operators, guarantee a transmission approach that is highly secure between the sending and receiving ends, and guarantee that digital contents cannot be illegally duplicated and tampered.

5.3.2.2 Enterprise Content Management

Enterprise content management (ECM) provides technologies with capturing, managing, storing, preserving, and delivering content and documents related to an organization and its processes. ECM integrates Web content management (WCM), document management (DM), digital asset management (DAM, takes Rich Media as the core), imaging management (IM), record management (RM), collaboration management (CM), knowledge management (KM) and portal technology together. Here is a brief description of each technology:

- Web Content Management (WCM) helps website administrators work far more efficiently with automatic updates, dynamic content management, publication workflow, content authorization, etc.;
- Document Management (DM) provides document releasing, obtaining checkout, edition control, security inspection and provision of storage retrieval service for business documents;
- Digital Asset Management (DAM) provides ingesting, annotating, cataloguing, storage and retrieval of digital assets;
- Imaging Management (IM) provides replicating functionalities from many document imaging systems including microfilm, facsimile, copiers, scanners, etc;
- Record Management (RM) utilizes a special lifecycle record for each item of independent enterprise information, where all the operations can be tracked and recorded;
- Collaboration Management (CM) provides set of tools for document creation, storage, and sharing in a virtual collaboration environment;
- Knowledge Management (KM) provides organizational methods to identify, create, represent, store, and share knowledge in an electronic record.

- Document acquisition and imaging technologies are used to obtain and manage paper documents;
- Document center provides collaboration function and document sharing to support project teams;
- Workflow supports business flow, content transfer, configures task and state, and often creates search index.

5.3.2.3 Broadcast and Cable TV

Digital content management systems are increasingly important within the broadcast and cable TV industry. Cable TV systems require record management to manage their programs such as news, sports, and entertainment. A content management system supports content object classification and retrieval. Classification can provide automatic information retrieval by analysis methods and automatic index tools. A general retrieval tool supports traditional local database query including full-text retrieval. A management system can include multiple databases. Meanwhile, digital content management integrates those databases to support multiple retrieval modes with consistent results. In addition, content management systems make content available for online, near-line and offline to support professional and non-professional users to access.

Cable TV content development tools (automatic studio control systems and non-linear editing system, etc.) can benefit from the content management system due to shared content between different users and systems. It will avoid repeated operations and frequent transfers of specific content. Consequently, all digital content systems and devices should ideally be integrated within a broadcast TV management system, and all databases transaction should synchronize with each other and the storage management in a seamless manner.

Other considerations may apply when cable TV infrastructure is owned and operate by a government agency. Some of the issues outlined in the next section on government and public content management should be considered.

5.3.3 Content Management and Protection for Institution-Oriented Digital Content

Institutions such as government agencies (GAs) and non-governmental organizations (NGOs) have requirements and usage models that overlap significantly with private sector / enterprise requirements. There are at least two differences, however, worth noting briefly. Ironically, these additional requirements go in opposite directions. On one hand, public access and ownership of data can increase the requirements related to openness, transparency, access, and archival reliability. On the other hand, national security and other considerations can lead to requirements for more elaborate security and secrecy measures than what is typical in enterprise content management scenarios. Also, privacy considerations may be higher in the case of sensitive citizen data, such as financial data, tax information, health data, and the like.

For open access and transparency requirements, institutions may have much stricter requirements with regard to long-term access to content. This may come into conflict with

certain kinds of digital rights management systems. Thus, institutes must have policies in place that will ensure full public access to public data despite the passage of time, the demise of vendors, and/or the alteration of encryption technology. The Government of New Zealand submitted an excellent and detailed study (SGDCMP M0020 and SGDCMP M0021) on this topic to the DCMP Study Group. These documents are highly recommended for those interested in a more detailed analysis of that issue.

With regard to privacy, secrecy, and stricter security, many institutes have developed much more stringent guidelines and policies for the handling of ministerial, military, and citizen data. These guidelines and policies then translated into elaborate sets of security controls and requirements. Finally, technology solutions must implement these controls and requirements. All these additional requirements must factor in when analyzing content management and protection issues from a government and/or public institutional context.

