Future Technology Devices International Ltd.

Technical Note TN_129

Driver Release Signing

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Microsoft x64 bit operating systems (vista and Windows 7) will not allow unsigned drivers to be installed by default. This technical note will discuss some possible workarounds to allow for driver testing and certification. Further information on this subject may be obtained from Microsoft.

Future Technology Devices International Limited (FTDI)

Unit1, 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH United Kingdom
Tel.: +44 (0) 141 429 2777 Fax: + 44 (0) 141 429 2758
E-Mail (Support): **support1@ftdichip.com** Web: http://www.ftdichip.com

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1 Introduction

The drivers supplied by FTDI contain only our default settings but are certified to install on all variants of Windows OS. OEMs that choose to edit the driver may do so, but the WHQL certification will be invalidated.

Microsoft x64 bit operating systems (Vista and Windows 7) will not allow unsigned drivers to be installed by default. This technical note will discuss some possible workarounds to allow for driver testing including disabling the certification check in Windows and self certifying the driver.

Further information on this subject may be obtained from Microsoft.

For further advice on valid FTDI driver edits refer to:

http://www.ftdichip.com/Support/Documents/AppNotes/AN_107_AdvancedDriverOptions_AN_000073.pdf

An FTDI utility which helps users edit the driver is available from FTDI at:

http://www.ftdichip.com/Support/Utilities/FT_INF.zip

1.1 Required resources

The following items are required to create the release signing of the edited FTDI driver.

1. PC running Windows OS
2. The FTDI driver – provided by FTDI for accessing the FTDI peripheral silicon from a Windows PC.
3. Verisign (or equivalent) certificate – Provided by Verisign and used by Microsoft to authenticate code
4. Microsoft Cross certificate – Provided by Microsoft and used to allow the release signing against your Verisign (or equivalent) certificate
5. Windows DDK or WDK – Development tools provided by Microsoft (free download)

2 Disabling the OS Certification Check.

If the F8 key on the keyboard of a PC is held down while the OS is booting up the menu window appears. The last item on this menu is to disable the driver certification check. Select this option before continuing Windows startup. This will allow non-certified drivers to be loaded.

Note: This feature needs to be repeated every time the PC is rebooted but it does allow for developers to test customised drivers.

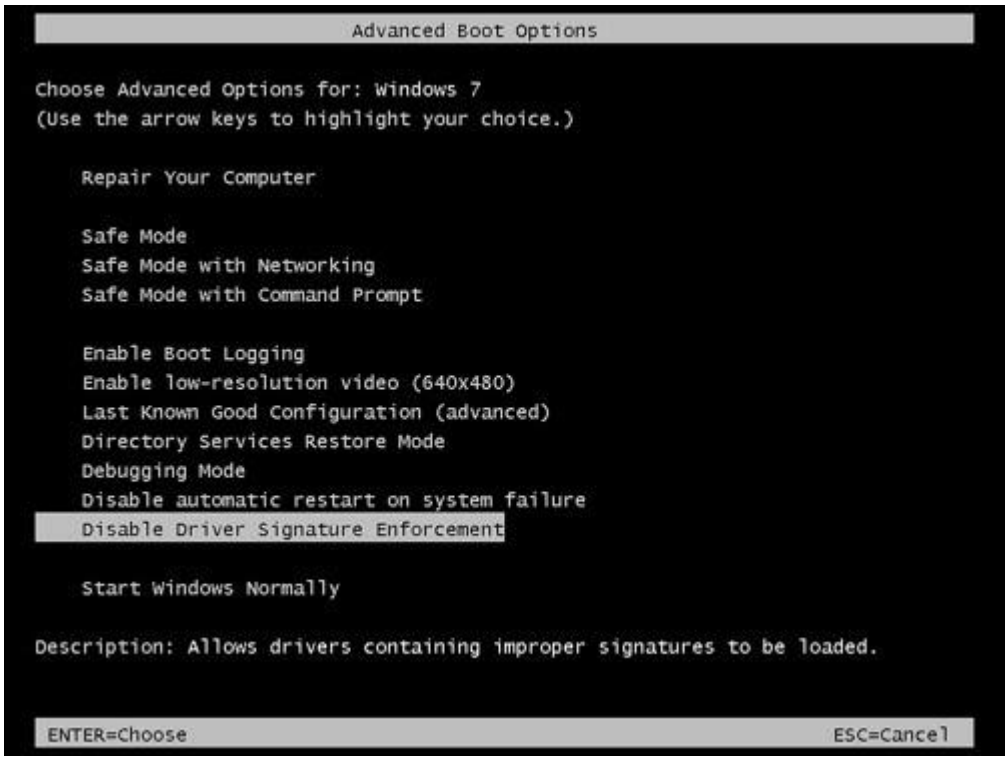

Figure 2.1: Windows 7 advanced Boot options

3 External Certificates

3.1 Trusted Certificates

FTDI use Verisign (www.verisign.co.uk) as their trusted certificate source. This certificate is required when signing the driver. The certificate file provided from Verisign is a *.pfx file which is a combination of a public certificate key (*.spc) and a private certificate key (*.pvk). Any fees charged for this certificate are charged and payable to Verisign.

