Document Number: AN456

Date: 23rd July 2002

Title:

TV Anytime Phase II example scenarios, related requirements and potential associated description attribute definitions

Source: INTRACOM S.A.

Contact: Dr. Sofia Tsekeridou, Dr. Athanasios Demiris,
Mr. Nikolaos Ioannidis

INTRACOM S.A.
Development Programs Department
Research and Development Division
19,5 km Markopoulou Ave.
GR-19002, Peania, Athens
GREECE
Tel: +30 10 6677829, +30 1 6674436
Fax: +30 10 6677312, +30 1 6671312
E-mail: soft@intracom.gr, dema@intracom.gr, nioa@intracom.gr

Response to CFCs:
- CFC on TV Anytime Phase II Requirements (Business Models WG)
- Partially, CFC on Target Metadata (TV107), contribution to draft Specification S-3 V2.0 (Metadata WG)

---

1 MELISA Consortium: INTRACOM, OGILVY INTERACTIVE, SYMAH VISION, CANAL+ TECHNOLOGIES, UNIV. OF ESSEX, INTRALOT, COSMOTE, UPPSALA UNIV., LADBROKES, ERT

2 PiSTE Consortium: INTRACOM, UNIV. OF CRETE, THOMSON MULTIMEDIA R&D, FRANCE TELECOM, DUBLIN CITY UNIV., POZNAN UNIV. OF ECONOMICS, FHG/IGD, ZGDV, UNIV. OF HANNOVER, ERT, DARTFISH, EPFL
1. Introduction
The current contribution is a 2nd extended response to the Call for Contributions on New Content Types, Targeting & Redistribution, published by the Business Models Working Group. It presents an extension to the AN415 contribution submitted in the 17th TV Anytime meeting and draws from the Phase II system functionalities introduced in an older contribution AN322, where the PiSTE system architecture, functionalities and extensions to TVA Phase I definitions have been initially introduced. This contribution greatly relies on the actual requirements introduced by two IST funded R&D projects:

- PiSTE: Personalized Immersive Sports TV Experience, and
- MELISA: Multi-platform E-publishing for Leisure and Interactive Sports Advertising

that both present enhanced and interactive TV applications featured by many of the envisioned TV Anytime Phase II characteristics. The MELISA objectives, concepts and abstract architecture will be jointly presented with Canal+ Technologies at the 2nd Implementers' Workshop taking place during the 18th Meeting.

This contribution presents project-related application scenarios falling within the TV Anytime Phase II areas and the correspondence with already presented in AN415 envisioned requirements is shown.

Furthermore, based on the identified requirements, the current contribution presents input for the draft specification S-3 V2.0, responding partially (also introducing new concepts) to the Call for Contributions on Target Metadata. Potential new description types and attributes are introduced.

2. TV Anytime Phase II Example Usage Scenarios & Associated Requirements

<table>
<thead>
<tr>
<th>USAGE SCENARIOS</th>
<th>REQUIREMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcasting and Consuming multiple synchronized AV streams (use of multiple decoders)</td>
<td>1. Since alternate parallel AV streams are transmitted in parallel with conventional programs, appropriate unique identification (GRID mime types) and referencing/locating mechanisms should be also considered. Cross-referencing and cross-linking is also necessary to allow for the dependency and relations implementation of one to another.</td>
</tr>
<tr>
<td></td>
<td>2. Apart from the alternate, parallel AV streams that have to be synchronized, associated metadata descriptions should be synchronized also with the displayed content. The metadata lifecycle in this case is crucial to be accurately handled. Timeliness of content and metadata is very important, especially in dynamic updating of both. Temporal definitions (dynamic versus static) should be provisioned for.</td>
</tr>
<tr>
<td></td>
<td>3. The way that received streams, the one referencing to the other, will be presented to the viewer has to be also considered. Presentation style definitions are deemed necessary. For example, overlay AV2 on</td>
</tr>
</tbody>
</table>
him/her in the form of overlaid graphics.

top of AV1, or replace AV1 with AV2, or display AV2 to the top-right corner of the TV screen, etc.

4. Parallel and synchronized transmission of alternate AV streams impose certain network requirements with respect to bandwidth, directionality (for example if remote interactivity is provided), QoS, etc. Related network definitions should thus be incorporated within metadata descriptions. They may be handy especially in cases of redistribution of new content types.

