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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.

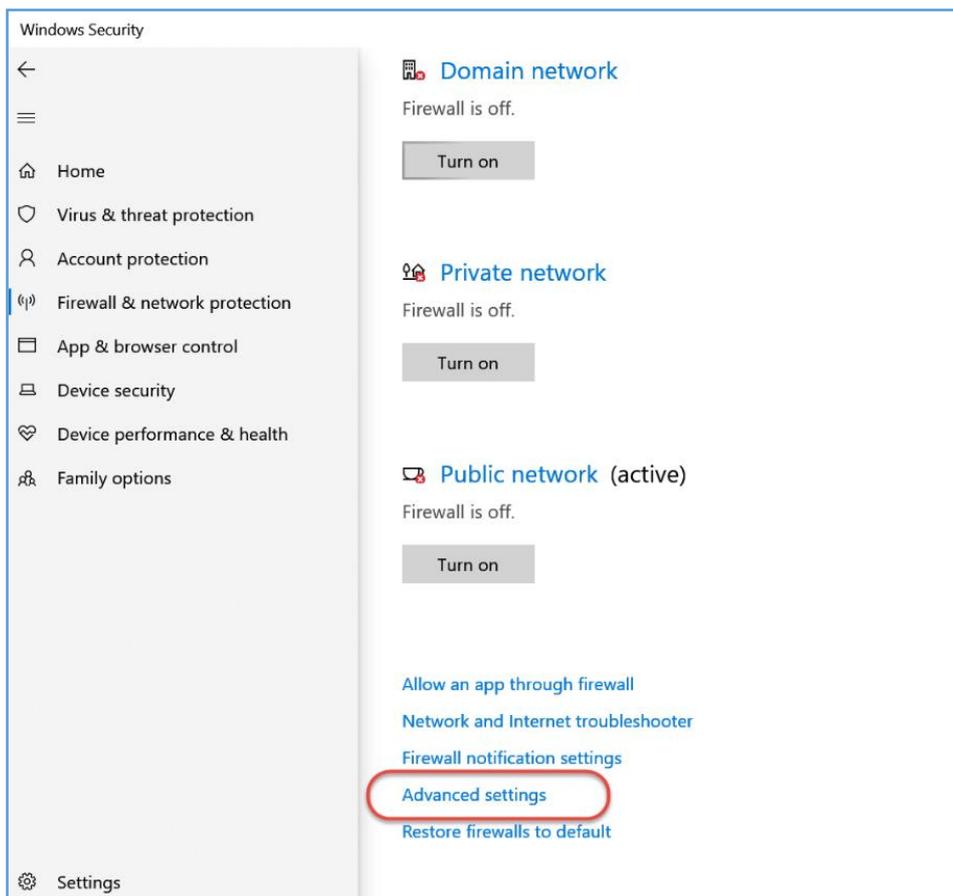
This article explains:

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]

