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Response to Business Models CfC on TV Anytime Phase Two
Requirements

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Relevant parts of the CFC:
- Requirements
1. Introduction
The current contribution aims at responding to the Call for Contributions on New Content Types, Targeting & Redistribution, published by the Business Models Working Group. An attempt is made to identify requirements for the TV Anytime Post Phase II targeted application scenarios as far as metadata, content referencing and rights management extensions or newly introduced aspects are concerned for the identified key areas: new content types, targeting, redistribution.

2. New Content Types

2.1 Content Referencing
In the concept of introducing generation, management and consumption of new content types in addition to the conventional TV broadcasts, extensions to content referencing mechanisms are foreseen as mandatory.

Unique content referencing should be defined for any type of new content considered in addition to the content referencing mechanisms defined for conventional TV broadcasts. Such references should also enable content sharing. Attributes or references that will also contain information/links on the type of application/decoder that will be handling the new type of contents should also be defined. For example, when multiple a/v streams are received in parallel on a PDR equipped with multiple and in many cases different in nature decoders, the PDR control interface should be able to identify which decoder will handle which received type of content. The same is valid for a variety of terminals operating in parallel, e.g. a TV where conventional broadcasts are displayed, a PC where downloaded Web Pages are shown or a Mobile Phone/PDA where a downloaded application enables the viewer to communicate back to the server.

2.2 Metadata
Metadata definitions should be extended to provision for the description and proper management of new content types. Such descriptions may differentiate according to the type of new content. In particular, definitions should among other take under consideration:

- Definition and identification of the type of new content
- References to the decoder/player/application that will be handling it
- Access mechanisms
- Scalability information of a/v content to be used in order to select that scalable version that will be managed at the terminal end according to the terminal capabilities (terminal adaptability). Also terminal-based target information, when certain types of content (or same type of content in different formats) are aimed for consumption by certain terminals. Such requirement also applies for metadata definitions within the Redistribution Key Area. For these purposes, metadata definitions at the network side should also include specification of required terminal capabilities. Such specifications could be managed by extending and managing generic sets of terminal capability profiles at the provider, network or terminal side. All these should be coordinated keeping in mind the desirable Quality of Service (QoS) both at the network as well as the terminal ends. Definitions should include hybrid functional information related to network or terminal such as (but not limited to) reference(s) to/information about Network/Terminal(s) that will be handling new content types, e.g. bandwidth requirements, terminal capabilities (e.g. MPEG-4 playback, middleware-capable, graphics handling).
- In cases where such information is not inherent in content, synchronization information, associations among multiple content types, definition of relationships, playback time, signaling information, temporal activation in order to allow accessing of this information independently of the underlying encoding format.
Hybrid functional information related to type of content, e.g. interactive or non-interactive, to be overlaid on or replace already displayed content on targeted player (mixing options), playback time, duration, expiration time (if subsequent related content is to be received)

Segmentation and indexing metadata for new content types captured at the PDR to be further used by middleware applications such as bookmarking ones.

In case of interactive content/applications, user interaction capabilities information: how to interact, why, when.

In case of e-commerce or t-commerce applications or generally applications that involve transactions and there is a back-link to the server side, there is the need to initially describe and uniquely identify the provided service through the use of registered service references and later on describe and uniquely identify the “client” requesting the service. Subscription information when required should also be described. All these should be managed in a secure manner based on proper access control and authentication mechanisms. Metadata definitions should also include proper descriptions for transactional information: service requested, item selected to be bought, client information including credit card information, user request, payment model. The possibility to instantiate such metadata descriptions at the terminal (end-user) side should be enabled. Such metadata instances will be transmitted back to the server side for further processing and response. There are cases that the content itself (e.g. MPEG4) may trigger the initiation of e- or t-commerce transactions. Metadata definitions should efficiently describe such potentials.

Adaptable multidimensional dictionary on new content types according to emerging needs and services – mechanisms to allow terminals to account for dictionary updating also. The need to identify new dimensions may arise.

Multilinguality or regional cultural specific information

Copyright, access control or content management information (copy once, copy never, …)

User preferences should now include attributes related to new content types/applications consumption. There may be two types of user preferences: static ones involving always received content as well as dynamic ones referring to new content types consumption.

Any other necessary metadata information being of rather application specific nature could be incorporated in proprietary metadata schemas and handled by proprietary applications. However, metadata definitions should include proper identification or wrapper elements to trigger handling of proprietary metadata instances at the terminal(s) end.

Local storage management should now be possible for all types of content received and associations among them should be preserved.

Dynamic updating/adaptation of the above should be possible in the case that new content types are necessary to be handled (as new applications emerge). For such reason, dictionaries, unique identifiers and hybrid service/network/terminal/interaction profiles should be extensible and easily transformable and definitions related to those should be of a rather generic nature.

All metadata definition extensions to be identified within the Post Phase II specifications should target at providing an intuitive and at the same time transparent access to any system/service/content components to the end-user and allow for interoperability among standards and proprietary applications.

### 2.3 Rights Management and Protection

New content types such as captured a/v or non a/v content should be protected in a similar manner to captured conventional broadcasts. Associated metadata descriptions are also a valuable asset. Access control, authentication and authorization mechanisms should be
considered for applications requiring them, such as secure transactions in e-commerce applications.

3. Targeting

3.1 Rights Management and Protection

A major issue in this case is user privacy protection and user profile sensitive data protection. Identification of which parts of user/groups profiles could be accessed by service providers should be made and the way of access mode defined (read, read and modify/store, …).

Use of advanced smart cards, where user profiling and targeting information could be stored and where data are encrypted and thus protected, may help in the process. Smart cards could also enable controlled access to provided services or content. There could be storage partitioning where sensitive data could be stored on different storage units, appropriately protected against unauthorized access, while publicly available data could be stored on different storage units where access is allowed. Such principles could be implemented within the PDR architecture as well. Otherwise data hiding or encryption techniques could be considered.

4. Redistribution

4.1 Metadata

As already described within the requirements set for metadata definitions as envisioned for the management of New Content Types, terminal profiles and terminal-based target information serve in distributing and managing the same (in different scalable formats) or different received types of content to the appropriate display or storage devices within a home network to be further managed. Indications within accompanying metadata concerning content distribution to registered and identified multiple terminal platforms, such as Internet terminals, mobile phones, PDAs, etc. should be accounted for. Since the scalability in the case of visually enhanced services is non-trivial, one could assume that there should be some content-related assistance, such as metadata, that denotes aspects related to the perceived QoS. For example a line indicating a distance measurement might be displayed as such on a TV set, but it might only launch the display of some text on a 3G Mobile Phone.