When you receive your certificate it should be copied into your personal certificate store on the machine the modified driver package is generated on.

There are other providers that Microsoft accept as trusted sources. These are listed on their website at: http://www.microsoft.com/whdc/driver/install/drvsign/crosscert.mspx

Note: You can view what certificates available on a particular PC with START-> RUN -> Certmgr.msc

3.2 Cross certificates

A Microsoft cross certificate is available for free from their website. This is a *.cer file and must correspond to the issuer of the code-signing certificate being used. This will provide the link between the trusted certificate you own and Microsoft. In our setup we use the Microsoft/Verisign cross certificate.

http://download.microsoft.com/download/d/7/f/d7fea3df-4e87-4f8e-b748-212334653028/_MSCV-VSClass3.exe

When you receive your certificate it should be copied into your personal certificate store on the machine the modified driver package is generated on.

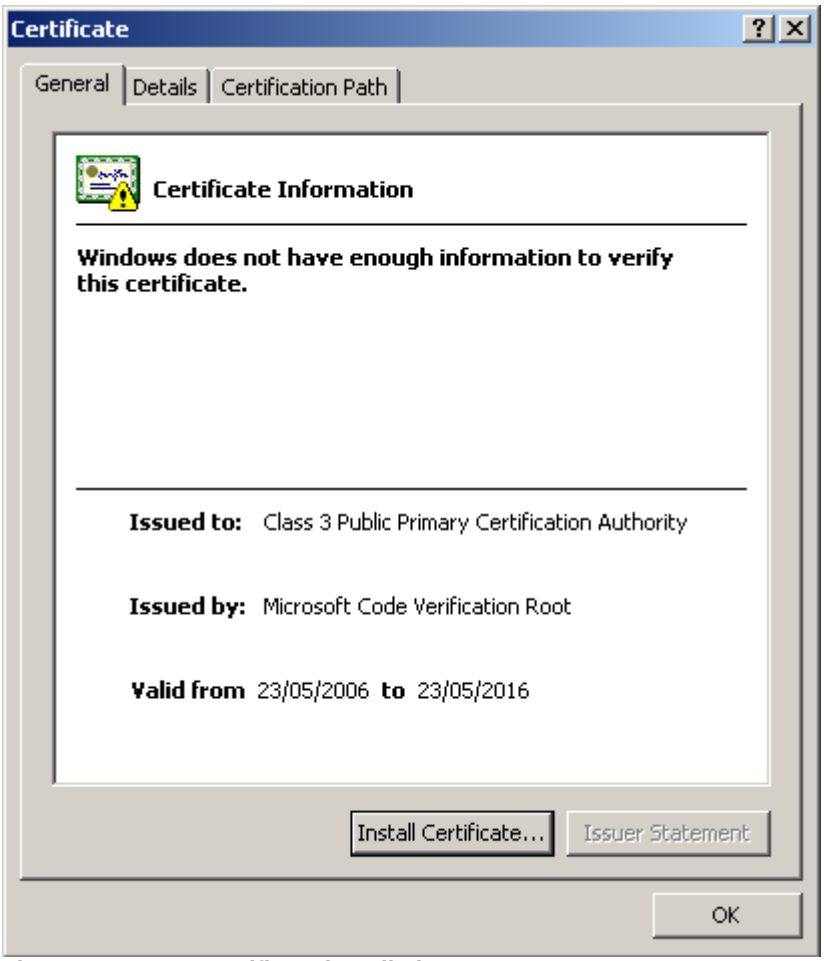

Figure 3.1: Cross certificate installation.

Simply select the Install certificate button and accept the defaults in the next popup window.

4 Preparing the Driver

4.1 Downloading

The FTDI driver may be downloaded from the FTDI website in a zip file.
http://www.ftdichip.com/Drivers/VCP.htm

This file should be downloaded and unzipped before starting the signing process.
Free tools such as WinZip or WinRAR may be used to unzip the package.
The driver package provided uses a common inf file with separate x86 and x64 .sys files.

