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Introduction

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Installation

How to Install Advanced Time Synchronizer:

- 1) Download the latest version of Advanced Time Synchronizer from our web site;
- 2) Run the installation program. The installer will guide you through the installation process;
- 3) After installation, Advanced Time Synchronizer will initially execute with the default settings. The default settings are enough to realize the basic functions of time synchronizing.

Updating and reinstalling Advanced Time Synchronizer:

If you want to upgrade your Advanced Time Synchronizer version, download the latest version from our web site and start the installation program. During the installation process all system changes will be made automatically. Program will be upgraded but your preferences and registration information will be kept.

Uninstalling Advanced Time Synchronizer:

If you want to uninstall Advanced Time Synchronizer, open **Uninstall or change a program** section from your Control Panel, select **Advanced Time Synchronizer** item and click the **Uninstall** or **Remove** button.

Silent installation:

Advanced Time Synchronizer installation program uses Windows Installer internally. If you start the installation program with command line arguments, those arguments will be passed to the msiexec.exe making it is possible to automate installation process via command line.

Prerequisites:

Advanced Time Synchronizer does not require and will not force you to install any additional components such as vcruntime or .NET framework.

System requirements

<i>Operating Systems</i>	<i>Processors</i>	<i>Disk Space</i>	<i>RAM</i>	<i>Graphics</i>
Windows 11 Windows Server 2022	Any Intel or AMD x86 processor	Under 10 MB	Minimum required by operating system	No specific graphics card is required
Windows Server 2019	Any Intel® EM64T or AMD64 processor			
Windows Server 2016				

Windows 10				
Windows 8.1				
Windows 8				
Windows Server 2012				
Windows 7				
Windows Server 2008				
Windows Vista				
Windows Server 2003				
Windows XP				
Windows 2000				

Translation

To install an additional language you need to download language file, unpack it to the subfolder "Ingfiles" in the folder where Advanced Time Synchronizer is installed and restart Advanced Time Synchronizer. Then you can select installed language from **File / Language** menu.

English US	(10 KB)	Download
Spanish	(14 KB)	Download
Polish	(14 KB)	Download
Czech	(13 KB)	Download
Ukrainian	(14 KB)	Download
Chinese Simplified	(13 KB)	Download
Chinese Traditional	(13 KB)	Download
Russian	(14 KB)	Download
Belarusian	(14 KB)	Download
Dutch	(13 KB)	Download
French	(13 KB)	Download
Italian	(13 KB)	Download

If you did not find any files with your language, you can translate Advanced Time Synchronizer by yourself. You only need to translate a single file that contains all text strings that are used in the Advanced Time Synchronizer. In return for the translation that we don't yet have, we are offering you a free license of Advanced Time Synchronizer. Please send your translation to our [Support Service](#).

All dialog box controls in Advanced Time Synchronizer are automatically resized according to their text. So it should not be the problem if the text in your language is longer than the same text in English. In that case, all dialog box controls will be rearranged so the longer text will be fully visible.

Translation Guidelines

All strings used in Advanced Time Synchronizer are located in the language file in the "lngfiles" subfolder in the folder where Advanced Time Synchronizer is installed. Help files in different languages are also located in that folder. When Advanced Time Synchronizer starts, it tries to load a language file, corresponding to the selected language. If it fails, then default (English) language file is used.

If you would like to translate the program to another language you have to create your own language file with the standard name (for standard file names see the [table below](#)). You can create your language file by copying the original file (english.lng) to the file named as specified in the table. After your language file is created, you can start program and select your language on the Run tab of the Settings window.

Language file contains multiple sections. Each section must have the following form:

```
[section]
key=string
.
.
.
```

Only **string** is subject to translation.

Do not translate **section**

and **key**.

Text strings may contain special format characters.

Please keep formatting as close to the original as possible. Special characters and their meaning can be found in the following table:

Special Characters in Language File

Character	Meaning
&	Ampersand (&) is placed in front of the letter that is used as access key for menu or dialog items. For example, to use F as the access key for a menu named File , use &File . If the F in the menu name is underlined you can open the menu by pressing ALT+F .
\t	TAB character. For menu items \t is used to display the shortcut key combination for the menu item with right align.
\n	Line break character. You can add extra line breaks where

	you want to make some strings multilined so they fit better in their area.
%%	%% will be replaced with some test when string is displayed.
\\	Textfmt control: "\" character.
#9 (\t)	Textfmt control: soft break.
#13 (\n)	Textfmt control: line break.
\tn	Textfmt control: Set tab position in n pixels from the left margin.
\ln	Textfmt control: Set left margin in pixels.
\bn	Textfmt control: \b1 turns on bold, \b0 turns off bold.
\in	Textfmt control: \i1 turns on italic, \i0 turns off italic.
\wn	Textfmt control: \w1 turns on word underline, \w0 turns off word underline.
\un	Textfmt control: \u1 turns on solid underline, \u0 turns off solid underline.
\on	Textfmt control: \o1 turns on strikethrough, \o0 turns off strikethrough.
\sn	Textfmt control: Set font size to n .
\cn	Textfmt control: Set font color to n . For example " #000000 " - black).
\hn,m	Textfmt control: Insert hyperlink (n - (1-begin, 0-end), m - id).
\pn,mk	Textfmt control: Insert bitmap (n-id, m-vert align {t(TOP),c(CENTER),b(BOTTOM)}, k-ROP2). ROP2 = {a(SRDAND), c(SRCCOPY), e(SRDERASE), i(SRCINVERT), p(SRCPAINT)}.