5.3.4 Content Management and Protection for Public Access Digital Content

5.3.4.1 Web-based Information and Databases

The widespread use of the Internet changes the value and importance of public information dramatically and increases the quantity of electronic documents in the information age. The Web and its hyper-linked electronic documents have profoundly impact for business, cultural, artistic, and academic. Since websites are provisioned and run outside the scope from the document creation, management, and archiving mechanisms, therefore website itself is a valuable repository and is in need of content management and protection. In the network era, enhancing research on website archiving is very practical. The necessities for archiving are listed as follows:

- Protect Original Electronic Documents

  When the quantity of network electronic documents is increasing exponentially, they also are disappearing at a surprising speed. A large number of network information such as webpages, blogs, e-mails and instant message run their course due to no good archiving and preservation strategy. If no active strategy is taken, although we have powerful storage means, much of our cultural memory that was once preserved in letters and newspapers and other tangible media will be blank in the Internet era. Thus it is important to archive the information resources in websites in time to protect them.

- Preserve Organization History

  Website is becoming the universal platform for communicating and interacting among persons. For example, a governmental website is the platform for the communication between the public and government, inside the government, between governments, and between the government and enterprises. The E-commerce website is the platform for the communication between enterprise and citizen, among the enterprises, and between the

government and enterprises. These platforms can be regarded as the digital repositories for the governments and commercial organizations. Preserving these digital repositories at a historical point is an important measure for maintaining the complete history of an organization. It is also an extension of preserving traditional archiving work brought forward into the Internet era.

5.3.4.2 Institution-based Information and Data Centers

The industry sectors such as banking, finance, telecommunications, etc., are undertaking more and more tasks of growing important. Governments and their agencies are also often growing in scope and range of activities. These large and growing entities rely more and more on large-scale data centers.

The server system, storage system, and network system are more complicated in large-scale data centers. Smart storage technology which can realize maximum storage efficiency with minimum hardware and network resources is growing in importance. To reduce unnecessary systems operations, the distributed servers and storage systems are often consolidated into a central system. To further improve the flexibility, productivity, utilization rate of storage resource in the data center, virtualization technology is becoming more popular in the data center in order to better utilize server and storage capacity. Therefore the adapted virtualized storage platform should be designed and the universal data management tool for the physical server and virtual server should be provided. The storage and configuration function goes beyond the virtualized server and physical server, speeds up the storage and configuration procedure, and improves the capacity utilization rate. In addition, to assist the virtualization strategy of the data center, the seamless protection should be provided to the virtual environment, so the customers can deal with the increasingly diversified storage and data management demands on the simple and uniform data management platform.

5.3.4.3 Online Digital Content Services

Here are some of the forms in which copyrighted works are published or otherwise released:

Academic E-journal: at present, there are mainly two modes about the releasing service of academic e-journals mainly, one is that E-journals online retrieval platform is established and maintained by the E-periodicals service providers. In general, publishers take charge of collecting resources, maintaining system and providing retrieving service. Users can periodically purchase services of retrieving and/or downloading content. The other is similar to the digital library system (fewer), and the resource database is directly purchased by users and installed on their own server.

E-newspaper: the business model of E-newspaper are mainly divided into 2 types or the combination of these two types, one is online/offline downloaded E-newspaper that need to be paid, such as *The Wall Street Journal*. Payment mode can be in accordance with different periods. In general, newspaper issuers will provide software or website that can be updated, downloaded

or read online independently and automatically. The other is a free newspaper, the more common approach. In general, it seeks a profit through advertising and promotion, or is willing to operate at a loss in order to provide a side-benefit to the print version.

E-zine: E-zines are of rich content and complex form, many of them authored using Rich Internet Application (RIA) technologies such as Flash or Silverlight. Those sites require the user to download and install the special RIA runtime. They often include many additional functions such the storage of personalized links and favorites, peer-to-peer upload and download capabilities, automatic notice of new content or other changes based on user-defined triggers, etc. In addition, publisher often provide tools with which users can create or customize individualized content, and many publishers encourage Internet users to make and upload their content to the E-zine site. The business model is usually based on advertising in both print and on-line versions of the magazine.

The on-line digital content industry is a relatively new one. The on-line industry includes all digital content products and service as well as the other supported services, and it is an appreciable information content or service distributed to users through various content management and service systems. “On-line” means available by network transmission, and also covers the whole value chain including production and management of digital content. Meanwhile, the general category of digital content technology also includes network-based digital content manufacturing, transmitting, consuming and managing. All the on-line technologies including mobile TV, DAB and IPTV integrate on three types of network platforms, forming seven online digital content industries, i.e. digital TV, digital audio, digital learning, digital radio, digital game, digital publication and online non-media application.

