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FAQ-130: How to automatically synchronize the time of XP-8xx7-CE6 / WP-8xx7 / VP-2xW7 over a network?

XP-8xx7-CE6, WP-8xx7 and VP-2xW7 support **SNTP** (Simple Network Time Protocol) **Client** for **Network Time Synchronization**. The available versions of the OS image and Utility for SNTP Network Time Synchronization are listed below.

The available versions of the OS image and Utility files

The SNTP Network Time Synchronization is supported since the following versions:

PAC Series	Model	OS image Version	Utility Version
XPAC	XP-8xxx-CE6	Ver.1.3.2.0	XPAC Utility Ver.1.0.2.3
WinPAC	WP-8x3x	Ver.1.2.0.3	WinPAC Utility Ver.2.0.2.0
WinPAC	WP-8x4x	Ver.1.6.0.0	WinPAC Utility Ver.2.0.1.5
ViewPAC	VP-23Wx	Ver.1.1.0.2	ViewPAC Utility Ver.2.0.1.6
ViewPAC	VP-25Wx	Ver.2.0.0.1	ViewPAC Utility Ver.2.0.2.0

Steps to setup the SNTP Client Network Time Synchronization

1. Check OS image version (download new version first and update it as <u>Ch.1.1</u>)

- 2. Check Utility version (download new version first and update it as $\underline{Ch.1.2}$)
- 3. Setup the SNTP time synchronization (if above version is available, go to $\underline{Ch.1.3}$)

Download Center

If it is not available version, please download the newest OS image or Utility at: http://www.icpdas.com/download/download-list.htm

According to your PAC to click on "XP-8000-CE6", "WinPAC-8000 download center" or "ViewPAC Series download center", and download the suitable OS image or Utility.

Development Toolkits / Softwares / Manuals

XPAC Series	
• XP-8000	• XP-8000-CE6 💌
• XP-8000-Atom	• XP-8000-Atom-CE6
	baci
WinPAC/ViewPAC Series	
WinPAC/ViewPAC Series WinPAC-8000 download center	WinPAC-5000 download enter
	WinPAC-5000 download enter ISaGRAF PAC Driver, User's Manual & DataSheet

The setting steps for the XPAC, WinPAC and ViewPAC are similar. In the next section, we use the WP-8x47 as an example to show how to set up the WP-8x47 as a SNTP Client for Network Time Synchronization and how to test it after setting up.

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Setting up WP-8x47 as an SNTP Client for Network Time Synchronization

1.1. The steps to update the WP-8x47 OS image

There are two ways to update the WinPAC OS:

- 1. Update from file: copy the package file (.exe) into the WinPAC and install on WinPAC (easier);
- 2. Update from Eshell tool program.

Here we use the first method: copy the package file (.exe) into the WinPAC to run the installation.

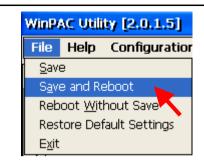
Please refer to the following website for the other method information: <u>http://www.icpdas.com/products/PAC/winpac/download/winpac_8000/download_os_images_c.htm</u>

1. Set up the root folder as the WP-8x47 FTP directory for easy updating

Run the WINPAC_Utility on the WinPAC desktop to set up the FTP Setting. When finishing, click [File] > [Save and Reboot] to restart the WP-8x47.

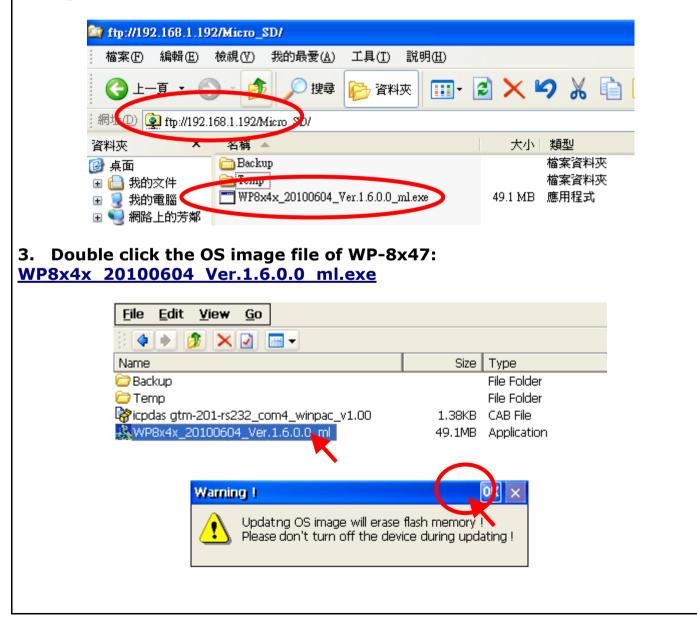
System Setting Ethernet Setting FTP Setting System Information Auto Execution M Access Login FTP Enable Allow Anonymous Enable Disable Allow Anonymous Enable Disable Allow Anonymous Enable Disable Disable Upload Disable Change FTP default download directory \Temp to: Setting Setting Isol 1234567890.== Tabl 9 W e r t t y u i 0 p []] CAPe a s d f 9 h j k l ; ' Shift z x c v b n m ; / + +	WinPAC Utility [2.0.1.5] File Help Configuration
FTP ● Enable ● Disable Allow Anonymous ● Enable ● Disable Allow Anonymous ● Enable ● Disable Upload Change FTP default download directory \Temp to:	
Upload Change FTP default download directory \Temp to:	FTP Image: Contract of the second s
Esc 1 2 3 4 5 6 7 8 9 0 - = ◆ Tab q w e r t y u i o p [] CAP a s d f g h j k l ; ' Shift z x c y b n m , / ←	Upload
CAP_a_s_d_f_g_h_j_k_l_; '] Shift_z_x_c_v_b_n_m_, . / . ←	Setting
	CAP a s d f g h j k l ; ' Shift z x c v b n m , / ←