Standard Language File Names

Language	Language file
Afrikaans	afrikaans.lng
Albanian	albanian.lng
Arabic	arabic.lng
Armenian	armenian.lng
Assamese	assamese.lng
Azeri	azeri.lng
Basque	basque.lng
Belarusian	belarusian.lng

Bengali	bengali.lng
Bulgarian	bulgarian.lng
Catalan	catalan.lng
Chinese Simplified	schinese.lng
Chinese Traditional	tchinese.lng
Croatian	croatian.lng
Czech	czech.lng
Danish	danish.lng
Dutch	dutch.lng
English US	englishus.lng
English UK	englishuk.lng
Estonian	estonian.lng
Faeroese	faeroese.lng
Farsi	farsi.lng
Finnish	finnish.lng
French	french.lng
Georgian	georgian.lng
German	german.lng
Greek	greek.lng
Gujarati	gujarati.lng
Hebrew	hebrew.lng
Hindi	hindi.lng
Hungarian	hungarian.lng
Icelandic	icelandic.lng
Indonesian	indonesian.lng
Italian	italian.lng
Japanese	japanese.lng
Kannada	kannada.lng
Kashmiri	kashmiri.lng
Kazak	kazak.lng
Konkani	konkani.lng
Korean	korean.lng
Latvian	latvian.lng
Lithuanian	lithuanian.lng
Macedonian	macedonian.lng
Malay	malay.lng
Malayalam	malayalam.lng

Manipuri	manipuri.lng
Marathi	marathi.lng
Nepali	nepali.lng
Norwegian	norwegian.lng
Oriya	oriya.lng
Polish	polish.lng
Portuguese	portuguese.lng
Punjabi	punjabi.lng
Romanian	romanian.lng
Russian	russian.lng
Sanskrit	sanskrit.lng
Serbian	serbian.lng
Sindhi	sindhi.lng
Slovak	slovak.lng
Slovenian	slovenian.lng
Spanish	spanish.lng
Swahili	swahili.lng
Swedish	swedish.lng
Tamil	tamil.lng
Tatar	tatar.lng
Telugu	telugu.lng
Thai	thai.lng
Turkish	turkish.lng
Ukrainian	ukrainian.lng
Urdu	urdu.lng
Uzbek	uzbek.lng
Vietnamese	vietnamese.lng

Hints and Tips

The "Tip of the Day" dialog box is normally displayed when you start Advanced Time Synchronizer.

You can turn "Tip of the Day" off by the check box bellow and later want see the tips, select

Tip of the Day from the **Help** pull-down menu.

Advanced Time Synchronizer can synchronize the time automatically at certain intervals. You can select an interval for automatic time synchronization on the **Scheduling** tab in the **Settings** dialog.

For your convenience Advanced Time Synchronizer documentation is available online. You can read it at any time [here](#). If you wish to read documentation offline, you can download it in PDF format [here](#).

To configure Advanced Time Synchronizer to start time synchronization when it starts, select **Synchronize time when program started** option on the **Run** tab of **Settings** dialog.

Advanced Time Synchronizer samples each time server multiple times and uses timestamp from the fastest sample to synchronize clock. This feature may be useful, because the network delays are often greater on the first sample and less on next samples. You can set number of samples on the **Operation** tab in the **Settings** dialog. Set this value to 1, if you want Advanced Time Synchronizer to sample a time server only once.


For answers to Frequently Asked Questions (FAQs), select **Frequently Asked Questions** from the Advanced Time Synchronizer **Help** pull-down menu or click [here](#) now.

Starting from Windows XP Advanced Time Synchronizer can show balloon tool tip near its icon in the system tray when the system time is adjusted. To enable balloon tool tips select **Show balloon tool tip when time adjusted** option in the **Operation** tab of **Settings** dialog.

Total number of time synchronizations made by Advanced Time Synchronizer you can always find in **Statistics** tab of **Settings** dialog.

Advanced Time Synchronizer can play sound when time server is connected and when system time is adjusted. You can allow these options and customize sounds on the **Sounds** tab of **Settings** dialog.

For a complete Tip of the Day list, select **Hints and Tips** from the Advanced Time Synchronizer **Help** pull-down menu.

Advanced Time Synchronizer window does not close by  button on its caption. It just minimizes to the system tray icon. To close Advanced Time Synchronizer, select **Exit Advanced Time Synchronizer** command from window menu, which appears by mouse click on the icon in the left side of window caption, or by Alt-Space keystroke.

If Advanced Time Synchronizer receives time that much differs with system clock, it can accept this time, do not accept this time, or show question message. These options may be customized in **Check time adjustment** group on **Operation** tab of **Settings** dialog.

Advanced Time Synchronizer calculates average drift of your computer clock per day. You can view your computer's clock drift on **Average drift** tab of **Settings** dialog.

All access to local time servers saves into the log file, which can be viewed on **Local server** tab of **Settings** dialog.

Advanced Time Synchronizer can start automatically on system startup. Select **Auto start the program** option on the **Run** tab of **Settings** dialog to set Advanced Time Synchronizer to start on system startup.

Advanced Time Synchronizer can start as Windows NT service on system startup. Select **Auto start the service** option on the **Run** tab of **Settings** dialog to set Advanced Time Synchronizer service to start.

Advanced Time Synchronizer's main window can be restored by pressing the hotkey selected in the **Run** tab of the **Settings** dialog. Advanced Time Synchronizer's main window will appear when you press the hotkey even when you are working in another application.

If you use a dial-up connection to the Internet, you can set the **Wait Dial-up connected** option on the **Scheduling** tab in the **Settings** dialog. Advanced Time Synchronizer will attempt to synchronize the time automatically at the specified interval, but if no dial-up connection is established, Advanced Time Synchronizer will wait till one is established and perform synchronization after that.

For Advanced Time Synchronizer to establish a dial-up connection automatically before synchronizing the time, open the **Dial-up** tab in the **Settings** dialog and check the **Auto-dial network connection** option, select a phone book entry and specify the username and password for it. If you want Advanced Time Synchronizer to disconnect after synchronization, check the **Automatically disconnect** option.

