

Strategies for supporting the DVB MHP in an MHEG-5 environment

J.C. Newell & I. Childs
BBC R&D Department

Overview

- DVB MHP and the UK DTG MHEG-5 specifications
- Migration scenarios
- Strategies for migration from MHEG-5
- Results of case studies

DVB MHP overview

- DVB has adopted the Java programming language as the interoperable application format for the MHP
- It has defined a version of Java called DVB-J
- Support for existing application formats can be provided using optional “plug-ins”

DVB-J

- Based on JDK 1.1 with TV specific extensions
- Supports a new application lifecycle model to support broadcast applications (Xlets)
- Broadcast data transport and application signalling
- Security and resource management framework
- TV-orientated user interface replaces the standard computer-centric GUI

Enhanced Broadcast Profile



- All information is received from the broadcast service
- “Local” interactivity only

Interactive Broadcast Profile



- Return channel using IP
- Allows interaction with remote servers

Internet Access Profile



- Built-in applications supporting Internet services (web browsing, email, etc)
- Able to connect to any ISP

MHEG-5 overview

- MHEG-5 is an object-orientated, declarative content format for interactive TV applications
- Designed for platforms with limited memory and processing power
- Applications are expressed in terms of high level constructs such as scenes, visible objects and links
- MHEG-6 provides support for Java

UK DTG MHEG-5 profile

- A closely specified profile of MHEG-5 has been developed for the digital terrestrial television services in the UK
- The UK MHEG-5 profile uses the Object Carousel specified in the DSM-CC specification to deliver applications and data across the broadcast channel
- To achieve interoperability it was necessary to define detailed profiles of the MHEG-5 and DSM-CC specifications and rules for text rendering, data caching, etc.

Migration scenarios

- In most cases legacy platforms will be present in large numbers
- The technical specification is likely to be inadequate to support a software upgrade to the MHP
- It will be necessary to support the legacy platform for the remainder of its economic lifetime

Migration goals

- When the MHP is introduced it should provide access to legacy applications or equivalent services
- To encourage the uptake of the MHP platform it may be necessary to provide attractive new applications or enhancements to legacy applications
- During the migration period broadcasters will be keen to minimise the duplication of authoring costs and bandwidth requirements

Migration from UK MHEG-5 profile

- Many important elements of the MHP specification are compatible with the UK MHEG-5 profile:
 - Object carousel profile
 - Content formats
 - Fonts & text rendering
- The most significant difference is the declarative MHEG-5 content format and the procedural language used for MHP applications

Shared content assets approach

- One approach to migration is to broadcast MHEG-5 and MHP applications in parallel
- The additional bandwidth required can be minimised by sharing a common pool of content assets such as images and graphics
- The service provider has to maintain both types of application throughout the migration period

Partial MHEG-5 decoder approach

- The shared assets approach can be extended by exploiting the objects from MHEG-5 applications within MHP applications
- This is possible because of the powerful capabilities of DVB-J and the declarative nature of MHEG-5
- MHP applications can load and parse MHEG-5 objects to create equivalent objects in DVB-J

MHEG-5 plug-in approach

- An MHP with an MHEG-5 plug-in can run MHEG-5 applications in exactly the same way that they run on legacy platforms
- However, navigation between legacy applications and MHP applications is difficult
- It is impossible to enhance legacy applications to provide extra features for MHP users
- This might mean that there is little incentive for consumers to choose an MHP rather than the legacy platform

MHEG-6 plug-in approach

- The limitations of an MHEG-5 plug-in can be overcome by adopting the MHEG-6 approach
- MHEG-6 provides a good integration between the MHEG and Java domains. This could be extended to include some of the DVB-J APIs
- This would allow legacy applications to be enhanced during the migration period to provide additional features for the MHP whilst remaining backwards compatible with legacy platforms