5. Terminal targeting information should also be transmitted alongside metadata instances. The complexity of handling multiple synchronized AV streams may only be handled by terminals with extended capabilities, e.g. equipped with multiple decoders, capable of handling graphics, etc. Terminal targeting in the means of identifying preset terminal profiles (i.e. set of capabilities) is crucial.

6. Rights management and protection should be considered for all new content types broadcasted and consumed.

Broadcasting and consuming new, alternate media types – non-synchronized, download case

The broadcaster broadcasts supplementary content in non-live mode, not necessarily related to the conventional broadcasts content. Such content is characterized as enhanced content or visual enhancements and could be sports video replays of event critical phases, 3D video clips showing a virtual reconstruction of an athlete’s attempt and allowing the consumer to navigate within the scene, etc. The consumer is able to initiate downloading of such content and view them upon termination of downloading using the same or alternate decoders (e.g. MPEG-4 ones). Interaction capabilities may be offered to him according to the type of content (like the inherent interaction capabilities offered by MPEG-4). The consumer can alternatively select to store the content on his/her PDR for later viewing.

1. Unique Identification (CRID mime types) and referencing/locating alternate parallel non-synchronized media types is necessary, as described above.

2. Presentation styles should be applicable here as well.

3. Terminal targeting presents a requirement here as well.

4. Network definitions are again necessary.

5. Rights management and protection for all new downloaded content types is necessary here as well.

6. Description of media type (the term list under the MEDIA TYPE category is already existent). However, an additional element or attribute should be added to supply more details (the term list in this case could be proprietary) in order to further allow for enhanced content personalization at the PDR. For example, Media Type = 7.3.9, Enhancement Type = xxx, where xxx is taken out of a proprietary dictionary.

Providing/Using a variety of services

1. Service package profiles: basic, extended
An extended scenario that comes along with the provision of alternate media types is the provision of a variety of services, some of them interactive, transactional, subscription enabled. Thus, one or maybe many service providers joined as one may offer a number of service packages. For example, broadcasters, advertisers, betting companies and network operators join together to offer basic or extended service packages including one or more of: visual enhancements broadcasting services, betting services, advertising/promotional with e-commerce capabilities services, supplementary information services.

Subscription to service packages may be required. The consumer is given the option to choose what he/she wants to consume and to subscribe when necessary. He may select which items/types of content/sub-services to pay for. He is capable of changing the service package at any time, complying with the new applicable rules of that package.

Extending profile information, enhanced personalization (pull model)

The consumer receives a variety of enhanced/interactive broadcasting services, offering new types of content as well as associated services, some of which he has to previously subscribe too. Among the variety of information+content he/she may now consume, he is capable of selecting which types of content he is most interested in. For free services, he is also capable to select which types of services he wants to use. The PDR is capable of automatically offering to him/her the types of content+services he/she is interested in. For example, in promotional/advertising services that broadcast in-content and context-sensitive advertisements and enable e-commerce transactions, the consumer may register for which product types he/she is interested to receive promotional information.

Extending profile information – transactional aspects

When the consumer is subscribed to use transactional or e-commerce related

1. User profile definitions should be extended to allow for new service / content types of interest registration in order to further enable automatic personalization mechanisms. Extensions to the multi-dimensional dictionary to include e.g. service terms are necessary.

2. Sensitive user data protection, access level types definition and controlled access are required in case that service providers have access to use profiles via a return path.

1. Basic subscription definitions from the subscriber point of view should be included within the user’s profile. Subscription
services, he/she is able to smoothly perform such transactions and retrieve a history of his/her transactions at any time. He is informed of any subscription as well as payment packages options. He/She trusts the transactional system with sensitive data like his/her credit card details.

