How to Remote Debug on Windows-CE devices with Microsoft Visual Studio

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Document History:

Doc Version	Date	Author	Comment
1.0	2013/9/25	Tony Liu	First edition
1.1	2013/11/05	Ryan Tsai	Add exception processing
1.2	2014/10/01	Ryan Tsai	Modify context and add
			troubleshooting
1.3	2014/12/26	Quentin Lee	Modify context

1. Introduction

This manual contains the information you need to remote debug on Windows-CE devices based target device.

Advantech provides library and sample code which allows developers and end users to connected I/O modules, perform configurations, and simple testing of the I/O.

This manual also supplies information about how to apply Advantech *DiagAnywhere* software to remote control Advantech controllers, including accessing remote desktop and file transfer.

1.1. Organization of This Manual

This user manual is divided into the following sections:

- Introduction
- <u>Setup environment</u>
- Start Debugging
- Troubleshooting

Introduction

This section gives the user a basic idea of this manual.

Setup environment

This section describes how to set up remote debug environment.

Start Debugging

This section gives the user step-by-step procedures of remote debugging.

Troubleshooting

This section provides troubleshooting information and procedures for remote debugging.

2. Setup environment

This section describes how to set up your remote debug environment on host PC and the target device.

2.1. Target Device

You need to copy the CoreCon files to target device. On the development computer, these files are automatically installed when you install Microsoft Visual Studio. They typically install to

C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Target\wce400\<Hardware Platform>

For APAX-5520/5620, which is based on the ARM hardware platform, these files are in C:\Program Files\Common Files\Microsoft Shared\CoreCon\1.0\Target\Wce400\ **armv4i**; For APAX-6572 ADAM-5560, copy files in **x86** directory.

The CoreCon files to copy to target device are:

- Clientshutdown.exe
- Cmaccept.exe
- ConmanClient2.exe
- DeviceDMA.dll
- eDbgTL.dll
- TcpConnectionA.dll

Now, we apply **Advantech** *DiagAnywhere* to transfer the above files to the target device. For example, we create a folder named "WinCEDebug" under "Harddisk" on target device, and then copy CoreCon files to the folder.

🍅 Diag	Anywhere File Tran	isfer - APA)	x-5520(172.18	.3.1)					
Local	C \Program Files\Cor	nmon Files\Mi	crosoft Shared \Cc	neC 🗸 😭		Remote HardDisk\WinCEDebu	g		
Name		Size	Туре	Modified		Name	Size	Туре	Modified
Client	shutdown exe	28 KB	産用程式	2007/11/2		514c36hf-c13e-4091-a3a7	1 KB	檔案	2013/9/25
ПСМА	ccept.exe	31 KB	應用程式	2007/11/7		clientshutdown.exe	28 KB	應用程式	2013/9/25
Com	nanClient2.exe	85 KB	應用程式	2007/11/7		CMAccept.exe	31 KB	應用程式	2013/9/25
💽 Devic	eAgentTransport.dll	47 KB	應用程式擴充	2008/7/30		ConmanClient2.exe	85 KB	應用程式	2013/9/25
💽 Devic	eDMA.dll	40 KB	應用程式擴充	2007/11/7		S DeviceAgentTransport.dll	47 KB	應用程式擴充	2013/9/25
🛐 eDbg	TL.dll	79 KB	應用程式擴充	2007/11/7		S DeviceDMA.dll	40 KB	應用程式擴充	2013/9/25
emula	torstub.exe	50 KB	應用程式	2007/11/6		seDbgTL.dll	79 KB	應用程式擴充	2013/9/25
🛐 TepC	onnectionA.dll	61 KB	應用程式擴充	2007/11/7		emulatorstub.exe	50 KB	應用程式	2013/9/25
-					Ľ	S TcpConnectionA.dll	61 KB	應用程式擴充	2013/9/25
					+				
<	ш			>		<			>
8 objects				416.3 KB		9 objects			416.4 KB

2.2. Host PC

You have to configure Microsoft Visual Studio for debugging. In Visual Studio, go to the **Tools** menu and click **Options**.



You will then be prompted for the options dialog box. Expand **Device Tools** and click **Devices**. Under Show devices for platform, select **Windows CE**. Set **Windows CE Device** as default device. Select **Windows CE Device** in Devices list and press **Properties** to set connection configuration.

