DVBGuide

Version 0.70, 11th February 2007

A DVB-T EPG capture utility

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Contents

Introduction

DVBGuide is a utility to capture the Electronic Programme Guide (EPG) data as broadcast over a digital television DVB-T network. The original intended purpose for **DVBGuide** was to provide guide data for Windows® Media Center (when used in conjunction with a separate utility such as *QuickGuide*). However, since the EPG data is written in the widely supported *XMLTV* format, **DVBGuide** may find other uses that require the capture of EPG data on a Windows platform.

The key features of **DVBGuide** are:

- Runs from the Windows command line;
- Uses any DVB-T tuner that has a BDA driver;
- Generates EPG data in *XMLTV* format;
- Generates a matching `ChannelInfo.xml` file for use with *QuickGuide*;
- Limited support for Windows Media Center category classifications;
- Option to set the PC system time from broadcast timestamp;
- Option to write NIT, PAT and SDT tables as comma separated value files;
- Silent mode for incorporation into a batch process.

Windows Media Center has its own Guide service provided free by Microsoft and its partners. So, why would anyone want to use **DVBGuide** instead? There are three main reasons:

- The Media Center PC is not connected to the Internet making the Guide service unavailable;
- The Guide service is unavailable in the region of use (but broadcast EPG data is available);
- Dissatisfaction with the normal Guide service because of inaccuracies, bad mapping of channels to names used by the broadcaster, and slow response to scheduling changes.

New in version 0.70

Version 0.70 is the second public release of **DVBGuide**. It includes the following main changes:

- *Bug fix:* crash when writing *XMLTV* file for an event where the programme title was not broadcast;
- *Bug fix:* generating invalid *XMLTV* file for events where the title is broadcast but is empty;
- Support for many of the multi-lingual and accented character mechanisms defined in the DVB specification added;

- ❑ ISO639 two character language code attribute now correctly present in programme title and description;
- ❑ Programme events in the *XMLTV* file are now sorted in date/time order – not strictly required by the *XMLTV* specification but it makes manual examination of the file contents easier;
- ❑ Improved MCE category support (but this is still very much work in progress);
- ❑ *XMLTV* programme events now include audio and video attributes if those attribute descriptors are present in the broadcast EPG;
- ❑ Other minor bug fixes;

Caveat emptor

This version is only the second public release of **DVBGuide**. As such, it has had limited testing. There are three main variables that will affect how well (or how badly) **DVBGuide** behaves.

- ❑ Windows platform and service patches/update version;
- ❑ DVB-T tuner hardware and driver;
- ❑ Regional differences in adherence to MPEG transport and DVB-T standards by transmitting systems and broadcasters.

Testing has so far been done on Windows XP with Service Pack 2 and on Windows Media Center Edition 2005 with Rollup 2 and latest patches. Using either of those operating systems will remove the first variable.

Testing has only been performed on a small selection of DVB-Tuner hardware. This is likely to be a problem area that could prevent **DVBGuide** from working correctly. Using the debug output option may provide additional information to help solve this type of problem if it is encountered. User feedback from version **DVBGuide** version 0.60 shows that some types of DVB-T tuner hardware/drivers do indeed cause problems. The cause of these problems is being investigated but they have not been specifically addressed in version 0.70. The only tuner currently known not to work with **DVBGuide** is a Genesyslogic USB tuner (vendor ID 0x0DB0, product ID 0x5581). But there may well be others.

The third variable is the hardest one to deal with. Testing has only been carried out in the United Kingdom with broadcasts from London's Crystal Palace transmitter. If you're one of the 10 million people within the coverage area of this transmitter then you're in luck! Hopefully, **DVBGuide** should work for you. If you receive the Freeview DVB-T service elsewhere in the UK then you're also likely to be OK (although regional variations in the content and format of MPEG Transport Streams may just possibly cause problems).