<table>
<thead>
<tr>
<th>Providing/Consuming services to/from a variety of terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>The broadcaster is transmitting a variety of new content types, some requiring presence of multiple decoders at the terminal side. Such content may be consumed at a variety of terminals at the same time. Terminal targeting from the provider side is enabled to direct the types of content to the targeted terminals, capable of handling them, at the consumer side. Alternatively, bandwidth permitting, the broadcaster may send a variety of scalable version of the same type of new content, each scalable version targeted to a different type of terminal to be handled by. On the consumer side, terminal profile instances reside at each terminal (instantiated by its manufacturer) to denote its capabilities in a hybrid way.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Providing/using e-commerce (generally transactional) services</th>
</tr>
</thead>
<tbody>
<tr>
<td>An advertising agency in agreement with the broadcaster offers in-content and context-sensitive advertisements transmitted as a real-time, synchronized, parallel MPEG-4 stream (interactivity enabled) along with the conventional sports content broadcasts. Sports equipment that an athlete holds, or stadium side banners are displayed highlighted to the consumer, who has selected to receive such content. Using his/her interaction unit (e.g. remote control), he/she is capable to “click” upon (select) the highlighted object, receive promotional information about the product and initiate a transaction by linking to the e-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Providing/using e-commerce (generally transactional) services</th>
</tr>
</thead>
<tbody>
<tr>
<td>For transactional services, a return path is necessary. In some cases, e.g. real-time betting, fast bi-directional system responses should be managed.</td>
</tr>
</tbody>
</table>

| 2. The PDR should be able to monitor and store previous transactions information, either finalized or pending, thus the user profile should include a local “shopping cart” definition including all previous transactional user requests and related information and also showing the status of transaction. |

| 3. Again, protection of the especially sensitive transaction/subscription information is a high requirement. Such protection should be managed either locally or when transmitted back to the service provider. |

<table>
<thead>
<tr>
<th>Providing/using e-commerce (generally transactional) services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection of sensitive data (e.g. transactional data transmitted back to the service provider, credit card information) should be managed to enable user trust to the system.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Providing/using e-commerce (generally transactional) services</th>
</tr>
</thead>
<tbody>
<tr>
<td>User authentication and controlled access to subscribed services is necessary.</td>
</tr>
</tbody>
</table>

| 1. Terminal targeting information should be included within the service/new content type descriptions. A dictionary of terminal profile preset terms should be defined. |

| 2. Terminal profiles should be defined involving a generic set of definitions for identifying their hybrid capabilities. A dictionary of related terms is therefore required. Such capabilities may include new media formats that could be handled, e.g. graphics enabled, or presentation/display requirements, e.g. up to 352 x 288 spatial resolution video clip playback in MPEG2 format, etc. |

| 1. For transactional services, a return path is necessary. In some cases, e.g. real-time betting, fast bi-directional system responses should be managed. |

| 2. Protection of sensitive data (e.g. transactional data transmitted back to the service provider, credit card information) should be managed to enable user trust to the system. |

| 3. User authentication and controlled access to subscribed services is necessary. |
commerce site of the advertiser.

<table>
<thead>
<tr>
<th>Extended local storage management</th>
</tr>
</thead>
<tbody>
<tr>
<td>The consumer is capable of capturing or downloading and storing new types of content apart from conventional broadcasts. He/She can retrieve to use or view or even delete them from the PDR's local storage at any time. He/She may also transfer profile + stored content data to other types of terminals.</td>
</tr>
<tr>
<td>1. Copyright protection of captured/downloaded new content types should be managed.</td>
</tr>
<tr>
<td>2. Copy control mechanisms should also be considered.</td>
</tr>
</tbody>
</table>

3. Metadata descriptions and related attributes

Based on the requirements and usage scenarios presented in the previous section, it is foreseen that extensions to already existing metadata definitions or introduction of new ones are necessary. The current section aims at solely introducing such definitions in the form however of simply explaining the attributes considered necessary for sufficient Phase II applicable descriptions without introducing the actual XML encoded definitions.

Service description
- Service identification
- Service Provider
- Subscription status
- Type of activation

Service Package description (service profiling)
- Service Package name
- Service Package identification
- Service Package description
- Services References

Terminal Targeting
- Profile type (middle-ware capable, graphics enabled, multiple decoders, etc)

Network descriptions
- QoS features
- Bandwidth
- Directionality
- Congestion

Presentation
- Style

---

TV Anytime Forum

INTRACOM S.A.
Extension to Multidimensional Dictionary

- Service Dictionary
- Terminal Profile Dictionary
- Copy Control Dictionary
- Transactional Dictionary (?)