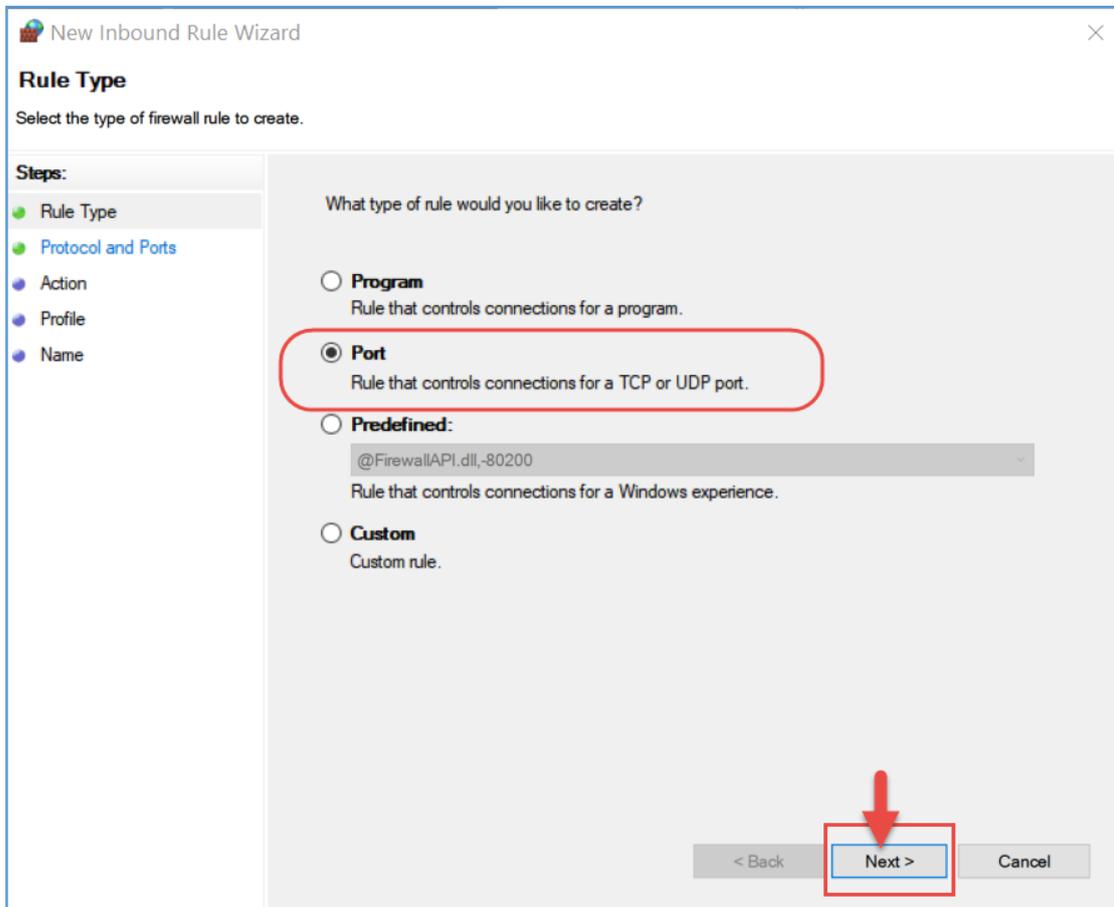
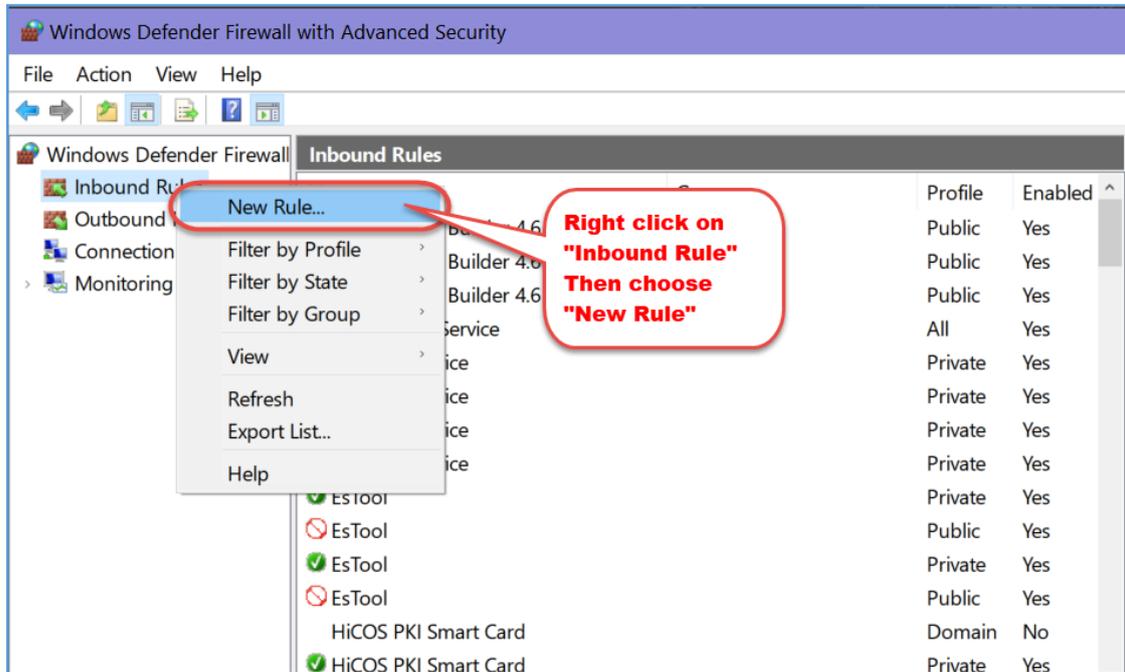
1. How to set up an NTP Server Environment?

