

# TV Anytime Forum

“PERSONAL DIGITAL VIDEO RECORDERS - PDR’S  
THE FUTURE OF MEDIA CONSUMPTION”

Presentation by Gary Hayes

Senior Development Producer

Also chair of TV Anytime ‘Business Models & System description  
group’

**B B C** Broadcast

Gary Hayes, Senior Development Producer

Interactive TV

# TV Anytime Forum

BBC Interactive TV learning lunch - 27 Oct 99

What we will be covering

- The background to the future - personal storage
- The commercial market & access issues
- TV Anytime - Personal storage open standard's group
- A closer look at some of the TV Anytime work

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## Storage possibilities - Introduction

- In the last 10 years there has been a 100 fold increase in the capacity/cost ratio of hard disks - doubling every 10 months
- In 2000, 10 GB of hard disk storage will cost \$100, providing four hours of MPEG2 audio-visual storage
- The capacities below, doubling every 10 months or a pessimistic 18 months, are based on 5.5Mbit/s video stored on a \$200 disk

<u>Year</u>	<u>Pessimistic</u>	<u>Expected</u>
2000	8 hours	8 hours
2005	80 hours	480 hours
2010	800 hours	28,800 hours

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## Storage possibilities - Introduction

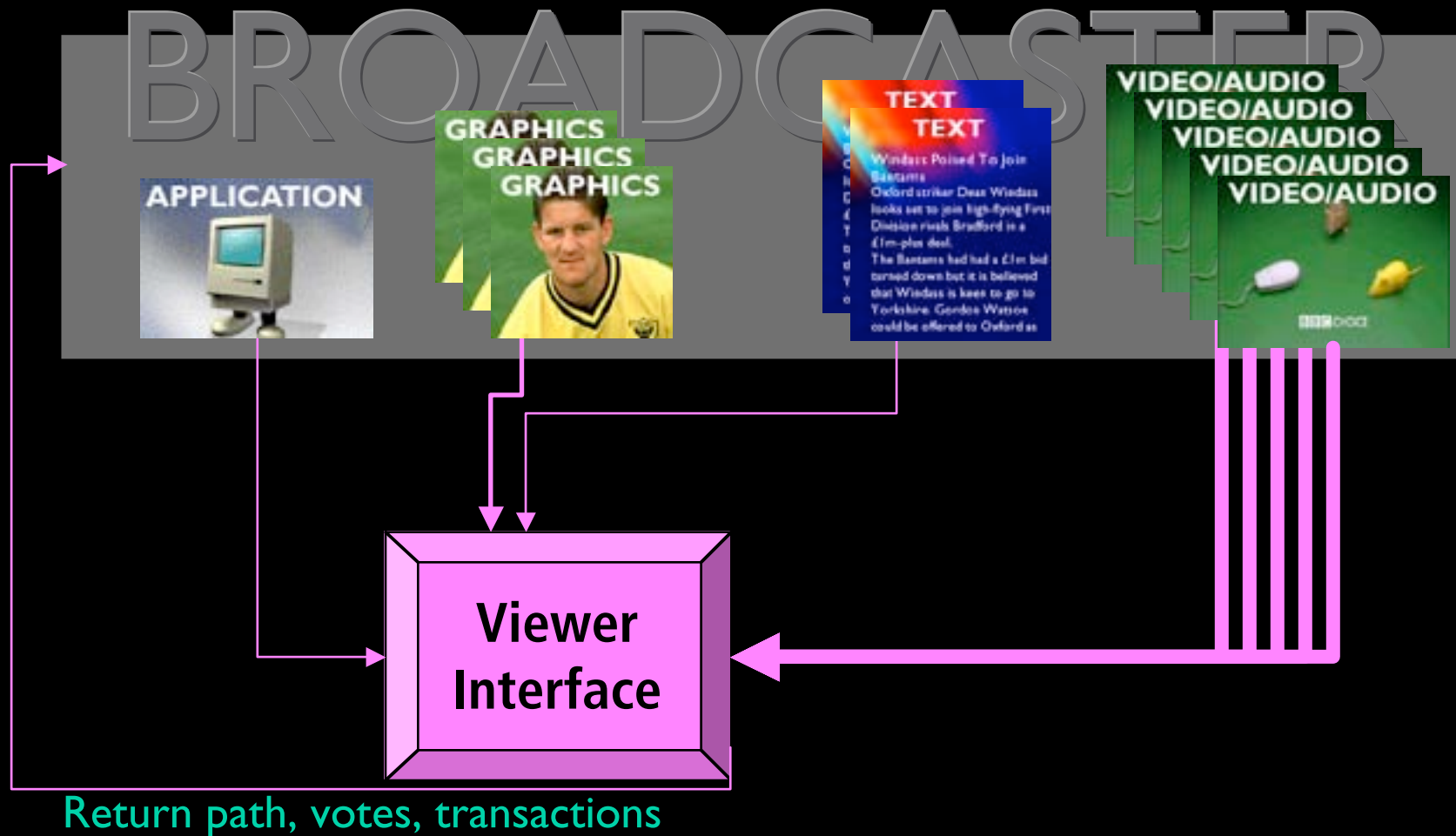
### Forester research in to Personal Storage