If you live outside of the United Kingdom (and particularly in a non-English language speaking area) then problems with EPG capture are most likely. **DVBGuide** captures all the EPG data by tuning to a single Transport Stream (TS)

multiplex frequency. However, unlike the UK's Freeview service, broadcasters may choose not to send the entire network EPG data set on every transport stream (just as broadcasters may choose not to send EPG data at all – in which case you're really out of luck!). If your broadcaster only sends EPG data for the current TS then you can still use **DVBGuide**, but it will need to be run separately for each multiplex frequency. The separate *XMLTV* data files produced would then need to be renamed and merged in some way. This whole process could perhaps be automated in a batch file.

Version history

Version	Date	Comments
0.70	11th February 2007	*Bug fixes:* empty or missing event title. *Additions:* multi-lingual character set support, programme events in XMLTV file sorted in date/time order.
0.60	3rd December 2006	First public release.

Operation

Parameters

Carrier frequency and bandwidth

Typical operation requires at least one parameter to be set: the carrier frequency for the Transport Stream multiplex that is to be used for EPG data capture. In the United Kingdom, the frequency used may be for any one of the six[1] multiplexes broadcast by your local transmitter. If you are aware of reception problems on certain channels (e.g. freeze frame video or picture break-up) then, since you have a choice, avoid multiplexes that carry those problem channels.

The carrier frequency must be specified in kHz. Tables of multiplex frequencies for regional transmitters are usually freely available from your broadcaster.

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[1] If your local transmitter is Crystal Palace then the additional multiplexes carrying the current High Definition trials should be avoided since these only carry EPG data for the HD broadcasts.

However, if you are using Windows Media Center then there is an easy way to determine channel frequencies. Go into the *Settings/Guide/Edit Channels* menu and frequencies will be given for each channel that you normally receive. Note that these frequencies are in MHz so add three zeros to get a frequency in kHz.

The other parameter that you may need to supply is the bandwidth frequency in MHz. This information will be available from your broadcaster but since there are only three likely values for this it is easy to determine by trial and error. If the default of 8 MHz doesn't work (i.e. fails to result in a tuning lock) then try 7. And if that doesn't work try 6.

For the United Kingdom, the default bandwidth of 8 MHz applies across the entire region. The default carrier frequency of 506000 will work for the 10 million people or so in the coverage area of London's Crystal Palace transmitter since this is the frequency[2] of the main BBC multiplex (i.e. that carries BBC ONE and BBC TWO).

EPG timeout

Be prepared to wait for an entire set of EPG data records to be captured. This is a relatively slow process. The actual time taken will depend on your broadcaster's choice of number of days in the EPG and the TS bandwidth devoted to EPG data packets. It will also obviously depend on the total number of channels carried by the network.

As a reference point, the UK's Freeview seven day EPG is specified to have a broadcast repetition rate of 270 seconds (i.e. every individual EPG event will be broadcast at least once during that time). This is confirmed by experiments that show that the complete EPG is usually captured in a little less than five minutes and results in around 11,000 unique EPG records. Consequently the default EPG timeout of 10 minutes seems appropriate.

If the timeout is set too short then only a partial capture of the EPG will result. Since EPG capture is unlikely to be a time-critical process there is usually little to be gained by setting a short timeout.

If the EPG timeout is set to 0 then the EPG capture part of **DVBGuide** does not take place. This may be used if **DVBGuide** is only being used to set the system date or to write tables as CSV files.

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[2] The Crystal Palace BBC mux frequency is actually 506 MHz less an offset of 167 kHz. Such offsets are sometimes introduced to avoid co-channel interference between neighbouring transmitters. However, most BDA tuner cards will cope without this offset being specified (and Media Center does not include these offsets in its display of frequencies).

Setting system date/time

An accurate EPG is only useful to a PVR application if the current date and time is also accurate. **DVBGuide** may optionally be used to synchronise the PC system date/time to that broadcast.

Note that **DVBGuide** must be run with Administrator privileges if the system time is to be set successfully.

