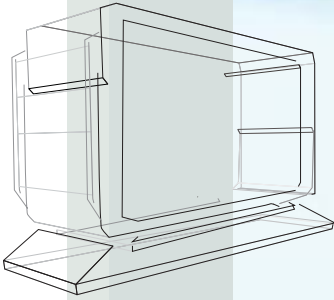


# DVB over IP

# DVB - SCENE

Tune in to Digital Convergence



03

## DVB®

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### This issue's highlights

- ▶ Ulrich Reimers looks at Tomorrow's World
- ▶ MHP Test Suite Report
- ▶ DVB-T Parameters
- ▶ DVB-IP Infrastructure
- ▶ IP Datacast Forum Update
- ▶ Marketing MHP




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# TOMORROW'S WORLD

**Professor Ulrich Reimers reflects on DVB 2.0, MHP and so much more**

In just a few decades historians writing books about the introduction of digital broadcasting in the world will state that the year 2002 was characterised by the commercial launch of the MHP. With the release of the MHP test suite, manufacturers can start to introduce DVB receivers onto the market carrying the MHP logo, which indicates that the receivers have successfully passed the self-certification process and are able to launch and run MHP applications. Numerous broadcasters, especially in China, Finland and Germany have started to transmit MHP applications in parallel to their more classical digital radio and digital TV programmes.

Another big step forward in the MHP domain will take place later this summer. At the time of writing this little article in early July I look forward to seeing the final GEM document be approved by the Technical Module during the meeting in August 2002. GEM stands for "Globally Executable MHP". This document basically includes all the nuts and bolts needed to incorporate the MHP in those parts of the digital broadcasting world which are not completely "DVBish". A

significant example is OCAP. The Open Cable Applications Platform is a development of CableLabs in the U.S. They chose the MHP as their software platform and the GEM document describes how to implement the MHP in American cable networks.

Is DVB concentrating on the MHP only? Not at all. Numerous activities can be reported which relate to the vision underlying DVB 2.0 namely "building a content environment that combines the stability and interoperability of the world of broadcast with the vigour, innovation and multiplicity of services of the world of the Internet". Just recently, a specification was approved which describes how to carry DVB transport streams on IP networks. Is this significant? Well it shows that DVB is devoted to delivering its content via all kinds of networks - not least, those using the Internet protocol.

Delivering (audio and) video content via networks which do not offer data rates typical for DVB broadcast channels potentially will require the choice of new coding methodologies for (audio and) video. DVB is right in the middle of making its choice in this



**Ulrich H. Reimers**

area. It may well be that in a few months we will produce a document entitled "Guidelines for the use of JVT video coding for the delivery of DVB content via non-broadcast networks". Well, the title of the document may be different. But the message.....

DVB 2.0 - lots of work in front of us - and lots of fun.

## IP IN OUR SIGHTS

**A word from the DVB Project Office**



**Peter MacAvock, Executive Director**

Internet Protocol (IP) is an important part of this issue of DVB-SCENE. Some of you may remember that we have reported in the past a shift in focus within the DVB Project to concentrate on something called DVB 2.0. Well, one of the key work items was to develop appropriate

mechanisms for the delivery of DVB services in IP networks and vice versa. Sounds easy, but this has far reaching consequences stretching to the possibility for low bit-rate video coding technologies when you go below CIF (Common Intermediate Format) resolutions - for example as would be the case for PDAs, or mobile telephones. This issue of DVB Scene will deal with the views of some key DVB members on the issue of IP in a DVB world.

The last issue of DVB Scene reported on the failure of the UK and Spanish digital terrestrial pay-TV operations. An important point lost in the flurry of reports is that such failures have not affected the free-to-air offering available to those who have purchased, or, been given, in some cases, decoders. The UK Independent Television Commission has announced that BBC and Crown

Castle will lead the consortium to re-launch digital terrestrial TV in the multiplexes vacated by ITV Digital not so long ago. An important change is that the recent ITC studies have suggested that a move from 64QAM to 16QAM would yield an improvement in coverage without having to make changes to the frequency plan in the UK. Barry Tew covers the technical issues and provides a layman's guide to this technically complex point. One thing is clear — DVB's flexibility has enabled the new operators to implement changes relatively painlessly.

Rainer Schaefer brings good news for those waiting to launch products with the MHP logo into the expectant market with the arrival of the MHP Test Suite. Watch the [www.mhp.org](http://www.mhp.org) and [www.etsi.org](http://www.etsi.org) sites closely for more details on how to become an MHP Implementer.



# DVB-T PARAMETER CHANGES IN THE UK

**Barry G Tew explains the difference between the three different levels of DVB-T modulation.**

Recently the UK announced a change of DVB-T modulation parameters from 64 QAM to 16 QAM and a code rate change from 2/3 to 3/4. The following article explains the tradeoffs and benefits of these changes.

The DVB-T system was designed to be extremely flexible so that present and future requirements could be easily accommodated. The resulting specification provides many choices for those designing DVB-T services, primarily modulation, protection code rate, guard interval and the number of carriers used.

**Modulation** - Three different levels of modulation are allowable in the DVB-T specification.

Quadrature Phased Shift Keying (QPSK) allows the best Carrier to Noise ratio (C/N) and hence needs the lowest transmitter power to cover a given area. The compromise is a reduction in the amount of information that can be transmitted, known as the bit rate.

QPSK is in fact Quadrature Amplitude Modulation and is the same as 4 QAM. It has four possible states and can transmit two bits of information.

16 QAM is the next possible choice and can carry twice as much data as QPSK but at the expense of C/N. In fact the C/N increases by almost 6 dB

and to cover the same area as a QPSK transmission, 4 times more power is required.

With 16 possible states, 16QAM transmits four bits of information.