- by 2001 900,000 people will be using PDR's
- by 2004 there will be 4 million
- by 2009 80% of the world's developed population will be using Personal Storage systems - whether PC or set top based

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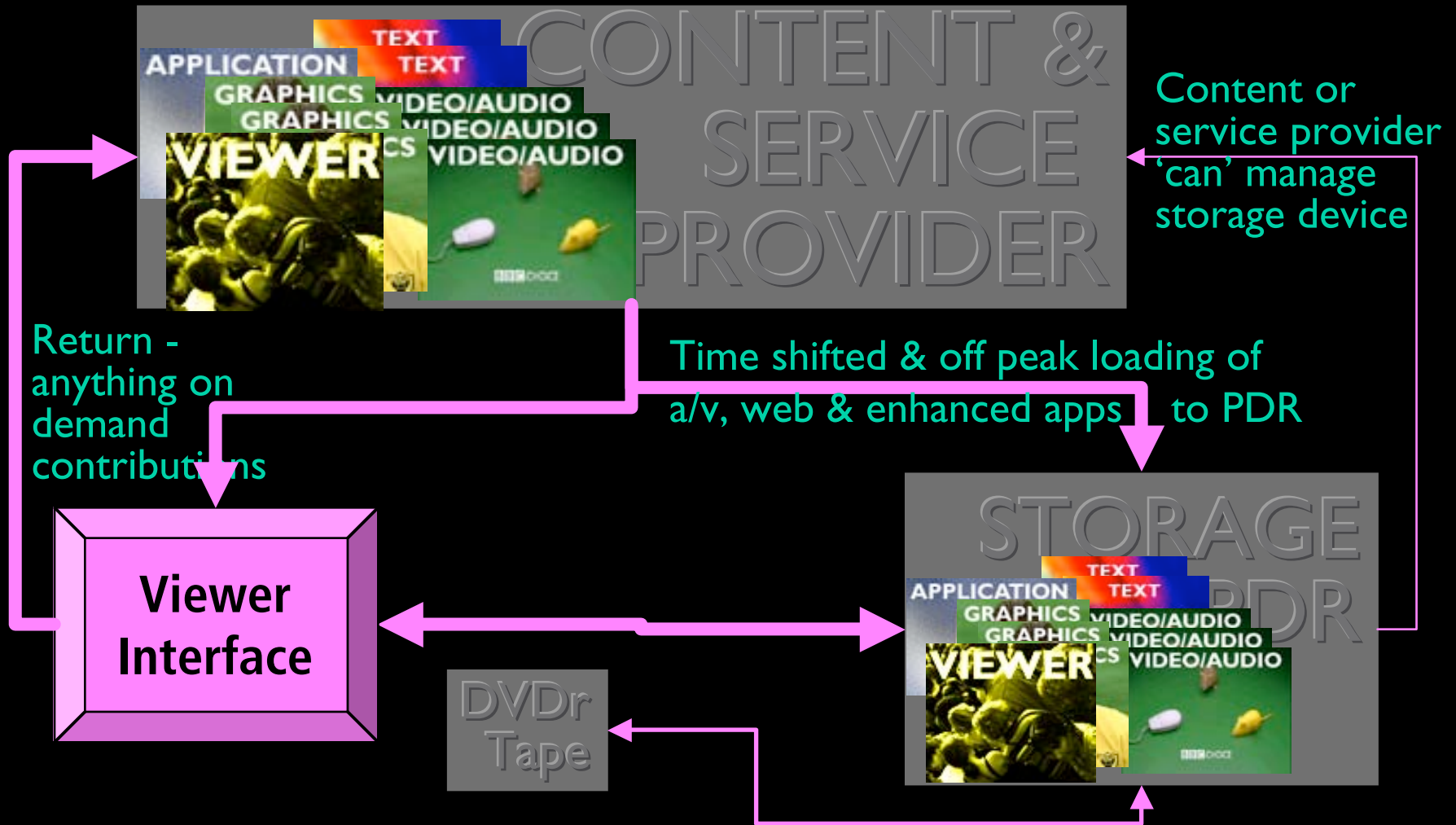
Current broadcast scheduled services model