Writing tables as CSV files

A bonus extra feature, but probably one not likely to be used much, is the option to write the Network Information Table, the Program Association Table and the complete set of Service Description Tables to comma separated value files.

Command line options

DVBGuide has the following command line options:

-b*N*   Set tuning bandwidth to *N* MHz (default is 8).

-c*NNN*   Set tuning carrier frequency to *NNN* kHz (default is 506000).

-d   Show debug information. Not normally required.

-e*NNN*   Set EPG capture timeout to *NNN* seconds (default is 600 or 10 minutes). A timeout of 0 will disable EPG capture.

-q   Enable quiet mode.

-t   Set the system time from the broadcast time stamp.

-v   Display version information and exit.

-w   Write NIT, PAT and SDT tables as comma separated value files. Not normally required.

Numbers are specified using C language conventions (i.e. default is decimal, prefix with 0x for hex, prefix with 0 for octal).

Output files

Captured EPG data is always written to the file `dvbepg.xml`. A matching `ChannelInfo.xml` file is also produced containing channel "friendly" names, virtual channel numbers and their mapping to the channel identifiers used in the *XMLTV* format file. The *XMLTV* format file itself contains the channel identifier to friendly name mapping but does not include the virtual channel numbers.

Not that it matters if the `dvbepg.xml`/`ChannelInfo.xml` combination is used with *QuickGuide* but for the technically minded; **DVBGuide** eschews the normally

recommended dotted channel domain notation and uses the channel service number (in hexadecimal) as the channel identifier.

Note that the broadcast of logical channel (i.e. virtual channel) numbers is not a mandatory part of the DVB specifications. For the UK's Freeview system, this information is sent as "user defined" data[3]. It is this information that DVBGuide uses to construct the `ChannelInfo.xml` file. So, this file will be generated correctly in the United Kingdom.

In other regions, if this logical channel information is missing then all the virtual channel numbers will be set to 0. This is not a major problem. The output file could be edited; with the correct channel numbers entered manually from information provided by *QuickGuide*'s *Dumper* program.

Platform

DVBGuide is a Win32 console application. It requires DirectShow support and a DVB-T tuner card with a Broadcast Driver Architecture (BDA) driver. Currently, testing has been performed on Windows XP SP2 and Windows Media Center 2005 with Rollup 2. It may work on older versions of Windows or on Windows Vista, but no guarantees are made that it will work.

Typically, you will run the **DVBGuide** from a command line window or from a batch file or command script (possibly as part of a scheduled task).

Future enhancements

Whilst there is no guarantee that future versions will be released, some or all of the following areas are likely to receive attention in any future version:

- ❑ Better support for content categories;
- ❑ Support for re-tuning during EPG capture to support regions where the entire EPG is not broadcast on every transport stream in a network;
- ❑ Full support for all languages and character sets possible according to the DVB specification;
- ❑ Tuner selection where more than one tuner is available;
- ❑ Usability enhancements for better integration with Windows Media Center.

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[3] A logical channel number descriptor in the Network Information Table.

Contacting the author

Feedback to the author may be made via pclare@bigfoot.com or via the community forums on The Green Button.

References

The following publications were referred to in the course of the development of **DVBGuide**.

[1]   *Information technology − Generic coding of moving pictures and associated audio information: Systems*, International Standard, ISO/IEC 13818-1, Second Edition, December 2000.

[2]   *Digital Video Broadcasting (DVB); Specification for Service Information (SI) in DVB systems*, ETSI, EN 300 468 V1.7.1, May 2006.

[3]   *Digital Video Broadcasting (DVB); Carriage and signalling of TV-Anytime information in DVB transport streams*, ETSI, TS 102 323 V1.2.1, November 2005.

[4]   *Plan for UK DTT SI*, Digital TV Group, Version 4.

[5]   *Platform SDK help*, Microsoft Platform SDK for Windows Server 2003 SP1.