

DVB-H Trial Berlin

Parameters of DVB-H Transmission

T-Systems Media&Broadcast

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Abstract		

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Revision History

Version	Date	Editor	Revisions / Comment
0.1	05/07/05	P. Pogrzeba; S. Krueger	Version 0.0; Initial Draft
0.2	01/08/05	P. Pogrzeba	Editorial changes
0.3	16/08/05	P. Pogrzeba	Updated service list
1.0	18.08.2005	S. Krueger	Editorial Changes
1.1	24.08.2005	S. Krueger	Changes: GI in channel 46
2.0	22.09.2005	S. Krueger	Changes after IFA

Distribution List

Name	Company

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1 Introduction

T-Systems Media&Broadcast is operating a DVB-H pilot channel in Berlin. Different service providers offer their IP datacast services for that network. The main targets of the pilot are the following:

- Evaluation of the DVB-H standards
- Evaluation of Coverage and Network Structures
- Evaluation of DVB-H equipment and terminals
- Study of Business Cases
- Interoperability Tests
- Friendly User Trials
- Preparation of the Roll-Out in Germany

IP datacast over DVB-H is currently in the specification process of DVB. This work is performed in different areas, service protection and purchase, ESG, file delivery, content formats, QoS and PSI/SI. The final specifications should be available in late 2005. That means, for an early pilot phase no standardized end-to-end solution for IP datacast is available.

An interoperability subgroup was set up within BMCo-forum to define intermediate steps until the complete IP datacast specification is adopted. The first milestone was the IFA exhibition in Berlin.

This paper describes parameters used for transmission of IP datacast services used at the Berlin DVB-H Pilot. Two different IP platforms provided by Siemens and T-Systems are currently operated.

2 DVB-H infrastructure

The T-Systems infrastructure of the DVB-H network Berlin on channel 39 (618MHz) is illustrated in Figure 1.

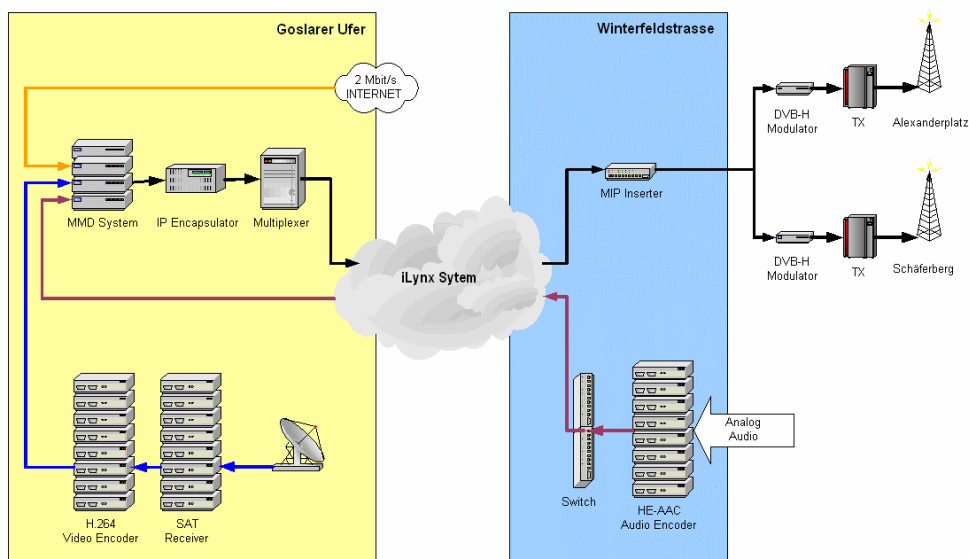


Figure 1: Net structure of DVB-H pilot project in Berlin

The service bouquet includes streaming of TV programs, streaming of audio programs, file download, ESG and some interactive TV applications.