Note: may or may not have a return path, limited personalisation & local agents



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Future PDR model where broadcaster access 'home networks'



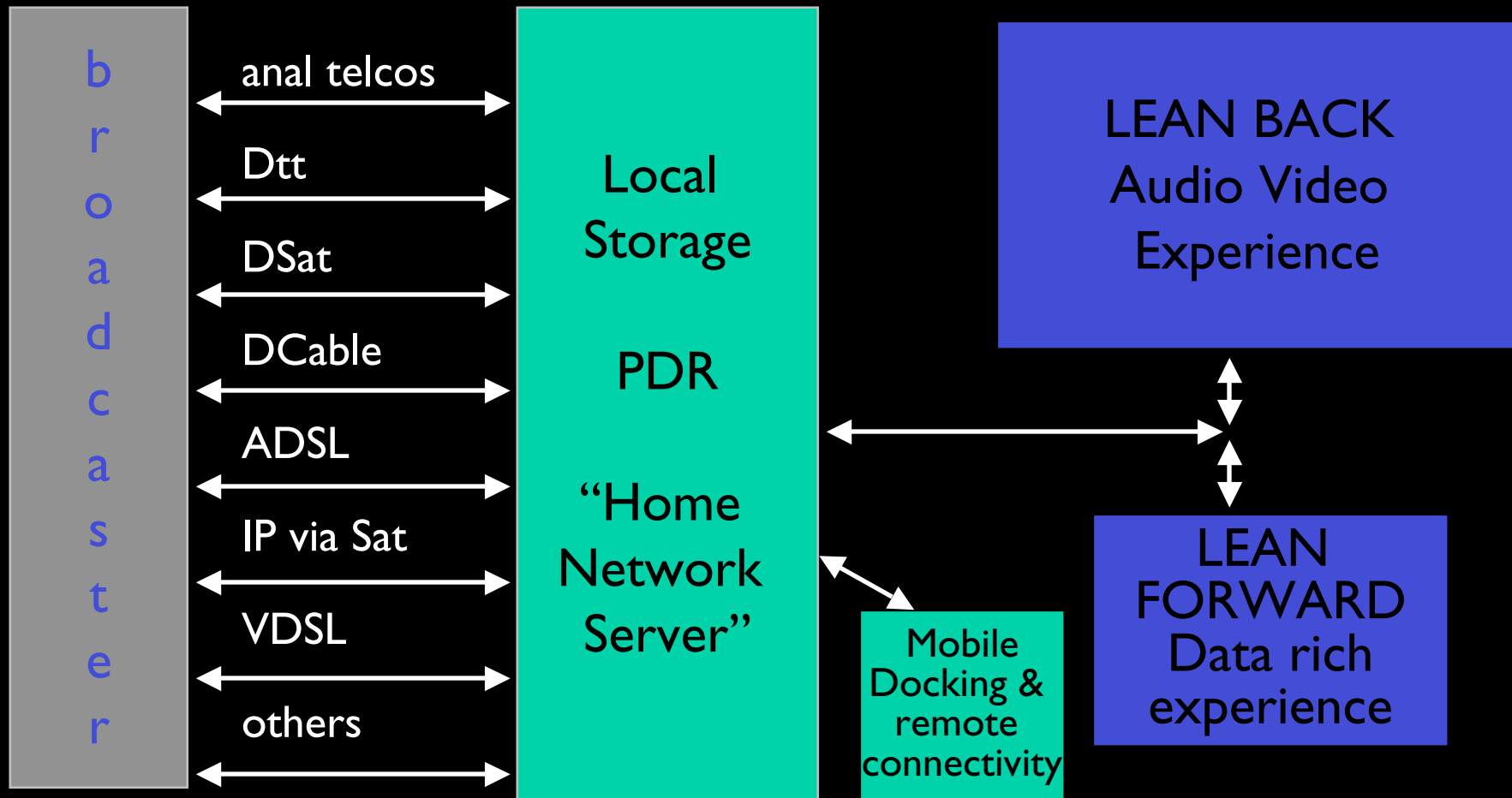
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Storage possibilities - Benefits for content providers