64 QAM is the most complex modulation allowable and can transmit 6 bits of information using its 64 possible states, three times the bit rate of QPSK. However as we have seen transmitting more data requires more power for the same coverage and the C/N is almost 12 dB higher than for QPSK. In fact, 16 times more power is now needed for the same coverage.

Clearly increasing the data rate has a C/N or system power penalty but it also produces other unwanted effects.

The receiver has a more difficult job demodulating 64 QAM than QPSK especially in noisy situations or where the transmission path is changing. The Doppler performance is also compromised reducing the maximum speed of reception in mobile applications. QPSK is certainly more robust than 64 QAM but there are other parameters that can be changed to add or reduce robustness at each modulation level.

This is done with protection codes included in the system to help recover lost data. One of these codes, the Forward Error Correction (FEC), can be adjusted according to user requirements.

**Forward Error Correction** - Several fixed code rates can be selected within the DVB-T system. The code rate 1/2 is used where strongly disturbed channels are to be experienced such as mobile applications. It has the highest redundancy and the highest transmission safety. Other code rates of 2/3, 3/4, 5/6 and 7/8 can also be selected. 7/8 has the lowest redundancy and a weak error protection, but it does allow the highest useful bit rate to be transmitted. Conversely using a code rate of 1/2 provides the lowest usable bit rate, some bits having been used to provide the added redundancy.

**UK DVB-T coverage** - The DVB-T service in the UK uses low transmitter powers to prevent interference with existing services. Even the high power stations only have an average Effective Radiated Power (ERP), 20dB (100 times) lower than the equivalent peak of sync power used by the existing analogue transmitters. With these low powers some users at the edge of the coverage areas have experienced reception problems, e.g. impulse noise. In addition, only 80 DVB-T transmitter sites are in operation compared to the 1200 analogue sites needed to cover 99.4% of the population. As a result, DVB-T coverage is limited and even in high population areas the received signal is sometimes marginal.

**Improving UK coverage** - Recently real-time tests have been carried out and 16 QAM and a code rate of 3/4 have been chosen for the new service. This provides an improvement in effective power or C/N of 2.5 times or 4 dB.

In order to provide the same coverage for all 6 multiplexes, the powers of each are being equalised and where possible main and standby transmitters will be paralleled increasing ERP by 3dB (2 times).

These changes do not reflect any problems with the DVB-T system but do highlight the difficulty of running dual services during the digital transition period.

64 QAM should still be the first choice for any broadcaster able to find spectrum and generate the required ERP.

The complete DVB-T specification is detailed in ETSI EN 300 744 V1.4.1

Crown Castle's Crystal Palace Transmitter



# PASSING THE TEST

by Dr. Rainer Schaefer

**Rainer Schaefer is head of the Production Systems TV department of the IRT. He is chairman of the DVB MHP Experts Group (MEG).**

**IRT is the Research and Development Institute of the public broadcasters in Germany, Austria and Switzerland (ARD, ZDF, DLR, ORF, SRG/SSR).**

With the DVB having approved the first Test Suite for MHP 1.0.2, the Test Suite now comprises more than 10,600 individual tests which need to be passed by any MHP implementation in order to prove conformance with the standard and to obtain the right to use the MHP logo.

During the past twenty months, about thirteen DVB member companies (including subcontractors) have successfully shared the task to cover the MHP specification with an adequate set of tests and to contribute to the work of the MHP Experts Group (MEG) that had been established within the Technical Module of DVB for this purpose. Major contributions have been received by DVB from Sun and from the MHP Test Consortium that was founded in order to further share the significant costs involved. Even more DVB members participated in the review of the tests.

Typically, for each test feature a test assertion related to a specific paragraph of the specification has been identified and a test strategy has been developed prior to creation of the test source code. All these elements

are fundamental parts of the Test Suite documentation and support an Implementer to solve problems in case a product fails to pass a test. Tests are usually provided as compiled MHP Xlets together with (machine readable) information on how to assemble these with other class files for a particular test case and on how to stream these to the receiver. Also, where adequate, complete transport streams are provided for a test. This method gives flexibility to each Implementer to use the Test Suite with their own test environment. Such an environment - a so-called test harness - which may require product specific interfaces, runs all tests sequentially, emulates any defined user interaction such as key-presses on a remote control or a return channel, and logs all results.

In addition to the number of tests for the Java, DVB, DAVIC and HAVi, other more "terminal behaviour" oriented tests are grouped separately. DVB approved these tests for the first version of the MHP Test Suite (1.0.2.a) and also asked MEG to further improve coverage and depth of testing in a few areas (mainly certificate management) in version 1.0.2.b by the end of this year, when remaining decisions will have been made by DVB. Manufacturers of early products will be required to make provision to upgrade their products in the field during the first quarter of 2003 if they do not pass this deeper testing. Manufacturers have already confirmed their ability to do so.

As with every major software deliverable, a Test Suite may contain bugs almost regardless of the length of the review and verification process. DVB has therefore defined mechanisms to handle any such challenges to the Test Suite without imposing additional requirements on those manufacturers who have already successfully passed.

After packaging of the approved tests and a final verification, the first MHP Test Suite is expected to become available on a DVD in early autumn 2002 through ETSI as Custodian. Any related up-to-date information will be announced to registered users on a web page. More detailed information on contractual arrangements can be found in DVB's Blue Book A066.



**The world's first Video-On-Demand guide running on MHP that provides viewers "One Screen, One Glance" convenience to quickly find on-demand programming. Picture courtesy of Alticast.**

DVB-SCENE : 05

## REVVING UP



The Finnish broadcaster MTV Oy has developed MHP services to meet its viewers needs for information and entertainment. The digital MTV3-channel recently provided Formula 1 fans with a new way of watching their favorite sport. In addition to normal transmission signals, background information, statistics, driver presentations, interviews, results and the possibility to view a parallel channel are provided. An interactive return channel even enables digital betting. "We have directed our Formula 1 service to active viewers, who want to

participate in discussions and obtain additional information whenever they wish. The digital platform gives viewers more freedom and more space even during live transmissions" explains Tatu Lehmuskallio, Head of Sport of MTV3.