You can view detailed information on all time synchronizations performed by the program on the **Statistics** tab in the **Settings** dialog. If you want to stop saving statistics, check the **Do not save statistic information** option. You can also clear the list by clicking the **Clear** button.

You can quickly open **Settings** dialog on required tab by a command from **Options** pull-down menu.

To start automatic time synchronization, click the **Synchronize** button.

In automatic mode Advanced Time Synchronizer connects to all the servers in the list one by one until either the time is successfully synchronized or the list is over.

If you are behind a firewall, Advanced Time Synchronizer can support HTTP, SOCKS4, SOCKS4A and SOCKS5 proxy servers.

Proxy servers may be customized on **Proxy** tab of the **Settings** dialog.

Frequently Asked Questions

Please read the FAQ and use [support form](#) to contact our Support Service if you have additional questions or problems.

General Questions

[1. What is Advanced Time Synchronizer?](#)

Advanced Time Synchronizer is a powerful and easy-to-use utility to synchronize your PC clock with a public time servers over the Internet.

[2. Where can I get it?](#)

You can download it from our web site: <https://www.advtimesync.com/downloads>.

[3. How do I register?](#)

Please read more information about Advanced Time Synchronizer registration at <https://www.advtimesync.com/purchase>.

Technical Questions

[4. Does Advanced Time Synchronizer support Windows x64 Editions?](#)

Windows XP, Windows Vista, Windows 7 and Windows 8 x64 Edition For Intel® EM64T and AMD64 Platform Architecture are fully supported by Advanced Time Synchronizer.

[5. How do I protect Advanced Time Synchronizer settings from reinstalls, upgrades or operating system crashes?](#)

Advanced Time Synchronizer keeps all its settings and logs in the advtimesync.ini and advtimesync.log files, which are located in your "Application Data" directory. In order to save Advanced Time Synchronizer settings you can copy these files somewhere else and when you'll need to restore Advanced Time Synchronizer settings you must copy advtimesync.ini and advtimesync.log files back to your "Application Data" directory.

[6. Can I set different location for Advanced Time Synchronizer settings?](#)

Since version 2.4 Advanced Time Synchronizer uses registry key to allow override its settings files location. Specify directory where settings files are located in the string value "SettingsDir" in the key "HKEY_CURRENT_USER\Software\Southsoftware\advtimesync" of the system registry and restart program. Advanced Time Synchronizer will keep two files in the specified directory: advtimesync.ini and advtimesync.log.

[7. Which settings files are used when Advanced Time Synchronizer is started as service?](#)

Since version 2.4 Advanced Time Synchronizer uses registry key to locate its settings files when it is started as service. You can change this location in the **Service** tab of **Settings** dialog or by specifying directory path directly in the string value "ServiceDataFolder" in the key "HKEY_LOCAL_MACHINE\Software\Southsoftware\advtimesync" of the system registry.

[8. Why Advanced Time Synchronizer doesn't work at my company?](#)

Most likely, you are running behind a proxy server. Currently Advanced Time Synchronizer supports HTTP, SOCKS4, SOCKS4A and SOCKS5 proxy servers. If your company network works on one of these proxy servers you must open **Proxy** tab on **Settings** dialog and specify proxy server address and port number.

[9. Does Advanced Time Synchronizer support proxy servers that require a username and password?](#)

Advanced Time Synchronizer supports user authentication for HTTP and SOCKS5 proxy servers. If your proxy server requires authentication you must check **Use authentication for the server** check box on the **Proxy** tab in **Settings** dialog box and specify your username and password.

[10. Why Advanced Time Synchronizer doesn't display help correctly?](#)

If you do not have Internet Explorer 5 or higher, you need to install Html Help. You can download it here: <https://www.southsoftware.com/hhupd.exe>.

[11. Why Advanced Time Synchronizer window reports a time hours different than the local PC time, but yet the difference is only a few seconds?](#)

This may be because your daylight time settings in time zone information are incorrect. You can download [Tzedit](#), a Windows program from Microsoft that allows you to edit the time zone settings.

[12. Can Advanced Time Synchronizer automatically start my Dial-Up Networking connection?](#)

Yes. Advanced Time Synchronizer can auto-dial network connection before time synchronization and, if turned, hang up it after time synchronization made. To set auto-dial network connection options, open **Dial-up** section in Settings dialog and set corresponding settings.

[13. Why when I click on the on the upper right corner, the application doesn't close?](#)

Advanced Time Synchronizer has an option that moves Advanced Time Synchronizer main window to the system tray icon instead of close it. This option is in the **Run** section of the **Settings** dialog. NOTE: If you've enabled Advanced Time Synchronizer to synchronize time automatically by some intervals, then Advanced Time Synchronizer must be started or its service must be run for be able to start time synchronization when scheduled time is reached. If Advanced Time Synchronizer is not being started, automatic time synchronizations will not work.

[14. Why the program does not start in Windows 95?](#)

Starting from version 4.0 Advanced Time Synchronizer does not support Windows 95, however, older version may be installed on Windows 95 with Windows Sockets 1.1 or later. You can download W95 Winsock Upgrade here: <https://www.southsoftware.com/W95ws2setup.exe>.

[15. Why SNTP local server does not start in Windows 2000 and XP?](#)

Windows 2000 and XP contain a new built-in system called Windows Time Service. This service starts its local SNTP time server.

You can stop this service by typing:
net stop w32time

To restart the time service type:
net start w32time

To turn off the time service:
Go to Control Panel - Administrative Tools - Services.
Find "Windows Time" in the list of services.
Stop the service and then set the "Startup type" to either Manual or Disabled.


[16. Where can I find Advanced Time Synchronizer documentation?](#)

We provide downloadable documentation for our products in PDF format. You can download Advanced Time Synchronizer documentation in PDF by this link: <https://www.advtimesync.com/docs/advtimesync.pdf>.