- Usage reporting data - did people request & store programming
- Profiling the audience - aggregating individuals, public service
- Targeted push/pull services - ads, trails, programmes, apps
- Downloading (Web, TV and eTV) in off-peak hours
- Transaction control - for eCommerce providers
- Rights management - conditional access reporting

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Where storage is headed - it equalises broadcast and 'pull' services





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Storage possibilities - Benefits for content providers

In the **USA** there are nearly 10 million able to adopt PDR technology:

TiVO announced two recent broadcasting deals:

- 1 With Direct TV - 7 million subscribers end July
- 2 with Echostar/WebTV's set top with storage - 2.7 million users

In **Europe** TiVo have partnered with Philips who are building D-Boxes

- Kirsch (German Satellite 1 million - "Premier World" 3 years old) are the first to adopt this new technology
- Philips and TiVo are actively building relationships with Canal + and TPS etc to enter the Euro market
- 'Singularis' developed boxes for Ono, Spanish broadcaster. 3.5 mill
- BSkyB are already moving to have their own storage devices

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## Current PDR commercial activity

- TiVo service in the US. 48 hours storage as standard. Already provide live linking from promos and ads to PDR functions. Partners - America Online, Discovery, News Corp, TV Guide, NBC, CBS, ABC, Sony & Showtime
- Replay TV. PDR technology. Partners - Time Warner, Disney, Liberty Media, United Television, Matsushita Kotobuki Electronics, and Showtime
- Fast TV in Germany. 30 hours with mobile and internet interoperability - control your PDR via web or mobile phone
- Others include EchoStar's DISH player-WebTV. BSkyB/Java storage & many others kicking off

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## The proprietary nightmare

- If there are platforms owners, hardware manufacturers & service providers creating vertical, non standard PDR structures the BBC will be locked out yet again
- Who controls the personal recorders, controls content
- Who controls the personal recorders, controls brand & content owners position - “Dad, let's see what's on TiVo”
- Scheduled TV becomes, to the viewer, mostly irrelevant
- Channels become irrelevant, viewers want ‘content type’ and programme brands begin to dominate
- The BBC will find it impossible to promote, distribute & report if technologically and commercially we have no access to PDRs

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Some of the 28 inaugural member organisations



**SONY**

**CANAL+**

**Microsoft**

**BBC Broadcast**



**NOKIA**  
CONNECTING PEOPLE



**SHARP**



**Pioneer**



**NOB INTERACTIVE**



**BBC Broadcast**

Gary Hayes, Senior Development Producer

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## Who we are?

- The *TV Anytime Forum* has announced its formation at an inaugural meeting held in Newport Beach, CA, 27-29 September 1999.
- The global *TV Anytime Forum* has started work to develop open specifications designed to allow consumer electronics manufacturers, content creators, telcos, broadcasters and service providers to exploit high volume digital storage in consumer platforms.
- The group plans to publish its first specifications in July 2000, and calls for contributions will be issued in December 1999 for a number of work areas including content referencing, metadata and rights management