Options	2 🗙
 Environment Projects and Solutions Source Control Text Editor Database Tools Device Tools Device Tools General Devices Form Factors HIML Designer Office Tools Test Tools Test Tools Test Tools Windows Forms Designer Workflow Designer 	Show devices for platform: Windows CE Deyice Save As Rename Delete Default device: Windows CE Device
	OK Cancel

Set default output location as Program Files Folder.

Under Transport, select **TCP Connect Transport** and click **Configure**.

Windows CE Device Properties	? 🔀
Default output location on device: Program Files Folder	~
T <u>r</u> ansport: TCP Connect Transport	<u>C</u> onfigure
Bootstrapper: ActiveSync Startup Provider	Con <u>fig</u> ure
Detect when device is disconnected	
	OK Cancel

You will then be prompted for the TCP/IP transport window.

Select **Use specific IP address**, and enter the target device's IP address. Click **OK** as needed to exit the dialog box.

Configure TCP/IP Transport	2 🛛 🤶 🔀
<u>U</u> se fixed port number:	5655
– Device IP address	
ODbtain an IP address auton	natically using ActiveSync
⊙ Uge specific IP address:	
172.18.3.1	~
	OK Cancel

3. Start Debugging

Now that you have set up Visual Studio to connect to target device, you need to prepare target device to connect to Visual Studio.

3.1. Connect to Visual Studio

You can connect to target device by using Advantech *DiagAnyhwhere*. Click "Start->Programs->Command Prompt" and open a command prompt.



Navigate to the directory to which we copied the connectivity files.

For more detailed information about directory path, see <u>Chapter 2.1</u>.

At the command prompt, type conmanclient2.

Open another command prompt, type: cmaccept.



Note!

Quickly move to the next step because you have only **three minutes** to initiate a connection between your development computer and your device.

3.2. Start to Debug

Now, you can deploy your application for debugging.

Open the program you want to debug and set break points.



In the Visual Studio, on the Debug menu, click Start Debugging.



You will then be prompted for the dialog box. Select **Windows CE Device** and click Deploy. Visual Studio will connect to your device and download your application onto it.

Deploy APAX-Main	? 🛛
Choose where to deploy your application.	Deploy
De <u>v</u> ice:	Cancel
HITACHI SH7750 HARP: SH4 Win32 (WCE SH4) NEC DDB-VR5500A: MIPSII Win32 (WCE MIPSII) NEC DDB-VR5500A: MIPSII FP Win32 (WCE MIPSII FP) NEC DDB-VR5500A: MIPSIV Win32 (WCE MIPSIV) NEC DDB-VR5500A: MIPSIV_FP Win32 (WCE MIPSIV_FP) Pocket PC 2003 Device Pocket PC 2003 SE Emulator Pocket PC 2003 SE Square Emulator Pocket PC 2003 SE Square WGA Emulator Pocket PC 2003 SE Square VGA Emulator Pocket PC 2003 SE VGA Emulator USA Windows Mobile 5.0 Smartphone R2 QVGA Emulator Windows CE Device	
Show me this dialog each time I deploy the application	

Note!

On target device, the system will create the program folder under **Program Files** and copy your application automaticity while starting to debug. If you encounter the problem below, it means that your program calls functions in DLL file. You have to copy you DLL file from host PC to target device.

Microsoft Visual Studio					
8	Unable to start program '%CSIDL_PROGRAM_FILES%\APAX_Main\APAX-Main.exe'. 系統找不到指定的檔案。				
	確定				

You can apply **Advantech** *DiagAnywhere* to transfer DLL files to program folder on target device. The program folder can be found under **Program Files.**