Set up Firewall.



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Right click on [Inbound Rules] and then choose [New Rule]



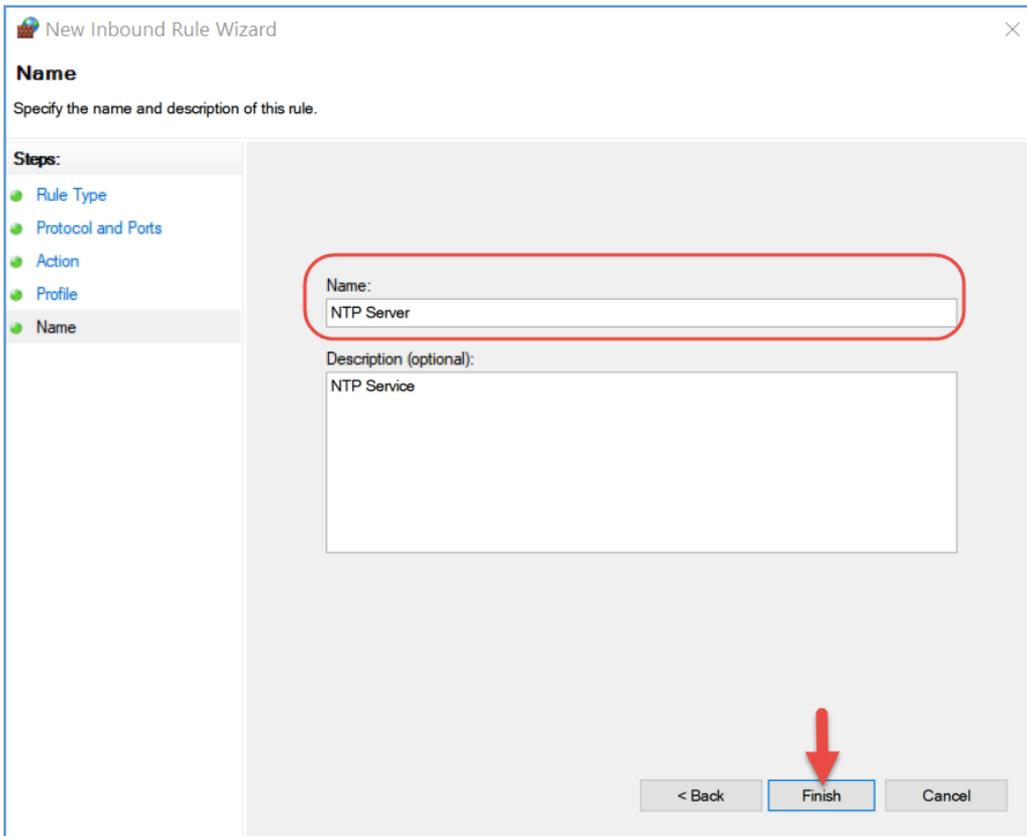
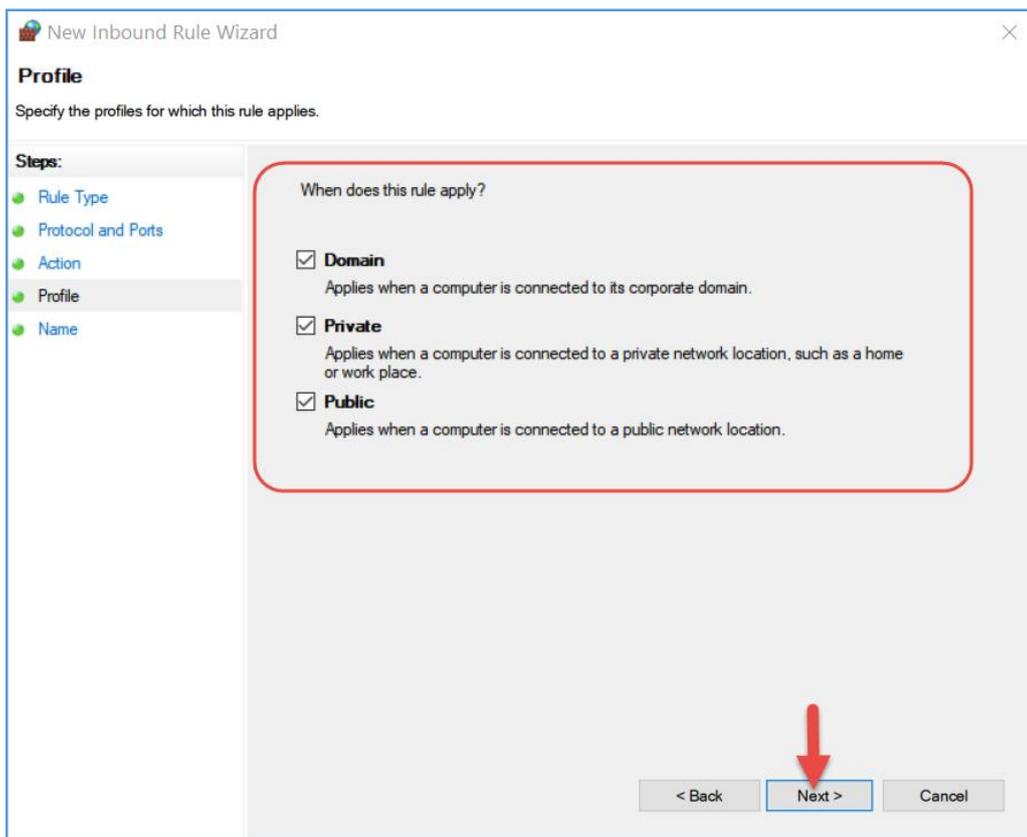
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Choose [UDP], [Specific local ports]: 123

