Codge Notes

Fun and games with a 3View PVR.

3View is a Freeview HD PVR with additional online and media player features. It's an interesting little box with potential for user tweaking. Under the hood is a basic, but functional, Linux system. As shipped the underlying OS is not exposed to the end user (though a telnet daemon is running by default).

The manufacturer 3view CE Ltd has apparently all but vanished, and their websites and customer support are no longer available. Thus owners must now fend for themselves if anything goes wrong.

Around the 23rd August 2012 changes were made to the Freeview EPG that apparently cause the 3view to crash while decoding the DVB SI tables. For most owners this has made their 3view effectively useless.

While there is some effort within the user community to try and find a long term fix for this issue, none is available at this time.

This site exists to document a hack that works around the problem, but does not fix it.

Workaround General Concept.

When the PVR is operating normally, a process is running that monitors the Service Information (SI) data that is sent in addition to the TV or radio transmission. This SI data contains information such as the EPG (Electronic Program Guide) and details about the various services available. The PVR uses this information to keep it's copy of the EPG up to date and to learn about new channels or changes to existing channels (among other things).

Something changed in this broadcast information on or around the 23rd August 2012 that causes this monitoring process to crash, which in turn renders the entire PVR unusable. Only a reboot will fix it and it is likely to crash again as soon as it restarts. The exact reason for this crash is still being investigated, and may take some time to find and fix. Until then a workaround has been devised which stops the monitoring process from being started at all. This in turn stops the crash from occurring.

But there is a problem with this workaround, if the monitoring process is not running, the EPG will not be updated. The PVR will not learn about changes to the program schedules (needed to ensure scheduled recordings happen at the right time) and after about a week the entire EPG will be completely empty.

The current solution is to let the user of the PVR decide whether to start the monitoring process or not. When the user is watching programs or recordings or generally using the PVR, they would not want the monitoring process to run as it would be likely to crash the PVR. However, when the user is NOT using the PVR (e.g. at night after they have gone to bed) this crash-prone process can be run to ensure EPG updates occur.

As the PVR will likely crash when the monitoring process is enabled, the workaround modifies the PVR to make it automatically reboot itself when the crash occurs thus giving it a chance to eventually complete the EPG update, even though it may keep crashing all night.

At startup, the PVR attempts to go online and contact a manufacturer related website. This website has been taken offline so an annoying message is displayed on screen "Connection status: Connecting". This message is harmless and can be removed by taking any action that redraws the screen such as pressing "guide" or "pvr" on the remote. It is hoped that an updated patch will remove this message some time in the future.

Using the Workaround

The workaround is applied to the PVR as a set of 'patches' to the existing firmware. These patches modify the way the PVR operates to permit choosing whether the monitoring process is run at startup. Two unused buttons on the remote are used to instruct the PVR whether to start the monitoring process.

Blue Button. (viewing mode)

A long press of the blue button on the remote commands the PVR to boot with monitoring disabled. This avoids the crash completely and although the EPG will not be updated, all other functions of the PVR continue to work as normal. Thus you would choose this mode when you want to use the PVR for normal viewing.

Yellow Button. (EPG mode)

A long press of the yellow button on the remote commands the PVR to boot with monitoring enabled. The PVR is very likely to crash when started with monitoring enabled so would normally be put in this mode overnight or when not in use. To help avoid the crash happening immediately after the PVR is started, the PVR is immediately put into the 'recordings' view, displaying the previously recorded programs. This alleviates (but does not entirely avoid) the very common case where the crash happens as soon as the PVR starts. This mode is only useful when the PVR is not being used and allows the EPG to be updated and any scheduled recordings to take place. When the PVR is started in EPG mode it may restart several times before finally starting up successfully - this is normal so just let it do so.

Thus the blue and yellow buttons on the remote allow the user to choose whether the PVR is in 'viewing' or 'EPG' mode.

The standby message is altered so that it is different in EPG and normal modes. To check which mode you are currently in, briefly put the PVR into standby to see the on-screen message.

Note that it is not possible to run a channel scan when in normal mode. The scan will appear to start normally but never find any channels. The PVR must be in EPG mode in order for a channel scan to work. It may crash (and reboot) while scanning for channels, if so just run the scan again until it succeeds.

Summary of changes

A number of changes are made when the workaround is applied to the PVR. In addition to the blue and yellow buttons having new functions, other usability and convenience changes are made.

