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How to Create NTP Server Under No External Network Environment?

In a factory or special circumstances, the network are usually private and could not connect with external network. It is necessary to set up an NTP server to provide internal equipment time calibration to make sure that all devices have the same time. This article explains:

- 1. How to set up an NTP Server environment?
- 2. How to set the time of UA products and NTP Server?
- 3. NTP stratum

[This example operate under Windows 10 environment]

1. How to set up an NTP Server Environment?

Set up Firewall.

÷	🐻 Domain network
=	Firewall is off.
ல் Home	Turn on
♡ Virus & threat protection	
A Account protection	9 Private network
(ip) Firewall & network protection	Firewall is off.
App & browser control	Turn on
□ Device security	
℅ Device performance & health	
战 Family options	Public network (active)
	Firewall is off.
	Turn on
	Allow an app through firewall
	Network and Internet troubleshooter
	Firewall notification settings
	Advanced settings
	Restore firewalls to default
Settings	

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Right click on [Inbound Rules] and then choose [New Rule] Windows Defender Firewall with Advanced Security File Action View Help 🗢 🔿 🙇 🖬 🚔 🚺 🖬 🔐 Windows Defender Firewall 🛛 Inbound Rules 📖 Inbound Ry Profile Enabled New Rule. 🚮 Outbound **Right click on** Public Yes Filter by Profile 🌆 Connection 'Inbound Rule" Builder 4.0 Public Yes 통 Monitoring Filter by State Then choose Builder 4.6 Public Yes Filter by Group 'New Rule" service All Yes View Private Yes ice Refresh ice Private Yes Private Export List... Yes ice ice Private Yes Help Private Yes 🚫 EsTool Public Yes 🥑 EsTool Private Yes 🚫 EsTool Public Yes HiCOS PKI Smart Card Domain No HiCOS PKI Smart Card Private Yes Provide the second seco \times **Rule Type** Select the type of firewall rule to create. Steps: What type of rule would you like to create? 2 Rule Type Protocol and Ports ۵ O Program Action Rule that controls connections for a program. Profile ۲ Name Port Rule that controls connections for a TCP or UDP port. O Predefined: @FirewallAPI.dll,-80200 Rule that controls connections for a Windows experience. O Custom Custom rule < Back Next > Cancel

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Choose [UI	DP], [Specific loc	al ports]: 123
	 New Inbound Rule Wi Protocol and Ports Specify the protocols and ports to 	zard ×
	Steps: Protocol and Ports Action Profile Name	Does this rule apply to TCP or UDP? • UDP • UDP Does this rule apply to all local ports or specific local ports? • All local ports • Specific local ports: 123 Example: 80, 443, 5000-5010
		< Back
	Steps: Protocol and Ports Action Profile Name	 What action should be taken when a connection matches the specified conditions? Alow the connection his includes connections that are protected with IPsec as well as those are not. Alow the connection if it is secure Alow the connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node. Customize Block the connection
		< Back Next > Cancel

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Profile	
Specify the profiles for which this ru	ule applies.
Change:	
Steps: Rule Type Protocol and Ports Action Profile Name	 When does this rule apply? Domain Applies when a computer is connected to its corporate domain. Private Applies when a computer is connected to a private network location, such as a home or work place. Public Applies when a computer is connected to a public network location.
New Inbound Rule Wiz	<pre>cancel</pre>
Name	
Steps: Rule Type Protocol and Ports	or this rule.
 Action Profile Name 	Name: NTP Server Description (optional): NTP Service

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Download and Install NTP Packages	
Linkage: https://www.meinbergglobal.com/english/sw/ntp.htm	
(ntp-4.2.8p15-win32-setup.exe)	
NTP for Windows XP and newer, with IPv6 support The current stable NTP version can be used with Windows XP and newer, on 32 bit and 64 bit Windows versions. Besix standard IPv4 network protocol it also supports IPv6. Alternatively there's an <u>older version</u> available which can also be Windows 2000 or Windows NT. Note: The current stable version ntp-4.2.8p15 provides a minor security patch and some enhancements. See the <u>chan</u> details. This package also includes the current openSSL DLL v1.1.1g. It is explicitly recommended to upgrade earlier installations to this version. Pownload this file 0 ntp-4.2.8p15-win32-setup.exe (4.29 MB) 3 July 2020 NTP package with IPv6 support for Windows XP and newer SHA512 Checksum: ntp-4.2.8p15-win32-setup.exe.sha512sum How to verify integrity of the downloaded file	de the e used on <u>Igelog</u> for

