DVB

Digital Video Broadcasting

COMMERCIAL REQUIREMENTS

FOR ASYMMETRIC INTERACTIVE SERVICES

SUPPORTING BROADCAST TO THE HOME

WITH NARROWBAND RETURN CHANNELS

DVB DOCUMENT A008

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Contents

1. Introduction

The commercial requirements of users, service providers and network operators represent guidelines for interactive services which should facilitate interoperability and compatibility of different systems whilst promoting the positive competitive market forces which will accelerate the technological development of the whole system.

This document specifies the commercial requirements for asymmetric interactive services supporting broadcast to the home with narrowband return channels, where the term narrowband refers to the number of bits per second available, up to about 150 kbit/s (e.g. 2 times 64 kbps B channels with 16 kbps D channel ISDN).

It describes a set of service types and gives typical examples in section 2. The third section gives a system overview illustrating the signal paths. The commercial requirements are defined in section 4. The Annex gives examples of different types of interactive services.

In constructing the commercial requirements, rather than producing an exhaustive list of services and functions, examples have been examined in order to highlight classes which enable the range of requirements within the scope of this document to be defined.

A simple layered communications model has been used to identify the necessity and importance of each commercial requirement and consists of the following layers:

1. Physical layer: where all the physical (electrical) transmission parameters are defined.
2. Transport layer: defines all the relevant data structures and communications protocols, like data containers, etc.
3. Application layer: is the interactive application software and runtime environments, e.g. home shopping application, script interpreter, etc.

The aim is to specify the commercial requirements for the physical and transport layers and to leave the development of the application layer and the terminal hardware and software (e.g. operating system, remote control, etc.) up to competitive market forces. It is not the intention of this document to define a standardised DVB end user terminal for interactive applications.

2. Types of services

Table 1. lists service types on the basis of increasing levels of interactivity. Each service type includes the interactivity of the lower levels. The 'return' channel, or more accurately stated, the interaction channel, can carry only a user response or can carry both a user response and content individually addressed to the user.

Service types	Service type description	Examples of services
a. Local interactivity	Broadcast including local interactivity with user terminal (no return channel)	broadcast TV, Teletext, electronic program guide, broadcast game channel
b. One-way interactivity	Broadcast with user response only	advertisement direct response, opinion polling, voting
c. Two-way interactivity	Broadcast with user response and content individually addressed to the user	e-mail messaging, telebanking, teleshopping, gambling

Table 1: Service types with examples of typical services

3. Signal path overview

The interaction channel can have a reverse path only or both forward and reverse paths. In the former the forward path can be embedded in the broadcast channel, or can be provided separately.

The interaction channel specification should accommodate the requirements for various networks (including at least CATV, MATV, PSTN, ISDN, satellite based systems)
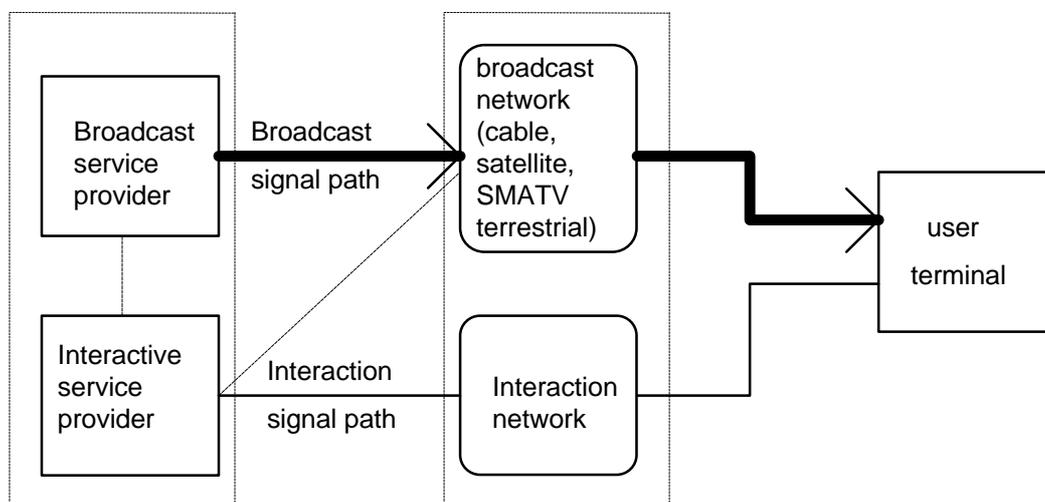