The company also claims to transmit the world's first TV-bank, Osuuspankkiryhmä. The bank's customers can utilise the service to pay bills. While Veikkaus Oy, the country's national lottery, will introduce a new way to play the Lotto via digital TV at the beginning of next year.

# DVB COPY PROTECTION

## BACKGROUND & UPDATE



### Macrovision's Achille Di Virgilio reports

With the advent of mass consumer broadband access and the digital home network, concerns over safeguarding digital content delivery and access have become more critical. The requirement for enhanced content protection and secure Digital Rights Management solutions, have become paramount if owners of premium content are going to use these mediums.

To address this concern the DVB-Commercial Module set-up a Copy Protection Sub-Group (DVB-CP) consisting of cross-industry members with the aim of defining the commercial requirements required by a DVB Content Protection and Copy Management (DVB-CPCM) system, to provide a common framework for the protection and management of content beyond the traditional boundary points of DVB compliant Conditional Access systems. This expanded scope encompasses the growth of in-home digital networks and personal digital video recorders; where content is moved and recorded on devices that have before now, not been a focus of the DVB Project.

There now exists a comprehensive list of 45 commercial requirements outlining the need for both a baseline CPCM system and an interface to propriety CPCM systems; providing cover for areas such as environment, framework, performance, robustness, security and compatibility.

With this list, the DVB TM Sub-Group on Copy Protection Technologies (DVB-CPT) issued a Call for

Proposals (CfP) in July 2001 for the industry to come up with a standard system. Twenty-four proposals were received and presented in Geneva during the 13th-15th November 2001 meeting. Varieties of content protection technologies were submitted, such as watermarking, cryptography and non-traditional based solutions. These covered complete systems, supported specific areas and even extensions to a CPCM system.

The first priority of the group is to progress, through consensus, a CPCM 'baseline' specification describing a 'module' of copy protection functionality which can reside in any compliant device and supporting elements such as the functional model, process flow and usage scenarios. The 'baseline' DVB-CPCM system should provide support for the four required copy control usage states. These are, Copy Control Not Asserted, Copy Once, Copy No More and Copy Never. In addition, the baseline DVB-CPCM system must also provide a means of indicating whether content may be Moved for Consumption outside the consumer's Authorised Domain (AD).

The group moved forward by dividing into two working groups under the headings of Usage Scenarios (applying to devices containing CPCM in the home environment) and Layered Technical Design (to develop a technical infrastructure based upon the ISO model addressing CPCM operation from a layered approach).

The output of the Usage Scenarios group will be used as a benchmark to assess the progress of the Technical group. It is clearly requisite to develop a functional model of the DVB-CPCM system in order to provide a framework to identify the necessary technologies.

The CPT group has many issues to resolve before it can reach a common technical interpretation of the commercial requirements within the CfP document; this is required before it can seriously consider the proposals. In the main, the issues revolve around terminology and clear understanding of intent.

Recent activity has focused on producing a technical description & requirements listing for the AD, the carriage of Usage State Information (USI) and the actions taken by the system when content enters and leaves the AD. To provide support of legacy equipment, which the DVB is duly supporting in the realms of copy protection, further work will involve how to provide mechanisms to enable mapping of the USI to other agreed digital and analogue copy protection systems; thus ensuring persistent protection of content within a CPCM environment.

The group has begun to record input and discussions in various working documents. A small drafting group, made up of DVB-CPT members, has been set-up to progress a draft technical requirements document, comprising all input documents received for interpreting & clarifying the commercial requirements. Other documents are the 'Issue and Decision Log', a living document intended to record the resolution and decisions made and a "Comparison Grid", to provide a quick look-up table of the specific elements in the proposals, received in response to the CfP. The grid will be consulted when the required technologies have been identified.

There is a strong desire within the DVB-CPT group to move this project forward as quickly as possible; however, the commercial challenges and the technical obstacles that lay ahead demand that we progress at a considered rate, mindful of the responsibilities we have undertaken.





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# In My Opinion - Arturo Paz Huguet

## GETTING IT RIGHT IN SPAIN

Arturo Paz Huguet is Executive Editor of Spain's VideoPopular [www.videopopular.es](http://www.videopopular.es)



In October 1998, the regulation of Digital Terrestrial Television (DTT) in Spain was made more from a political standpoint rather than a technical one. Instead of making rules based on the simple analogue-to-digital system migration, the Government decided to start a new platform and to provide new television franchises to new operators. Economic factors and market conditions among other reasons made it difficult to develop the state project, and Quiero TV the first pay DTT platform ceased broadcasting with accusations of poor management.

The Spanish regulators supported multiplexes instead of trying to encourage each station to control its own channel. Consequently, a multiplex transmitted up to five programmes from competing broadcasters - Telecinco, Antena 3, Canal+, TVE1 y La2. This was not popular with the broadcasters, they instead preferring to broadcast their own interactive programmes and services on their own channels.

However, we must not only look at the negative side of the DTT panorama. The autonomous channel, Televisió de Catalunya (TVC), broadcasts experimentally multiplexed MHP, over which different programmes are transmitted: TV3, K3/33, TVC Sat, TVC' Data and Music.

With regard to DTT, Pere Vila, Technical Director at TVC, says: " Quiero TV's

disappearance has made broadcasters think. It has emphasised that the viewers feel they are already well served and are reluctant to pay to watch more programmes. DTT is a development, not a revolution. DTT is the natural migration of existing analogue television, as it takes better advantage of the limited frequency spectrum. It improves reception quality and, at the same time, allows interactive applications to be offered. We are living in a time of reflection, which can facilitate the introduction of HDTV and the progressive scanning of images, proving to viewers that DTT can offer higher quality images".

