The *TV-Anytime* Forum

www.tv-anytime.org

Call for Contributions

On:

New Content Types, Targeting & Redistribution

(*TV-Anytime* Phase Two)

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1 Contents

2 Summary

This Call for Contributions (CFC) by the *TV-Anytime* Forum is issued as part of its charter to develop specifications for audio-visual and other services based on high-volume digital storage in consumer platforms.

The *TV-Anytime* specifications will allow consumers to watch programs in the way they want and when they want. Consumers will be able to explore and acquire TV content from a variety of sources, including traditional broadcast and new on-line interactive services, for presentation at any time. *TV-Anytime* will combine the immediacy of television with the flexibility of the Internet.

In this call, the TV-Anytime Forum has identified three distinct areas that form the first part of its Phase Two work. These include New Content Types, Targeting and Redistribution. Each of these areas will have implications for Metadata, Content Referencing and Rights Management, for which Phase 1 specifications are completed or nearing completion.

The *TV-Anytime* Forum plans to publish its Phase Two specifications beginning in October 2002.

3 Policy Statement on Intellectual Property Rights

To ensure that *TV-Anytime* specifications can be widely used, the *TV-Anytime* Forum expects that all intellectual property in the technologies included in its specifications will be made available for use on *fair, reasonable and non-discriminatory terms and conditions*.

In responding to this Call for Contributions (CFC), organizations shall identify any IPR (including copyrights or patents, either granted or pending) that they hold relating to the technology proposed. Before any specific technology can be included in *TV-Anytime* specifications, those submitting contributions shall sign a Contributors Agreement, available at www.tv-anytime.org.

If a response to the CFC proposes technologies where the IPR is known to be held by a third party, the *TV-Anytime* Forum will require that third party to submit a proposal and to complete a Contributors Agreement. Where necessary, the third party will be permitted an extension of up to 30 days beyond the deadline for responses to the CFC.

All Contributors Agreements must be submitted on official company stationery and signed by the appropriate company official. The *TV-Anytime* Forum reserves the right to reject technologies for inclusion in its specifications if a signed Contributors Agreement has not been received by the deadline specified in the CFC.

Organizations should be aware that any documents submitted in response to the CFC may be made available on the *TV-Anytime* Web site. Such documents are thus considered to be in the public domain.

All specifications produced by the *TV-Anytime* Forum will include the following disclaimer:

> **NOTICE**
>
> Use of the technologies described in this specification may infringe upon patents, copyrights or intellectual property rights of Members or non-Members of the *TV-Anytime* Forum.
>
> Although the *TV-Anytime* Forum makes a reasonable effort to ascertain the ownership of intellectual property as an aid to the users of its specifications, it is entirely the responsibility of individual users of the specification to obtain all necessary licenses.
>
> Neither the *TV-Anytime* Forum nor any of its Members accept any responsibility whatsoever for damages or liability, direct or consequential, which may result from use of this specification.

4 Introduction

4.1 The TV-Anytime Forum

The global *TV-Anytime* Forum is an association of organizations which seeks to develop specifications to enable audio-visual and other services based on mass-market high volume digital storage in consumer platforms – simply referred to as *personal media storage*.

The *TV-Anytime* Forum was formed at an inaugural meeting held in Newport Beach, California, USA, on 27-29 September 1999. It has started work to develop open specifications designed to allow Consumer Electronics Manufacturers, Content Creators, Telcos, Broadcasters and Service Providers to exploit personal media storage.

As part of its formation, the *TV-Anytime* Forum has established four fundamental objectives for the organization, which are:

- The *TV-Anytime* Forum will define specifications that will enable applications to exploit persistent personal media storage in consumer electronics platforms.

- The *TV-Anytime* Forum is network independent with regard to the means for content delivery to consumer electronics equipment, including various DTV delivery mechanisms (e.g. ATSC, DVB, DBS and others) as well as the Internet and enhanced TV systems.

- The *TV-Anytime* Forum will develop specifications for interoperable and integrated systems, from content creators/providers, through service providers, to the consumers.

- The *TV-Anytime* Forum will specify the necessary security structures to protect the interests of all parties involved.

Member organizations from Europe, the USA, and Asia, are drawn from a wide variety of industries: Traditional Broadcasters, Internet Broadcasters, Content Owners, Service Providers, Telcos, Consumer Electronics Manufacturers, IT Industries, Professional Equipment Manufacturers, Component Manufacturers and Software Vendors.

The *TV-Anytime* Forum invites *participation* from all interested organizations. Membership is open to all who sign the TVAF Membership Agreement. Meetings are held approximately every two months in Europe, the USA, and Asia.