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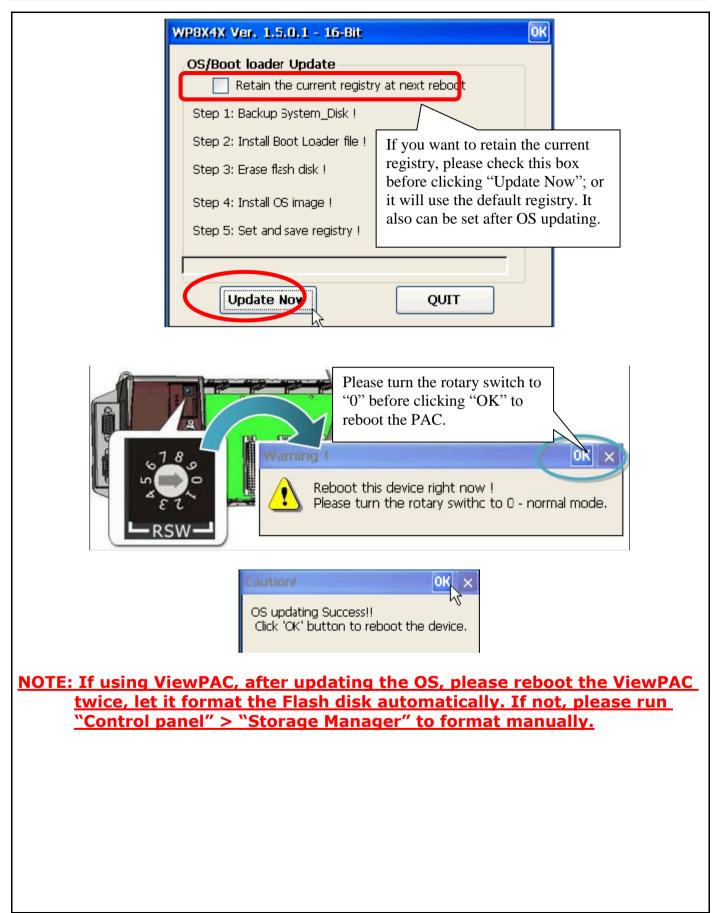


2. Copy the OS image file to the folder "Micro_SD" of the WP-8x47 PAC

On the PC, run the "Windows Explorer" and key in the FTP IP address of the WP-8x47 in the web address column, Ex: <u>ftp://192.168.1.192/</u>, please enter your WP-8x47's IP address. Change to the folder of "Micro_SD", then copy the OS image file into the PAC.



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1.2. The steps to update the WinPAC Utility

1. On WP-8x47 desktop, run the "WinPAC_Utility" to check if it is the available WinPAC OS version.

File Help Config	uration	
System Setting Ethe	ernet Setting FTP Setting System	n Information Auto Execution Multi-serial port
Slot 0:	Module Type:	WP-844x (96MB)
Slot 1:	Flash Type(System_disk):	Intel J3 95ns X 1
Slot 2:	Flash Type(OS):	Intel J3 95ns X 2
	64-bit Serial Number:	01-97-ED-8E-13-00-00-5D
Slot 3:	OS Version:	1.6.0.0 , 2010/06/04 14:54:05
Slot 4:	Eboot Version:	1.2.0.17 , 2010/06/04 11:33:30
Slot 5:	Backplane Version:	1.0.4.0
Slot 6:	CPU Version:	1.0.8.0
	WinPacSDK Version:	1.0.9.3
Slot 7:	WinPacNet Version:	1.2.0.6
	.NET Framework Version:	2.0.7045.00
	SQL CE Version:	3.5.5386.0
	Last Save Date:	Monday, July 05, 2010