The screenshot shows the 'New Inbound Rule Wizard' dialog box, specifically the 'Protocol and Ports' step. The title bar reads 'New Inbound Rule Wizard'. The main heading is 'Protocol and Ports' with the instruction 'Specify the protocols and ports to which this rule applies.' On the left, a 'Steps:' pane lists 'Rule Type', 'Protocol and Ports', 'Action', 'Profile', and 'Name'. The main area contains two questions: 'Does this rule apply to TCP or UDP?' with radio buttons for 'TCP' and 'UDP' (the latter is selected and circled in red), and 'Does this rule apply to all local ports or specific local ports?' with radio buttons for 'All local ports' and 'Specific local ports:' (the latter is selected and circled in red). A text input field next to 'Specific local ports:' contains the value '123', with an example 'Example: 80, 443, 5000-5010' below it. At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a red box and a red arrow pointing down to it), and 'Cancel'.

The screenshot shows the 'New Inbound Rule Wizard' dialog box, specifically the 'Action' step. The title bar reads 'New Inbound Rule Wizard'. The main heading is 'Action' with the instruction 'Specify the action to be taken when a connection matches the conditions specified in the rule.' On the left, a 'Steps:' pane lists 'Rule Type', 'Protocol and Ports', 'Action', 'Profile', and 'Name'. The main area contains the question 'What action should be taken when a connection matches the specified conditions?' with three radio button options: 'Allow the connection' (selected and circled in red), 'Allow the connection if it is secure', and 'Block the connection'. The 'Allow the connection' option has a sub-description: 'This includes connections that are protected with IPsec as well as those are not.' The 'Allow the connection if it is secure' option has a sub-description: 'This includes only 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.' Below this is a 'Customize...' button. At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a red box and a red arrow pointing down to it), and 'Cancel'.

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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. Beside the standard IPv4 network protocol it also supports **IPv6**. Alternatively there's an [older version](#) available which can also be used on Windows 2000 or Windows NT.

Note: The current stable version **ntp-4.2.8p15** provides a minor security patch and some enhancements. See the [changelog](#) for details. This package also includes the current **openssl DLL v1.1.1g**.

It is explicitly recommended to **upgrade earlier installations to this version**.