[17. Does Time protocol expire?](#)

Time Protocol ([rfc868](https://tools.ietf.org/html/rfc868)) uses 32-bit binary timestamp, which represents time in seconds from 0h 0m 0s UTC on January 1, 1900. After 6h 28m 16s UTC on February 7, 2036 most significant bit of this timestamp will overflow 32 bit DWORD value and will lost. The time stamp will become zero. Should Time Protocol be in use in 2036, some external means will be necessary to qualify time relative to 1900 and time relative to 2036 (and other multiples of 136 years).

Most likely future versions of Advanced Time Synchronizer will still support Time Protocol after 7 February 2036.

 [18. Advanced Time Synchronizer fails to synchronize time with "Not enough privileges for change the system time." message and/or Advanced Time Synchronizer service does not start with "Access is denied." message?](#)

Administrator privileges are required to change system time and install service. However, an administrator can allow time synchronizations from non-administrator accounts by installing Advanced Time Synchronizer Service. Read more in the [Changing system time](#) topic.


 [19. Why program does not start with message "Your system has old version of Common Controls Library \(ComCtl32.dll\)."?](#)

ComCtl 5.80 or later must be installed on your computer. You can download Platform SDK Comctl32 Redistributables (499 KB) here: <https://www.southsoftware.com/50comupd.exe>.

 [20. I need a custom feature that I can't find in Advanced Time Synchronizer. Can you develop a special version for our environment?](#)

We are always open for feature request. Please contact our [Support Service](#) for further discussion.


Purchase Questions

 [21. Is it safe to order online?](#)

By clicking a purchase link on our web site, you order from our authorized sales agent. They provide you with an order process that is protected via a secure connection so that the data sent to the recipient can only be read by the recipient. Important information such as credit card numbers, addresses, etc. is sent to the recipient securely via the Internet.

 [22. Can I buy Advanced Time Synchronizer with PayPal?](#)

Yes, now we accept PayPal. Please follow this link to buy Advanced Time Synchronizer with PayPal: <https://www.advtimesync.com/purchase>.

 [23. How to purchase your product and how long will I receive the activation code after I complete the purchase?](#)

Normally, you will receive the activation code by e-mail immediately after your successful purchase. If you don't receive your registration information in a timely manner, or if you've lost it, please contact our [Support Service](#). If you are purchasing Advanced Time Synchronizer Industrial, you will also receive a separate message with your login information for our registered user area. The registered user area allows registered users of Southsoftware.com products to download latest versions of our software, view order information and activation status.

 [24. The registration key you sent me doesn't work, why?](#)

In most cases this happens simply because the activation code has not been typed into the registration dialog exactly as shown in the registration Email. It is important to remember that character case, punctuation, and spaces are significant. We suggest that you copy and paste the activation code directly from your registration Email to the registration dialog.

[25. How many times can I activate Advanced Time Synchronizer license?](#)

You can activate Advanced Time Synchronizer as many times as you want on the same computer (with the same hardware fingerprint).

The number of different computers where you can activate Advanced Time Synchronizer is limited by the number of copies purchased.

[26. How to reactivate Advanced Time Synchronizer, if computer hardware configuration changes?](#)

If you upgrade some significant parts on your computer, reactivation might be required. In that case please contact our

[Support Service](#). You will be able to reactivate your software automatically in 6 months after last activation.

[27. Will my license expire?](#)

Your Advanced Time Synchronizer license will never expire. Free life time upgrades are available for Advanced Time Synchronizer users. Updates and support for Advanced Time Synchronizer Industrial users will expire upon the expiration of their Updates and Support subscription.

[28. What happens when my Updates and Support subscription expires?](#)

Advanced Time Synchronizer Industrial only: When your Updates and Support subscription expires, your installed software will continue to work, you will be able to activate it in case of reinstallation, with your login information for our registered user area, you will be able to download the latest version that is available for your subscription (the version that was release before your Updates and Support subscription expired). However, you will not be able to upgrade to the newer version and you will receive only limited support.

[29. How to renew Updates and Support subscription?](#)

Advanced Time Synchronizer Industrial only: To renew your Updates and Support subscription, please login into our registered user area and click on one of the renew links. We provide a 50% renewal discount for registered users. If you are renewing a subscription that is not expired, new subscription will extended your existing subscription for the selected period, if your existing subscription is expired, your new subscription will start from the day of renewal.

If you can't use our registered user area, please contact our [Support Service](#).

Getting started

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Time synchronization

With the Internet, it became possible to synchronize the time, which resulted in the development of quite a few protocols for time synchronization allowing individual computers to regularly get the current time from a computer with a highly accurate clock and adjust their local clocks.

Daytime protocol

The **DAYTIME** service is an Internet protocol defined in [RFC 867](#). It is intended for testing and measurement purposes in computer networks.

A host may connect to a server that supports the DAYTIME protocol, on either TCP or UDP port 13. The server then returns the current date and time as an ASCII string with an unspecified format.

References:

DAYTIME. (2007, September 21). In Wikipedia, The Free Encyclopedia. Retrieved December 22, 2007, from <http://en.wikipedia.org/wiki/DAYTIME>.

Time Protocol

The **TIME** service is an Internet protocol defined in [RFC 868](#). Its purpose is to provide a site-independent, machine readable date and time.

TIME can operate over either TCP or UDP. When operating over TCP, a host connects to a server that supports the TIME protocol on TCP port 37. The server then sends the time as a 32-bit unsigned binary number in network byte order representing a number of seconds since 00:00 (midnight) 1 January, 1900 GMT and closes the connection. The host receives the time and closes the connection.

When operating over UDP, the client sends a (typically empty) datagram to UDP port 37. The server responds with a single datagram of length 4 containing the time. There is no connection setup or teardown.

Time Protocol uses TCP/IP connection and has resolution of 1 second. This protocol limited by range from 0h 0m 0s UTC on January 1, 1900 to 6h 28m 16s UTC on 7 February 2036.