🍅 DiagAnywhere File Trai	nsfer - APAI	K-5620AE(192.10	58.1.55)					
Local C:\Program Files\Adv	/antech\Adam	Apax.NET Class Lib	rə 🔽 😭		Remote Program Files\AP	AX_Main		× 🛍
Name	Size	Туре	Modi 🔨		Name	Size	Туре	Modified
🐏 APAX-5080.pdb	72 KB	Program Debug	2014/:		🔊 Advantech Adam DLL	342 KB	應用程式擴充	2014/10/1
🐏 APAX-5082.pdb	52 KB	Program Debug	2014/:		🛐 Advantech.Common.dll	36 KB	應用程式擴充	2014/10/1
🐏 APAX-Common.pdb	22 KB	Program Debug	2014/:		🔊 Advantech Protocol DLL	, 28 KB	應用程式擴充	2014/10/1
🐏 APAX-Controller.pdb	22 KB	Program Debug	2014/:		🔊 APAX-5013.dll	27 KB	應用程式擴充	2014/10/1
🐏 APAX-IOModule.pdb	18 KB	Program Debug	2014/:		🛐 APAX-5017.dll	27 KB	應用程式擴充	2014/10/1
🐏 APAX-Main.pdb	30 KB	Program Debug	2014/:		🛐 APAX-5017H.dll	25 KB	應用程式擴充	2014/10/1
🔮 Advantech.Adam.xml	761 KB	XML Document	20138		🛐 APAX-5018.dll	27 KB	應用程式擴充	2014/10/1
🖭 Advantech.Common.xml	181 KB	XML Document	2013/		🛐 APAX-5028.dll	32 KB	應用程式擴充	2014/10/1
📄 Advantech.Protocol.xml	59 KB	XML Document	2013/	لسنسا	🔊 APAX-5040.dll	17 KB	應用程式擴充	2014/10/1
TAPAX-Main.exe	14 KB	應用程式	2014/:		🛐 APAX-5045.dll	27 KB	應用程式擴充	2014/10/1
🔊 Advantech.Adam.DLL	342 KB	應用程式擴充	2013/	-	🔊 APAX-5046.dll	23 KB	應用程式擴充	2014/10/1
🔊 Advantech.Common.dll	36 KB	應用程式擴充	2013/		🛐 APAX-5060.dll	23 KB	應用程式擴充	2014/10/1
🔊 Advantech.Protocol.DLL	28 KB	應用程式擴充	2013/		🔊 APAX-5080.dll	57 KB	應用程式擴充	2014/10/1
🔊 APAX-5013.dll	27 KB	應用程式擴充	2014/:		🛐 APAX-5082.dll	35 KB	應用程式擴充	2014/10/1
🔊 APAX-5017.dll	27 KB	應用程式擴充	2014/:		🛐 APAX-Common.dll	11 KB	應用程式擴充	2014/10/1
🔊 APAX-5017H.dll	25 KB	應用程式擴充	2014/:		🛐 APAX-Controller.dll	12 KB	應用程式擴充	2014/10/1
🔊 APAX-5018.dll	27 KB	應用程式擴充	2014/:		🛐 APAX-IOModule.dll	5 KB	應用程式擴充	2014/10/1
🔊 APAX-5028.dll	32 KB	應用程式擴充	2014/:		📩 APAX-Main.exe	14 KB	應用程式	2014/10/1
🔊 APAX-5040.dll	17 KB	應用程式擴充	2014/:					
🔊 APAX-5045.dll	27 KB	應用程式擴充	2014/:					
🔊 APAX-5046.dll	23 KB	應用程式擴充	2014/:					
🔊 APAX-5060.dll	23 KB	應用程式擴充	2014/:					
🔊 APAX-5080.dll	57 KB	應用程式擴充	2014/:					
🔊 APAX-5082.dll	35 KB	應用程式擴充	2014/:					
🔊 APAX-Common.dll	11 KB	應用程式擴充	2014/:					
🔊 APAX-Controller.dll	12 KB	應用程式擴充	2014/:					
睯 APAX-IOModule.dll	5 KB	應用程式擴充	2014/: 🧹					
<			>		<	1111		>
36 objects			2.3 MB;		18 objects			762.0 KB;

After the program has been successfully deployed, you will see the program was stopped at break point.

Ng APAX-Controller-WinCE-Sample (Debugging) - Microsoft Visual Studio		
<u>File Edit Yiew Refactor Project Build Debug Tools Test Window H</u> elp		
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Windows CE Device 🔹 🔮 🚛 🗛 🚛 🗛 🖕 🕨 🗉 🖬 🖓 🖓 🖬	3 • ₂	
Process: [Dx8376336E] APAX-Main.e - Thread: [Dx837630AA] Main Thread - 🍸 🐺 Stack Frame: APAX-Main.ex	wIAPAX_Main.Fc 🔹 🖕	
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<pre>{ #essageBox.Show("Get controller information failed!\nPlease check the d] catch f</pre>	<pre>evice1", "Error"); panel tef this.m_dsInfoLocalSys, m_ScanTime_LocalSys[0]); ref this.m_dsInfoLocalSys, m_ScanTime_LocalSys[0]); ref this.m_dsInfoLocalSys, m_ScanTime_LocalSys[0]);</pre>	
e	2	

On target device, you will see the program halts. You can resume the program by issuing another debugging command, such as continue, step, or next.

