

## Standardization Activities in the Digital Living Network Alliance (DLNA)

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### Abstract

The Digital Living Network Alliance (DLNA) is currently in the spotlight as a non-profit industry association established to achieve digital interoperability. Its aim is to allow digital content to be shared among consumer electronics devices over home networks. This article provides an overview of DLNA standardization activities.

### 1. About the DLNA

The Digital Living Network Alliance (DLNA) [1] was founded in 2003 mainly by consumer electronics vendors to create an environment in which photographs, music, videos, and other digital content can be shared over a home network, connecting not only personal computers (PCs) but also TVs, DVD (digital video disc) players, and other audio-visual devices, as well as cellular phones and other mobile devices (**Fig. 1**) [2].

Up to now, standardization in the field of home networks connecting household devices and in the consumer electronics field has been carried out by individual industries and organizations. Although devices conforming to each industry or group standard have been made available to consumers, interoperability has so far been limited to devices based on the same standard specifications, or to devices that meet certain mutual conditions. Such standards have thus been slow to win wide adoption.

The DLNA is addressing this issue by devising implementation specifications for each device, based on the major industry and organization standards, as requirements for building products with a high degree of interoperability, thereby giving consumers a broader range of choices and encouraging wide adoption of the standards. It publishes its recommended standard specifications as the “Home Network

Device Interoperability Guidelines (DLNA Design Guidelines)”. By combining products compliant with the design guidelines, consumers should be able to enjoy content anywhere in the home. For example, a movie playing on the living-room TV or stored in a hard disk recorder could be viewed on a TV in the bedroom.

### 2. Organization of the DLNA

The DLNA is made up of Board Members with management and decision-making authority, Promoter Members with voting rights on specifications proposed for the guidelines, and Contributor Members who can propose specifications and take part in discussions. The Board Members are mainly the companies that founded the DLNA such as Sony and Intel, and the eight firms that have been part of the discussions from the beginning. There are 21 Promoter Members, including the Board Members. Contributor Members number more than 300 firms from 20 nations around the world (as of September 2006). The DLNA members represent a broad range of industries, including consumer electronics and audio vendors such as Sony, PC and computer vendors such as Hewlett-Packard, IBM, and Microsoft, national telecommunication carriers including France Telecom and Verizon, and telecommunications equipment and terminal vendors such as Cisco and Nokia, as well as service providers. Major Japanese firms are also involved, including carriers such as Softbank and KDDI in addition to NTT.

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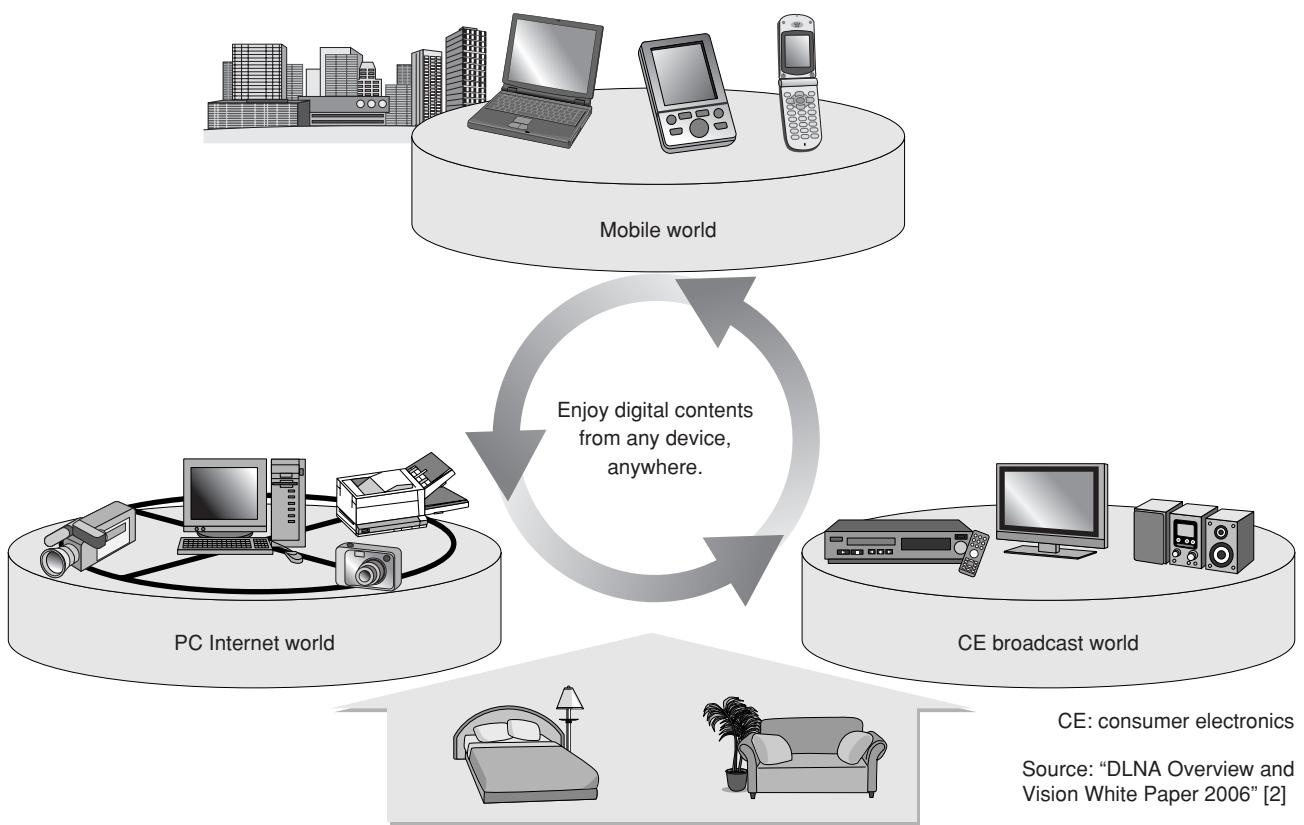