- 2. If not, download the WinPAC_Utility.zip and decompress the file into a folder <u>ftp://ftp.icpdas.com/pub/beta_version/WinPac-8000/WP-8X4X_ce50/wp-8x4x_ce50/System_Disk/Tools/</u>
- 3. Copy the decompressed folder into the WinPAC under the directory **``\System_Disk\tools\'** (refer to Section 1.1 for the ftp method)
- 4. Run the WINPAC_Utility on the WinPAC desktop. Now it's the new version WinPAC Utility.



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1.3. Set up the WinPAC as an SNTP Client for the SNTP network time synchronization

Run the WinPAC Utility. Select "System Setting" tab and click the "Configure" button to open the "Internet Time" setting window.

WinPAC Utility [2.0.1.5]	
File Help Configuration	
System Setting Ethernet Setting FTP	Setting System Information Auto Execution Multi-serial port 💶 🕨
WinPAC	Welcome to use WinPAC Utility This tool will help you to set WinPAC - 8000. Display Resolution : 800 * 600
Industrial Control Products	Setting
Battery1 : OK	Task Bar Setting: 🦳 Auto Hide 🛛 🗹 Always On Top
Battery2 : OK	Empty Desktop
Change HTTP document root directory \	
\windows\www\wwwpub\	Setting

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STEP 1 : Assign an internet NTP Server

The WinPAC Utility lists some NTP Server IP addresses (as the picture below), user can select the suitable one as the NTP Server to synchronize the time.

If user wants to use his own PC as the NTP Server to be synchronized by the controller, please key in that PC's IP address (Must be a fixed IP), and that PC must be set up as a Time Server. For the information about setting a PC as a NTP Server, please refer to the next section (Section 1.4).

If the assigned NTP Server for time synchronization is over the Internet in a different network domain, the user has to set up the "Default Gateway" for the WinPAC controller. Please refer to the <u>Section 1.5</u> for the setup information.

Internet Time								
Step1: Server: Step2: Autoupdat Step3:	pool.ntp.org							
Automatically s	ynchronize with an internet time server Update Now							
Step 4:Go to "File">"Save and Reboot" to enable driver								
Auto update running								

STEP 2 : Assign the auto-update frequency

The unit for the update frequency time is minute. If setting to update once a day (24 hours), please enter 1440 minutes. The minimum update frequency is 5 minutes.

Step1: Server:	nool ntn.ora								
500p1, 00, (0), (pooninpiong								
Step2: Autoupdat	e Frequency:	1440	minute						
этерз:									
\checkmark Automatically synchronize with an internet time server									
Update Now									
- Step 4:Go to "File driver	">"Save and	l Reboot" to	enable						
uriver									

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STEP 3 : Check the box for automatically synchronization

- 1. Check the box for automatically synchronizing with the internet time server set above (Step1). If uncheck the box, that will stop the SNTP network time synchronization function for the PAC.
- 2. Click "Close Windows" icon to close the window.

	Internet Time 📃 🚺 🔀									
	Step1: Server: pool.ntp.org									
	Step2: Autoupdate Frequency: 1440 minute									
1	Step3:									
	Automatically synchronize with an internet time server									
	Update Now									
	Step 4:Go to "File">"Save and Reboot" to enable driver									
	Auto update running									

STEP 4 : Save and reboot the controller

Select [File] > [Save and Reboot] of the WinPAC Utility to save the setting and restart the controller.

WinPAC Utility [2.0.1.5]	
File Help Configuration	
Save etting FTP	Setting System Information Auto Execution Multi-serial port
Save and Repoot	
Reboot Without Save	Welcome to use WinPAC Utility
Restore Default Settings	This tool will help you to set WinPAC - 8000.
E <u>x</u> it	Display Resolution: 800 * 600 🛛 🔽
WinPAC	
Data Acquisition System	Setting
Battery1 : OK	Task Bar Setting: 🔝 Auto Hide 🛛 🗹 Always On Top
Battery2 : OK	Empty Desktop
Change HTTP document root directory V	(windows\www\wwwpub to:
\windows\www\wwwpub\	Setting
Configure the synchronization with a tin	ne server Configure

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STEP 5 : After rebooting, test the SNTP Automatically Synchronize

After rebooting, the service for automatically synchronizing with the internet time server will execute and update the system time after connecting to the internet.