The TIME protocol has been superseded by the [Network Time Protocol](#) (NTP).

References:

TIME protocol. (2007, November 5). In Wikipedia, The Free Encyclopedia. Retrieved December 22, 2007, from http://en.wikipedia.org/wiki/TIME_protocol.

Simple Network Time Protocol

The **Network Time Protocol (NTP)** is a protocol for synchronizing the clocks of computer systems over packet-switched, variable-latency data networks. NTP uses UDP port 123 as its transport layer. It is designed particularly to resist the effects of variable latency (jitter).

NTP is one of the oldest Internet protocols still in use (since before 1985). NTP was originally designed by Dave Mills of the University of Delaware, who still maintains it, along with a team of volunteers.

NTP is not related to the much simpler [DAYTIME \(RFC 867\)](#) and [TIME \(RFC 868\)](#) protocols.

NTP uses Marzullo's algorithm with the UTC time scale, including support for features such as leap seconds. NTPv4 can usually maintain time to within 10 milliseconds (1/100 s) over the public Internet, and can achieve accuracies of 200 microseconds (1/5000 s) or better in local area networks under ideal conditions.

A less complex form of NTP that does not require storing information about previous communications is known as the **Simple Network Time Protocol** or **SNTP**. It is used in some embedded devices and in applications where high accuracy timing is not required. See [RFC 1361](#), [RFC 1769](#), [RFC 2030](#), and [RFC 4330](#).

References:

Network Time Protocol. (2007, December 13). In Wikipedia, The Free Encyclopedia. Retrieved December 22, 2007, from http://en.wikipedia.org/wiki/Network_Time_Protocol.

Time Synchronization Accuracy

The accuracy of Advanced Time Synchronizer depends on the accuracy of the selected time protocol and network delays:

- The most accurate SNTP protocol is 200-picoseconds accurate and takes network delays. The actual accuracy of this protocol is about 1/10 of a second, and the faster your Internet connection is the higher is its accuracy.
- The accuracy of the DAYTIME protocol depends on the syntax of the string the time on the server is presented in. Most servers are 1-second accurate, but the protocol standard does not define any definite accuracy, thus, the sent string can contain additional data making it possible to improve the accuracy. Servers using the syntax of the string proposed by NIST send such data. Such servers have better than 1-second accuracy.
- The Time protocol is about 1-second accurate and does not provide any opportunities to improve its accuracy.

Setting the current time zone

Advanced Time Synchronizer uses the time zone configured in Windows. If you find that Advanced Time Synchronizer is not setting your clock to the correct time, check that your Windows settings are correct using the Date/Time panel of the Windows Control panel.

If you are finding that the Windows time zone settings aren't correct, you can download [Tzedit](#), a free program that allows you to edit the time zone settings.

User guide

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Main window

The main Advanced Time Synchronizer window contains three control groups:

- Time server
- Local time
- Control buttons

In the **Time server** group you can specify the time server name and choose the time server protocol.

For begin connecting to the time server, choose the time server and click the **Check** button. While Advanced Time Synchronizer is establishing a connection to the server, you can see the status of this connection in the **Connection** box. After the connection is established and the timestamp from the server is received, the **Connection** box will contain the time on the server and the **Difference** box will contain the difference between the server time and the time on your PC.

Now click **Adjust** button to synchronize the time on your PC clock with the time on the Internet time server.

Local time and **Time zone** boxes contain your local computer time and time zone information.

Advanced Time Synchronizer main window will not be closed by **X** button on its caption or by ALT-F4 keystroke. It just minimizes to the system tray icon. To close Advanced Time Synchronizer, select **Exit Advanced Time Synchronizer** command from window menu, which appears by mouse click on the icon in the left side of window caption, or by ALT-SPACE keystroke.

Time server settings

You can change settings for existing time servers and add new time servers in the [Time servers](#) tab of the Settings window. The time server settings include its DNS name or IP address, the protocol you prefer to use to synchronize the time with this server and additional settings according to the selected protocol.

To add a server from our preset list, you can press the **Lookup** button. The **Server** lookup dialog will open, it contains the list of generally available Internet time servers arranged in the alphabetical order by their location.

In case you select the DAYTIME protocol for the server, you should specify the syntax of the server timestamp string. If you do not know the format the selected server supports, you can press the **Receive** button to receive a sample timestamp from the server. Depending on the received timestamp, you can specify the syntax of the server string or you can select the corresponding syntax of the string from the list of preset formats that can be accessed by clicking the **Preset** button. The field below displays the string that the syntax you specified represents. If you specified the server data syntax correctly, this string will coincide with the string that is received from the server. You can also press the **Test** button to check if the specified server

data syntax is correct.

Format specifications for syntax of the server timestamp string are described in [Daytime protocol timestamp format](#) topic.

Changing system time

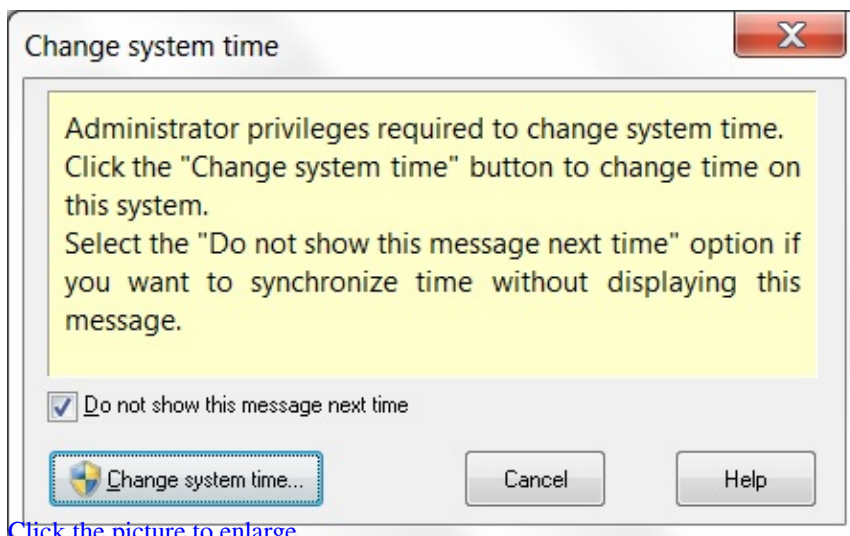
If you are running Windows NT, 2000, XP, Vista or later, then administrator privileges required to change system time. If you want to synchronize time on those operating systems, you can either run Advanced Time Synchronizer from an administrator account or install Advanced Time Synchronizer Service.