3 Parameters

3.1 DVB-H transmission parameters

3.1.1 Channel 39

Channel	39
Frequency	618 MHz, SFN
Transmitter location	Alexanderplatz, Schäferberg
ERP	20 kW, 50 kW,
Bandwidth	8 MHz
Mode	8k, 16-QAM non-hierarchical
Code rate	1/2
Guard Interval	1/8
MPE FEC rate	various between 2/3 and 7/8
Burst parameter	
Burst duration	approx. 280ms
Burst size	various
Peak bit rate per burst	various
Time slice period	2s
Number of MPE-FEC rows	512 (preferred)
TPS signalling	signalling of DVB-H and Time Slicing
TPS signalling	Signalling of DVB-H and Time Slicing

3.2 PSI/SI signalling

The PSI/SI signalling of DVB-H services is defined in [3] and [4]. Following tables will be used: NIT, INT, PAT and PMT.

3.3 IP layer

Feature	T-Systems platform	Siemens platform
IP version	IPv4	IPv4

File delivery	FLUTE/ALC	FLUTE/ALC
Channel	1 IPE channel 39	channel 39

Feature	T-Systems platform	Siemens platform
Platform ID	Ch39: 0x101	
Platform name	-	
Platform provider name	-	

3.4 A/V content format

Feature	T-Systems	Siemens	Nokia
Video codec	H.264/AVC		
Audio codec	HE AAC		
Profile	1.2		
Picture size	QVGA		
Frame rate	QVGA : 12.5 fps		
Max bit rates	QVGA : 256 kbps Audio: 64 kbps at 44.1 KHz sampling frequency		
Video encapsulation	RTP, RFC 3984		
Audio encapsulation	RTP, RFC 3640		

An example SDP file for Video used in T-Systems platform is contained in 6.2.

3.5 Audio only content format

Feature	T-Systems	Siemens	Nokia
Audio codec	HE AAC		
Max bit rate	64 kbps		
Audio encapsulation	RTP, RFC 3640		

An example SDP file for Audio used in T-Systems platform is contained in 6.3.

3.6 ESG (T-Systems/Siemens)

The ESG should provide the whole information of services delivered by T-Systems and Siemens platform over both channels.

An example of ESG fragments is contained in 6.1.

3.6.1 ESG Basics

Feature	Remarks
Data model	IPDC Snapshot, bmco Forum [8]
Transport	ALC/FLUTE
Destination IP address	224.0.23.14
Destination port number	3937

3.6.2 Types of Application

Application Type	Remarks
video/h264	H.264/AAC TV
audio/x-heaac	HE AAC Radio
text/html	HTML based content delivered by FLUTE carousel
application/xml	XML based content delivered by FLUTE carousel
application/x-esg	ESG data delivered by FLUTE carousel and presented by the ESG client
application/x-mitv-tv	Special application MiTV*, video stream with MiTV related data delivered by FLUTE carousel
application/x-mitv-radio	Special application MiTV*, audio stream with MiTV related data delivered by FLUTE carousel
application/x-mitv-data	Special application MiTV*, MiTV data delivered by FLUTE carousel
image/jpeg	Picture files (JPEG format) delivered by FLUTE carousel and presented by an image viewer
image/gif	Picture files (GIF format) delivered by FLUTE carousel and presented by an image viewer

* MiTV: MiTV is a special application to present interactive services. MiTV has been developed by Siemens/Contcast.

3.7 Service protection & purchase

All of the offered service at IFA will be unencrypted due to the lack of time to implement a common mechanism.

3.8 Services

The ESG provides information about the services available from both Siemens and T-Systems platforms.

Detailed information about the services (IP address, PID, Port) are provided with a separate ZIP File, <mailto:stefan.krueger@t-systems.com>.