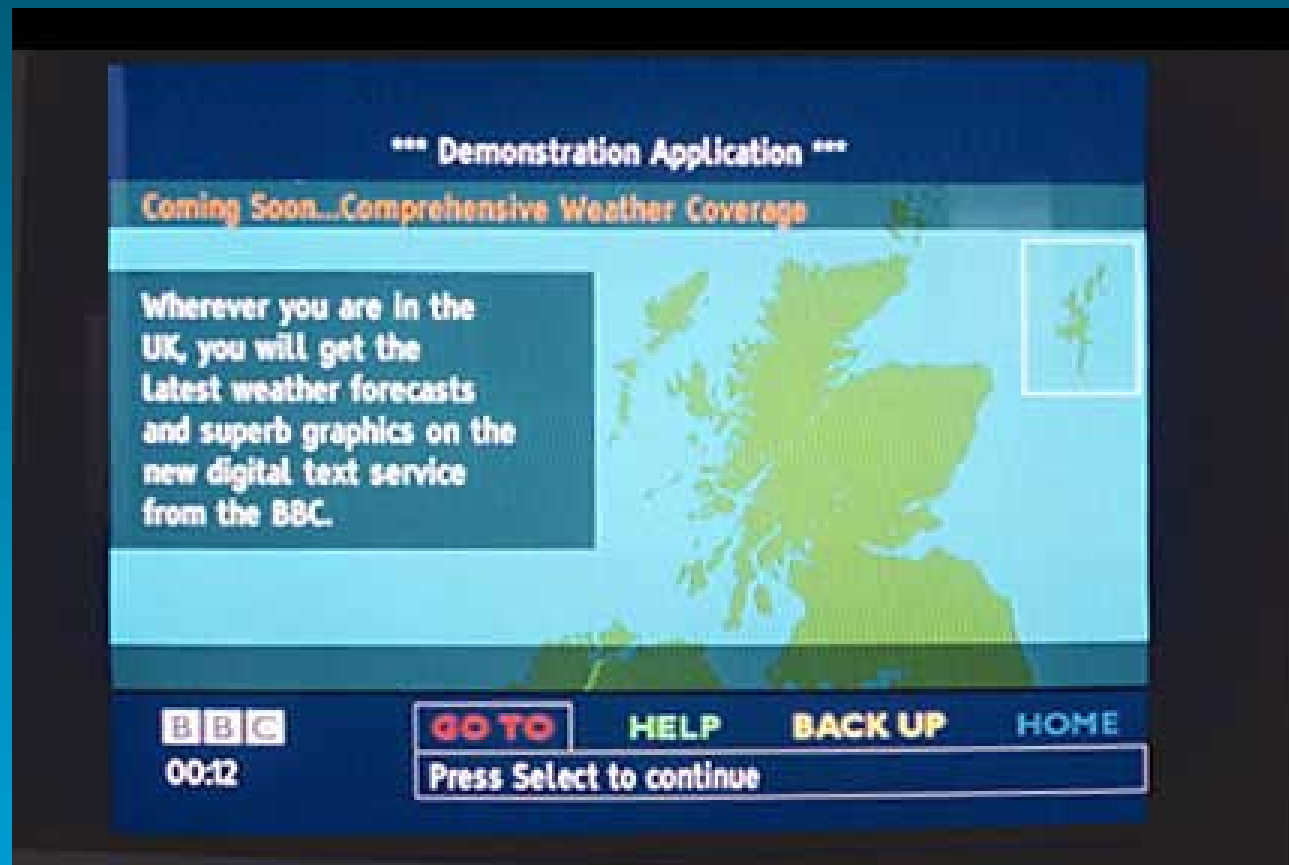
Case study 1: shared assets approach

- To explore the shared assets approach a demonstration version of the BBC's Digital Text service was created using DVB-J
- The application uses the same set of images and graphics used in the MHEG-5 application
- Each page of information is built up using Java "Lightweight Components". These can be designed to be equivalent in appearance to the visible objects used in the original MHEG-5 application

Case study 1: conclusions

- The compatible broadcast transport protocol and content formats in the UK MHEG-5 profile and the MHP specification greatly simplify application development
- The size of the Java class files and ancillary data files required for the DVB-J application was only 40 KB
- If legacy applications use many images the additional bandwidth required to simulcast an MHP application may be relatively small

Digital Text on the DVB MHP



Case study 2: partial MHEG-5 decoder

- In the shared assets approach additional data files were required to describe the layout of each page
- However, this information is already present within the MHEG-5 application
- A second MHP application was therefore developed using the partial MHEG-5 decoder approach
- This extracts the required information directly from the MHEG-5 application

Case study 2: technical approach

- Each MHEG-5 Scene object is loaded and parsed by the MHP to extract a list of MHEG-5 visible objects
- Each MHEG-5 visible object is then loaded and parsed to extract the object attributes
- Equivalent Java lightweight components are constructed using DVB-J
- The information pages can then be displayed on the MHP with identical results to the MHEG-5 platform

Case study 2: conclusions

- The size and complexity of the application is greater than the shared assets approach
- However, the overall size of the application is reduced due to the elimination of the ancillary data files
- DVB-J can easily load, parse and present MHEG-5 objects or even complete scenes from MHEG-5 applications and use them within MHP applications
- This is a useful alternative to the use of a full MHEG-5 plug-in decoder

Conclusions

- Several techniques have been proposed that can be used to provide services for the DVB MHP alongside an existing MHEG-5 service
- These techniques can be used to provide equivalent or enhanced applications for the MHP, re-using elements from the existing MHEG-5 applications to minimise the additional bandwidth required
- This suggests that MHEG-5 and the DVB MHP could coexist in a mutually supportive way during a period of migration between the two systems

Further information

The DVB MHP specification can be obtained from ETSI:

http://webapp.etsi.org/pda/home.asp?wki_id=10380

For more information contact:

chris.newell@rd.bbc.co.uk