5.3.5 Content Management and Protection for Preserved Digital Content

5.3.5.1 Preservation Repositories: Library, Archive and Museum

As the social organization for keeping the intellectual and artistic products of human culture, the library, archive and museum focus on the long-term preservation of intellectual and artistic creations. In the digital age that role is increasingly shifted towards the preservation of digital content.

American Research Libraries Group (RLG) defines the “trusted/reliable digital repository” as follows: “trusted/reliable digital repository is the repository which aims to provide long term access to controlled digital resources. The responsibility is to provide the long-term maintenance of the digital resources due to the interests of the operators and current or future users. The system is designed according to widely accepted routines and standards to guarantee security of the real-time information management, access and storage; the system evaluation method is established to meet users’ demand for document reliability; the repository can reliably publish and specifically perform the long responsibilities to the storage operators and user; the policy, operation and performance can be audited and measured. ”

The protection methods of the digital resources include carrier refreshing, static preservation of the original form, old-new migration and emulation. By establishing the open digital content access platform and uniformly planned organization repository, an access platform can be provided to other open resources. The data storage and disaster backup system and digital resource preservation center must uniformly preserve the digital contents for a long period. Below are some system preservation strategies:

Replication: back up the digital resources
Migration: migrate the digital resources to the new system or platform.
Transparency: open the coding of the digital resources to facilitate understanding and migration.
Diversity: multiple formats coexist so that other formats can replace when some formats are outdated.
Audit: continuously check the state of the digital resources to guarantee integrity.
Economy: identify the priority of the saved items. First the most important part should be saved.
Sloth: Purposefully reduce the operation speed of the system to increase repair possibility in case of the data crash-down.

In a word, the detailed functions of digital content management depend on the supported workflow mode, format of the content essence and representation form of the metadata describing the essence in the system. It is difficult to describe such complicated issues with single universal architecture. Based on the research of the DCMP Study Group, the design demands of DCMP system are summarized as follows:

1) The management system should understand the media structure, feature and coding format to process the media and essences.
2) The metadata should be collected and stored in the whole lifecycle of the content object.
3) The system should provide the storage, organization and retrieval mode same as the file system, can store, migrate, rename and delete the files, and organize, search and access the file.
4) The system should manage the users and realms and/or domains.
5) The system provides the operation service mode and makes the managed contents be accessible and processed.
6) The system can provide the controllable access, use and dissemination to the digital contents.

Ideally, the system is open and can support interoperability across different DCMP systems as well as interconnection between the DCMP system and other types of systems.

5.3.5.2 Preservation Infrastructure

It is getting more and easier each day to obtain high-quality digital content, while at the same time the value of content is often higher. The increase of network capacity and broadband access

will also generate more creative consumption and reuse of digital content, bringing new challenges and opportunities to digital content preservation, they include:

1) The new digital content providers are growing rapidly in number and size. To provide excellent services, the relevant organization must have mature and comprehensive skills in the long preservation and keeping of the digital content. For example, the digital legacy and its content require specific survey and auditing. Meanwhile, long-term access strategies should be considered in detail.
2) On the one hand, the digital content industry should be encouraged to continue its rapid pace of development on the other hand, an effective plan should be established to increase the likelihood that the legacy digital resources of the content producers who go out of business or otherwise disappear can be further accessed and used.
3) The broadcast communication mode may cause the loss of data content, so the related implementers should learn from the history lessons and check and evaluate the possible risks of the data contents prior to cross-platform migration.
4) The process for cultivating the digital content storage skills will create opportunities for the organization and other content creators who are capable of long-term preservation and can improve the persistence of the digital content via the knowledge transfer.
5) ”For tomorrow’s data access requirements, the data preservation strategy must be decided today”, so it is necessary to recognize the importance of the digital content storage and related strategy, culture and technology. Digital content storage is a relatively new subject and requires planning and development of digital contents. Experience shows that the early intervention facilitates the preservation and maintenance of the digital content. When the content is created, the later reliable access to the content should be guaranteed to some extent. Generally, the recovery process for digital content is a costly and impractical task. In reality, advance planning is the best practice to preserve and protect digital content.

In sum, digital content preservation includes the digital content storage and long-term preservation. The long-term preservation of digital content aims to effectively convert content with a short expected lifecycle into long-life content.