Regarding interactivity, Pere Vila comments: "At TVC we support interactivity and as a result we are considering the possibility of including a wide range of institutional information, which could be accessible in the same way as web pages are, but without the need to use a return channel".

TCV Multimedia, which will present its approaches on MHP at the IBC, is an enthusiastic defender of DTT. So as, Miquel Rullant, Marketing Director at TVC Multimedia, says: "The aim of DTT is to lead the introduction of the information society into all Spanish households. In 2012, when the analogue system disappears in Spain, DTT receivers will be present in 100% of Spanish households. At TVC Multimedia, we are working to accelerate this procedure to the

utmost by designing interactive applications able to justify the purchase of a DTT receiver. With these interactive applications, the digital viewers' experience will be more entertaining with an array of useful and entertaining services.

In Spain, Sony is also playing an important role in DTT development since it is planning to manufacture TVs for DVB-T with MHP. In this context, Fernando Gil, General Director of Sony Spain, says: "In September we are going to start production of a widescreen 32 inch integrated TV for the Finnish Market. With regards to the Spanish market, manufacturing is planned to start by June 2003, although it could be sooner, depending on demand".

Regarding DTT Spanish regulations, Fernando Gil states: " The regulations must be improved and the Administration has been notified of this through various channels, among them ANIEL (Asociación Nacional de las Industrias Electrónicas/ National Association of Electronic Industries)".

It is very likely that the Spanish Government will restructure the DTT regulations in order to adapt them to the requirements demanded by the broadcasters with domestic cover, as they do not want to share channels. This means that a new channel distribution will be necessary so that each broadcaster can have its own channel.



## INTERACTIVA EN ESPAÑA

Televisió de Catalunya (TVC) included three MHP interactive applications in recent DTT trial broadcasts on TV3, K3/33 and TVC-Sat. They consisted of an EPG, news ticker and weather information service that provides a six day forecast for the Catalanian region as well as European and other world capital cities.

Three affiliates of the Corporació Catalana de Ràdio i Televisió (CCRTV-Catalan Broadcasting Corporation) took part in the development of TVC's digital broadcasting service and in the creation and marketing of interactive applications. Activa 3 and TVC Multimèdia specialise in new technology management, while CCRTV Interactiva specialises in content creation for the new interactive channels.



# CONSUMER ACCESS

## DVB Internet Protocol Infrastructure

The Internet is a pervasive global communication network used progressively more and more by consumers at home. This has created viable business models to increase the bandwidth of the access networks to the home. Cable modems and xDSL are competing to provide consumers with fast Internet connections.

Additionally, Internet sharing between PCs and the availability of cheap and easy-to-use hubs and switches have proved to be a reason for consumers to invest in home networking technologies.

These two developments, the growth of Internet bandwidth to the home and the increasing use of home networking with Internet Protocol, are the enablers for Audio/Video services delivered to and through the home via IP networking. The Internet Engineering Task Force (IETF) has developed many IP networking protocols that make these services possible. The vast majority of these protocols, however, is aimed at implementation on PCs, keeping pace with the technology growth in this area, with new generations appearing every two years. Some technology renewal on existing PCs is possible through user-initiated download.



**Albert J. Stienstra, Philips Electronics, Eindhoven & Chairman of DVB-IPI Module.**

For high volume consumer electronics products like TVs it is necessary to achieve stability over a longer generation lifetime and to require no more than a minimal effort from the consumer to get equipment to work and to keep it working. These requirements form the justification for DVB to develop specifications for DVB services over IP. The objective is the



same as for the previous generation of digital TV specifications: to enable high volume retail products that require no more effort to access services than connection to the network and switching on the power. The specifications will mainly consist of selections of existing IETF standards.

## “The DVB set of IP networking protocols will be network independent...”

The DVB Technical Module installed the ad-hoc group on IP Infrastructures (IPI) to do the technical work. The first IPI deliverable is the Architectural Framework for DVB Services on IP, approved by the Steering Board in February 2002 and now in the ETSI process as draft TS 102 033. This document provides a general reference model of the end-to-end IP system, with additional details of the network interfaces in the home. The interfaces to the home network end devices are the prime targets for standardisation, to enable high volume production of interoperable equipment. The document also gives terminology and definitions. The intention is that other groups in DVB make use of this document where appropriate.

To fill in the architecture, the IPI group identified the need for specifications of Transport of DVB Services over IP-based Networks, Service Discovery and Selection, Network Provisioning and IP addressing and Home Network Segments for Ethernet and IEEE 1394. Some form of network layer security may also be required; this will be decided when a clearer view exists of the DVB copy management and copy protection system.

At its meeting in June 2002 the Steering Board approved the specification “Transport of DVB Services over IP” (Part 1: MPEG-2 Transport Streams). The documents “Service Discovery and Selection” and “Network Provisioning and IP Addressing” are still works in progress. These specifications will be sent to

ETSI when the complete package is ready. In the meantime, the completed documents will be made available as DVB Blue Books to assist in product development and communication with other bodies. The Steering Board also approved the specifications of the IEEE 1394 and Ethernet Home Network Segments, to be sent to ETSI immediately. In addition to Part 1 of the Transport specification, the IPI group will develop another Part for MPEG-4 part10 streams over IP. This will be done in cooperation with the ad-hoc group for Audio Video Content.

The DVB set of IP networking protocols will be network independent, meaning that the IP networking protocols can be used to access services outside the home using the well known DVB physical layers (DVB-S, -C, -T etc.) in combination with appropriate return channels, as well as on new xDSL and cable modem technologies. The DVB-IP protocols are also intended for home networking on wired and wireless physical layers (DVB-WIN, Ethernet, DVB-HLN). Adoption of IP networking will greatly increase accessibility of real-time and storage based Audio/Video services to consumers.