To install Advanced Time Synchronizer Service:

- Logon into your system as administrator;
- Select the **Advanced Time Synchronizer Service Control** from the **Advanced Time Synchronizer** group in the **Start** menu (or execute svctimesync.exe file from the folder where Advanced Time Synchronizer is installed);
- Click the **Change Settings** button and make sure that the option **Allow time synchronization from non-administrator accounts** is enabled;
- Click the **Install service** button;
- When the service is installed, you can logon under your account and use Advanced Time Synchronizer to synchronize your computer clock.

Changing time in Windows Vista or later

If you are running Vista or later with User Account Control (UAC) turned on, the following message appears before system data and time is changed:



Because administrator privileges are required to change system time, you have to click **Change system time** button to allow Advanced Time Synchronizer to act as administrator. If you are running under non-administrator account, you will be prompted for administrator password.

You can select **Do not show this message next time** option before clicking the **Change system time** button, if you want to synchronize time without displaying this elevation prompt. Alternatively, you can avoid this elevation prompt by installing Advanced Time Synchronizer Service manually as described in the [Changing system time](#) topic.

Daytime protocol timestamp format

Advanced Time Synchronizer supports the format templates for Daytime protocol timestamp strings.

When Advanced Time Synchronizer connects a time server and received Daytime protocol timestamp string, it parses it by using following format specifiers:

space or underscore	Space
%x,%w	Any text
%d	Day in month
%m	Month number 1..12
%M	Month text (three letter abbreviation or full)
%y	Year number
%h	Hour
%n	Minutes
%s	Seconds
%a	AM/PM
%z	Time zone abbreviation
%z=ABB or %z=±hh:mm	Set time zone ignoring source string
%z!ABB or %z!±hh:mm	Read time zone from source string but set time zone from template
%e	A health digit that indicates the health of the server. If e=0, the server is healthy, otherwise the received timestamp will be rejected as incorrect.
%j	MJD is the Modified Julian Date. The MJD is the last five digits of the Julian Date, which is simply a count of the number of days since January 1, 4713 B.C.
%v	msADV displays the number of milliseconds that NIST advances the time code to partially compensate for network delays. The advance is currently set to 50.0 milliseconds.

Examples:

"15.02.04 13:13:04 CST"	->	"%d.%m.%y %h:%n:%s %z"	(date, time and time zone)
"15 Feb 04 13:13:04"	->	"%d %M %y %z=EST %h:%n:%s"	(date and time in EST time zone)
"13:13:04 EDT 02/15/04"	->	"%h:%n:%s %z!EDT %m/%d/%y"	(date and time, but change time zone to EDT)
"02/15/04 1:13:04 PM UTC"	->	"%m/%d/%y %h:%n:%s %a %z"	(date and time with AM/PM specification)
"53050 04-02-15 10:23:32 00 0 0 909.7 UTC(NIST) *"	->	"%j_%y-%m-%d_%h:%n:%s _%x_%x_%e_%v_%z(NIST) *"	NIST

When Advanced Time Synchronizer functioning as a local time server it sends Daytime protocol timestamp strings encoding them by using following format specifiers:

space or underscore	Space
%D	Day in month
%d	Day in month (2-digit always)
%w	Weekday text (three letter abbreviation)
%M	Month text (three letter abbreviation)
%m	Month number 1..12
%Y	Full year number
%y	Two digit year number
%H	Hour
%h	Hour (2-digit always)
%N	Minutes
%n	Minutes (2-digit always)
%S	Seconds
%s	Seconds (2-digit always)
%A	AM/PM
%a	am/pm
%z	Add time zone abbreviation
%z=ABB or %z=±hh:mm	Use time in specified time zone, but not add abbreviation
%z!ABB or %z!±hh:mm	Use time in specified time zone and add its abbreviation
%e	A health digit that indicates the health of the server. If e=0, the server is healthy, otherwise the received timestamp will be rejected as incorrect.
%j	MJD is the Modified Julian Date. The MJD is the last five digits of the Julian Date, which is simply a count of the

	number of days since January 1, 4713 B.C.
%v	msADV displays the number of milliseconds that NIST advances the time code to partially compensate for network delays. The advance is currently set to 50.0 milliseconds.
%C	Day in year
%c	Day in year (3-digit always)

Examples:

"%d.%m.%y %h:%n:%s %z"	->	"15.02.04 13:13:04 UTC"	(date, time and time zone)
"%d %M %y %z=EST %h:%n:%s"	->	"15 Feb 04 13:13:04"	(date and time in EST time zone)
"%m/%d/%y %h:%n:%s %A %z"	->	"02/15/04 1:13:04 PM UTC"	(date and time with AM/PM specification)
"%j_%y-%m-%d_%h:%n:%s _0_0_%e_%v_%z(NIST) *"	->	"53050 04-02-15 10:23:32 0 0 0 50.0 UTC(NIST) *"	NIST
"%w,_%M_%d,_%y_%h:%n: %s%a-%z!PDT"	->	"Sun, Feb 15, 04 1:02:11am- PDT"	(date and time with AM/PM specification in PDT time zone)

Lookup a predefined time server

This window allows you to choose time server from [The list of public time servers](#) arranged by countries. To use time server from this list select it in the list view on the left of window and click **OK** button.