For more information or to get involved with the work of the *TV-Anytime* Forum, visit the *TV-Anytime* Forum (www.tv-anytime.org) or contact:

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4.2   The Purpose of this Call For Contributions

In order to achieve rapid progress, the *TV-Anytime* Forum has decided to work on the basis of issuing this Call For Contributions (CFC). The essential difference between a traditional Call for Proposals (CFP) and a CFC is that the organization issuing the CFC – in this case, the *TV-Anytime* Forum – will start working on the items covered by the CFC immediately, rather than waiting for responses to a CFP by a certain deadline.

The *TV-Anytime* Forum has started technical activities on the basis of a preliminary view taken by its participants of the essential requirements that need to be addressed. At the same time, the Forum is seeking input and views from interested parties on requirements that it should take into consideration. As part of this process, the Forum plans extensive consultation, in particular with the content creation and distribution industries.

The *TV-Anytime* Forum is therefore inviting contributions that address:

- Requirements

- Technologies

- Participation

Responses are invited to enable the *TV-Anytime* Forum to specify *technologies* for:

- New Content Types

- Targeting

- Content Redistribution

Contributions may address one or more of these subjects. If necessary, the *TV-Anytime Forum* intends to develop its own technologies to meet requirements and appropriate technical development work is already under way.

The *TV-Anytime Forum* invites all interested organizations to submit contributions and also to participate directly in its activities.

4.2.1   The Tool Specification Development Process

This CFC is issued on the basis of a preliminary view of the Requirements that need to be addressed, while seeking views on any necessary additional Requirements. This CFC also seeks appropriate Technologies to satisfy these Requirements.

While the CFC for both Requirements and Technologies is being issued at the same time, the final deadline for responses to the request for Technologies for the Tools mentioned in Section 6 below is later than that for corresponding Requirements. Shortly after the Requirements deadline for each Tool, Requirements will be "frozen" and published, allowing a further 'window' of opportunity for contributions on Technologies. This allows time for any additional Technology inputs to take into account the full range of Requirements according to all received contributions.

5 TV-Anytime Phase Two

5.1 Introduction

The *TV-Anytime* Forum is moving its focus into a world beyond TV (i.e., beyond audio plus video). This is a world where consumers build their digital entertainment and information-rich lives around a digital hub. This hub will need to accommodate the many and various new services that the market demands: network and standalone games, information and educational packages, entertaining enhanced television, transactional services and utilities such as banking, shopping and smart appliances. These consumers will also expect flexible content-buying models and the option to purchase and control how their content is distributed within their personal domains and physical networks. Service and content providers also want to understand their audiences and be able to deliver relevant content and services to groups, individuals or devices.

The Phase One *TV-Anytime* series enables audio and video search, capture and playback of content. It also enables segmentation and indexing of that content. Phase Two will specify open standards that build on the foundations of Phase One specifications and will include areas such as targeting, redistribution and new content types.

5.1.1 Summary of Phase Two key areas

The key areas for which the *TV-Anytime* Forum now requires contributions are:

1. **New Content Types:** Integration of content types other than audio and video (e.g., games, enhanced TV, web pages, music files, graphics, data and many other applications).
2. **Targeting:** Automatically matching and delivering relevant content to profiled consumers.
3. **Redistribution:** Moving content around among devices and systems.
   - *Content sharing:* Peer-to-peer distribution of unprotected and protected content over provider networks.
   - *Home networking:* Sharing content among multiple storage and display terminals within a defined private physical network.
   - *Removable media:* Distribution of unprotected and protected content on physical storage.

5.2 New Content Types

TV-Anytime storage should not be limited to the capture of television programs only. Audiences will require the ability to search, locate and acquire content outside traditional linear A/V formats. This content may be provided by commercial suppliers, by other consumers, or be of a personal nature.

Content and service providers are also delivering interactive services to many millions of consumers today. These services are combinations of many media types often controlled by software applications to provide entertaining, enriching and transactional experiences. The *TV-Anytime* Forum's Phase Two efforts aim to provide the specifications to support the capture of these complex services that will be delivered to viewers' PDRs or NDRs for offline local interaction – i.e., time-shifted, localized playback of the experience, or dynamically updated in real time.

