TECH 3358

MEDIA STORAGE FRAMEWORK MODEL

VERSION 1.0

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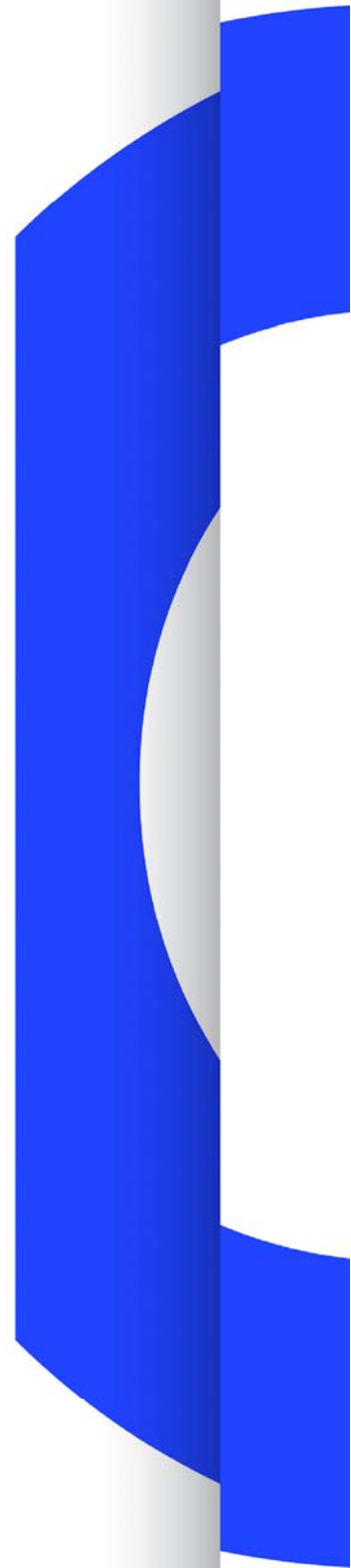
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Media Storage Framework Model

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Keywords: Storage, Media, Framework, persisted data.

1.   Introduction

This storage framework model is designed to provide a simple high level overview of the storage system components seen from the perspective of media applications.

The intention is to provide a common vocabulary to both Broadcast Media Organisations and to Storage Vendors, using a simple view of the technical media production landscape in this way each group will better understand the other group's issues. The model should not be seen as representing physical structures; it is there to help understand the media specificities, complexities and costs of such structures.

Two distinct groups or audiences are being targeted with this model.

- The first is comprised of those of the Broadcast Media Organisations who are interested in the media storage environment either operationally or managerially but who are not storage experts.
- The second is comprised of the Storage Vendors and storage experts in Broadcast Media Organisations who are not media experts.

2.   Model Structure

The Model is illustrated in **Figure 1**, below.

This Model is made up of adjacent and overlapping layers that attempt to show areas of interaction and their dependencies. These layers are grouped into three base layers that are fundamental to IT-based media production, namely **Usage**, **Access** and **Storage**. These are the base layers of the Model.