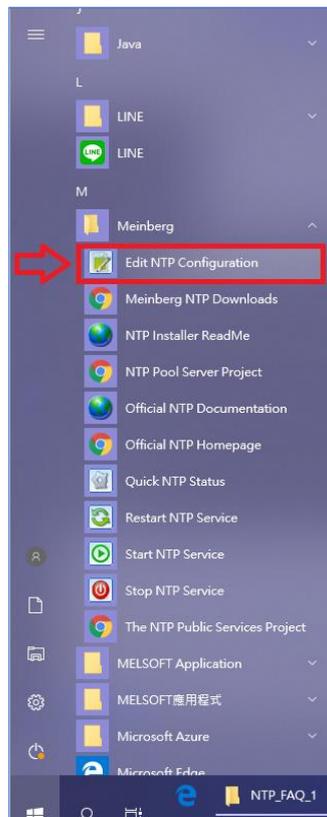
[Download this file](#)

 **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](#)

After installation, Execute [Edit NTP Configuration]



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After deleting all the contents in the file, copy and paste the following contents and save them.

```
# NTP Network Time Protocol
# **** ATTENTION ****: *You have to restart the NTP service when you change this file to activate the changes*
# PLEASE CHECK THIS FILE CAREFULLY AND MODIFY IT IF REQUIRED
# Configuration File created by Windows Binary Distribution Installer Rev.: 1.27  mbg
# please check http://www.ntp.org for additional documentation and background information
# restrict access to avoid abuse of NTP for traffic amplification attacks
# see http://news.meinberg.de/244 for details
restrict default noquery nopeer nomodify notrap
restrict -6 default noquery nopeer nomodify notrap

# allow status queries and everything else from localhost
restrict 127.0.0.1
restrict -6 ::1

# if you need to allow access from a remote host, you can add lines like this:
# restrict <IP OF REMOTE HOST>

# Use drift file
driftfile "C:\Program Files (x86)\NTP\etc\ntp.drift"

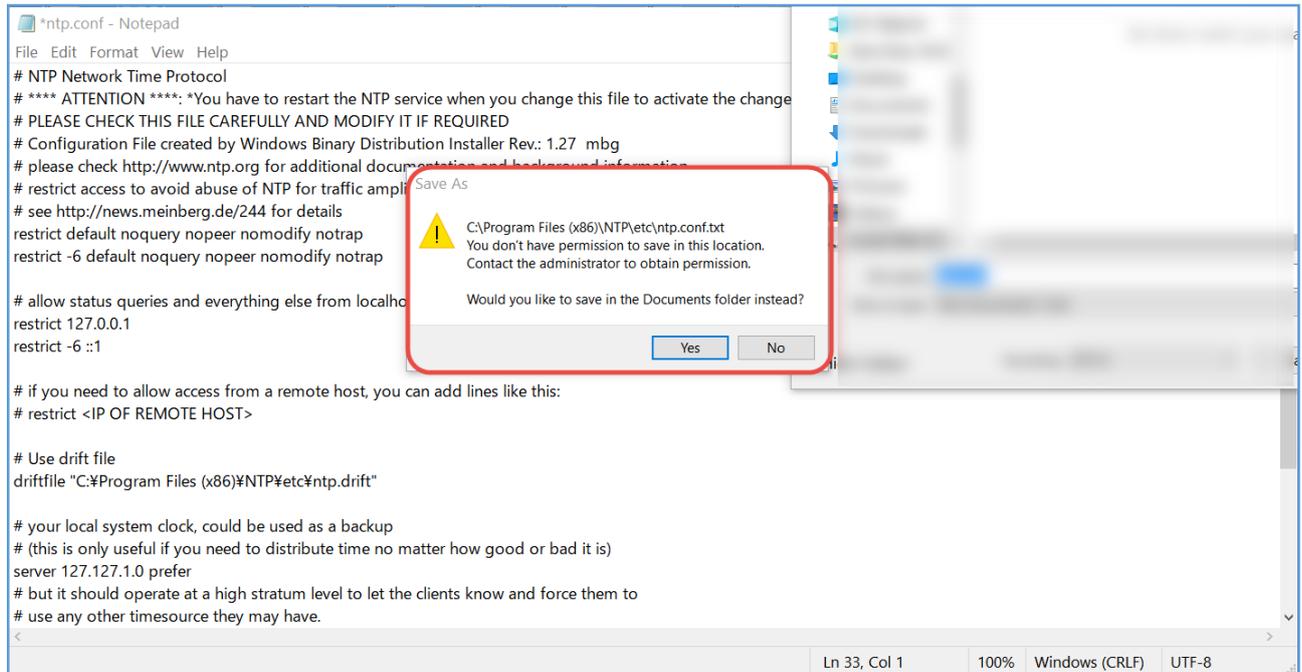
# your local system clock, could be used as a backup
# (this is only useful if you need to distribute time no matter how good or bad it is)
server 127.127.1.0 prefer
# but it should operate at a high stratum level to let the clients know and force them to
# use any other timesource they may have.
fudge 127.127.1.0 stratum 3

# Use specific NTP servers
#server tw.pool.ntp.org iburst minpoll 6 maxpoll 7
#server time.google.com iburst minpoll 6 maxpoll 7

# End of generated ntp.conf --- Please edit this to suite your needs
```