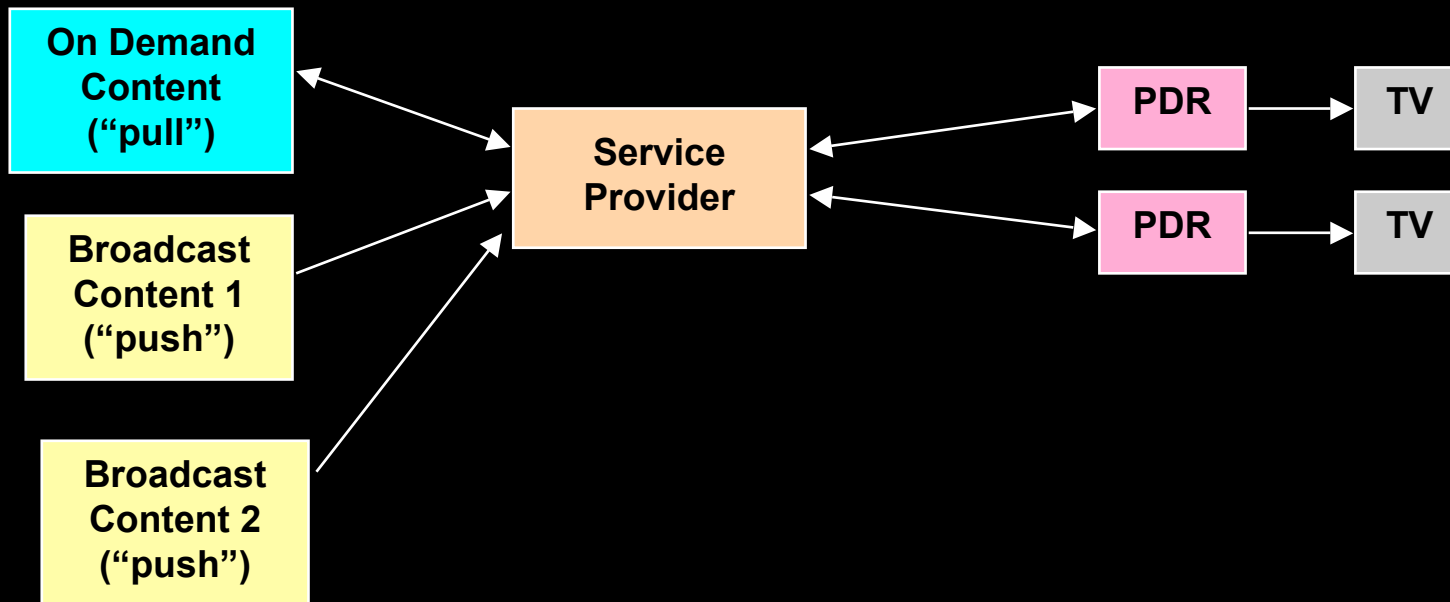
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Working groups set up so far:

- 1) Working Procedures
- 2) Work Plan
- 3) Technical Requirements
  - a) System Description (Business Models) / Gary Hayes (BBC)
  - b) Metadata / Jean-Pierre Evain (EBU)
  - c) Security and Rights Management / Guy Hirson (NDS)
  - d) Content Referencing / Simon Oren (Homing)