After installation, Execute [Edit NTP Configuration]



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Author Author After deleting al them. # NTP Network Time Protoco # **** ATTENTION ****: *You # PLEASE CHECK THIS FILE C # Configuration File created # please check http://www.r # restrict access to avoid abo # see http://news.meinberg restrict default noquery nop restrict -6 default noquery nop restrict 127.0.0.1 restrict -6 ::1	I the contents ol have to restart the NT CAREFULLY AND MODI by Windows Binary Di ntp.org for additional d use of NTP for traffic ar .de/244 for details beer nomodify notrap toppeer nomodify notrap	Version Version in the file P service when y IFY IT IF REQUIRI Incumentation attain p calhost	1.0.2 e, copy and you change this fil ED ler Rev.: 1.27 mbg ind background in cks	Date d paste the le to activate the o g formation	2020,6 e followin	Page g contents a	6 / 10 nd save
# if you need to allow access # restrict <ip h<="" of="" remote="" td=""><td>s from a remote host, y OST></td><td>ou can add lines</td><td>s like this:</td><td></td><td></td><td></td><td></td></ip>	s from a remote host, y OST>	ou can add lines	s like this:				
# Use drift file driftfile "C:\Program Files (xi # your local system clock, co # (this is only useful if you no server 127.127.1.0 prefer # but it should operate at a # use any other timesource fudge 127.127.1.0 stratum 3	86)\NTP\etc\ntp.drift" ould be used as a backu eed to distribute time r high stratum level to le they may have.	up no matter how g et the clients kno	lood or bad it is) ww and force them	to			
# Use specific NTP servers #server tw.pool.ntp.org ibur #server time.google.com ib	st minpoll 6 maxpoll 7 urst minpoll 6 maxpoll	7					
# End of generated ntp.conf	f Please edit this to	suite your needs	5				

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nile have no permission to sav	e this file, please save th	nis txt file in	to another lo	cation.
<pre>*ntp.conf - Notepad File Edit Format View Help # NTP Network Time Protocol # **** ATTENTION ****: *You have to restart the NTP service # PLEASE CHECK THIS FILE CAREFULLY AND MODIFY IT IF RE # Configuration File created by Windows Binary Distribution # please check http://www.ntp.org for additional document # restrict access to avoid abuse of NTP for traffic ample # see http://news.meinberg.de/244 for details restrict default noquery nopeer nomodify notrap restrict -6 default noquery nopeer nomodify notrap</pre>	when you change this file to activate the change QUIRED Installer Rev.: 1.27 mbg tisse and bookserved information As C\Program Files (x86)\NTP\etc\ntp.conf.txt You don't have permission to save in this location. Contact the administrator to obtain permission.		_	
# allow status queries and everything else from localho restrict 127.0.0.1 restrict -6 ::1	Would you like to save in the Documents folder instead	?		
# if you need to allow access from a remote host, you can ac # restrict <ip host="" of="" remote=""></ip>	d lines like this:			
# Use drift file driftfile "C:¥Program Files (x86)¥NTP¥etc¥ntp.drift"				
# your local system clock, could be used as a backup # (this is only useful if you need to distribute time no matter server 127.127.1.0 prefer	how good or bad it is)			
# but it should operate at a high stratum level to let the clien	ts know and force them to			
# use any other timesource they may have.				
<				>
		Ln 33, Col 1	100% Windows (CRLE)	UTE-8

Replace the previous ntp.conf file with new saved one.