If you need to update the time immediately, please click "Update Now" button to update the system time immediately.

Internet Time 📃 🔲 🔀										
Step1: Server: pool.ntp.org										
Step2: Autoupdate Frequency: 1440 minute										
Step3:										
Automatically synchronize with an internet time server										
Update Now										
Step 4:Go to "File">"Save and Reboot" to enable driver										
Auto update running										

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1.4. How to set up a Windows XP PC as the SNTP Server to test the WinPAC SNTP Client

Prepare a Windows XP PC for the WinPAC SNTP client to synchronize the time.

STEP 1 : Enable and set up the NTP Server of Windows XP PC

- 1. Run "Registry Editor"
 - On PC, select [Start] > [Run] and enter "regedit ", then click "OK".



2. Enable NTP Server

The NTP Server in a normal Windows XP PC is default enabled.

Left window:

Please change to the following directory.

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\TimeProvi ders\NtpServer\

Right window:

The most right "Data" number of "**Enabled**" is (1). It means the NTP Server is enabled. If it is (0), it means the NTP Server is disabled. Please right click "Enabled", select "Modify". Change "Value" to become "**1**", and then click "OK".



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3. Set the Windows time to use the internal hardware clock

Left window:

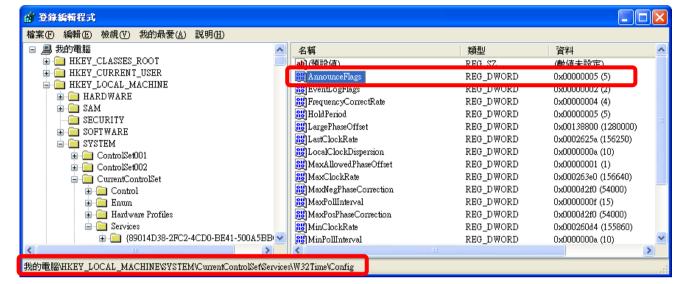
Please change to the following directory.

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\W32Time\Config\ Bight window:

Right window:

Please right click "AnnounceFlags", select "Modify".

Change "Value" to become "5", and then click "OK". Exit the "Registry Editor".



STEP 2 : Restart Windows Time Service

1. On Windows XP PC Desktop, click [Start] > [Run]

2. Enter "net stop w32time && net start w32time", then click "OK".

User also can operate by mouse in the window. Please right click [My Computer] > left click [Computer Management] > [Service] > double click [Windows Time] to stop/start the "Windows Time Service", and set it to "Automatically".

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← → 🖻 🖪 🗗 🚱 🛙							
3 電脳管理 (本機) ぶ 系統工具	物 服務						
■ 圖 事件檢視器	Windows Time	名稱 🗸	描述	狀態	啓動類型	登入身分	
● ■ 共用資料夾 ■ ■ ■ 本機使用者和詳組 ■ ■ ■ 效能記錄及整示 停止	<u>停止</u> 服務 <u>重新啓動</u> 服務	A Yahoo! Updater World Wide Web Publishing Workstation WMI Performance Adapter	Keeps your favorite Yahoo! software up Provides Web connectivity and administr Creates and maintains client network con Provides performance library informatio	已啓動 已啓動 已啓動	自動 自動動 手動動	本機系統 本機系統 本機系統 本機系統	
🗄 😭 卸除式存放裝置	描 ::	🐝 Windows Time	Maintains date and time synchronization	已啓動	自動	本機系統	
 磁碟重組工具 一致磁碟管理 路弦电碟用程式 路弦电碟用程式 多服務 每 WM1 控制 ● 臺 索引服務 ● 副 加合型 	Maintains date and time synchronization on all clients and servers in the network. If this service is stopped, date and time synchronization will be unavailable. If this service is disabled, any services that explicitly depend on it will fail to	Windows Management Instrumen Windows Management Instrumen Windows Installer Windows Image Acquisition (WIA) Windows Firewall/Internet Conn	Shares windows wheth a riager indianes the Provides systems management informatio Provides a common interface and object Adds, modifies, and removes application Provides image acquisition services for s Provides network address translation, add Manages user-mode driver host processes Manages audio devices for Windows-bas Enables Windows-based programs to cre	已 啓動 已 啓動 已 啓動 已 啓動	宁手自手自手自自于自自 <u>了</u> 動動動動動動動動動動動動動動	本機機系系系系統統統統統統統統統統統統統統統統統統統統統統統統統統統統統統統統	