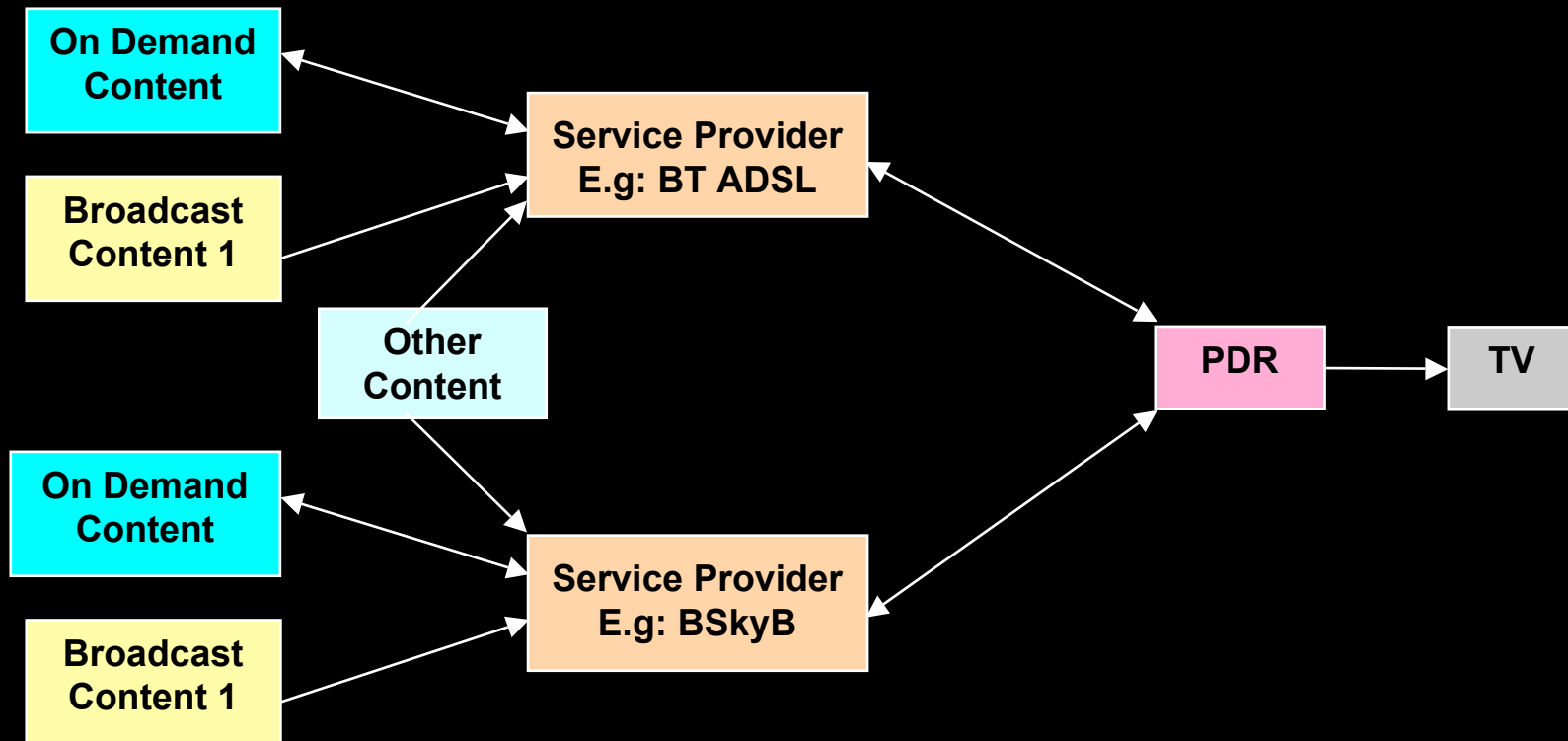
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## Distribution Scenario I: Single aggregator subscription



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## Distribution scenario 2: Multiple aggregator subscription





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Example of how we can advise - metadata key areas

- Global content identifiers (UMIDs)
- Basic ECG content & technical attributes
- Enhanced programming
- Programme segmentation and storage attributes
- Intelligent agents
- Conditional access (ca) & security encryption attributes
- Internet localisation attributes

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Example of UMID. Global - Unique Material Identifier

## Basic UMID

Universal label SMPTE UMID – globally unique number

Length Defines the length of the UMID

Instance number Different instances of the main number -

Material number Identification of each clip

## Signature metadata

Time/date

Content creation

Spatial co-ordinates

The size of the content 720/576 etc

Country

Country of origin e.g.: UK

Organisation

Broadcaster e.g.: BBC

User

Eg: BBC's own cross linked reference

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## Basic TV content attributes

.Date Programme/event transmission  
.Date carry over Flag to say item crosses dates i.e.: 24:00  
.Time Transmission in 24 hour clock format  
.Timezone Either International offset or local e.g.: GMT  
.Duration Length of item  
.Title Programme/event name  
.Episode Title Secondary, episode name of title  
.Series Title Umbrella title for all episodes  
.Original Episode Title Original language title if translated  
.Synopsis Descriptor of the item. 58, 100, 150, 700, 1000  
.RightsTransmission rights over varied networks, over time

### Yes No flags relating to content

.Repeat Yes/No  
.Live Yes/No  
.Colour C - colour, B/W, Z - colourised, other  
.VD Viewer discretion  
.HD High definition or not

### Genre

.Main genre The main genre e.g.: Sport  
.Sub genre The sub theme e.g.: Magazine Show  
.Main Keyword Relating to main genre e.g.: Football  
.Sub Keyword Relating to 'main key' e.g.: FA Cup  
.Keywords Non category keys e.g.: UK, Scotland, 3<sup>rd</sup> Round etc.  
.Conversion code A unique classification code that has 4 levels of category  
.Extra Genre fields that 3<sup>rd</sup> party broadcasters can use based on?  
.Global An agreed global genre wording conversion  
.Indexes Globally recognised cross referenced indexes of genre

### Channel Specific

.First showing Yes/No - is first appearance on channel  
.Last showing Yes/No - last appearance on channel  
.Pay per view Yes/No - scheduled event is p-p-v  
.Channel rating quality rating assigned by the channel