File route: C:\Program Files (x86)\NTP\etc



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Open Task I	Manager	by press Ctrl+Alt+Del, and then cho	ose [Services] tag, righ	nt click to
NTP and se	lect [Rest	art]		
🔛 Task Manager				– 🗆 X
File Options View	/			
Processes Performance	ce App history S	artup Users Details Services		
Name	PID	Description	Status	Group ^
SISCSI 🖏		Microsoft iSCSI Initiator Service	Stopped	netsvcs
🖏 msiserver		Windows Installer	Stopped	
MSSQL\$ICPDAS	12284	SQL Server (ICPDAS)	Running	
Satural Authenticat	ion	Natural Authentication	Stopped	netsvcs
Second Se		Network Connectivity Assistant	Stopped	NetSvcs
Service NcbService	1232	Network Connection Broker	Running	LocalSystemNe
NcdAutoSetup		Network Connected Devices Auto-Setup	Stopped	LocalServiceNo
Set Driver HPZ12		Net Driver HPZ12	Stopped	HPZ12
🔍 Netlogon		Netlogon	Stopped	
🔍 Netman		Network Connections	Stopped	LocalSystemNe
🖏 netprofm	3664	Network List Service	Running	LocalService
🖏 NetSetupSvc		Network Setup Service	Stopped	netsvcs
NetTcpPortSharing		Net.Tcp Port Sharing Service	Stopped	
🖏 NgcCtnrSvc	784	Microsoft Passport Container	Running	LocalServiceNe
Salar Section		Microsoft Passport	Running	LocalSystemNe
🗞 NlaSvc 2696 Netw		Network Location Awareness	Running	NetworkService
🖏 nsi	2240	Network Store Interface Service	Running	LocalService
S NTP	11700	Notwork Time Protocol Daemon	Running	
OneSyncSvc	Start	lost	Stopped	UnistackSvcGro
🔍 OneSyncSvc_1b	Stop	lost_1b268496	Running	UnistackSvcGro
Sose64	Restart	64 Source Engine	Stopped	
Sector p2pimsvc	Open Services	etworking Identity Manager	Stopped	LocalServicePe
n2neve	Search online	etworking Grouping	Stopped	LocalServiceDe
Fewer details	Go to details			

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2. How to set the time of UA products and NTP Server?										
Login UA Web UI, click [System Setting] > choose [Time Setting], choose "Customize the										
Server" and key	in IP and cho	ose Time	e Zone, press	[Save].						
System Setting M	lodule Setting loT	Platform Settir	ng Convert Setting	g Advo	anced Setting L	ogger Setting.	I/O Status			
File Setting										
System Setting Time Set	ting									
Controller Service Setting Date And Time Display										
Time Setting			O Septemb	oer 2020	0					
Network Setting			Su Mo Tu W	/e Th Fi	Sa					
Boot		Date	6 7 8	9 10 1	1 12					
COM Port Interface Set	ting		13 14 15 20 21 22	16 17 1 23 24 2	8 19 5 26					
			27 28 29	30						
		Time	15 : 19	: 17						
	NTP Time	NTD Time Sunchronization Setting								
	Fu	Functional Status O NTP Time Server Customize The Server								
	Custor	Customize The Server 192.168.101.2								
		Time Zone	Taipei	~						
				Save						
	Set The Tir	ne Manual	ly the second se							
		Time Setting	2020 / 9		30					
	Read The Lo	al Computer	15 : 23	: [34					
		Time	Read							
		Time Zone	Taipei	~						
	Save									
	© ICP DAS Co., Ltd. All Rights Reserved									
<note></note>										
If you press [Sav	e] for the [Set	the Time	e Manually], tł	ne [NTF	o time synch	ronization]	function			
will turn off. If yo	u need to res	tart the N	ITP Time, re-o	check [l	NTP time sy	nchronizati	on]			

settings and then click [Save].

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3. NTP stratum

The range of NTP hierarchy that can synchronize is from 0 to 15, if it exceeds the range, it cannot be synchronized.

When installing the NTP Server file < ntp-4.2.8p15-win32-setup.exe >, the value we currently set in ntp.conf is 3.

If you need to adjust the stratum value, all devices must be within this range, and then refer to Chapter 1 in this document to restart the NTP settings in [Task Manager].