5.3.6 Long-term Preservation Digital Content

With the rapid increase of digital information and the rapid formation of a digital human culture and environment, more and more people and institutions are dependent on digital resources and network service, and the long-term preservation of digital resources is becomes more important day by day. The long-term storage of digital information mainly has two aspects: one is to prevent the digital information from be changed or destroyed against the intentions of the information owners and managers, and the other is to maintain the integrity and accessibility of digital information over the long term.

Making sure that digital information can be read and written involves many aspects, including both technological and non-technological factors, such as policy, standards, capital, personnel, management, etc.

5.3.6.1 Long-term Digital Preservation Methods

One critical factor is a complete set of key technologies for preserving digital information. At present, the common key technical methods of preserving digital information include following kinds:

1) Refreshing

Information update means to transfer the data stream from an old storage media into a new storage media, preventing any loss of the information caused by the change of the physical properties of the storage medium. This method has been widely used in the preservation of tapes, disks and CDs, but it is unable to solve the long-term preservation problems caused by the computer software and hardware gradually becoming out-of-date. Reading some electronic information may require dedicated software; some electronic information can be directly transferred, but some relevant structure, link or environment information may be lost, or relevant code, compression and encrypted information has not been transferred at one time, or the structural features of information, depicted metadata, and searching and presenting capabilities have not been maintained. All these problems can prevent users form retrieving previously saved information. Therefore, the method of preserving information that is mainly dependent on the update and transfer of electronic information can be only part of the solution.

2) Migration

Migration is a relatively mature and frequently used method in actual operation at present. In order to ensure that current stored digital information can always be read and written by the current system, the method of data "migration" is adopted to continuously transform the digital information from the old software and hardware environment into a new computer environment. Migration includes the necessary changes to the data or content in a way that continues to provide rich accessibility within new software or hardware environments. There are three main cases for migration: migration of the electronic information from the storage media with low stability to the one with high stability, from a format strongly dependent on very specific software (such as a binary file format) to the one that is more generically readable (such as XML), and from the old computer software & hardware environment (e.g. old version, old format) to the new environment (e.g. new version, new format). However, in the process of migration, the original appearance, the format, the structure, even the content of files may be compromised, so migration stipulations and quality control process should be established during the migration so as to reduce the loss.

3) Emulation

Emulation is the replicating of functionality of an obsolete system, meaning to allow a computer system to completely emulate in software (often with assist from the hardware) the complete environment of another computer system. This method can make a computer system execute the full operating system and all associated or compatible programs written by another computer system without rewriting. In the view of maintaining the readability of the electronic information, a emulated OS/application environment can itself be archived along with the digital information that it was used to create, thus providing a means by which the original electronic

information is fully available. Both emulation and migration are used for solving read-write issue on digital information. But unlike migration, the emulation has an eye to the application software environment where information is read and written rather than the information format. Emulation can not only present the digital information that is generated on the old system with its original user interface, but also protect its functions. So emulation is becoming increasingly popular as a tool to help solve preservation and archiving problems. Still, in some respects the problem remains, and is simply pushed up to an easier-to-manage level. The emulation software must be able to read and execute the older execution environment (OS and applications) and, even once running, the user may still be faced with export or migration issues in order to make the old data truly useful in a new environment.

4) Data Reestablishment

Data reestablishment means to recover the original state of the digital resource from the original byte stream, and guarantee readability and usability of the data resources. Data recovery includes data disaster recovery and the data format recovery, etc. Data recovery is a technical method with some technical challenges. What we should lay stress on is that simply reestablishing the data in its original form may not be enough to make it truly usable, as previous comments about aging software and hardware environments have made clear. So in the normal process of preserving a digital resource, data reestablishment is not a catch-all solution for long-term preservation. This method is only used in conditions where other long-term preservation method can't be implemented.

5.3.6.2 Long-term Digital Preservation Strategies

Generally speaking, digital content is designed for the immediate needs of users rather than with long-term data preservation in mind. When producing digital content, it is important to apply standardized preservation technologies in the areas of file formats, metadata, packaging mechanisms, and network delivery protocols. In order to ensure long-term preservation of digital content, the following strategies should be considered:

1) MinimizeSystem Dependence

The standardized preservation technologies can be used in operating systems with different languages and different hardware platforms without limitation of the software and hardware platform. They not only reduce the management and preservation procedures and costs, but also enable resources sharing. Furthermore, they can reduce the risk of losing data when data is kept for the long-term. For digital content with low system dependence, the migration rates are also decreased, which can reduce the losing risk when data is kept for a long-term.