# IP DATACAST FORUM UPDATE

Keith Hayler



The IP Datacast Forum aims to identify and resolve key business issues affecting datacast services, promote and support members to participate in work enabling interoperability, enabling and ensuring security of content, encourage and facilitate pilot projects, and represent and promote the interests of IP Datacasting to create a harmonised regulatory environment across Europe.

The Forum has identified three key areas of interest: Business, Technical and Regulatory. In order to promote relevant and appropriate study the Forum is proposing the use of two Reference Service Models: datacasting in cooperation with cellular telephony and datacasting to devices with local storage.

## Business

This area of Forum work has the objective of identifying viable business models using the principles of IP Datacasting. One of the first tasks undertaken by the Forum has been to study the potential business cases for IP Datacasting and present the results in an overview Business Opportunity document. One of the principle outcomes from the group was the visualisation of a generic business model, shown in Figure 1.

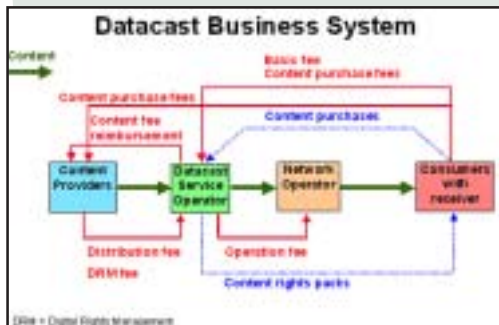


Fig 1.

Working from a foundation of simple one-line assumptions the business study group undertook to identify the business models, players and consumption models that could form the basis of viable services. The primary conclusion from the study was that there are five business cases worthy of further study. The first of these is a business-to-business case, effectively a business IP delivery service within an enclosed environment. This case has the simplest business model and revenue flows. The remaining four areas are all business-to-consumer models but with differentiation between the consumption environment; fixed, portable, mobile-automotive and mobile-transportation.

## Technical

To date, the prime output from the IP Datacasting Forum Technical Group has been a document summarising the current technological landscape for IP datacast services. Like the business group, the technical group also felt that they needed a generic visualisation of a datacast system upon which they could focus their thoughts. This Reference Technical Model is shown in Figure 2.

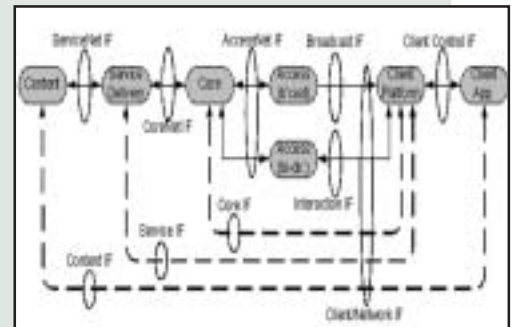
The purpose of the model is to identify the domains and interfaces which constitute an overall generic system. Many of the key 'transport' interfaces, denoted by solid lines, already exist but may require enhancement to cope with specific requirements raised by the datacast model. The higher layer and 'compound' interfaces, shown as dotted lines, are largely comprised of existing standards and protocols. Shortcomings in the existing standards will be identified by considering the needs of the Reference Services in the context of the Reference Technical Model and will then be fed back into the relevant organisations for

consideration in future upgrades.

Currently, it is anticipated that study work will be required primarily in the areas of service description and announcement, content rights management and security, and billing.

Technical workgroups will be set up to

Fig 2.



investigate these areas. An ad-hoc group has already been established within the DVB Commercial Module to 'prime' the DVB specification processes to the future arrival of IP Datacasting requirements.

## Regulatory

One of the common issues that was noted across the potential IPDC members at their very first gathering in Sweden was that of regulation. To this end, the Forum is setting up a regulatory lobbying group to present datacast regulatory issues to national bodies with the added strength of a common multinational voice.

## Onwards!

As you can see the IPDC Forum has progressed on the basis of some clear objectives. Early work has resulted in valuable 'foundation' documentation that will pave the way for future study work. With the ultimate goals of clear standards, an industry consensus upon implementation and a harmonised regulatory approach, the Forum sees a healthy future for IP Datacasting.

# BISS-E UNSCRAMBLED

by Dr. Ir. Xavier Verians - Octalis SA

The EBU recently published the new BISS-E specification that defines a common "Basic Interoperable Scrambling System" for DSNG applications or transmissions between fixed stations. It is now adopted by all major encoder manufacturers and is already in use to scramble contribution signals for sport events and live DSNG transmissions.

The nonproprietary BISS-E specification is based on the DVB-CSA (Common Scrambling Algorithm). The principle is simple and employs a Session Word or scrambling key at the emission side. On the reception side, only the devices having received the same Session Word are able to unscramble the signal. BISS-E was designed with the flexibility requirement of DSNG applications in mind and is simple to use. The 12-

character Session Word can be inserted manually or through remote control interfaces in the equipment.

BISS-E equipment can work in three different modes: Mode 0 - No scrambling; Mode 1 - The signal is scrambled by a Session Word. In Mode 1, the session word is manually or remotely entered in clear (not encrypted) in the scrambling/descrambling devices. This means that anybody knowing the Session Word is able to decode the programme; Mode E - Mode 1 with increased security. The Session Word itself is entered encrypted in the device so that only the dedicated unit or group of units with the right identifier is able to use the Session Word to access the signal. Combining security and flexibility is possible in BISS-E. The specification

allows for different kinds of identifiers to exist in a unit. Space can be provided to store several identifiers, each one attaching the unit to a group. This allows moving or loaning the equipment without having to change the unit identifier.

The transition to the BISS-E specification however implies an upgrade or replacement of some encoder equipment, as most of the older generation encoders do not have a built-in BISS-E scrambler. To limit the cost of this transition, manufacturers have designed scramblers to be inserted between existing encoders and the DVB modulators. Hence, existing transmission chains can easily be upgraded at a limited cost and without needing to replace the recently acquired encoder equipment.