The current Phase One *TV-Anytime* specifications are concerned mainly with audio and visual searching, location, acquisition and playback. There is also support in Phase One for sophisticated

searching and navigation using EPGs. Phase Two is taking into account key business and consumer requirements for the capture of new services such as:

- ▪ ***Games:*** Competitions, traditional console games, play-along-with-show challenges, gambling/betting and other game formats.
- ▪ ***Information and education:*** Pre-downloading of local news and information services with national, dynamic information delivered in real time; delivering multimedia non-linear learning packages that combine audio/video content with textual, graphical rich application; level-learning, tailored to users, etc.
- ▪ ***Interactive TV and Radio:*** Real-time integration between a TV program and applications such as chats taking place over local and remote systems; alternate, parallel streamed audio or video access (linear and non-linear); voting, etc.
- ▪ ***Transactional and Utility:*** Pushed VOD, rich media home shopping, banking and home finance services, personal digital video and stills collections, personal messaging mailbox, etc.

These services are enabled by and contain content types such as:

- ▪ ***Text***
- ▪ ***Digital images***
- ▪ ***Digital audio***
- ▪ ***Digital video***
- ▪ ***Software and associated data***
- ▪ ***Composite Formats*** (combinations of content types)

Examples of TV-based composite formats include:

- ▪ ***Linear program with non-synchronized, non-A/V content***
  Captured TV program with relevant captured web pages, games and iTV application.
- ▪ ***Linear program with synchronized non-A/V content***
  Captured program with relevant captured web pages or gaming that are triggered by the program as it plays.
- ▪ ***Non-linear single A/V program***
  Highlights extracted from a stored sports program or other forms of non-linear narrative.
- ▪ ***Hybrid VOD and NVOD***
  Locally stored material linking back to scheduled A/V content and vice-versa, e.g.: scheduled news broadcasts linking to stored extra video, data or application-based services.
- ▪ ***Linear broadcast program with dynamically inserted content from other sources***
  A broadcast program with advertising or other segments that are overwritten by targeted advertisements or segments stored on the local PDR drive.
- ▪ ***Single video stream with multiple soundtracks***
  A stored program with alternate audio stream(s), e.g.: other language(s), commentary, music, etc.
- ▪ ***Multi/parallel-stream linear A/V program***
  Synchronous presentation of multiple, selectable streams, such as a sporting event where the stored package remains true to timing of the original live event but offers multiple camera angles of the event.

- *Non-linear multi/parallel-stream A/V program*
  Asynchronous presentation of multiple, selectable streams, such as a learning package in which the viewer can jump between topics, review items, be graded, move up and down between competence levels, etc.

There are, of course, many other types of composite formats that do not necessarily include traditional television A/V streams, such as games, utilities, rich media shopping catalogues and the like, which also will be considered by Phase Two work.

We encourage and welcome contributions that address issues and enable key business models in the areas represented by the above examples.

5.3 Targeting

Today, content creators broadcast their content and hope that viewers tune in. They position their content (programs and advertisements) to capture targeted viewers by placing it based on time, channel and other factors. The content will only reach those viewers who happen to tune into the right channel at the right time.

Advertisers place ads based on audience demographics that they define as being the most likely buyers of their products. The broadcaster identifies programs in which those audience members are best found, and the advertiser agrees to buy at a rate that is appropriate. With fragmentation of the advertising market due to channel proliferation, advertisers increasingly struggle to reach prospective customers.

Tomorrow, in a world of ubiquitous local storage in PDRs, broadcasters will have the capability to automatically match and deliver relevant content to profiled consumers. Program content will be targeted to groups of users based on aggregated profile data at the head-end, and/or they will broadcast content and allow intelligent profiling agents at the PDR level to capture and store content of specific interest to individual users.

When advertisers can target individual profiles within their viewing audience, broadcasters/service providers will charge a premium rate for each group delivered. Further, when they have a mechanism to track delivery and playback in individual households (via a return path), the rate charged can be even higher.

Another scenario might involve consumers sharing content they have created with other consumers who have specified profile attributes.

Viewer profiles may be stored locally on PDRs or in protected space on NDRs. A profile may consist of both static and dynamic attributes. For example, static attributes include data imported from external sources and preferences provided by the viewer. Dynamic attributes might be generated from viewing history and "thumbs up" ratings. An intelligent agent on the PDR will use some or all attributes in the profile to capture and playback (or insert, in the case of ads) relevant programming content and promotional material.

The *TV-Anytime* Forum's Phase One business models include some basic types of targeting. For instance, one business model describes a PDR capturing content that matches the consumer's interests. The technical specifications in Phase One enable this and other models like it.

However, in order to enable more advanced targeting business models such as targeting programs and advertisements based on demographics, geography, and consumption profiles of consumers (see examples below), more technology must be incorporated into the *TV-Anytime* specifications. There are a number of different variants on how content will be targeted in the PDR environment based on the following profiles:

- *Consumer:* Inserting content based on the viewer's parameters, e.g. location, demographics, consumption habits, preferences, etc.
- *Related content:* Cross-linking of targeted elements to specific program content; e.g., an advertisement inserted in a program for a product featured in that program.
- *Specific devices:* Inserting content only when a program is viewed on certain platforms, e.g. only on mobile PDRs (3G, PDA, in-car, etc.)
- *Others:* We encourage suggestions and contributions.