Passwords.

The root password is changed to 3view. In addition a new user is added to the system: username 3view password 3view. It is highly recommended that all subsequent logins are done with the 3view username rather than the root username. See the section of this site named "Getting out of trouble" for details on how these passwords can be changed if desired.

Startup script.

The original startup process is complex and convoluted. The original startup script is moved aside and two new scripts installed in it's place. These are compact, easier to comprehend and execute faster, therefore the PVR starts faster. The new startup scripts also contain the extra pieces needed to implement 'viewing' and 'EPG' modes as well as fixes to known bugs in the original startup script.

Standby and splash screens.

The splash screens shown late in the startup process are modified to show which mode the PVR is starting in. In addition, the message displayed on screen when the PVR is in standby is changed to show which mode the PVR is currently running in.

Binaries (programs).

Some of the binaries (programs) contained in the original firmware are altered (patched) to change the way they operate. All files modified in this way are backed up before being modified.

Debugging.

When a process crashes the PVR automatically collects debugging information about the crash, presumably intended to help support engineers diagnose the problem. As there are no support engineers any more and this process can take 20 seconds or so to complete, it has mostly been disabled to make restarting significantly quicker.

Backups.

Additional components are added to the PVR to enable automatic backups of the internal database and last known DVB channel list. These can be used to recover if either of these items become corrupt. Details on using these backups in the event that either of them becomes damaged or corrupt will be added to the "Getting out of trouble" section of this site at a later date.

Secure Shell.

Secure Shell (or 'ssh' as it's more normally called) is a service that runs on the PVR and allows secure remote logins and file transfers to and from the PVR.

Scheduler Daemon (cron)

A scheduler daemon (service) is installed which can be used to run specific tasks at certain times of the day or days of the week/month/year. This is used to schedule the automatic backups mentioned above.

Hosts file.

The file "/etc/hosts" is modified to stop the PVR attempting to connect to manufacturer related websites that no longer exist. In addition the PVR is programmed to ping www.google.com once a second the entire time it is on to determine if it has a working internet connection. An entry in the /etc/hosts file is added pointing www.google.com to the local host to stop this unnecessary behaviour.

Calling home.

The PVR was designed to open a "backdoor" to the original manufacturers servers to allow remote logins by support staff. As the servers and support staff no longer exist the patch disables this. It can be re-enabled from the "support" menu but will have no useful effect.

Filesystems.

The root filesystem is mounted read only by default. This is a sensible design. However the patch adds two new commands which are only available to the 3view user to permit changing this. The command "unsafe" remounts the root filesystem read write and the command "safe" mounts it read only. It is recommended to use these commands only when absolutely necessary.

Rescue system.

By default, when the PVR is booted into the rescue system there is no telnet daemon running. The patch alters a key stored in the PVR's memory to enable telnet in the rescue system. To access the PVR when it is booted into the rescue system you must use the username "root" and password "avtrex". Due to the way the rescue system works, the username and password for the rescue system cannot be changed.

Scheduled mode changes.

It is possible to program the PVR to automatically boot into EPG or normal mode at set times of the day. This is done using the cron scheduler installed by the patch. Details on how to do this will be added to this guide at a later date, however if you are already familiar with cron then example entries are included in the installed crontab that you can customise (they are commented out so are disabled by default).

Getting out of trouble

When the PVR is operating in EPG mode, it can get stuck in a reboot loop. This is when it continuously restarts and then immediately crashes. To resolve this press and hold the blue button on the remote until the PVR restarts in normal mode.

Discussion about this patch and help and assistance to those wishing to use it can be found on the excellent 3viewpvr.info forums. These forums can be found at the following site:

http://www.3viewpvr.info/forum/

Many thanks to digitl for providing and maintaining this essential resource.

The patch installation procedure can go wrong if not followed exactly as instructed later in this guide. Should this happen to you, the simplest and recommended repair procedure is to use the PVR's built in rescue system to re-install the official firmware. This will overwrite any changes made during the patch installation process and should get you back into a working system. Re-installing the firmware via the PVR's rescue system will not delete any of your recordings or previously scheduled recordings / series recordings.

In the event that re-installing the firmware does not recover your system, check to see if you can telnet into the PVR. If you can then all is not lost. Seek guidance on the 3viewpvr.info forums for other things you can try.

