

### Introduction

This note is the result of many attempts to connect the Western Digital WDTV to a Windows based network for watching DVDs that have been transferred to external hard-disks in the VOB format.

It may be argued that today the VLC software used on a mini-computer instead of the WDTV, or alternatively on an Apple-TV, constitutes a viable alternative, without the hassles of connecting a WDTV. However, the WDTV has an immediate advantage in the direct access with a dedicated remote control, whether physical or as an app on a smart telephone.

WDTV offers direct USB access for an external storage media, such as hard-disks, but with larger collections of movies, the WDTV data management system does not seem adequate. The following is therefore based on using a dedicated PC, to which one or more external hard-disks have been connected, using USB hubs where necessary. Best results seem to be achieved relying on the USB-3 standard, for the PC, the external hard-disks and the hubs.

### SMB

The first issue to address on the PC is that the WDTV relies on the Samba (SMB) protocol for network communication, but by default this protocol is switched off in the recent versions of Windows 10.

To enable SMB under Windows 10, open 'Settings' in the Start menu of the PC, and select 'Apps' and further select 'Programs and Features' (which may also be reached through the Config menu). Select 'Turn Windows features on or off', turn on 'SMB 1.0/CIFS File Sharing Support' and make sure that the 2 or 3 sub-functions are also turned on.

### File sharing

WDTV relies on file sharing using Windows shares. An alternative is Media streaming, but when using this method the DVD menus will not work. Additionally, Mac and Linux shares may be used, but this is not covered by the present note.

To permit file sharing, open the 'Settings' menu on the PC, select 'Network & Internet' and further select 'Ethernet' (or Wifi, as appropriate, although using Wifi may present video transfer rate problems), so as to select 'Advanced sharing options'. In the group 'Private', check that 'Network discovery' is turned on (also the sub-function 'Automatic setup of networks') and that 'File and printer sharing' is turned on.

Likewise, in the group 'All Networks' check that 'Turn off password-protected sharing' is selected (although Windows may still require a password for WDTV access). Because of the possible request for a password, go to the 'Accounts' menu select 'Family & other users' and add a new user ('Other users'), as a local user with administrator rights, with a simple name and password. One option would be 'wdtv' for both username and password. At first login on WDTV, check the box for remembering access details.

On the PC, in 'File Explorer' (on the toolbar at the bottom of the screen), select the directory to be shared, right-click and select 'Properties' and select 'Sharing'. In order to be able to see the size of

shared directories, it is recommended that also drives are shared, which requires use of 'Advanced Sharing' and selecting 'Permissions'.

Add the new user (in the example 'wdtv') and grant full rights (both read and write rights, as WDTV uses write to set bookmarks for how far a movie has been watched). Repeat for all drives and directories to be shared.

Rights may be granted to the category 'Everybody', but it is suggested that this category should only have read rights, which will suffice for viewing files in other media. In this manner, deleting and saving files requires use of the 'wdtv' username and password.

Sharing may already include other entities, some of which may be marked as unknown. To clear this, select the tab 'Security', placed next to 'Sharing' in 'Properties', and select 'Advanced', where the ownership of the directory or hard-disk may be changed to the main user of the PC. After this, sharing may be limited to the owner and 'wdtv', as well as possibly 'Everybody'. Other pre-existing sharing rights may then safely be deleted.

### Network access

In the search box on the PC toolbar, enter 'Services' and open the app. Check that 'Function Discovery Provider' is set to 'Automatic (Delayed start)' and 'Function Discovery Resources' is set to 'Automatic', which will subsequently display as 'Automatic (Triggered start)'.

Likewise in the search box on the toolbar, enter 'Regedit' and open the app. Select 'Hkey Local Machine', 'System', 'CurrentControlSet', 'Services', 'LanmanServer' and 'Parameters'. Check if there is a parameter entitled 'IRPStackSize', if that is not the case, then create it (right click, select 'new') as a 'Dword (32-Bit)'. The normal value is 20 (decimal, not hexadecimal), but may need to be increased to allow for discovery of external hard-disks attached to a computer. It cannot be above 50, but 40 appears to work (by default displayed as 28 hexadecimal), whereas it has been reported that some values in the 30s give problems.

Still within 'Services' select 'Browser' and 'Parameters', check if there are parameters entitled 'IsDomainServer' and 'MaintainServerList' and otherwise create them by right clicking and selecting 'New', followed by 'String Value'. This relates to a function called 'MasterBrowser', which is not something that the user can specify, but which is the outcome of an election held amongst computers, routers and other units on the local network.

WDTV relies on the MasterBrowser, so the objective is to avoid an election conflict. Many modern routers will assume the role of MasterBrowser, which works fine with WDTV, and in such case the PC with the VOB files should be told not to stand for election. This is done by entering 'False' in the parameter 'IsMasterBrowser' and 'No' in the parameter 'MaintainServerList'.