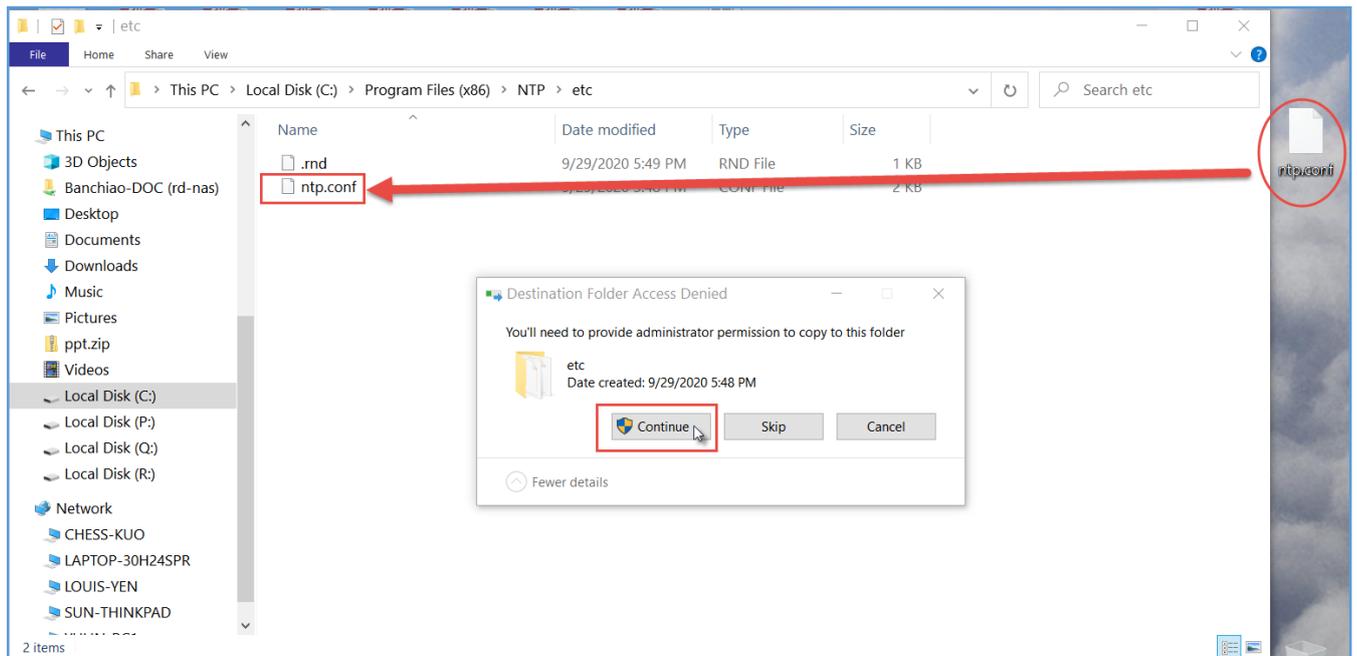
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While have no permission to save this file, please save this txt file into another location.