## EASY READ

Adopted by DVB, the Tiresias Screenfont is the standard font for the MHP. The Tiresias Screenfont was originally designed by a team led by Dr. John Gill, Chief Scientist for the Royal National Institute for the Blind (RNIB). The RNIB developed the Tiresias Screenfont in response to a need for improving text for television subtitles.

According to Dr. Gill "The design was carried out on the philosophy that good design for visually impaired persons is good design for everybody." The Tiresias Screenfont includes characters that are easily distinguishable from one another. Throughout the design process, the key factors that affect legibility were studied. These factors include character shapes, relative thickness of the character shapes, inter-character spacing, and aspect ratios that affect the maximum size at which the font can be used. The font has met with widespread approval and the design team is confident that the new typeface brings considerable improvement to the legibility of text on screens.

### Features to Look for in a Typeface Viewed on TVs & Other Low-Resolution Devices

- Simple, legible design
- High x-height
- Wide & tall counters
- Even stem weights
- Condensed face

The quick brown fox

## NEW POSTMAN ON

## THE BLOCK



Hard to believe, maybe, but a lot of training videos, product information, entertainment content, software packages and upgrades are still delivered via CD-ROM or DVD to the end user by post. With standard Internet networks providing neither the bandwidth nor the security required for the cost efficient on-line transmission of large amounts of data.

Now, however, satellite networks can overcome most of the constraints of terrestrial IP networks. But isn't satellite too expensive? Yes, it is, if you are sending your CD-ROM to a single addressee. However, with a larger distribution, the difference between satellite and postman comes into play. The transmission costs are independent of the number of addressees, so the end-to-end transmission of a 300 Mbyte data

package to 100 addressees costs about 3 Euros per receiver. Compared to the cost of burning, packaging, forwarding and depackaging the CD-ROM this is a significant cost reduction. Also, using a consumer USB DVB receiver, the transmission of that CD-ROM takes less than 10 minutes! Thanks to the wide market penetration of DVB receivers the cost for such receivers are in the same range as the cost of a modem.

The DVB-S "Satellite Autobahn" provides end-to-end broadband connectivity without router crossings and traffic lights. End-to-end data rates of up to 40 Mbps can be provided. IP via DVB-S also offers two levels of security that allows even the distribution of confidential company information.

ND SatCom offers a solution that provides the complete infrastructure for a CD-ROM distribution network. The easy-to-use system offers a hub station that can be equipped with all the features of an IP network, e.g. firewall, user authentication, policy routing, conditional access and IP security. For the transmission itself a dedicated uplink using dedicated transponder bandwidth can be installed. Another potential scenario is the "hosting" of the uplink service at the site of a satellite service provider.



# MARKETING MHP

**ADB** - Advanced Digital Broadcast has unveiled its i-Can set-top box for the Finnish MHP TV market and will highlight the product at IBC. The i-Can set-top box, targeted to DVB MHP 1.0.2 Enhanced and Interactive Broadcast profiles, will fill the long awaited request of mass-market availability of MHP decoders. Finland was the first country, in August 2001, to adopt the MHP standard, but the nation-wide digital upgrade of its terrestrial broadcasting infrastructure did not reach TV viewers due to the lack of decoders.



**ADB i-Can Set-Top Box**

The i-Can decoder is set to reach a sub 400 Euros retail price, allowing a fast market deployment. The company is expected to start large-scale deliveries this coming autumn.

The i-Can is based on STMicroelectronics' OMEGA microprocessor and has a memory footprint of 32MB DRAM and 4MB Flash. It also features an embedded Conditional Access System from Conax, and a modem return channel.

Field trial units of ADB's terrestrial and cable set-top boxes have already been delivered to key players in Finland's digital TV market, including the state broadcaster YLE, and leading diversified media groups AlmaMedia (MTV3) and Sanoma WSOY (Channel Four).

**Alticast** will introduce at IBC Alticast 2.0, an MHP content authoring tool that enables content designers and programmers to rapidly create applications for any DVB-MHP set-top box by using a convenient drag-and-drop graphical user interface.

Alticast 2.0 is completely graphical and does not require any hand-coding or creation of XML structures. Designers and developers can just point and click the mouse. Alticast claims the feature greatly reduces the required time and skill-level to create iTV applications, making it possible for both designers and Java programmers to use the tool.



**Alticast Alticomposer**

Alticomposer 2.0 includes a Component Development Kit (CDK), which allows Java programmers to use their technical talents to create customized Java components. The custom-built components can then be imported into the Alticomposer 2.0 user interface to be used in an advanced application.

Alticomposer 2.0 also includes a PC-based MHP set-top box emulation tool that plays out the application on a PC monitor. The company claims that the emulator can be used to test and debug MHP applications, including any third party MHP application. The virtual remote control ensures that all of the buttons are mapped correctly. The idea is that if the application works in the Emulator, it will definitely work on a set-top box.

**Canal+ Technologies** are showcasing MHP applications designed by Sofia Digital that have been integrated with its MEDIAHIGHWAY middleware technology.

## MHP on MEDIAHIGHWAY



**Fujitsu Siemens Computers GmbH** (FSC) will demonstrate MHP running on its ACTIVITY Media Center (AMC), a PC-based advanced set-top box) with its own navigator. An alpha-blending API module has also been created as a by-product of this, and is available with AMC. The first step in bringing MHP to the AMC was the installation of IRT Reference Implementation (RI). The RI was written for Windows 98

and NT platforms, so it worked as designed in the AMC. Its latest version is 1.0.2-1, which is based on MHP 1.0.2, using Java 2, (JDK 1.3.0) and running on Windows XP.

The ACTIVITY Media Center is offered with a Software Development Kit (SDK) that enables customers to easily develop their own graphic user interfaces. It consists of different API modules like the Multiplayer (DVD, CD, MP3, Video-CD, Photo-CD), Internet access (browser), DVB and other modules for complete hardware control.

Together with the features that the AMC presents, FSC will also offer MHP as an API module of the AMC SDK.