Fig. 1. The DLNA vision.

### 3. Activities of the DLNA

The DLNA carries out activities broadly in two areas. One is creating design guidelines for building products with high interoperability. The other is supporting the guidelines by running a certification program that ensures wide availability of products compliant with the guidelines, by coordinating with related organizations, and by nurturing the market for such products. Five committees formed under the Board of Directors are in charge of these activities (**Fig. 2**). The creation of the design guidelines is carried out by the first two committees, whose work is aimed at product supply. Products that are certified as compliant with the design guidelines are shipped with the DLNA logo affixed.

#### (1) Technical Committee

This committee is responsible for drawing up technical requirements, based on major industry and organization standards that will enable the interconnection of consumer electronics devices over home and outside networks. New study projects are also

frequently created in the subcommittees, where active discussions are conducted.

#### (2) Ecosystem Committee

The “ecosystem” for achieving the DLNA vision is the necessary combination of market forces, user needs, and industry cooperation. This committee works toward the formation of such an ecosystem by proposing and verifying scenarios that will benefit consumers, devising market-driven strategies, and building industry relationships.

#### (3) Interoperability and Compliance Committee

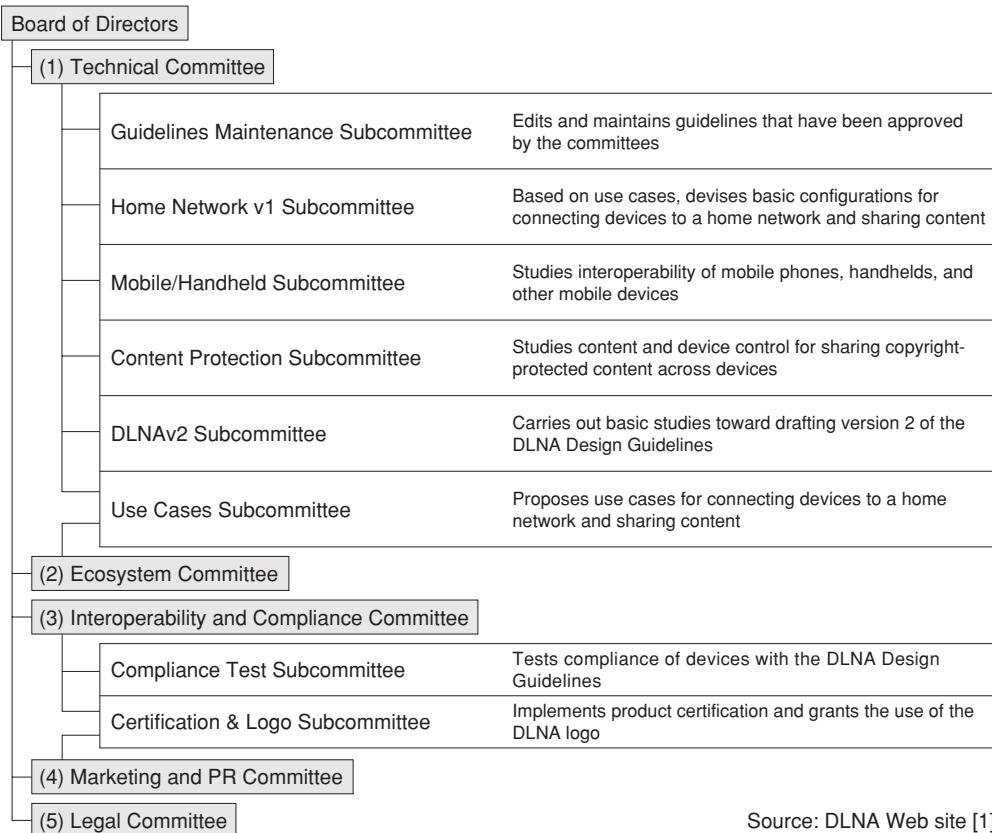
This committee tests and certifies product compliance with the DLNA design guidelines and grants the use of the DLNA logo.