The patch enables telnet in the rescue system, so in many cases a PVR that will not start properly can be investigated and possibly fixed by accessing it when booted into the rescue system. The rescue system username is "root" and password is "avtrex". The use of telnet in the rescue system is beyond the scope of this guide, however those familiar with Linux may find this useful.

If all else fails, the last option is to use the PVR's rescue system to reformat the disk and re-install the firmware. This will delete everything, so don't use this option unless all other methods and guidance has failed.

The patch sets the root and 3view users password to "3view" These can both be changed if desired. The procedure for changing passwords is relatively simple but must be followed carefully:

Log into the PVR as user 3view.

Enter the following commands exactly as shown, pressing enter after each line. In the example below we are changing the password for the 3view user:

unsafe

passwd 3view

You will be asked to type in the new password twice. then When that is done, enter the following command and press enter:

safe

The new password takes effect immediately.

Installation

If you have not read and understood all the previous pages in this guide, then please go back now and carefully read them again.

Prerequisites.

You must be running the last official firmware version V37956.1. No other firmware version can be used with these patches and the installation procedure will refuse to proceed if you do not have the required firmware version installed.

The PVR must be connected to your network and have access to the Internet. The patch procedure downloads the required files from the Internet so cannot be used without a working network connection to the PVR. If you do not have your PVR connected to the Internet, an alternative method of installing the patch is given at the end of this page. If possible, it is recommended that you use the Internet method (the first method described below) as it is simpler and safer.

Telnet.

The commands you will be instructed to enter must be typed into a telnet connection to the PVR. If you do not know how to use telnet or even what telnet is, please refer to the guide posted on the 3viewpvr.info forums and practice using telnet before you attempt to go any further.

Installation Procedure:

To start the installation procedure you must first telnet into the PVR as the user root. The root password is:

qj34jscj6thdj47opsbnwh56u7j105nfdhrt6yhiogn67mfjhwio2456huwqnaakty

Copy the password and paste it into your telnet session when you are asked for it.

Now you must enter the following commands, exactly as shown here. Take it slowly and double check everything as you type and again before you press enter at the end of each line. It cannot be stressed strongly enough that you really, really don't want to make any mistakes.

Enter each line below, one at a time, and press enter at the end of each line. If you see any errors or warnings stop. Check what you type carefully.

The part of line four in (brackets) below is a note and should NOT be typed in. Note that there are spaces in the commands on lines one, two and three. These spaces are required so ensure you type them as they are shown.

cd /tmp

wget http://159.253.213.108/3viewPVR/codgev1.tar

tar -xf codgev1.tar

./install.sh   (note: that's a dot slash at the beginning)

The installation should now start and will print it's progress as it goes. At the end of the installation it will ask you to reboot. If all goes well just type reboot and press enter. If you have any problems, before you close the telnet session copy and paste the entire transcript somewhere safe so you can later show others what happened. This will greatly help diagnosis and repair (should that be necessary).

If, for whatever reason, you cannot connect your PVR to the Internet before you install the patch, there is an alternative method that can be used. First, you must download the patch onto a USB stick. The patch can be downloaded from: **http://159.253.213.108/3viewPVR/codgev1.tar**

Put the patch file (codgev1.tar) into the root folder of the stick (i.e. not into any folder or sub-folder on the stick). Telnet into thr PVR as root using the password given above and run the following commands exactly as shown. Carefully read the section above for important information about entering these commands before you begin.

cd /tmp

cp mp0/codgev1.tar .

tar -xf codgev1.tar

./install.sh

Once the installation has finished you should reboot the PVR. Type the command reboot into the telnet session or use the "restart system" option from the PVR's setup menu.

If all went as expected you should now have a PVR that can be used without crashing and with some useful extra features.

Acknowledgements

These patches contain software provided as source code by third parties which have been compiled by the patch author to run on the PVR. The software was compiled "as-is" - no changes were made to the code prior to compilation.

Rsync   http://rsync.samba.org

OpenSSH   http://www.openssh.org

ISC Cron   ftp://ftp.isc.org/isc/cron/cron_4.1.shar

The website www.3viewpvr.info has been (and continues to be) essential in the creation this patch. Without this site, the co-operation of it's owner and the many forum members who have contributed ideas and assistance, this patch would not exist. If you find this patch useful and want to contribute something back in return, please consider using the donation link on the www.3viewpvr.info site to contribute to the cost of running it.

http://www.3viewpvr.info