Actions

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Check

This command starts the manual time synchronization. Advanced Time Synchronizer will try to connect to the selected time server. When a timestamp is received, you can click the **Adjust** button to adjust your clock.

Adjust

This command adjusts computer's clock with time server. It becomes available only after you connected a time server and received a timestamp. When Advanced Time Synchronizer operates in automatic time synchronization mode, this command is implemented automatically when time correction is received from a time server.

Synchronize

This command starts the automatic time synchronization. Advanced Time Synchronizer will connect to all the servers in the list one by one until either the time is successfully synchronized or the list is over. If option **Auto-dial network connection** on the **Dial-up** tab of the **Settings** dialog is checked, Advanced Time Synchronizer will try to establish Dial-up network connection by dialing with parameters from that dialog.

Settings

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Run

Language

Language group allows you to change language interface of the program. If you want to translate this program to your language please read this topic: [Translation](#).

In return for the translation that we don't yet have, we are offering you a free license of Advanced Time Synchronizer.

Hot key

Advanced Time Synchronizer's main window can be restored by pressing the selected hotkey. Select this option and in the hotkey entry field press the hotkey, which you will use for restoring Advanced Time Synchronizer. Advanced Time Synchronizer's main window will appear when you press the hotkey even when you are working in another application.

Windows XP and later

Show balloon tool tip when time adjusted. Advanced Time Synchronizer can show balloon tool tip near its icon in the system tray when the system time is adjusted.

Options

Auto start the program causes Advanced Time Synchronizer to start when you log on to the system.

Show main window at the center of screen shows main window at the center of screen when the program starts.

Synchronize time when program started causes Advanced Time Synchronizer to start time automatic synchronization when it is started.

Ask before exit Advanced Time Synchronizer. With this option selected, Advanced Time Synchronizer asks for confirmation before the closing.

Hide window after time correction causes Advanced Time Synchronizer main window to be hidden when system time is updated. This option takes effect only when automatic time synchronization performs.

Hide even if attempt fails causes Advanced Time Synchronizer main window to be hidden even when system time is update failed. This option takes effect only when automatic time synchronization performs.

Close window after time correction causes Advanced Time Synchronizer main window to be closed when system time is updated. This option takes effect only when automatic time synchronization performs.

Close even if attempt fails causes Advanced Time Synchronizer main window to be closed even when system time is update failed. This option takes effect only when automatic time synchronization performs.

Operation

Timeout

Timeout value, through which time server request will be canceled if there is no answer from the server.

Sample

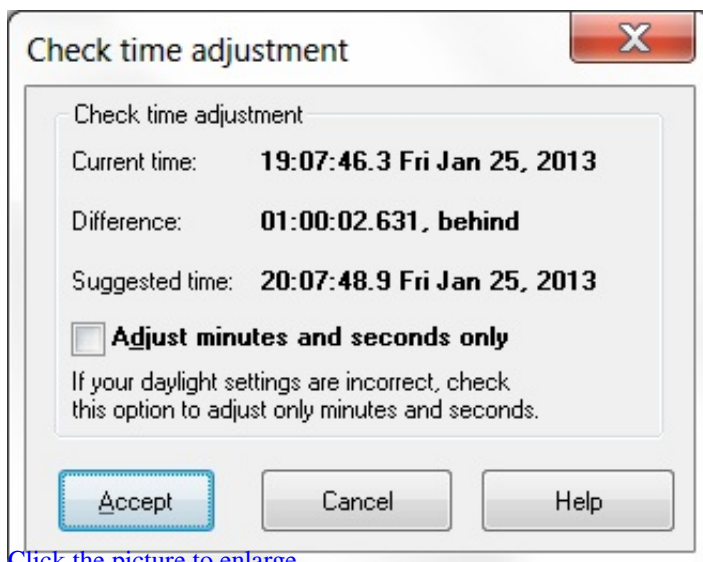
Advanced Time Synchronizer samples each time server multiple times and uses timestamp from the fastest sample to synchronize clock. This feature may be useful, because the network delays are often greater on the first sample and less on next samples. So this allows increasing accuracy of time synchronization by choosing a timestamp that is received with less network delays.

Log file

Option **Write time server connection log** allows Advanced Time Synchronizer to save all operations performed with time servers to the log file. You can view or clear this log by **View log** and **Clear log** buttons.

Check time adjustment

If a difference between computer's clock and time server is more that specified in this group, Advanced Time Synchronizer will consider that received time is probably incorrect. On the same settings dialog, you can set behavior of Advanced Time Synchronizer in this situation. You can set it to automatically accept this timestamp, not accept this timestamp or alert **Check Time Adjustment** window like this:



[Click the picture to enlarge.](#)

Check Time Adjustment window displays extended information and allows you to decide accept this timestamp or not. Additionally this window has an options for adjust only minutes and seconds. This option is useful if your time zone or daylight settings are incorrect. For more information about time zone settings please see [Setting the current time zone](#) topic.

Service

Install service

Click the **Install service** button to install Advanced Time Synchronizer Service. When Advanced Time Synchronizer is started as service it loads settings from the folder specified in the **Service settings** section. Click **Change settings** button to change location of the settings folder.

Uninstall service

Click the **Uninstall service** button to uninstall Advanced Time Synchronizer Service.

Service settings

In this section you can configure the Advanced Time Synchronizer Service.

Allow time synchronization from non-administrator accounts

When this option is enabled, any user of this computer will be able to use Advanced Time Synchronizer to synchronize computer clock.

Enable time synchronization from service

When this option is enabled, service loads settings from the specified directory and perform all operations that are due in case of a normal launch, such as scheduling automatic time synchronization and functioning as an time server for your local area network.

Service specific INI-files

Location of the settings files which are used by service.

Edit service settings

Click this button to change service specific settings. Administrator privileges are required.