### Credit/Info

.Country country of production  
.Year of production year of production  
.Original Language actual original language title  
.Actor List actor/roles - 10 each include: director, producer  
.Crew Camera, Floor mng etc  
.Non actor Host, Anchor, Correspondents, Guest casts, etc  
.Other Composer, narrator, character voices, etc  
.Broadcaster URLContent ownerweb address, homepage and Email

## Technical Attributes (with programme)

.PDS PDS programming time and date  
.Live Yes/No  
.Stereo Yes/No (excludes two-tone)  
.Encryption Yes/No - program is encrypted  
.Language languages of program - codes  
.Subtitles Yes/No - open (language) closed (e.g.: ceefax 888)  
.Audio signing Yes/No - type vision, bitmaps  
.Source Format Source code 4/3, 14/9, 16/9, 21/9, Anamor  
.Audio specials Alternative audio tracks e.g.: music only, commentary only  
.Vision specials Alternative vision accessible without enhancement  
.Miscellaneous tech A batch of unknown tech fields for future use

### Technical Attributes (at transmission)

.PDS PDS programming time and date  
.Live Yes/No  
.Stereo Yes/No (excludes two-tone)  
.Encryption Yes/No - program is encrypted  
.Language languages of program - codes  
.Subtitles Yes/No - open/closed  
.Audio signing Yes/No - type vision, bitmaps  
.Format No 4/3, Yes 14/9, 16/9, 21/9, Anamorphic  
.AFD Active format descriptor. Format spec codes switch  
.Audio specials Alternative audio tracks e.g.: music only, commentary only  
.Vision specials Alternative vision accessible without enhancement  
.Miscellaneous techA batch of unknown tech fields for future use

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## Enhanced Programmes

*Technically able to carry criteria. Dependencies to run properly. tech tree...*

.App Code	HTML 4.0, MHEG 5.0 etc (receiver support)
.STB support	OS version number per platform and per processor
.Assets	Have you got all the assets, the parts list
.Platform flags	I am delivered over DTT, DSat, DCable, ADSL, etc etc

## Features of enhancement

Enhancement Genre	Text/graphic, dynamic synchronous, fully interactive
Features	Video switching, audio switching, commentary, alt video
Associated	Is it programme attached and associated or can be orphaned
Start time	When does it start
Length of	How long is it transmitted for
Links	Connections to other services or internet – yes/no
World Wide Web	Fields to carry time-stamped URL links
Transaction	Are transactional elements included? What system
Security	Does it contain password protected entry? What system?
Control	Control via qwerty keyboard or remote control or other
User	Does it contain multi-user support – profile and bespoke
eProg	personalisation Can it import internet profiling – yes/no
Can it use global personalisation settings	– y/n data
Does it contain 'bespoke personalisation' settings	– y/n data

## Main Storage Requirements – as ECG basic plus

Keywords from global genre/settings, existing systems cross ref. indexes  
Rebroadcast Info What time/date will it be repeated  
Conversion Extra conversion sets from internet programme databases  
Rights Can it be stored and what type of storage, rights codes

## User settings Range of individual user preferences for storage:

PIN	User individual entry
Keywords	Users particular favourite 'keyword' strings
Priorities	Ordered genre of wanted programmes/promo
Programmes	Ordered programme lists – based on UMID & series data
Dislikes	Lists of unwanted genre/keywords
User ratings	local preferences set as guide by user
Storage behaviour	Auto erase, over record settings Etc etc

## Magazine segmentation (e.g.: news, daytime shows)

Indexed time from start of main  
Time based indexes each with an attribute & genre sub-set  
Length of sub-section UMID for segment  
Other segment UMIDs allowed either side  
Music UMIDs allowed over section  
Commentary tracks – language & type  
Structural coding – as CD pointers  
WWW link. What URL's may be linked to the segment

## Multi-linear segmentation (e.g.: docs/drama)

.Indexed time from start of main  
.Time based indexes each with an attribute & genre sub-set  
.Length of sub-section UMID for segment  
.Other segment UMIDs allowed either side  
.Music UMIDs allowed over section  
.Commentary tracks – language & type Structural coding – as CD pointers  
.Structural maps – in total VOD route lists  
WWW link. What URL's may be linked to the segment