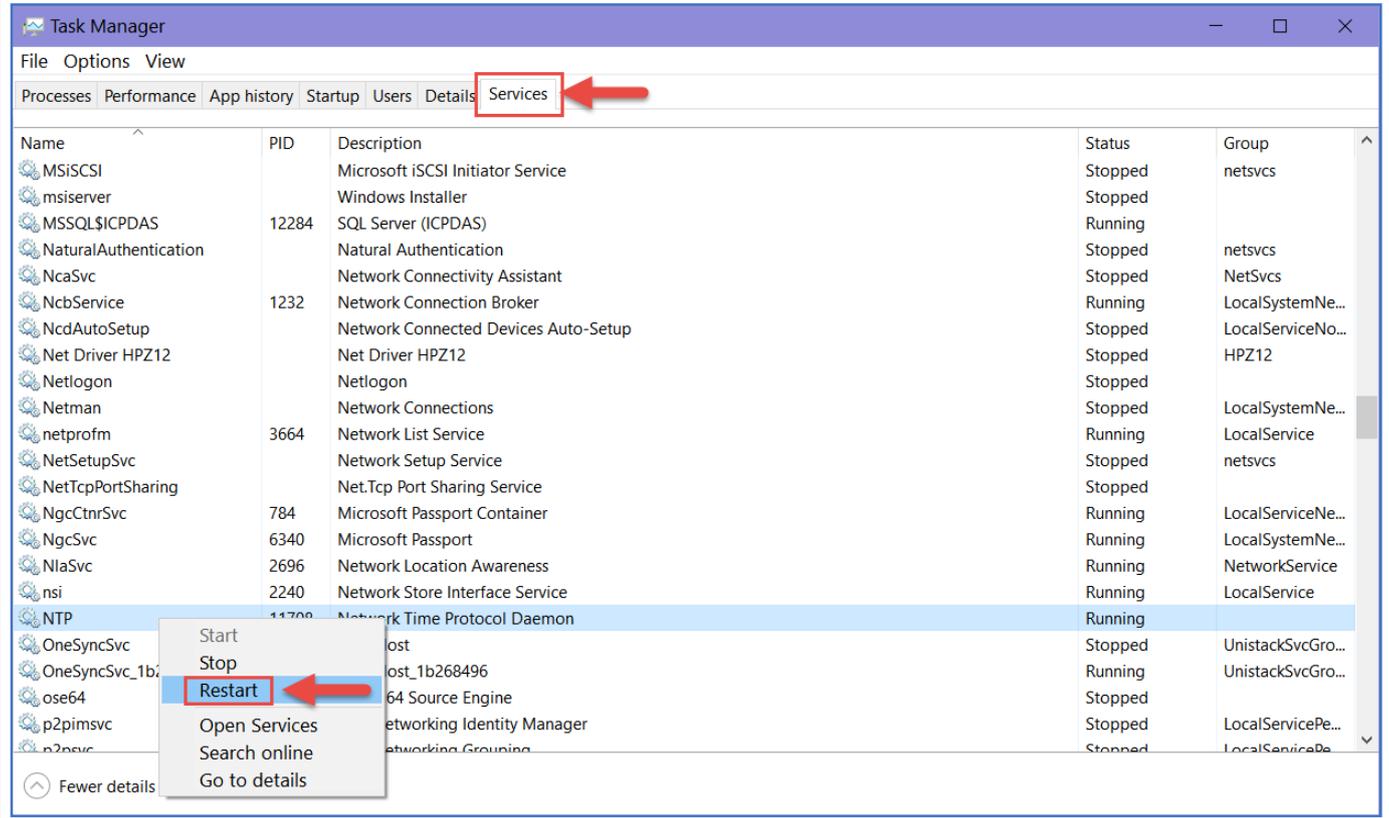
Replace the previous ntp.conf file with new saved one.

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



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Open Task Manager by press Ctrl+Alt+Del, and then choose [Services] tag, right click to NTP and select [Restart]



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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 choose Time Zone, press [Save].