5.3.1 Further examples

- *Advertising targeted to consumer profile:* For example, an automobile maker buys a spot, but designates several different pieces of content to be viewed depending on the profile of the individual household. PDRs in some households will insert from local storage a Minivan ad, while others see an SUV or luxury vehicle, and still others a tractor.
  In another instance, the same advertiser might specify that it only wants to reach rural farm homes to run its tractor ads. The broadcaster gives that advertiser those homes only, and can sell the remainder to other advertisers.
- *Advertisement targeted to content:* An advertiser identifies a program whose viewers are known to be likely buyers of its products. Every viewer who selects this program for capture using a PDR, will see this advertiser's messages every time the program is viewed.
- *Content targeted to consumer profile:* A content creator (TV program producer, software maker, game provider, etc.) specifies profile attributes of its target audience. A consumer's PDR will capture/download the content if its locally stored profile matched the content creator's specified targeting criteria.
- *Content targeted to specific device:* A provider targets a new service to consumers who have 3G mobile phones with storage. Advertising is also delivered based on the demographic of the group of 3G mobile PDR users.

The above are just a few examples of potential targeting scenarios, and in a truly digital world where PDRs are ubiquitous, the opportunities for innovative targeting of programming and promotions are virtually limitless. Furthermore, targeting *with return path* enables mechanisms to track fulfillment.

To encourage success of these new models, it is imperative that the enabling technologies be developed by the *TV-Anytime* process.

We are asking for further requirements, scenarios and technologies that enable advanced targeting of content – programs, advertisements and other content types – to individual consumers based on their profiles.

5.4   Redistribution

5.4.1   Introduction

Phase One concerned itself with the initial deployment of PDRs and NDRs, without contemplation of redistribution or usage by another device.

The market today reflects a situation where PDRs can begin to interact with other PDRs and storage devices in and beyond the home.

In its next phase of activity, therefore, the *TV-Anytime* Forum intends to address networked PDRs and NDRs – traditional fixed devices as well as mobile devices – and the addition of removable media. These will enable new forms of storage inside the personal domain as well as the redistribution to other personal network domains.

5.4.2   Home networks

This category concerns itself with multiple connected storage and display terminals within a defined private network and how they can operate and function together.

5.4.2.1   Home Network Access Illustration

Illustrated below is one PDR accessing content managed by another PDR located in the same home.
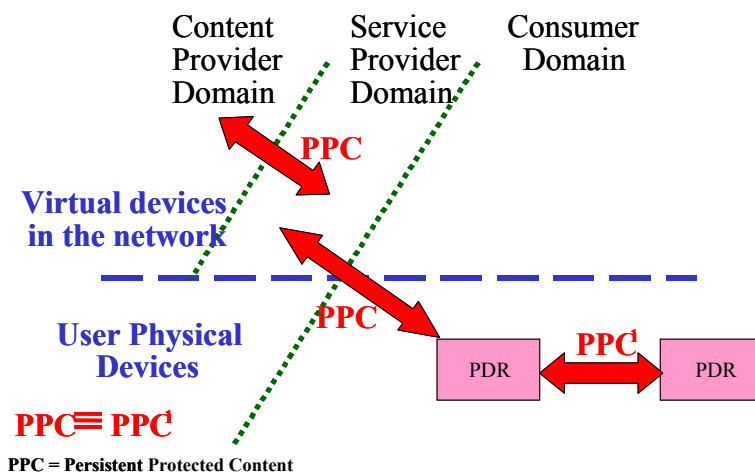
5.4.2.2   Home network scenario

A consumer captures a console game on his PDR with a license for this single device. He then purchases an expanded license permitting play on any capable device within his home network. After playing the game on several devices physically within the home, he transfers the game to his mobile wireless PDR so that he can play the game while traveling overseas.

5.4.3   Content sharing

The advent of peer-to-peer sharing of content has become a mainstream activity among consumers with regard to data, audio, and video. The introduction of the PDR into the market will enable these models to extend content domains into multiple storage domain environments.

The process for sharing content could differ widely. It could occur freely and unlimited for some content or be restricted for other content, and even include additional remuneration beyond the initial transaction for still other content.

The illustration below demonstrates sharing of content between customers in different personal domains. This sharing could be enabled by a single or by multiple service providers.