2) Maximize Standardization Effort

Using open and standardized preservation technologies provides both more options with respect to software that can read or use the digital content, but also the standard itself allows (if need be) a programmer to write new code to make accessible the information in the standardized specification. This decreases the need for the digital content management department to retain a specialized application for dealing with any particular digital content, or transform it into a

general format. Standardization means that more manufacturers are likely to provide the products that can read and share the data, so the risk of losing data in the preservation process can be reduced.

3) Extensible Framework Support

Independent of official or de jure standardization, data formats that are widely supported and used in the industry are also valuable in preservation scenarios. Simply by their leading place in the market they are likely to be usable by a wide variety of software and hardware for a long period of time. In fact, widely supported data formats are often called “de facto standards” because they function like a formal standard despite the lack of definition within a formal standards process. From the perspective of preservation, manufacturers will provide migration paths for such formats to ensure the compatibility between the new and the old versions as much as possible.

4) Transformation and Migration Possible

Transformation and migration are unavoidable, especially in many new fields, as at first only special formats, such as geographic information system and virtual realization technology, can be used. So the selected formats should support such a function that the file data can be migrated from the special environment and be easily transformed from one media to another or from one digital platform to another.

5) Extensibility, Verification, and Evaluation

During long-term preservation, some data may be changed, or some metadata may be added for search or other requirements. Therefore, on the premise that the actuality and integrality of the file content should be able to be maintained across such transformations, the selected format should allow the relevant information to be added into the file. This is known as extensibility. In addition, ideal formats can present the data and metadata in a way that allows the integrity of the content to be verified, allowing detection of legal and illegal changes to the file since it was created and/or preserved. Furthermore, a good data format and the surrounding preservation system can also provide the data or tools which allow users to evaluate the actuality and integrity of the file, and present appropriate and useful metadata, such as where the file was legally created, when the file was transferred, or how the file was updated or eve deleted.

6) Utilize Open Source Code

Some functions and features of file formats can best be understood by access to the source code for software that creates and manipulates the format. Access to source code can enable the developer of the preservation system to ensure that supported file formats have all-round functional features including the functions of preserving file contents, displaying file formats and keeping file functions, capable of providing convenience for management, safety and sharing of files in a full-featured way. An open source implementation can also help transform the data format(s) into a de facto standard, with the benefits outlined above.

5.3.6.3 Long-term Digital Preservation Standardizations

In order to preserve and share archival information resources easily, various standards need to be developed. But not all progress need wait for the standards. The standardization work, the digital library research, and the development of the necessary human and financial resources can be developed in parallel. In the process of processing, organizing, and managing digital information resources, relevant international standard should be followed and the standards and specifications of the information resource with the characters of your own country should be deeply researched so as to lay a solid foundation on resource sharing. In establishing digital library, relevant technical standards should be worked out as soon as possible, which should keep in line with international standards. When establishing the standard system of the digital library, following contents should be specially considered: standards on digitized information collection, standards on digitized information organization and storage, and standards in the area digital rights, security, privacy, and so forth.

The ultimate goal of a digital library, repository, and archive is to provide digital storage and retrieval services for users. During the process of establishing some of the properties of a digital library, many new ideas have been introduced. Services provided by digital libraries is not only a matter of updating traditional library services into the digital environment, but also includes developing and perfecting a whole new range of capabilities that apply only to digital data and content. Foresight, flexibility, and innovation are the necessary requirements for establishing the digital libraries of the future.

5.4 Terms of Reference #4: Recommendations to JTC 1

Having reviewed the field of Digital Content Management and Protection (DCMP), the Study Group has concluded that although the area is of great importance to many parties, it is broad and complex, and implicates numerous divergent requirements (not all consistent with each other) in the technical, commercial and regulatory environments. Further, considerable activity is already underway in the creation of standards by both consortiums and formal standards bodies.

Recommendation 1

Based on its work to date, SG on DCMP recommends that JTC 1 re-constitute the Study Group with more focused terms of reference. Specifically, the SG recommends that its attention be targeted on the important issue known as long term “digital preservation”. This term is understood to include the protection and management of both digital data and digital content, including associated metadata.

Recommendation 2

SG on DCMP recommends that the new terms of reference should include the following:

- To study the area of long-term digital preservation, understanding this term to include the safeguarding of digital content over an extended period, and the capture, creation,

persistent association and management of related metadata, and the impact of digital rights management technologies.