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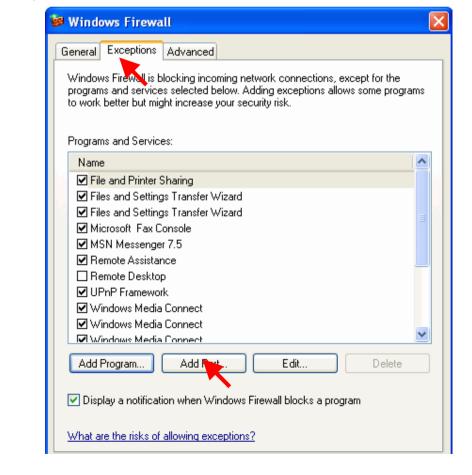
STEP 3: About the Windows Firewall

If the Windows Firewall is enabled in the communication, the user needs to open the UDP123 communication port.

1. In Windows XP, select [Start] > [Control Panel] > [Windows Firewall]



2. On the "Exceptions" tab, click "Add Port...".



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3. Give a name "NTP Server",	set up the por	t number ``123"	and select	"UDP".	Click
"OK" to exit.					

新增速接埠			×
使用這些設定值透 號和通訊協定,諸	Windows防; 參閱您要使用的	火牆來開啓連接埠。要尋 Ŋ程式或服務的文件。	找連接埠編
	NTD O		
名稱(<u>N</u>):	NTP Server		
連接埠編號(P):	123		
	O TCP(<u>T</u>)	O UDP (U)	
開啓連接埠會有啁	些風險?		
變更領域(C)		確定	取消

STEP 4 : Assign the fixed IP address to the Time Service PC

As the Time Service computer of the network time synchronization for the WP-8x47, the PC must use the fixed IP, and must has the same IP address as the IP assigned in setting the Server of WP-8x47. Only when the setting is the same, the Server and the Client can communicate with each other to achieve the network time synchronization.

For instance, in this example, the SNTP Server is set a fixed IP address, "192.168.1.190"; therefore, the assigned IP in setting WinPAC the client's server is the same as "192.168.1.190".

STEP 5 : Testing

After setting SNTP Server, we can test with the SNTP Client – WP-8x47. Please refer to the Section 1.3, the setting IP of "Server" column must be the IP of this Server PC and then test WP-8x47.

System Settin	g Ethernet Setting FTP Setting System Information Auto Execution Multi-
	Welcome to use WinPAC Utility This tool will help you to set WinPAC - 8000. Internet Time Image: Comparison of the set winPAC - 8000. Step1: Server: 192.168.1.190
	Step2: Autoupdate Frequency: 5 minute
DAS Dat	Step3:
Battery1 : OK	Update Now Always On Top
Change HTTP	Step 4:Go to "File">"Save and Reboot" to enable driver Auto update running
\windows\ww	synchronization with a time server Configure

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1.5. How to set up the Gateway, IP and DNS Server for PAC

If the PAC's SNTP Client is synchronizing the time with the Time Server over the Internet in a different network domain, the user has to set up the "Default Gateway" and "DNS Server" for the controller.

The Steps: ****** Using the XPAC as the example

- 1. On the desktop of WinPAC, click [Start] > [Settings] > [Network and Dual-up Connections 1
- 2. Double click [PCI-FETCE581] (XPAC's LAN1) to open the LAN1 setting window. Double click [PCI-FETCE582] can setup LAN2. For normal setting, one LAN is enough.
- 3. The PAC's IP and "Default Gateway" can be set here. Please set up your "Default Gateway" according to your PAC, in this example: 192.168.1.1. (ISaGRAF application must **use the fixed IP address**, no DHCP accepted. If the LAN2 is enabled, please set it as a fixed IP also.)

<u>File Zoom Display Tools H</u> elp
Eile Edit View Advanced
Make New ConnectionPCI- FETCE5B1PCI- FETCE5B2
'PCIVETCE5B1' Settings ○K × IP Address Name Servers An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space provided. ○ Obtain an IP address via DHCP ● Specify an IP addresss □92.168.1.192 > Up addresses, ask your network administrator for an address, and then type it in the space □92.168.1.192 > Up addresses □92.168.1.1 • Click "Name Servers" page to set the "Primary DNS". The DNS Server address of Google is "8.8.8.8", and the DNS Server address of Chunghwa Telecom Co., Ltd.
is "168.95.1.1". You can fill a suitable address for your PAC.
IP Address Name Servers Name server addresses may be automatically assigned if DHCP is enabled on this adapter. You can specify additional WINS or DNS resolvers in the space provided. Primary DNS: 3.8.8.8 Primary DNS: Secondary DNS: VINS or DNS resolvers in the space provided. Secondary WINS:
fter setting up, click "OK" and restart the controller.