Content Provider Domain   Service Provider Domain   Consumer Domain

PPC

Consumer Domain

Virtual devices in the network

PPC

User Physical Devices

PPC ^{1}

PDR   PDR

PPC $\equiv$ PPC^1

PPC = Persistent Protected Content
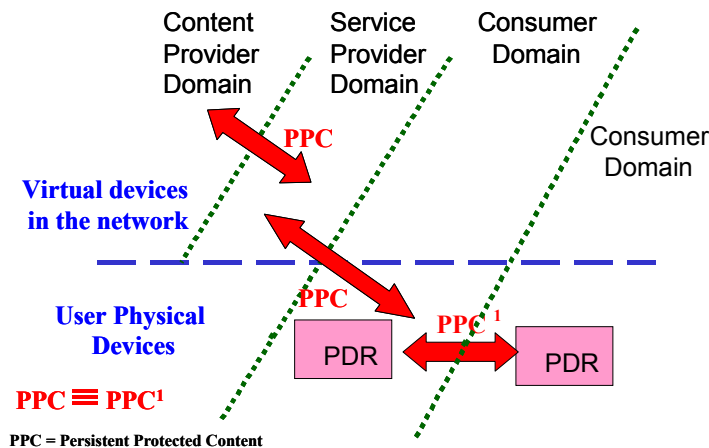
5.4.3.1 Content sharing scenario

A consumer misses an episode of a favorite series. He sends a message to his community of connected PDR users who have between them limited sharing rights to see if anyone has captured this particular program. Another user contacts him to say she has the program and asks if he would like her to send a copy to his PDR. He replies affirmatively and the program is transferred.

5.4.4 Removable media

Consumers will expect to use and store content they own on multiple devices within their personal domains. There are many types of removable media that the *TV-Anytime* Forum must consider as appropriate to transfer content to and from PDRs.

5.4.4.1 Example scenario

A content rental organization rents a movie to a consumer and delivers it to her PDR. She views the movie and decides to purchase a number of plays (10). She subsequently stores the movie on a DVD and presents it to friend as a gift with five viewings remaining. The friend enjoys the movie and decides to purchase it. He copies it to his home network after obtaining an unlimited license for viewing.

The *TV-Anytime* Forum seeks contributions regarding the redistribution types listed above. These contributions can include, but are not limited to:

- Relevant business models
- Priorities that the *TV-Anytime* Forum should assign to these models in its developmental activities
- Specific requirements required to realize these models
- Migration and compatibility issues with the existing framework

6   Impact on *TV-Anytime* Specifications

The *TV-Anytime* Forum's work is broken into several Working Groups. The normative specifications that the Forum produces come primarily from three of these groups: Content Referencing (CR), Metadata (MD), and Rights Management and Protection (RMP).
The forum's Phase Two work will naturally involve efforts from each of these groups. The following sections explain how the experts in each of these Working Groups envision their work proceeding on Phase Two elements.

6.1   Content Referencing

In its Phase Two, the *TV-Anytime* Forum wishes to enable much richer distribution and acquisition models, which will probably require extensions to the current Content Referencing specification. Content sharing will enable models other than only accessing content from centralized content service providers. This will need to be considered within any Phase Two Content Referencing specification, and so contributions are requested in this area.
For example, it is envisioned that in the future consumers could become creators of their own content, which they may wish to share with others. The sharing of consumer-created content could benefit from extensions to the current specification and an enhanced Content Referencing system could be used to allow consumers to find content created by other consumers.
Within the Phase One TV-Anytime system there is no facility for redistributing content beyond the boundaries of a single PDR. The Forum desires to enable the ability to search, select, locate, acquire and consume content on a distributed network of connected PDRs in a persistently secure manner. This will require additional technology and protocols to efficiently locate, acquire and consume content.

6.1.1   New Content Types

The *TV-Anytime* Forum's Phase One Content Referencing specification considers content to be any deliverable that can be acquired by a consumer. In Phase Two, TV-Anytime wishes to consider new types of content, and the combinations of various types of content.
To enable some of the business models based on these new media types, it may be necessary to extend the current Content Referencing specification. For example, the current Content Referencing specification allows for a piece of content to consist of many parts, but the only directive that can be represented is "all parts must be acquired." It may be necessary to extend the current location-resolution process to allow for more complex relationships between its components.
The support for interactive media (such as downloadable applications) is another area that could require enhancements to the Content Referencing specification. Enhancements may be needed to enable more complex acquisition models (e.g. timeliness of delivery, order of acquisition and/or replay, conditional acquisition and/or replay).
Ideas, requirements and/or solutions that enable enhanced acquisition are sought.
Innovative new interactive applications might be made possible by providing the application with access to an extended Content Referencing process. Because the *TV-Anytime* Forum is agnostic to the platform used for executing interactive content, we are only calling for ideas and requirements for the use of content referencing within interactive applications.