- To utilize in its study at least the Open Archival Information System (OAIS) reference model defined in ISO 14721:2003 Space data and information transfer systems -- Open archival information system -- Reference model.
- To study possible interoperability models for a preservation interoperable framework (PIF) including a Submission Information Package (SIP), and Dissemination Information Package (DIP) as defined in ISO 14721.
- To ensure in its study and recommendations that these interoperability models are completely agnostic to the file formats, packaging methods, metadata schemas and metadata binding mechanisms used in the digital data or content being preserved.
- To study and report on the requirements for digital content identification in long term digital preservation and their relation to general digital content identification, in particular cooperating through a liaison with ISO / TC46 / SC9 (Identification and Description).
- To study and report on the creation by JTC 1 or others of technical specifications or guidance that would enable real-world interoperability in digital preservation systems.
- To study and report on the creation by JTC 1 or others of technical specifications or guidance on effective and sustainable management models for operations and maintenance.
- To report to JTC 1 at its 2010 Plenary Meeting.

6. Review of Contributions

No.	Document Title
M0001	US Contribution
M0002	China Contribution
M0003	Digital Data Preservation Proposal
M0004	Content based Identification of Multimedia
M0005	SC29 Liaison Letter
M0006	MPEG IPMP
M0007	Liaison from TC100 to JTC 1 SG-DCMP
M0008	1553e DC DLNA Part 3 Link Protection
M0009	1551e CDV 62455Ed2 DVM-IPDC
M0010	155e3 CD 62579 Domain Management
M0011	DMP1260
M0012	DMP
M0013	A Study on Electronic Records Information System Model
M0014	Theory and Practice Management and Protection of Digital Resources
M0015	Suggested Topics from a Chinese Research Group
M0016	Management and Protection of 3D Content

M0017	DVB-TV-CPT Letter to JTC 1 DCMP Study Mission
M0018	The Technological Framework of Digital Preservation
M0019	New Zealand Liaison Contribution to JTC 1
M0020	TC-DRM Principles
M0021	TC-DRM Standards
M0022	ARIB Standards for ISDB-T
M0023	MCD Rationale and Roadmap
M0024	DRM Reference
M0025	DRM Influencing Standards

7. Report of Workshop

There were seven presentations with four focuses on digital data preservation, two on digital rights management, and one on content management and protection. The highlights of the presentations are as follow:

Digital Data Preservation Presentations:

1. Chinese Academy of Sciences presented the needs to preserve and make available digital content for: (a) Scientific database for physics, chemistry, geosciences, biosciences, ocean science, energy science, material science, astronomy, space science, etc.; (b) Virtual science museums for Principle of the Universe, Story of the Earth, Mystery of Lives, Discover the Universe, Technology, and Culture & Civilization; and (c) Digital science and technology museums for natural sciences, engineering, agriculture, medical sciences, etc. Their interests included (a) the ability to effectively preserve, manage, protect, and retrieve digital data content as digital technology continues to produce vast amounts of valuable and irreplaceable knowledge and information; and (b) to seek standard ways to interoperate and consume digital content.
2. National Science Library of Chinese Academy of Sciences presented an overview of the OAIS (Open Archival Information System) reference model and its functional components for (a) Ingest, (b) Preservation Repository, (c) Storage Management, (d) Preservation Management, and (e) Access. Their conclusion was that the digital preservation technologies required is a complicated framework but worth pursuing for standardization.
3. Anhui Provincial Archives of China presented their Anhui Provincial Electronic Center's strategy to improve government efficiency for their provincial records. Currently the Center applies three aspects of the reference models: (a) System Function Model which is based on the OAIS functional requirements; (b) Information Model which deals with metadata, archival format, and information structure; and (c) Business Model which deals with management of hardware, software, data, and people. Their interests included standardized infrastructure and applications for (a) metadata for electronic administrative records, (b) XML-based electronic records, and (c) requirements for archiving format of fixed-layout electronic document.
4. Proposal for Establish Unify Digital Data Preservation Interface Framework presented by Wo Chang by introducing why digital data preservation is important in the areas of

preserving (a) irreplaceable historical heritages and records, (b) valuable knowledge and findings, (c) critical financial and corporate data, and (d) personal memories and social networks. He then presented a set of surveys for mandated activities from different countries and which standards/industries activities are currently being undertaken on digital data preservation followed by how preservation systems are built today. He then described the interoperability problems with the current implementation approach of preservation systems and gave recommendations on how to establish a unified digital data preservation interface framework for interoperability between preservation systems. The response to the presentation was well received and our contribution became the focal discussion subject for the rest of this meeting.