**FSC ACTIVITY Media Center**

**Harmonic** will exhibit its newly extended statistical multiplexing system that now fully supports the carriage of MHP compliant streams.

The DataTrack product is a core part of Harmonic's DiviTrackXE statistical multiplexing system which enables digital broadcasters to multiplex both video (standard or high definition) and application data into a single statistical multiplex. Statistically multiplexing data creates a great benefit for today's broadcaster - it enables both higher average data rates and higher peak rates for video. As a result, broadcasters can deliver new data services, such as DVB-MHP applications, while maintaining better picture quality and consistent, predictable data capacity.

**IRT**, an industry-independent, not-for-profit institute and co-developer of the DVB-MHP standard, is laying the foundations for a successful introduction of the DVB-MHP standard with its Reference Implementation (RI). The IRT MHP-RI is designed for integration into products, like set-top boxes and is valuable both for programme providers and equipment manufacturers for developing and testing MHP products.



The IRT MHP-RI, written in Java, runs on Pentium compatible platforms under Windows or Linux and is easily ported to other platforms. In order to perfectly serve the embedded market IRT co-operates with several Java Virtual Machine (JVM) manufacturers and system integrators.

The cooperation with ICT Embedded B.V., embeds IRT's MHP-RI to various platforms. Equipment manufacturers may choose any desired hardware platform, real-time OS, JVM and CA system. The partnership benefits from IRT's extensive MHP know-how and ICT's many years of experience in building embedded systems.

In October of last year, **Liberate** announced that it had expanded its solution set based on the Multimedia Home Platform (MHP) standard by licensing the reference implementation of the Institut für Rundfunktechnik (IRT). At IBC, Liberate will be demonstrating this solution running on a commercial set-top box in conjunction with the latest version of the Liberate TV Navigator client connected to a variety of Liberate infrastructure servers. MHP applications will be broadcast on a carousel to the client and run seamlessly with other complementary services currently supported by the Liberate platform.

IBC will see the first public demonstration of the **NDS Value@TV** interactive solution for MHP. The Value@TV system has already been proven in large-scale deployments, delivering interactivity to millions of homes worldwide for systems based on NDS Core and OpenTV. An evolution of the existing NDS interactive system, operators can now provide compelling interactivity to MHP compliant set-top boxes.

NDS Core is the high performance middleware designed for cost effective set-top boxes and is capable of running both Java and HTML based applications. This shared technology foundation with MHP allows for fast and simple adaptation of applications to run on both systems.

The demonstration will show how an interactive stocks application can be delivered to both NDS Core and MHP set-top boxes at the same time from the NDS Value@TV solution. In implementing this system, an operator could launch TV and interactive services now based on NDS Core and

have the flexibility to add MHP to the system at the same time or at a later stage.

**Panasonic's** newly developed TU-MSF100 digital satellite set-top box supports MHP and is ready for the launch of MHP in Germany this Autumn. MHP is supported by ARD, ZDF, RTL and pay TV network operator Premiere. Panasonic claims that the TU-MSF100 is the only set-top box available with two API's - MHP 1.0 and Open TV EN2.3.

Also featuring at IBC is Panasonic's MHP Application Development Kit (ADK) to facilitate creation, testing, debugging and validation of MHP content. The ADK is based on the Panasonic TU-MSF100 MHP-compliant consumer receiver as a reference platform.

The standard ADK-package allows even inexperienced developers to immediately start creating sophisticated iTV content and to author a complete MHP interactive television application (Xlet), including generation of baseband MPEG2 transport streams. Furthermore, it includes a Premium Support Service, offering developers high-level assistance in their development phase.



**Panasonic ADK**

**Philips** and the Belgian broadcaster VMMA (Vlaamse Media Maatschappij) are co-operating to show IBC visitors the real and exciting entertainment possibilities of MHP interactive television. The demonstration is based on various interactive application concepts developed by JIMtv, the youth channel of VMMA. The applications promise to be a fun and exciting experience for consumers and a revenue generator for broadcasters. For example, polling is demonstrated by the show presenter asking viewers their opinion on topics during the show. With live chat, people at home can talk to interesting guests on the show. Gossip is always popular. The choice of gossip categories includes 'business', or better still 'fun stuff', or even better 'romance'. An even bigger



thrill is the interactive word-quiz. Participate and win a prize! Which of the statements on the screen are correct? What is my score and the percentage of right/wrong answers? And what about deciding on how a soap should continue.....The interactive fun is endless.

Philips provides the MHP technology component including tools to create applications in a cost efficient and easy way as well as offering the full integration services for the implementation of operations. Moreover, broadcasters are provided with the right software components that can be easily re-skinned and adapted depending on the application or event. For example, in a soccer game where viewers can give their opinion on a referee's decision, or voting for which song should win the Eurovision song contest, or being involved in which music or video-clip should be played next. They are all part of the same basic underlying technology that Philips is offering.

Philips is licensing its MHP iTV software solutions for middleware and resident applications, with end-to-end application components and integration services, to broadcasters, media production houses, service operators and other content providers. Philips' iTV software modules can be easily tuned to the specific requirements or context of a broadcast channel or TV show.

**Scientific-Atlanta** are launching at IBC new versions of the PEGASUS and PEGASUS XT Re-multiplexers and TS-processors (v3.1) offering the ability to integrate any MHP application by simple plug-'n-play. The PEGASUS/PEGASUS XT manages all the SI information including the MHP related AIT (Application Information Table) and visualises all MHP

applications in a Transport Stream (TS). These applications can then simply be dragged/dropped to the outgoing TS and deleted if necessary.

**Sofia Digital** will unveil its Sofia Annex RadioPlayer integrated with Jutel's RadioMan which is a complete radio station management system integrating programme planning, scheduling, content production, versioning, and broadcasting of programmes simultaneously to multiple channels in different environments employing MHP.