6.1.2 Targeting

Within the current *TV-Anytime* system there is no means to distribute content targeted at a limited number of consumers. However, within *TV-Anytime's* Phase One specifications, PDR consumer preferences and usage history can be used to filter content.

In Phase Two the *TV-Anytime* Forum wants to enable service providers to target content at specific consumers. One potential solution is to specify a mechanism to retrieve user preferences and usage history from the PDR. This solution might be too limited to satisfy all service provider environments and raises issues such as privacy so we are requesting contributions with additional requirements and technology satisfying those requirements.

The Content Referencing specification designed during Phase One of the *TV-Anytime* work is concerned with the selection and acquisition of content based on the desires of the consumer. The targeting of consumers and devices has so far only involved the use of metadata. Where someone or something fits the described target, the result might be a set of content references for content that would be desirable for the targeted *group*.

For a Phase Two version of the Content Referencing specification, it might be possible to extend the location resolution process to facilitate the acquisition of content that has been targeted. This will allow targeting information to affect the location-resolution process (e.g. tailoring location resolution to the services available to the PDR). Ideas, requirements and/or solutions that enable such targeting mechanisms are sought.

6.1.3 Redistribution

Content Referencing is focused on the fulfillment of the acquisition choices made by the consumer. However, in Phase One of the TV-Anytime Forum', this acquisition has exclusively considered access to content from centralized content service providers (using either unidirectional or bi-directional networks).

Within the Phase One TV-Anytime system there is no facility for redistributing content beyond the boundaries of a single PDR.

In Phase Two, the Forum desires the enabling of consumers' ability to search, select, locate, acquire and consume content on a distributed network of connected PDRs in a persistently secure manner. This will require additional technology and protocols to efficiently locate and acquire and consume content.

Consider the following example: A rich multimedia experience has been captured, with different content types from different sources. There are multiple consumption places in the home, using different physical devices, each with local storage, and connection of these local stores to a network PDR with larger storage capacity. There are also connections to extended-family PDRs in other homes.

6.1.3.1 Home networking

Due to their increasing popularity, home networks will need to be addressed a future version of the Content Referencing specification.

Within a home network there may be many appliances from which content can be obtained. This requires consideration of maintenance and tracking of content around a home network, to enable resource optimization within a dynamic shared living space. It is not only content that will arrive and leave the home network – devices may be inserted and removed.

An in-home network may have access to the "outside world" via some sort of residential gateway (logical home network). The issues resulting from the relationship between the in-home network and the outside-the-home network is another area of work that will need to be accommodated within Phase Two of the Content Referencing specification.

Consider the in-home network situation from a systems perspective: How do we know what is on these stores? We may need query protocols. We may need protocols to resolve results of these queries into real locations. How do we transport that content to a display and interaction device? We may need streaming protocols, and control protocols (e.g. RTSP). How do we manage the local stores? We may need protocols to delete, move, copy, pieces of content within these stores. We may need to adapt content on these stores to the display and interaction capabilities of different devices, and the availability of other resources e.g. bandwidth, decoders, CPU power.

Consider the outside-the-home network situation from a systems perspective: We may want to know what is available on the network. We must first determine what the network is (e.g., virtual friends networks, or Gnutella-like protocol-based networks, etc.). We may need protocols to query the network, which might be streaming protocols or store-and-forward protocols. We may need protocols to transport the content over the network. We may need protocols to assemble content distributed over several nodes.

Ideas, requirements and technologies that allow content referencing to enhance PDRs in an in-home network are requested.

6.1.3.2 Removable media

Content Referencing has been designed around the idea of being able to locate content regardless of when and where it is available. The introduction of removable media in to the scope of TV-Anytime is an area that could lead to some interesting challenges for an enhanced Content Referencing specification that is able to use content stored on removable media.

Once content is on a removable medium it can be moved from one device to another. There may be issues with the temporary absence of the content (while it is being moved, stored on a shelf, etc.) and the subsequent re-appearance of the content. This situation could be further complicated when considering some of the new media types that combine several dynamically distributed assets into one ensemble. An extended Content Referencing specification might be able to solve some of these tracking issues, for example by being able to track the location (or the last known location) of assets, or finding alternative locations for them.

Ideas, requirements and technologies that allow content referencing to interoperate with removable media are requested.

6.2 Metadata

During Phase One of the *TV-Anytime* Forum's work, the Working Group on Metadata has developed a set of content description tools (schema DSs) focused on broadcast and on-demand television.