Figure 1. Diagram of signal paths

Interactive information flow

The dotted lines in figure 1. show that a signal path can go from the interactive service provider to the broadcast service provider or from the interactive service provider to the broadcast network. It is also possible that other signal paths or no signal paths can be made available, as shown here.

Organisational relationship

The dashed lines in figure 1. show that in practical cases a broadcast service provider and an interactive service provider could be the same organization and that the broadcast network and the interaction network could be (partly) the same network. Other organizational relationships are possible.

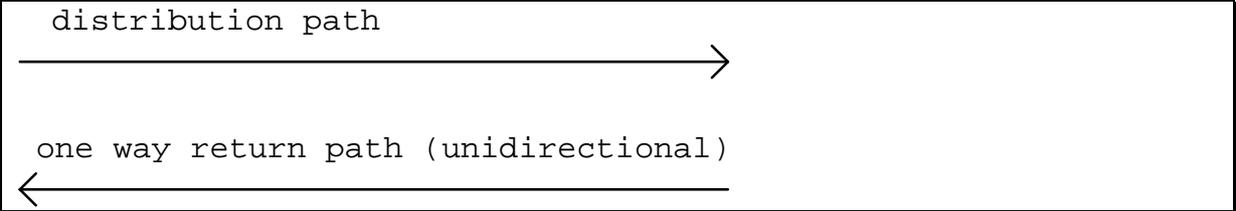The two interaction channel configurations are shown in figures 2 and 3.

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  distribution path

  ─────────────────────────────────────────➔


 one way return path (unidirectional)
  ⟵─────────────────────────────────────────
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figure 2. One way return path (uni-directional)

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              distribution path

  ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━➔


  ⟵─────────────────────────────────────
 two way return path (bidirectional)
  ─────────────────────────────────────➔
```
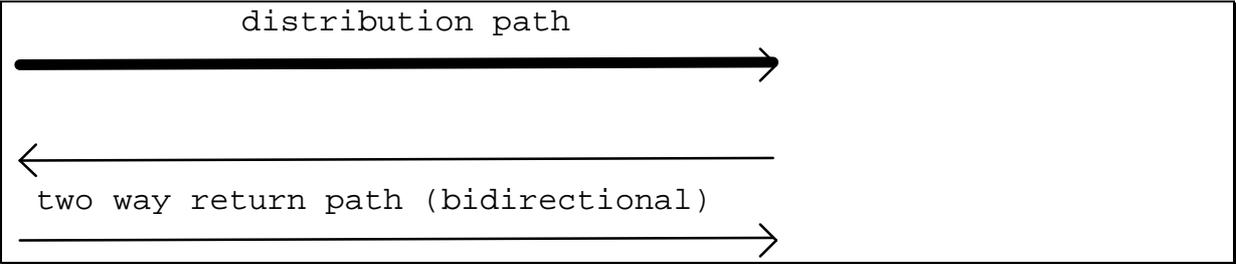
figure 3. two way return path (bi-directional)

4. Commercial requirements

The following commercial requirements cover the interests of end users, service providers and network operators. The terminology is taken from the simple layered communications model presented in the introduction.

All issues covered by local and national laws, especially those related to the security of financial transactions and to the protection of personal data, have to be taken into account by the service providers and network operators.

Core requirements
Technical specifications need to be defined for the following core requirements:

1. Any technical specification shall be based on a fully layered model and shall indentify the layer it is addressing.
2. Where appropriate, existing international standards shall be adopted.
3. The transport layer for interactive services shall be independent of the physical layer (e.g. interactive channel via cable or telephone).
4. The transport layer (i.e. data structures and containers) must be future-proof, so that future network or service extensions will not interfere with existing services.
5. The transport protocols for the interaction path shall be standardised.
6. The transport layer shall enable the use of encryption to allow secure communication.
7. The transport layer shall enable the use of any kind of conditional access system, or other applications, for both way communications.
8. The physical and transport layers shall allow for the provision of secure transactions between end users and service providers, as well as a mechanism to prevent unauthorized access.
9. Specifications (compliant with the DVB core specification) for access to the physical layers of various networks shall be provided to include CATV, MATV, PSTN, ISDN and satellite based systems.
10. The application layer shall not, as far as possible, be influenced by constraints within the lower layers (e.g. management of network congestion).
11. Flexibility to access a number of different servers through a range of different networks shall be supported by the physical and transport layers.
12. The specification of the transport and physical layers shall not prevent the equip-ment manufacturers from building a user terminal which is easy to install and use.
13. The transport layer protocols shall allow the end user terminal to identify whether a certain kind of service can be accessed.
14. The transport layer protocols shall allow the end user terminal to identify to the service provider the resources available to support services delivered.

15. The server and the user shall be able to identify the capabilities which can be accessed by each end user terminal.
16. The end user terminal should be able to access information on the services available and service operating parameters, interaction channel parameters, etc. This information should be transmitted in a way that it is compatible with the DVB SI tables where appropriate.
17. The proposed specifications shall be available as soon as possible, preferably by February 1996, for PSTN and CATV.
18. The price of the end user terminal, including interactive features shall as a guide not be significantly higher than the CSCM/TCM IRD target figure plus 10%.
19. There should be a standardised mechanism to deliver text, still pictures, graphics, audio and data to the user terminal via the interactive channel.
20. In the case that the return channel is shared with other communication services (e.g. telephone) it shall be possible to terminate the use of the interaction channel in a fast, easy and failsafe way (e.g. if the user needs to make an emergency call).
21. The protocols shall not inhibit the use of e-mail services.

Optional requirements

The following optional requirements should be examined to evaluate their feasibility:

22. The protocols shall support authorized incoming communications to the end user terminal, for example to access applications remotely.
23. The protocols should enable the monitoring of incoming telephone calls and CLI (Calling Line Identification) and audio plus other messages on the end user terminal.
24. The protocols shall allow for checking the end user terminal remotely for diagnostic purposes.
25. The protocols shall allow for downloading new applications to the end user terminal through a common, secure downloading mechanism.
26. There is a requirement for a standardized physical interface for connecting a network module to support narrowband interactive services. The protocols for interactive services shall be compatible with the DVB common interface.

Annex: Cases

The following annex describes examples of different types of interactive services, grouped according to the level of interactivity.

1 Local interaction

In this case data (like Teletext) or software is downloaded to the end user terminal and only local interactivity can take place (no return path is required). Also fixed software in the end user terminal can be used to control local devices (e.g. VCR, CD-ROM, CD-I). This implies the following functionalities:
- Downloading data or software
- Storing data or software
- Local interaction with downloaded data or software
- Interface to other local devices

2 Response to broadcast service

In this case the end user can respond to broadcast material in an anonymous manner, for instance by voting for the Eurovision Song Contest. Another example is opinion polling. These cases only require the number of votes to be counted. The response can be immediate or by store and forward techniques. This implies the following functionalities (in addition to the functionalities in 1):
- Network contention measures
- Information on failed interaction channel connection
- Information on services available

3 Request for information or purchase request

In this case the end user requests information from a remote database with for instance details of a sporting event or other ongoing broadcast service. This would extend the scope beyond that possible with current Teletext. The data which is delivered could be conditional access controlled. Note: Financial transactions and conditional access control are part of the private system implementation of the network- or service provider. Once again this case can be implemented using immediate delivery or store and forward techniques. This implies the following functionality (in addition to the functionalies in 1 and 2 above):
- Data transmission to the server via the interaction channel

4 Messaging

This case covers two types of service. First the user can initiate a message to the service or network provider (e.g. help). Second the service provider can send messages to users or one user in particular (e.g. to inform them about new software releases).