Digital Rights Management Presentations:

1. Content-based Identification of Multimedia described how content-based multimedia identification can be used as a passive approach for digital rights management by automatic feature extraction from the media content.
2. Digital Entertainment Content Ecosystem (DECE) presented its goal for developing and licensing specifications for ecosystem in distributing digital entertainment content. It provides a platform to act as a broker on behalf of the DRM content providers/distributors and consumer devices so that the digital content can be consumed by the consumers from the registered DRM content providers. Currently, 40+ company members have joined DECE.

Content Management and Protection Presentation:

1. Management and Protection of 3D Content described how 3D content became widely used and important to many industries such as in the areas of medical and entertainment domains. The presenter introduced the ongoing research and development of the management and protection of 3D content followed with his own research results by applying watermarking techniques. The presenter also stated his future work to improve efficiency and effectiveness for better management and protection on 3D content.

At the end of all presentations, a panel of four panelists (Yuming Huang, Zhixiong Zhang, Bin Wu, Wo Chang) was formed for Q/A on digital data

8. Proposed Work Plan

Please see Resolution #10

9. Output Documents From Beijing Meeting

No.	Document Title	Available
N0012	SGDCMP Resolutions from Beijing Meeting, July 17, 2009	07/17/2009
N0024	Report of the JTC 1 Study Group on Digital Content Management and Protection from Beijing Meeting, July 17, 2009	09/09/2009
N0014	SGDCMP Work Plan from Beijing Meeting, July 17, 2009	07/17/2009

N0015	SGDCMP Recommendations from Beijing Meeting, July 2009	07/17/2009

10. Recommendations to JTC 1

Please see Section 5.4 for "Terms of Reference #4: Recommendations to JTC 1".

11. Future Meetings

SGDCMP resolved to conduct future meetings by electronic conferencing and to convene a meeting before the Tel Aviv meeting of JTC 1 to finalize and approve its report. SG on DCMP instructs its secretary to select a broadly acceptable date and time and arrange such a meeting. The meeting shall take place at least 2 weeks before the deadline for document submission.

12. Resolutions from the 1st SCDCMP Beijing Meeting

All following resolutions were approved unanimously unless otherwise noted:

Resolution 1 – Appointment of Editors of Study Group Report
SG on DCMP appoints Mr. Paul Jessop (GB) and Mr. Wo L Chang (US) as editors of the document "Report of the JTC 1 Study Group on Digital Content Management and Protection" (N0024).

Resolution 2 – Establishment of Liaison with ISO/IEC JTC 1/SC29
SG on DCMP instructs its secretary to take appropriate action to establish liaison with ISO/IEC JTC 1/SC29, and recommends the appointment of Mr. Wo L Chang (US) as the liaison representative from SG on DCMP.

Resolution 3 – Establishment of Liaison with IEC/TC100
SG on DCMP instructs its secretary to take appropriate action to establish liaison with IEC/TC100.

Resolution 4 – Establishment of Liaison with the Digital Media Project
SG on DCMP instructs its secretary to take appropriate action to establish liaison with the Digital Media Project (DMP), and recommends the appointment of Mr. Tei jun Huang (CN) as the liaison representative from SG on DCMP.

Resolution 5 – Establishment of Liaison with ETSI TC MCD
SG on DCMP instructs its secretary to take appropriate action to establish liaison with ETSI TC MCD, and recommends the appointment of Mr. Peter Mann (DE) as the liaison representative from SG on DCMP.

Resolution 6 – Establishment of Liaison with ISO TC46 SC9
SG on DCMP instructs its secretary to take appropriate action to establish liaison with ISO TC46 SC9, and recommends the appointment of Mr. Paul Jessop (GB) as the liaison representative from SG on DCMP.

Resolution 7 – Establishment of Liaison with ISO TC20 SC13

SG on DCMP instructs its secretary to take appropriate action to establish liaison with ISO TC20 SC13, and recommends the appointment of Mr. Mick Crouch (NZ) as the liaison representative from SG on DCMP.

Resolution 8 – Letter to DVB TM
SG on DCMP thanks DVB TM for the information provided to SG on DCMP as document m017.
SG on DCMP instructs its secretary to write to DVB TM expressing this gratitude.