System Setting | Module Setting | IoT Platform Setting | Convert Setting | Advanced Setting | Logger Setting | I/O Status

File Setting

System Setting | Time Setting

Controller Service Setting

Time Setting

Network Setting

Account Setting

Boot

COM Port Interface Setting

Date And Time Display

Date

September 2020						
Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Time: 15 : 19 : 17

NTP Time Synchronization Setting

Functional Status: NTP Time Server **Customize The Server**

Customize The Server: 192.168.101.2

Time Zone: Taipei

Save

Set The Time Manually

Time Setting: 2020 / 9 / 30
15 : 23 : 34

Read The Local Computer Time: Read

Time Zone: Taipei

Save

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<NOTE>

If you press [Save] for the [Set the Time Manually], the [NTP time synchronization] function will turn off. If you need to restart the NTP Time, re-check [NTP time synchronization] settings and then click [Save].

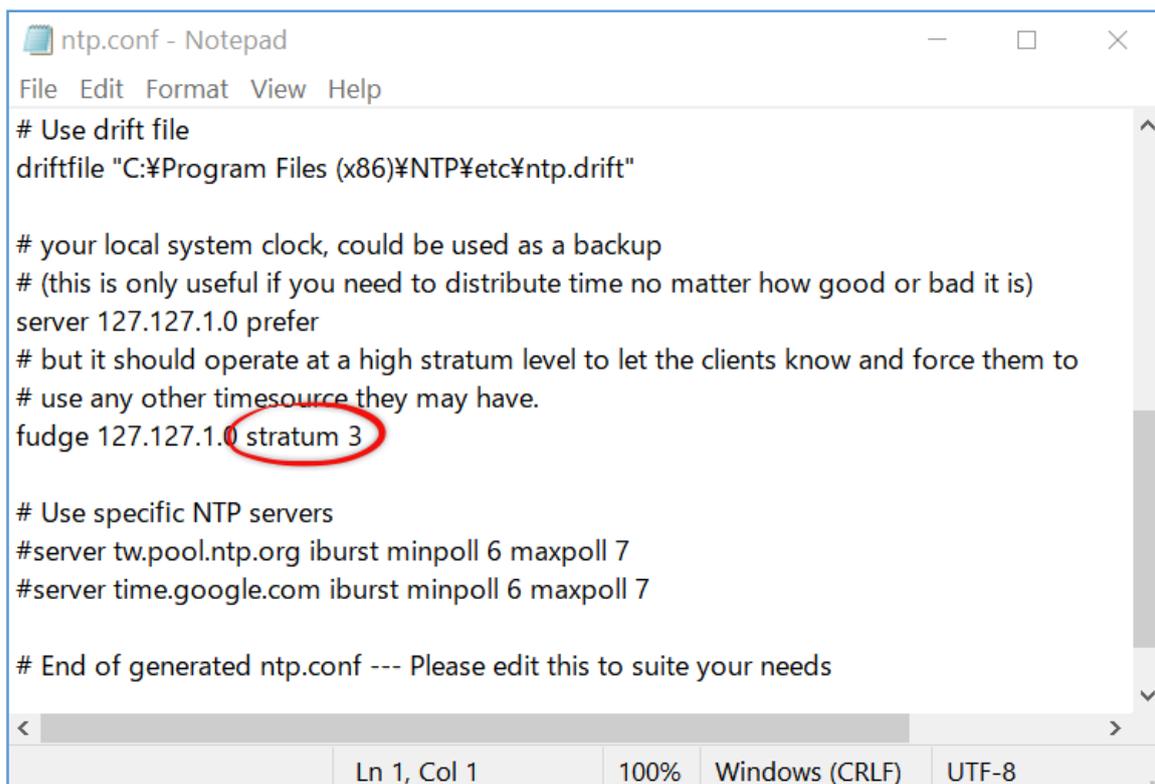
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3. NTP stratum

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].



```
ntp.conf - Notepad
File Edit Format View Help
# 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 how good or bad it is)
server 127.127.1.0 prefer
# but it should operate at a high stratum level to let the clients know and force them to
# use any other timesource they may have.
fudge 127.127.1.0 stratum 3

# Use specific NTP servers
#server tw.pool.ntp.org iburst minpoll 6 maxpoll 7
#server time.google.com iburst minpoll 6 maxpoll 7

# End of generated ntp.conf --- Please edit this to suite your needs
Ln 1, Col 1 100% Windows (CRLF) UTF-8
```