Access and Storage form the Storage System at the bottom of the Model whilst the Usage layer at the top of the Model represents how the media data is used. Similar elements in the same horizontal layer indicate different alternatives. The interface points are indicated by named lines.
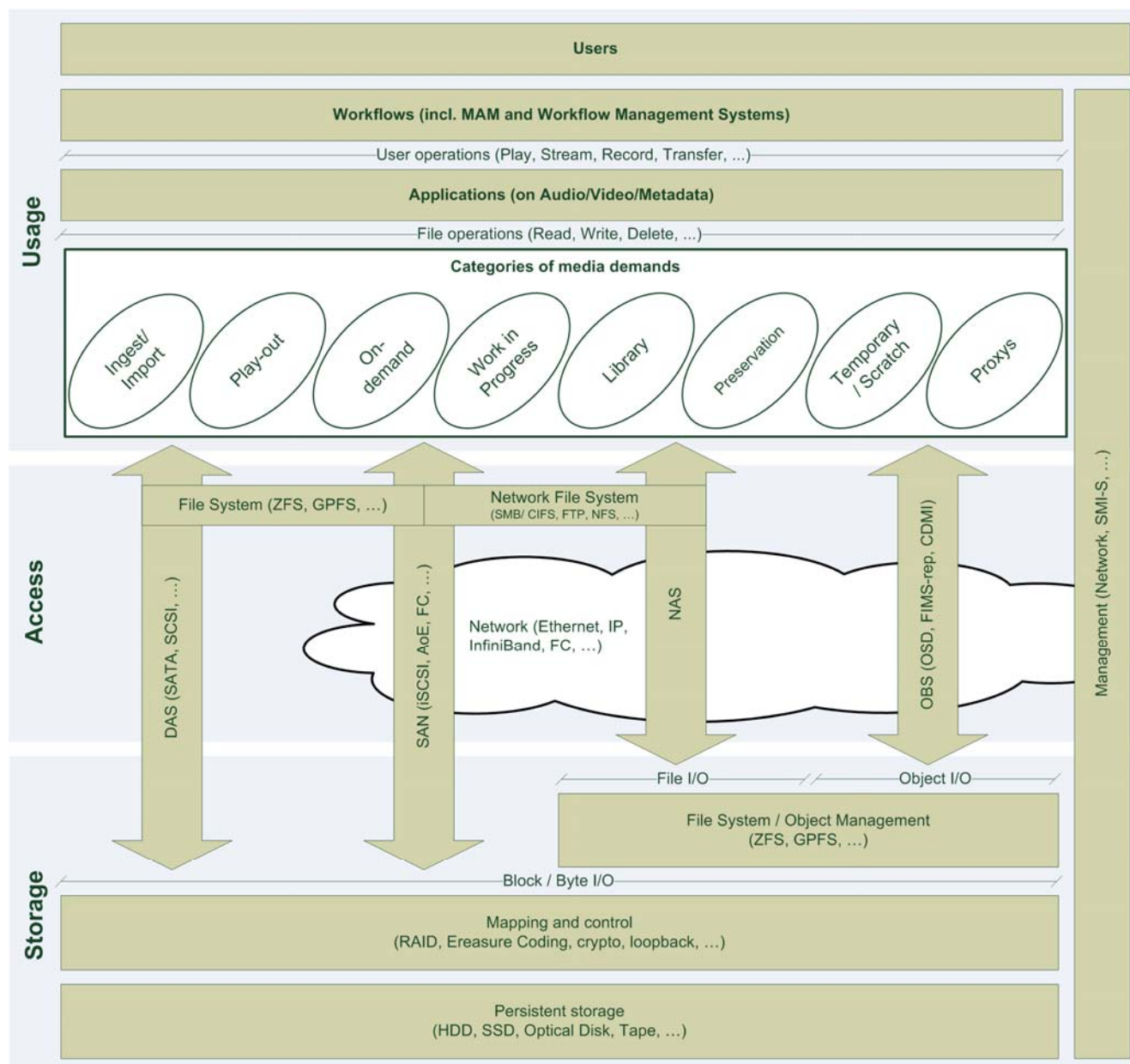
Figure 1: EBU Media Storage Framework Model

2.1   Layer Descriptions

2.1.1 Top base layer: Usage

This layer contains the media production users, processes and business requirements that drive demands on the access and storage base layers.

Users: The users carrying out the media production processes.

Workflows: Sequences of timely connected processes and steps carried out by the users (manually or automated) to achieve the business requirements. This also includes Media Asset Management (MAM) and Workflow Management Systems. Users and Workflows interact with the Application by the use of User operations (Play, Stream, Record, Transfer, etc.)

Applications: The products used to provide the processes needed by the business. They act on the Essence (Audio and Video) as well as the accompanying Metadata. Applications interact with the Storage System by File operations (Read, Write, Delete, etc.)

Categories of media demands: These are groupings of *user/workflow/application requirements* into categories that need to be fulfilled by Storage Systems. The exact categories, their number and their requirements depend on the particular business requirements of the relevant usage within the organisation concerned.

2.1.2 Mid Base Layer: Access

This layer supports both the physical and virtual networking structure as well as *Service Oriented Architectures*. This base layer encompasses all elements of data transport and services used across media production workflows.

File System (for DAS and SAN) or Network File System (for SAN and NAS): This supports the representation of persisted data or objects in a form used by operating systems to organise and manage I/O access to data as files or objects. A Network File System may be accessed at different layers of the structure.

Access methods: There are also a number of standardised methods to access storage directly or across data transport networks.

- Direct Attached Storage (DAS) is normally a collection of storage devices connected directly to a client or server via a host adapter and does not normally use a network.

- Storage Area Networks (SAN) provide specialised block level access to mass storage devices usually over a dedicated network while leaving the file system requirements to a higher layer of the structure.

- Network Attached Storage (NAS) is used to connect heterogeneous file based storage devices to clients or servers. Network storage connected in this way can be simply mounted to computer devices in a similar way as internal disk drives.

- Object-Based Storage (OBS) organizes data in flexible-sized data containers called objects as opposed to traditional fixed block-oriented disk interfaces. Objects encapsulate the user data plus attributes describing the object, as opposed to having them linked externally by a separate organizing mechanism.

Network: This cloud-like sub layer contains the data transport protocols and infrastructure associated with the local, enterprise and wide area networking.

Management vertical block: This block spans all base layers to provide network and storage management functionalities.

2.1.3 Bottom Base Layer: Storage

This contains the layers covered by most storage products on the market. The term 'storage' is frequently used to represent data stored as files using block structures on a technology that 'persists' the data placed on it.

File Systems / Object management (for NAS and OBS): This supports the representation of persisted data or objects in a form used by operating systems to organise and manage I/O access to data as files or objects.

Mapping and control: This layer supports the need for storage technologies to organise persisted data allowing access as block or byte I/O in the most efficient and reliable way and provide data recovery facilities in some cases. Methods used are often storage technology specific.

Persistent storage: This is the area that supports all relevant storage technologies that physically record the data into a restful, non volatile state.