Resolution 9 – Recommendations
SG on DCMP approves the document "Recommendations for inclusion in Report of Study Group on Digital Content Management and Protection 2009-07-17" (N0015).

Resolution 10 – Work Plan
SG on DCMP approves the document "Work Plan of the JTC 1 Study Group on Digital Content Management and Protection 2009-07-17" (N0014).

13. Any Other Business
There was no other business

14. Closing
The meeting closed at 2009/07/17T16:30

ANNEX 1

Attendees List for the 1st JTC 1 SGDCMP Meeting, Beijing, China, 15-17 July 2009

First Name	Last Name	Country
Gao	Lin	China (SCDCMP Convener)
Linpeng	Gao	China (SCDCMP Secretary)
Peter	Mann	Germany
Toshio	Tatsuta	Japan
Hide	Hosokawa	Japan (Workshop Speaker)
Kunihiro	Nishikawa	Japan (Observer from RITE)
Song	Yang	Japan (Observer from RITE)
Tian Tsong	Ng	Singapore
Paul	Jessop	UK
Stephen	Balogh	USA
Ryan	Caroll	USA
Mark	Ryland	USA
Wo	Chang	USA
Zhi	Tang	China
Bin	Wu	China
Wei	Sun	China
Da	Lu	China
Zhxiong	Zhang	China

Dongyan	Zhao	China
Tangli	Liu	China
Chen	Yang	China
Ningsheng	Liu	China
Zhiqiang	Cao	China
Yuming	Huang	China
Wei	Jiang	China
Shusen	Sun	China
Mingjie	Chen	China
Xiufen	Liu	China
GenXing	Dai	China
Yi	Lu	China
Zhenxin	Wu	China
Yonghong	Tian	China
Wen	Li	China
Tao	Zhang	China
Wilma	Su	China
Jeffery	Yan	China (Workshop Speaker)
LanLing	Wen	China
Jun	Zhang	China
Mick	Crouch	New Zealand (via telecom)

ANNEX 2

Program of SGDCMP Workshop, 15 July 2009

Operator:	Dr. Gao, Lin, The convener of SGDCMP
09:30-10:00	Exploration and Practice of Digital Content Management and Protection Professor Xiao, Yun (SGDCMP m014)
10:00-10:30	Management and Protection of 3D Content Professor Pan, Zhigeng (SGDCMP m016)
10:30-10:45	Tea break
10:45-11:15	Content based Identification of Multimedia Professor Huang, Tiejun (SGDCMP m004)
11:15-11:45	Introduction of DECE - The Future of Entertainment Starts Here Mr. Hide Hosokawa; Mr. Jeffrey Yan
11:45-12:00	Discussion
12:00-13:30	Lunch
13:30-14:00	A study on Electronic Records Information system model Mr. Huang, Yuming (SGDCMP m013)
14:00-14:30	The Technological Framework of Digital Preservation Professor Zhang, Zhixiong (SGDCMP m018)
14:30-14:45	Tea break
14:45-15:45	Digital Data Preservation Proposal

	Wo Chang (SGDCMP m003)
15:45-16:00	Panel Discussion
16:00-16:30	Closure

Agenda of SGDCMP Meeting, 16-17 July 2009

1. Opening of meeting - 9:30
1.1 Welcoming Remarks
2. Roll call of Participants
3. Adoption of agenda : SGDCMP N011
4. Remarks by Chairman
4.1 Appointment of Drafting Committee
4.2 Call for editor
5. Review of Terms of Reference
6. Review of contributions

US Contribution
SGDCMP m001
SGDCMP m024
SGDCMP m025

China Contribution
SGDCMP m002

New Zealand Contribution
SGDCMP m019
SGDCMP m020
SGDCMP m021

7. Study group Liaison's submitters

ISO/IEC JTC 1 SC29
SGDCMP m005
SGDCMP m006

IEC TC 100
SGDCMP m007
SGDCMP m008
SGDCMP m009
SGDCMP m010

Digital media project
SGDCMP m011
SGDCMP m012

8. Other Inputs

   Information Provided by Japan on ARIB
   SGDCMP m022

   DVB-TM
   SGDCMP m017

   ETSI TC MCD
   SGDCMP m023

9. Report of workshop
10. Proposed work plan
11. Recommendations to JTC 1
12. Future meetings
13. Any other business
14. Close