4 Test stream

T-Systems makes available recorded test streams in MPEG transport stream format. This streams can be downloaded from the following servers:

```
psts.berkom.de  
u: sud_ftp  
p: SU.4Cbwfa
```

or alternatively

```
Host: steambns.dyndns.tv  
User: tsigast  
Passw: tsi2005
```

5 References

- [1] ETSI EN 302 304: „Digital Video Broadcasting(DVB); Transmission System for Handheld Terminals (DVB-H).
- [2] ETSI EN 300 744: „Digital Video Broadcasting(DVB); Framing structure, channel coding and modulation for digital terrestrial transmission”.
- [3] ETSI EN 301 192: „Digital Video Broadcasting (DVB); DVB specification for data broadcasting”.
- [4] ETSI EN 300 468: „Digital Video Broadcasting (DVB); Specification for Service Information (S) in DVB Systems”.
- [5] ETSI TS 101 191: „Digital Video Broadcasting (DVB); DVB mega-frame for Single Frequency Network (SFN) synchronization”.
- [6] ETSI TR 102 377: „Digital Video Broadcasting (DVB); DVB-H Implementation Guidelines”.
- [7] ETSI TR 101 190: „Digital Video Broadcasting (DVB); Implementation Guidelines for DVB terrestrial services; Transmission aspects”.
- [8] J. Heuer: ESG Snapshot. Internal document of bmco interoperability group. June 2006

6 Annex

6.1 ESG test data

An example of ESG data is available in the provided ZIP File.

6.2 SDP File for Video

An example of SDP for video is displayed below. It is also available in the provided ZIP File.

```
v=0
o=- 41 3334036698 IN IP4 0.0.0.0
s=EinsExtra
i=Live TV-Stream EinsExtra
c=IN IP4 225.0.1.5
t=3333279600 3408101999
m=video 11050 RTP/AVP 96
m=audio 11052 RTP/AVP 97
a=control:*
a=range:npt=0-3000000
a=rtpmap:96 H264/90000
a=control:trackID=1
a=mpeg4-esid:201
a=fmtp:96 profile-level-id=42ffff; paketization-mode=1; sprop-parameter-sets=Z0LADfICg+I=,aNuOIA==;
a=rtpmap:97 mpeg4-generic/90000
a=control:trackID=2
a=mpeg4-esid:101
a=fmtp:97 streamtype=5; profile-level-id=15; mode=AAC-hbr; config=1210; SizeLength=13; IndexLength=3; IndexDeltaLength=3; Profile=1;
```

6.3 SDP File for Audio

An example of SDP for video is displayed below. It is also available in the provided ZIP File.

```
v=0
o=- 62 3334036698 IN IP4 0.0.0.0
s=Spreeradio
i=Live Radio-Stream Spreeradio
c=IN IP4 225.0.0.10
t=3333279600 3408101999
m=audio 10102 RTP/AVP 97
a=isma-compliance:1,1.0,1
a=mpeg4-iod:"data:application/mpeg4-iod;base64,AoFnAA8AAAAAABCgAAQHRkYXRhOmFwcGxpY2F0aW9uL2lWZWc0LW9kLWF1O2Jhc2U2NCxBVG9CT0FVZkF6UUFBUFFFTENBUkFEcVlBQmJqWUFBQUFBQUZIUUFBUFBQJBRFBQUJ0UWtBQUFFQUFBQUJQURJaUlBTBGAeJJVUVEQmdFQgQNAgUAOpGAFuNgAAAAAYBAQNRAABA NmRhdGE6YXBwbGljYXRpb24vbXB1ZzQtYmlmcy1hdTtiYXN1NjQsd0JBu1lRU0lVRVVGUhdBP QQSAg0AOpGAFuNgAAAAAUDAABABgEB"
a=rtpmap:97 mpeg4-generic/22050/2
a=control:trackID=1
a=mpeg4-esid:1
a=fmtp:97 mode=AAC-hbr; bitrate=64000; config=139056E5A0; SizeLength=13; IndexLength=3; IndexDeltaLength=3;
```

6.4 Service List

A detailed list overview about the services is included with the file [‘IFA 2005 Services K39K46 V12.pdf’](#) in the attached ZIP- file.

--- End of document ---