APAX-Lon	nple									(3 ×
Refresh	Local	Exit									
⊡- <mark>Local 9</mark> 504	ystem 6(S3)		ΑΡΑΧ-ΡΑ	C							
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			0 1 2								
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APAX-Driv	/er Vers	ion:2.	02.								
🐉 Start	🐻 Comi	mand P	Prompt	APAX	(-Sample				🕹 <mark>😼</mark> 🔕 (6:52 PM 【	3 🏸

Now, it is your turn to debug all your stuff.

4. Troubleshooting

4.1 ActiveSync bootstrap initialization failed

APAX*Coupler*Winde*Example * Microsol	t visual Studio					
<u>File Edit View Project Build Debu</u>	g D <u>a</u> ta <u>T</u> ools Te <u>s</u> t <u>W</u> indow <u>H</u> elj					
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		Windows CE Device	• 😼 🌆 🖅 🗛			
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-	107	• atterse	lect_coupletsion		•	Solution 'APAX-Coupler-Win
I nete ale no Usable controls in this group. Trag a nete note this test to add it to the toolbox.	106 'When select any 1/D Moh 107 Pinvis Buh AfterSelect Q. 108 Bin Slot Ke Integer 101 Bin Slot Ke Integer 102 Bin Slot Ke Integer 103 Slot - Convert Joint 104 Horgbox/The South 105 Functional Action Science 106 Bin Slot Ke Integer 107 Bin Slot Convert Joint 108 Horgbox/The South 109 The Apadobale Action Convert Joint 109 The Git Gitting Conpart 101 Tabel Convert Joint 102 "East Convert 103 Tabel Citting Conpart 104 Tabel Citting Conpart 105 Tabel Citting Conpart 106 Tabel Citting Conpart 107 Tabel Citting Conpart 108 Tabel Citting Conpart 104 - apadbolale - Mer	<pre>Lies, replace related APX /10 mobule (usercontrol) at upref al (b)/*i e & Treebtob) upref al (b)/*i e & Treebtob) upref al (b)/*i e / Treebtob) to demo APX/* + e / Text + *7*, MegRoxStyle.Yebbo, ** mont, 0, *5013*, 0, iOmplength) = 0) Then Form_APX_5013*m_al27, Cirpop(Slot, Byte) m_Scanling form_APX_5013*m_al27, Cirpop(Slot, Byte) m_Scanling form_APX_5017** 0, (Cinglength + 1)) = 0) Then Form_APX_5017** 0, *********************************</pre>	rignt panel Information") = HsgBozResult.No 1 _LocalSys(0)) .LocalSys(0)) .LocalSys(0))	Then	▲ H	(β- ja) APAX-Coupler-WinCE-E (β- ja) Apax_IO_Module_Library
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Emprist	[
1 Error 0 Warnings (i) 0 Messages					↓ <i>↓</i> ↓	
Description			File	L Column	Project	
 1 ActiveSync bootstrap initialization failed Application from http://go.microsoft.co 	I. Please connect/cradle a real device or d m/fwlink?linkid=67763	wnload the User-level Windows Mobile Device Center	Device Connectivity Component			
📸 Error List 🔂 Breakpoints 📷 Immediate W	indow 📰 Test Results					
Ready						ii 📾 😧 🕻

In host PC, execute the command "del /s "%USERPROFILE%\Local

Settings\Application Data\Microsoft\Corecon*.*" under command prompt.



On target device, you have to connect to visual studio again. For more detailed information about how to reconnect, see <u>Chapter 3.1.</u>

4.2 Mapping path failed

If you encounter this problem, check the following information on target device:

Microsof	Microsoft Visual Studio					
8	Unable to start program '%CSIDL_PROGRAM_FILES%\APAX_Main\APAX-Main.exe'. 系統找不到指定的檔案。					
	確定					

- Check whether the program fold exists under Program files. For more detailed information, see <u>Chapter 2.2.</u>
- Check whether the dynamic link library (.dll) exists in the specified folder. For more detailed information, see <u>Chapter 3.2.</u>

4.3 conmandClient2 execute abnormal

On the target device, close command prompt and execute **conmandClient2** again.

Pocket CMD v 6.00 > cd \harddisk\wincedebug harddisk\wincedebug> conmanclient2 harddisk\wincedebug>