The enhanced PDR scenarios outlined in this document will require an extension of the existing *TV-Anytime* Metadata specification to describe content other than A/V. Contributions are invited for the further elaboration of metadata requirements and technologies for the description of these new content types.

6.2.1 New Content Types

Within the Phase One *TV-Anytime* system there is support for the acquisition of any type of content. However, the metadata describing this content is focused on A/V content (television programs). Moving forward, the Forum's specifications must be able to describe, capture and playback other related material, including non-A/V content such as executable programs. Also, there is a need to describe, capture and playback associated A/V content. For example, the user may click on a trailer/promo to record the program the trailer/promo is advertising. Another example involves the output recording a multi-camera football match.

6.2.1.1 System-wide issues

Consider the following more complex scenario from a system perspective:
Capture a composite media experience consisting of a broadcast television channel, an interactive application from a website, a DIVX stream from another website, and someone's personal comments coming from a PDR as a chat text file. This might be a soccer match, with player commentary from a website, and an interactive "player rating" game, with chat from a friend. The viewer wants to capture all of this content so it can be re-experienced later. There are system issues with this scenario:

- How to know these items are linked i.e. how to describe the multimedia experience combination.
- How to synchronize the pieces.
- How to handle the non-live replay.
- How to handle a situation where content has changed prior to replay (e.g., updated player ratings information).

There are also issues around if one of the elements was purchased for a set period of time, but the experience is being replayed after that time. If a PDR captures a composite experience, but there was some content that was not consumed when live, is it possible to replay and consume that i.e. should all related content be captured, or just the references? Can references or content be added later on to the captured set, so experiences can be updated?

6.2.2 Targeting

During Phase One the Metadata working group developed schema Description Schemes (DSs) for *user preferences* and for *usage history* – two of the three prerequisites for effective targeting. The CFC for targeting metadata published after the 14th TVA meeting focuses on the third prerequisite: additional audience-specific targeting description information and tools not yet covered by TVA, including demographics, mood, atmosphere information and/or a consumption profile. This has already led to the identification of four targeting scenarios with specific requirements:

- Program targeting, including enhanced and interactive TV services or individual programs (audio, video, games, etc.)
- Advertising targeting
- Promotion targeting
- Terminal targeting

A preliminary phase of study has led to the identification of the following requirements that will need to be duly taken into account when developing the overall TVA targeting solution during Phase Two. It is generally recognized that:

- Targeting associated mechanisms shall be secure to reproduce the expected system behavior in response to a particular targeting action (e.g., insert a particular content at a particular place under particular targeting conditions). It should also allow preventing unauthorized actions to occur (e.g., avoid undue content associations respecting varying regulatory constraints).
- Targeting shall be feasible in a unidirectional environment.
- In a bi-directional environment, it shall be possible to monitor targeting actions including e.g. its fulfillment.
- It should be possible to define targeting actions to be processed automatically or requesting user interaction (e.g., confirmation).
- Consumer target description and targeting profiles, their management and their processing can be distributed along the distribution chain.
- It should be possible to use simple or complex target descriptions and targeting profiles by defining a scalable solution (e.g., systematically defining optional description attributes).
- It shall be possible to manage and process targeting information in different implementations covering a wide range of business models.
- The description of targeting profiles should be flexible enough to allow adaptation to regional cultural differences without having to support the burden of cross-mapping between regional targeting classification schemes (e.g., mood or atmosphere). However, it may be possible to define a common default classification scheme where cultural differences would be minimized.
- Targeting information will need to be protected.
- One or more security mechanisms may be needed (software or hardware based, also using accompanying measures such as certification and authentication).
- Originally designed target descriptions must be protected against tampering by other target description providers or users.
- Target descriptions and associated target audience profiles may carry business-sensitive information that must be protected against unauthorized access.
- Target descriptions and associated target audience profiles may carry private information that must be protected against unauthorized access.
- Targeting should also not be used for illegal and commercially unfair content delivery such as spamming.
- It shall be possible to define, manage and process a set of targeting metadata that would not contain private information and allow anonymous profile aggregation.

Contributions are invited for the further elaboration of the metadata aspects of the above requirements and for technologies that meet those requirements. These should take into account the earlier targeting CFC and the contributions received in response to it.

6.2.3 Redistribution

It is intended that the metadata solution for TV-Anytime Phase Two shall support content sharing by allowing e.g. the exchange of metadata, or information on how to access metadata giving access to content, in a bi-directional network environment.

It should also be possible to simultaneously transfer content-associated metadata particularly if it is to be used in conjunction with content-associated interactive applications. It shall also be possible to access and consult metadata across a multiple storage environment, or within an in-home network domain.