The inf files are in the top level folder. The x86 specific files are in the i386 folder and the x64 specific files are in the AMD64 folder.

The driver is effectively in 2 halves. The bus layer (FTDIBUS.inf and FTDIBUS.sys) must always be used. The Virtual Com Port Layer (VCP – ftdiport.inf and ftser2k.sys) is an optional filter layer that does not have to be installed, but must be present in the driver package for a reseller submission.

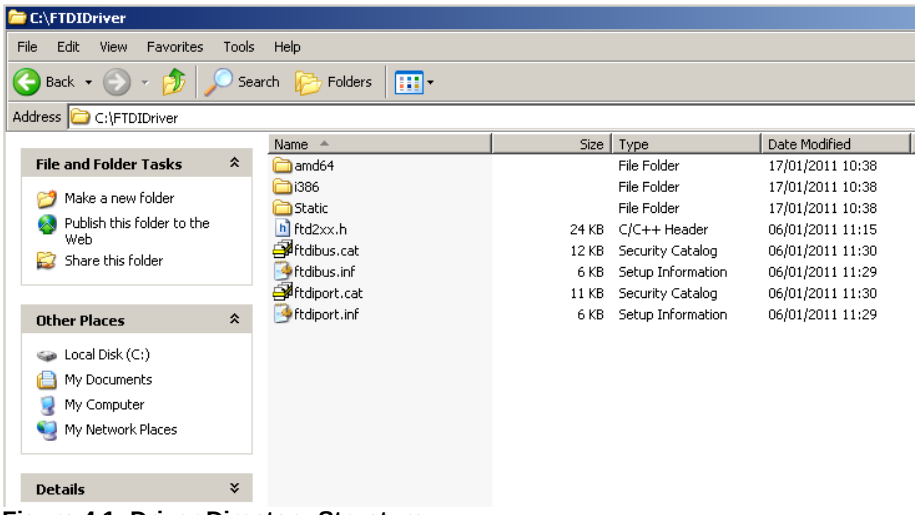

Figure 4.1: Driver Directory Structure.

Note: The folder used in this example and further paragraphs is C:\FTDIDriver. The OEM may use any folder name they prefer.

4.2 Creating the CAT file

CAT files are catalogue files that contain the information about the driver package. These need to be generated from the inf files to allow the signing to be done.

Windows WDK (or DDK) must be installed and running on the PC. This is a free download from the Microsoft Download Centre.

Open the WDK command prompt (Start -> Windows Driver Kits -> (WDK version) -> (build environment) and send the command:

Inf2cat /driver: C:\FTDIDriver /os:vistax64,7_x64

This will use the driver inf files in the FTDIDriver folder to create two CAT files (ftdibus.cat and ftdiport.cat) with the inf2cat.exe that is part of the DDK. The CAT files specify VISTA and Windows 7 x64 OS.

These CAT files replace the existing ones supplied with the download.

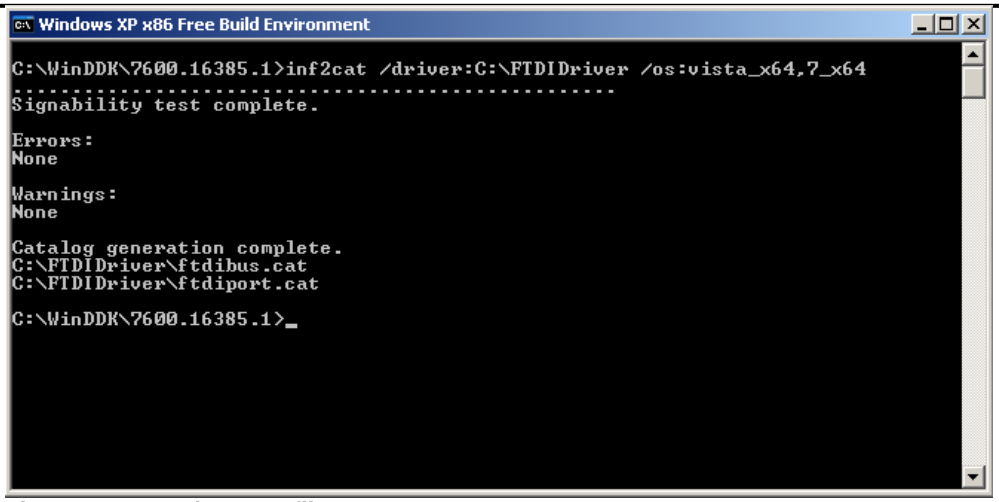

Figure 4.2: Creating CAT file.