**Sofia Digital Annex RadioPlayer**

MediaGateway from **Sony** is a new powerful authoring system designed to enable media professionals with little or no knowledge of Java programming to create innovative MHP based iTV services. The system is designed for the creation of compelling interactive services within a user-friendly graphical environment. The feature rich tool-set provides for

comprehensive control over content and its presentation while conforming to the DVB-MHP standard for interactive television services.

Sony claims the MediaGateway takes the programming out of MHP, leaving media professionals to do what they do best - concentrate on content and design. Designed to provide for a highly productive workflow oriented development environment the Content Gateway provides the tools necessary to generate new content, or import existing content from a variety of sources. While the Design Gateway features a rich graphical tool-set with which to design the visual appearance of the applications, the Service Gateway aggregates the products of the Content Gateway and the Design Gateway to produce broadcast ready MHP compliant interactive television services.

At IBC, **Thales Broadcast & Multimedia** will showcase two end-to-end interactive TV solutions aimed at network operators and service providers implementing, scheduling and delivering interactive TV Services. Thales claims the end-to-end MHP solution provides all the necessary tools for creating, broadcasting and receiving MHP applications. A reference MHP platform can be used by expert MHP application providers,

as well as MHP novice broadcasters, to fully test and validate the interactive television services along the end-to-end chain.

The solution relies on the Coral MHP Broadcasting server, part of the Coral product family. This represents a new offer in interactive TV for broadcasters with a new service platform that simplifies and automates the company's Multi-Coral Management system and allows several content providers to broadcast their interactive applications.

After this initial package, Thales plans to offer several digital enhanced packages to enable the broadcaster to access new value added services.

## NEW MEMBERS

**Akelia Wireless Ltd.**

**Convergence GmbH**

**Digimarc**

**Nielsen Media Research**

**Worldspace Corp**

**Silicon & Software Systems**

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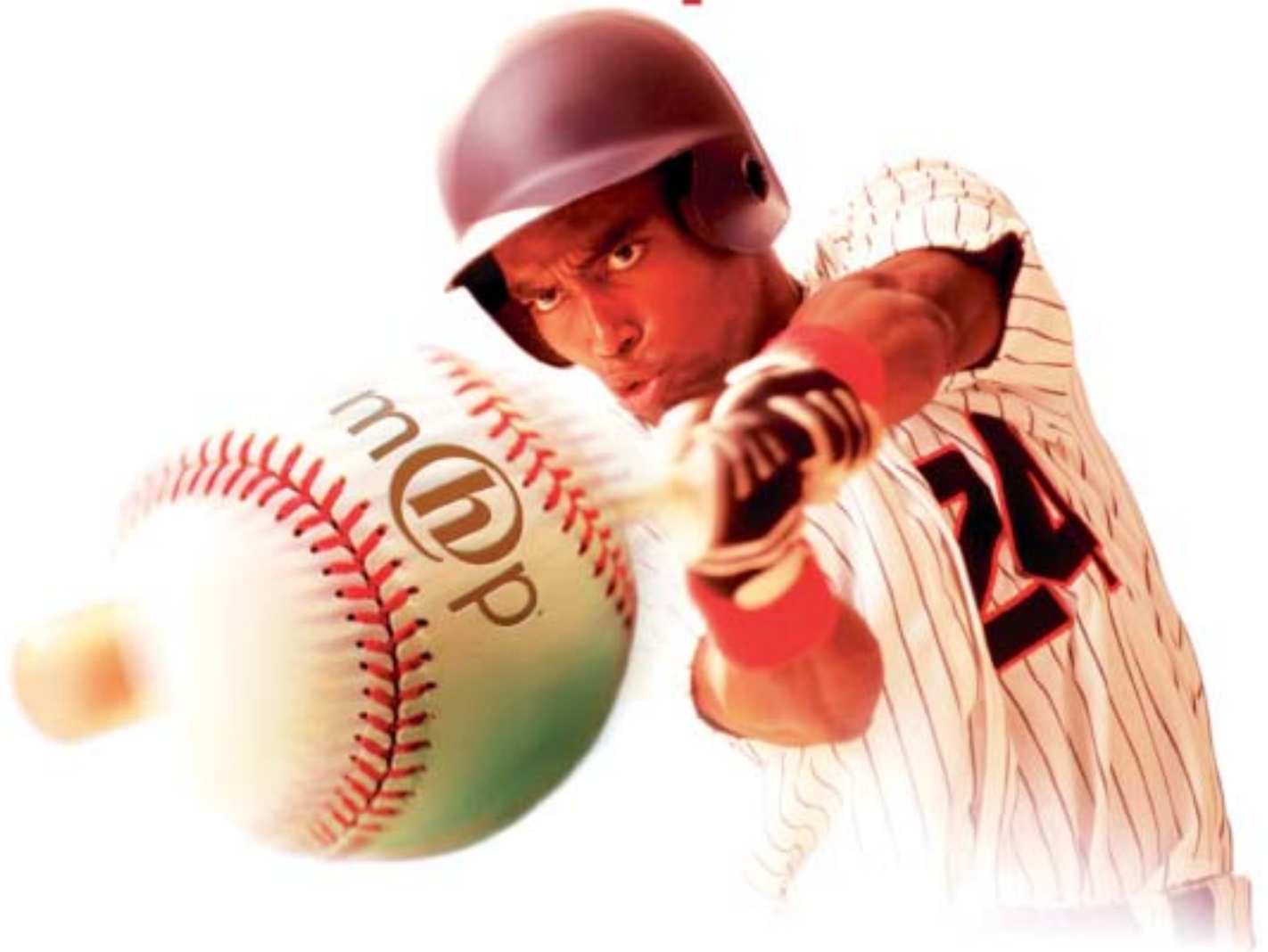


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# Hit a homerun with Philips MHP...



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So prepare to hit a homerun and see the demos at the Philips booth 1.411

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