#### (4) Marketing and PR Committee

This committee carries out market research and public relations activities to promote awareness of DLNA activities.

#### (5) Legal Committee

This committee provides advice on steering clear of legal pitfalls, which is also the responsibility of the DLNA as a whole.



Source: DLNA Web site [1]

Fig. 2. Organization of the DLNA.

#### 4. Accomplishments to date

The first DLNA Design Guidelines were drawn up in June 2004, slightly more than a year after the DLNA was established. They made possible device interoperability by bringing together various industry standard technologies in the areas of media formats, device control, media transfer, network stacks, and network connectivity. Eleven more media formats were added in January 2005, expanding the applicability of the guidelines. A Certification and Logo Program was launched in September 2005, under which more than 30 products have already been authorized to display the logo that indicates compliance with the guidelines.

In March 2006, a revised edition of the DLNA Design Guidelines was issued, with support for mobile devices, the addition of more transfer protocols, and guidelines on service quality control for high-quality services and on content uploading and downloading. At the same time, the scope of applicable devices was expanded from audio devices and personal computers to include controllers, such as

those in printers and remote control devices, for a wider range of interoperability. More recently, a members meeting was held in July 2006 for discussions leading to the issuing of Version 2 of the DLNA Design Guidelines, as well as deliberations on Content Protection Guidelines applicable to movies and other commercial content provided over DLNA networks.

In October 2006, the Content Protection Guidelines were issued as the "DLNA Link Protection Guidelines", an extension of the DLNA version 1.5 guidelines. The new guidelines provide two supported link protection systems: Digital Transmission Contents Protection for Internet Protocol (DTCP-IP) and Windows Media DRM for Network Devices (WMDRM-ND) (DRM: digital rights management). The DTCP-IP link protection system was approved by the Association of Radio Industries and Businesses (ARIB) as a transmission format for digital broadcasting in Japan, and the WMDRM-ND link protection system is used for movie and music delivery systems on PCs. Therefore, consumers can seamlessly enjoy content on all their DLNA devices over a home network, and

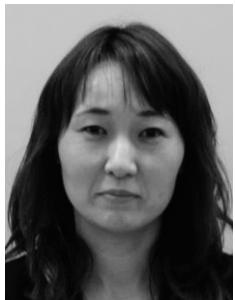
DLNA is expected to become more and more popular.

## 5. Future outlook

Looking ahead to coming developments, companies will be bringing out various new products, including DVD recorders and PCs from Sony, the ViiV platform from Intel, and mobile phones from various firms. At the same time, Wi-Fi hotspots and other types of communications infrastructure are being put in place, creating an environment in which content can be enjoyed anywhere at any time. As a result, access to content from mobile phones and other mobile devices is likely to increase. Since this will mean a greater role for telecommunications carriers, the NTT Group will be watching the trends and making proposals as needed.

## References

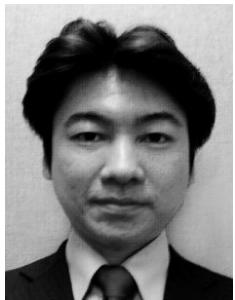
- [1] <http://www.dlna.org>
- [2] [http://www.dlna.org/en/industry/about/dlna\\_white\\_paper\\_2006.pdf](http://www.dlna.org/en/industry/about/dlna_white_paper_2006.pdf)



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She received the B.S. and M.E. degrees in computer science from Keio University, Kanagawa, in 1991 and 1993, respectively. She joined NTT Human Interface Laboratories in 1993. Since then, she has been working on a contents delivery and protection system that uses various media. Since 2004, she has been at NTT Department III, planning R&D strategy, and has served as an NTT Group support staff member for NTT's activities in DLNA. She was transferred to NTT Cyber Solution Laboratories in 2006 and is currently engaged in the development of media computing technology for a portal site.



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