4.3 Signing the CAT File

Signing the CAT files will allow for installation on the 64 bit versions of VISTA and Windows 7.

You must sign both the ftdibus.cat and the ftdiport.cat files.

Signtool sign /v /ac "C:\MSCV-VSClass3.cer" /a /s MY /n "Future Technology Devices International Ltd" /t http://timestamp.verisign.com/scripts/timestamp.dll C:\FTDIDriver\ftdibus.cat

Signtool sign /v /ac "C:\MSCV-VSClass3.cer" /a /s MY /n "Future Technology Devices International Ltd" /t http://timestamp.verisign.com/scripts/timestamp.dll C:\FTDIDriver\ftdiport.cat

Notes:
"C:\MSCV-VSClass3.cer" is the location that the Microsoft cross certificate was stored at.
"Future Technology Devices International Ltd" is the Certificate Number (CN Value) for our Verisign certificate.
Your strings may be different.

5 Redistribution of the Driver File

The edited and newly certified driver may be re-zipped up and redistributed provided it is for use with FTDI silicon.

Creating installers and self extracting zip files is beyond the scope of this technical note and up to the OEM as to how they wish to redistribute the files.

However for further reading the OEM may wish to refer to:
http://www.microsoft.com/whdc/driver/install/difxtools.mspx
http://msdn.microsoft.com/en-us/library/ff553615.aspx

6 Contact Information

Head Office – Glasgow, UK

Future Technology Devices International Limited
Unit 1, 2 Seaward Place, Centurion Business Park
Glasgow G41 1HH
United Kingdom

Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales1@ftdichip.com
E-mail (Support) support1@ftdichip.com
E-mail (General Enquiries) admin1@ftdichip.com
Web Site URL http://www.ftdichip.com
Web Shop URL http://www.ftdichip.com

Branch Office – Taipei, Taiwan

Future Technology Devices International Limited (Taiwan)
2F, No 516, Sec. 1 NeiHu Road
Taipei 114
Taiwan, R.O.C.
Tel: +886 (0) 2 8797 1330
Fax: +886 (0) 2 8751 9737

E-mail (Sales) tw.sales1@ftdichip.com
E-mail (Support) tw.support1@ftdichip.com
E-mail (General Enquiries) tw.admin1@ftdichip.com
Web Site URL http://www.ftdichip.com

Branch Office – Hillsboro, Oregon, USA

Future Technology Devices International Limited (USA)
7235 NW Evergreen Parkway, Suite 600
Hillsboro, OR 97123-5803
USA
Tel: +1 (503) 547 0988
Fax: +1 (503) 547 0987

E-Mail (Sales) us.sales@ftdichip.com
E-Mail (Support) us.admin@ftdichip.com
Web Site URL http://www.ftdichip.com

Branch Office – Shanghai, China

Future Technology Devices International Limited (China)
Room 408, 317 Xianxia Road,
ChangNing District,
ShangHai, China

Tel: +86 (21) 62351596
Fax: +86(21) 62351595

E-Mail (Sales): cn.sales@ftdichip.com
E-Mail (Support): cn.support@ftdichip.com
E-Mail (General Enquiries): cn.admin1@ftdichip.com
Web Site URL: http://www.ftdichip.com

Distributor and Sales Representatives

Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

List of Figures

Appendix A – Terminololgy

CAT	Catalogue File
DDK	Driver Development Kit
FTDI	Future Technology Devices International
OEM	Own Equipment Manufacturer
USB	Universal Serial Bus
VCP	Virtual Com Port
WDK	Windows Development Kit
WHQL	Windows Hardware Quality Labs

Appendix B – References

Microsoft Instructions:
http://www.microsoft.com/whdc/driver/tips/ifs_signing.mspx

Microsoft Cross certificate:
http://www.microsoft.com/whdc/winlogo/drvsign/crosscert.mspx

FTDI Drivers:
http://www.ftdichip.com/Drivers/VCP.htm

FTDI Advanced Driver Options:
http://www.ftdichip.com/Support/Documents/AppNotes/AN_107_AdvancedDriverOptions_AN_000073.pdf

FTDI INF Generator:
http://www.ftdichip.com/Support/Utilities/FT_INF.zip

AN_101 Using Microsoft's WHQL Process for Certifying Customer Modified FTDI Driver Files
http://www.ftdichip.com/Support/Documents/AppNotes/AN_101_WHQL_Certified_Driver_Process.pdf

TN_128 Preparing an FTDI Based Periphera for USB-IF Certification
http://www.ftdichip.com/Support/Documents/TechnicalNotes/TN_128_Preparing_for_USB-IF_Certification.pdf

Appendix C – Revision History

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