If the router is not the MasterBrowser, then the PC with the VOB files should insist on being elected ('True' and 'Yes' in the two parameters above), but the outcome is not guaranteed. To check who the MasterBrowser is, a piece of freeware is available on the internet under the name 'Lanscan'. Please note that the current version 2.01 appears not to work correctly, whereas the preceding version 1.68 works fine (also with Windows 10).

Some routers insist on being part of a workgroup entitled 'Workgroup', without any option to change the name. The PC and WDTV should then be members of the same workgroup when the router is the MasterBrowser. On the PC, in 'Settings' or 'Control panel', select 'System', and then on the right side

select 'System info'. On the systems overview that opens, select 'Change settings' to change the workgroup name if necessary. On WDTV do this in 'Settings' under 'Network'.

#### Hard-disks may not be visible

Windows 10 seems to cause an additional problem, whereby workgroup computers are not visible in the network neighbourhood. This may be circumvented by including the following task to be run at start-up of the PC that is host for the VOB files, which will then announce itself to the network.

In the search box on the PC toolbar, enter 'Task Scheduler' and add a new task, for which the name could be 'FDResPub' and the description could be 'Restart the FDResPub service'. It should be set to 'Run whether user is logged on or not - Do not store password' and configured for 'Windows 10'.

The trigger should be 'At Startup' and the action should be 'Start a program', for which the script should be 'cmd' with the arguments '/c net stop FDResPub && net start FDResPub', and with the specification 'Start in' left empty.

Finally, the conditions should be set as 'Start only if the following network connection is available - Any connection', while 'Settings' should be left at default values.

#### Stuttering

In some environments, WDTV develops a stutter. It seems that this may occur when there is an overload of traffic on the network card of the PC hosting the VOB files, for example when the PC is simultaneously sending or receiving large files. However, it apparently may also occur when the stream from the PC to the WDTV comes too fast.

Therefore, in the PC menu 'Settings', 'Network & Internet', select 'Change adaptor options', right-click on the Ethernet connection and select 'Properties'. Select the function 'Configure', 'Advanced', 'Speed and Duplex', which presumably is set to 'Automatic'. Select instead '100 Mbit/s Full Duplex' which matches the network card of WDTV. This naturally entails that the communication by that PC becomes slower in general, which may be a problem if the PC is also to serve other functions.

Additionally, it may help to change the manner in which any external drives are handled by the PC, by opening Disk Management (by right-clicking on the Start icon, or via the Control panel, Administrative Tools, Computer Management) and right-clicking on the grey box for each drive (with the drive number), selecting 'Properties' and choosing 'Policies', where 'Better performance' may be chosen to provide a faster access speed. The offset is the need always to use 'Safely remove hardware' when removing the disc.

The problem of stuttering may be further limited by selecting a fixed video resolution in the WDTV 'Setup' menu under 'Video'. Assuming a newer television with 1080p capability, it seems that selecting 1050p 50Hz and YCbCr give the best result. 50Hz and YCbCr are apparently part of the MPEG4 definitions and therefore require least work by the WDTV.

Stuttering most often occurs with high transfer rate files, such as good opera productions, and often when subtitles are selected. However, the above steps should eliminate the problem. As mentioned above, other traffic on the PC with the VOB may have an impact, whereas other traffic on the network does not seem to have any impact. However, if there should be problems with other

network traffic, some modern routers allow for granting priority to selected units, such as the WDTV and the PC with VOB files.

Finally, a further option is to use ISO files instead of VOB files, which some claim will alleviate stuttering.

### Resume function

The resume function on WDTV, continuing a video from the point left last time, works for VOB files when playing the folder containing the video and audio subdirectories. It does not work when playing VOB files from the preview window, so as to enable zoom, which is useful for videos with a wide screen image inside a 4:3 box.

For other files, such as TS and MP4, resume does not work when playing the folder containing the files, but it does seem to work when entering into the folder and playing the individual files.

Sometimes, the resume function does not appear to work, as the video restarts by running at a higher speed without sound. In such case, restarting the video once more from resume seems to clear the problem.

### Sound quality

It seems that the soundcard built in to the WDTV has limits, so that wide spectre music, such as opera, may sound distorted, especially in the treble. A work-around is to rely only on digital output, either through the HDMI to a television with good analogue conversion abilities, or through the optical out connection to an amplifier with such conversion abilities.

### Other problems

It may be that some antivirus programmes have a negative impact on SMB access to shared hard-disks, but tests have not been conclusive on this issue.

It may likewise be that using a VPN on another computer in the network has a negative impact on SMB access to shared hard-disks on the PC serving the WDTV. Tests seem to indicate that this effect occurs especially if the other computer changes networks without first disengaging the VPN.

Finally, some mobile phone amplifiers operate in the 5 MHz frequency area and may therefore conflict with some routers working in the same frequency area. Likewise, some remote controls for electricity use 433 MHz frequencies, which are also used by some wireless loudspeakers and headphones.