The automatic processing of metadata must be supported in the case user interaction is not required. The associated metadata protection and security issues should also be duly addressed (access to metadata, integrity of data, etc.). Furthermore, metadata could be used to provide further descriptive information on the environment within which content sharing / exchange shall be permitted.

It is acknowledged that these Phase Two scenarios will require the identification of new mechanisms strengthening the link between TVA data, content and enhanced content (interactive applications, additional non-AV components). Contributions are invited for the further elaboration of the metadata requirements for these new mechanisms and for appropriate technologies.

6.3 Rights Management and Protection

The *TV-Anytime* Forum's Working Group on Rights Management and Protection (RMP) has been developing a specification for the persistent protection of content in an end-to-end fashion, including the communication of a rich set of rights management features supporting current and emerging business models. At this writing, the RMP specification (S-5) is not yet complete, but its publication is expected later this year.

Following the S-5 release, the RMP Working Group envisions that its subsequent work will continue apace and move quickly into the areas considered in TV-Anytime's Phase Two. The most substantive new work will be required in the case of Redistribution.

6.3.1 Redistribution

For example, the rights associated with any content collected by the PDR will have to include a parameter allowing or disallowing the user to redistribute the content via the Internet, or to store it on removable media. There will also need to be significant work in the areas of RMP for new content types and particularly combinations of those that have different rights implications in composite services. A robust mechanism will be required by which RMP data will be preserved and passed along if content is allowed to be redistributed.

Therefore the RMP Working Group exhorts potential contributors to review the latest draft of the TV-Anytime RMP specification, and consider the extensions that will be required to protect and manage the rights for content in an environment that allows redistribution.

7 Guidelines for Submission

This section describes the preferred submission form for responses to this CFC.

7.1 General Guidelines

Contributions should address appropriate technologies as well as any additional requirements in response to the CFC. Please note that Requirements and Technologies have different deadlines, as follows:
- ▪ *Requirements:* **04 June 2002** (submissions delivered after this date may still be considered, at the discretion of the *TV-Anytime* Forum)
- ▪ *Technologies not involving Rights Management and Protection:* **17 September 2002**
- ▪ *Technologies involving Rights Management and Protection:* **05 November 2002**

Contributions should state the relevant parts of the CFC to which the response is made.

7.2 Declaration

Contributions in response to the CFC shall be accompanied by a *TV-Anytime* Forum **Contributors Agreement** or a reference to one already on file at the Forum. See Section 3 above for further detail.

7.3 Submission Format

The file formats accepted for the submission of documents are *.DOC (Microsoft Word), and *.PDF (Adobe Portable Document Format). Contributions in plain text are also acceptable (International Reference Version of International Alphabet number five -IA5/IRV also sometimes known as ASCII).

Drawings shall be made using simple functions of MS DRAW, PowerPoint or PICT formats, preferably incorporated in the main text of the proposal. Please avoid colors, patterns, and complicated polygons.

The contribution should include the following heading:

> Document Number:
> Source:
> Title:
> Date:
> Relevant parts of the CFC:

7.4 Submission Process

1. Create your proposal document in the form described in Section 7.3.

2. Advise the *TV-Anytime* Forum document manager (Wataru Kameyama, wataru@waseda.jp) of your submission. He will provide a document number ANxxx. Include the document number in your contribution.

3. Save the file as the assigned document number, such as: ANxxx.doc or ANxxx.txt

4. Put the file on ftp://tva:tva@ftp.bbc.co.uk/../incoming prior to the deadlines listed in Section 7.1 above.

5. Announce your submission by sending an e-mail to the general reflector (tva@lists.bbc.co.uk)

6. Submit a Contributor's Agreement (if one is not already on file from the contributing organization) to the Forum's Administrator:

> Dave Marples
> Global Inventures
> 2694 Bishop Drive, Suite 275
> San Ramon, CA 94583
> (925) 275-6648
> (925) 275-6691 fax
> dmarples@inventures.com

Any question arising from the submission process should be directed to either the Administrator above or to the Chair and Vice-Chairs, whose contact details are listed in Section 4.1 above.

7.5   *Model for notification of a submission*

Notification of a submission should be sent to the *TV Anytime* Forum and should take the following basic form:

> Subject: *TV-Anytime* contribution from <Company Xxx>
> Area(s) of contribution: <Contribution Area>
> Text: The <Company Xxx>, member (or alternatively, not a member) of the *TV-Anytime* Forum, submitted on (date and time) to the Forum's ftp site a proposal consisting of the following document(s):
>> ANxxx.doc: Contribution Title

The Forum encourages the registration of contributions by e-mail, but reminds submitters to indicate their complete contact details in the message.