Advanced Time Synchronizer as a service can be also controlled using the **Services** section in the Control Panel.

If you experiencing troubles with service please review [troubleshooting tips for service installation](#).

Servers

Time servers

The servers list displays the various network time servers you have specified. It also allows you to add new servers, delete and edit existing ones. The servers list is the ordered list of time servers that will be queried sequentially until a valid time source is contacted. Each line in the list contains the address of server and time protocol that you prefer to use with this server.

Ping

Test the server availability and display the time, in which the response from the server was received.

Select

Select the server. The selected server is displayed in the main window. Automatic time synchronization starts from sampling the selected server.

Edit

The **Edit** button allows you to change a server definition. You can also invoke the edit dialog by double-clicking any entry in the server list.

Add

The **Add** button invokes **New server** dialog allowing you to specify a new server name and select a time protocol. You can click **Lookup** button to choose time server from our predefined list.

Up

Moves selected server upwards in the list.

Down

Moves selected server downwards in the list.

Delete

The **Delete** button allows you to delete selected server.

Read more in the

[Time server settings](#) topic.

Scheduling

Auto start time correction

In this dialog you can customize an automatic start of time synchronization. **Auto start time correction** combo box contains several different intervals through which time synchronization must be started.

Dial-up

The Dial-up options may be customized in the **Dial-up** group. In the combo box titled **If computer is not connected at this time** you can choose an action for Advanced Time Synchronizer if there is no Dial-up connection established.

Do not connect option causes Advanced Time Synchronizer to prevent auto dialup connection, which Windows starts when some program trying to connect Internet.

Connect by Dial-up option causes Advanced Time Synchronizer to establish a dialup connection either with settings from the **Dial-up** tab, or if there is no auto dialup option enabled by standard Windows means.

Wait Dial-up connected option causes Advanced Time Synchronizer to wait for a dial-up connection to be established and only after that it will start automatic time synchronization.

Local server

Local time server protocols

Advanced Time Synchronizer can function as a time server for your local area network using three time synchronization protocols for that: Simple Network Time Protocol (SNTP), Time Protocol (TIME) and Daytime Protocol (DAYTIME).

For SNTP protocol: select **Simple Network Time Protocol** in the combo box titled **Time server protocol** and customize options concerning to this protocol.

For TIME protocol: select **Time Protocol** in the combo box titled **Time server protocol** and customize options concerning to this protocol.

For DAYTIME protocol: select **Daytime Protocol** in the combo box titled **Time server protocol** and customize options concerning to this protocol. For the DAYTIME protocol, you should also specify the syntax of the string that the server will be sending when requested. Format specifications for this string are described in [Daytime protocol timestamp format](#) topic.

When you press the **OK** button, Advanced Time Synchronizer will start functioning as a time server on your computer. From now on, to connect to this server, you should add the IP address or the name of the computer in the local area network, on which Advanced Time Synchronizer is running as a server, select the protocol that you specified for the server and, if you use the DAYTIME protocol, the syntax of the string. You can add a new server to the list of servers on the **Servers** tab in the **Settings** dialog.

Advanced Settings

Log server access

Save all connections to local server to the log file. You can view log file by clicking on **View log** button and clear it by **Clear log** button.

Restrict server access

This option allows local server to reject connections from some addresses. Use semicolons (;) to separate entries. Wildcards (*) and (?) are allowed. Example:
10.10.5.75;192.168.1.*;192.168.150.2?

Sounds

Advanced Time Synchronizer Sounds

In this dialog you can customize sounds that will be played after time synchronization events occurred. Currently two events available: Time server connected and local clock time updated. Also you can choose an audio output device for playing sounds through it.

Dial-up

Auto-dial network connection

In this dialog you can customize auto dial network connection. If you want to Advanced Time Synchronizer establish a dial-up network connection before it tries to connect a time server, check the **Auto-dial network connection** option, select a phone book entry and specify the username and password for it. If you want Advanced Time Synchronizer to terminate the established connection after it synchronizes the time, check the **Automatically disconnect** option.

Advanced Time Synchronizer will dial only if no any dial-up connections established and will hang-up only one connection it made. Advanced Time Synchronizer will not start auto dial, if **Do not connect** option is selected on the **Scheduling** tab of **Settings** dialog is checked.

Proxy

Use a proxy server

If you are behind a firewall, it can be still available to synchronize your local PC clock with time servers. You just need to know what type of proxy you use, its address and port number. Currently Advanced Time Synchronizer supports HTTP, SOCKS4, SOCKS4A and SOCKS5 proxy servers. Unfortunately, most proxy servers do not support UDP datagrams, so the time servers configured to SNTP protocol and TIME and DAYTIME protocols with UDP network protocol will be unavailable, if you using a HTTP, SOCKS4 or SOCKS4A proxy server.

If your proxy server requires authentication, you must check **Use authentication for the server** check box and specify your user name and password in the corresponding boxes.

Average drift

This tab displays the system clock drift statistics based on the differences of system clock with time servers. These statistics are accumulated over time, therefore the longer you wait between resets the more accurate the measurement will be. The **Reset** button is provided for cases such as mother board replacement where you want to restart the measurement from scratch.

Statistics

Advanced Time Synchronizer keeps information about all time synchronizations it made. In this dialog you can view this information. To clear all statistics information click **Clear** button. If you do not want to keep statistics information anymore, you can check **Do not save statistics information** check box.

Logo

Main window logo appearance can be customized in Advanced Time Synchronizer. The following appearances are currently available:

Animation:

Advanced Time Synchronizer version 4.0 and later: the default appearance.

World clock:

Advanced Time Synchronizer version 5.0 and later: up to 6 clocks with different time zones. Time zone information from Windows configuration is used. The local time may be calculated incorrectly under the following conditions:

Outdated or incorrect time zone information.

The time zone uses a different UTC offset for the old and new years.

The UTC time to be converted and the calculated local time are in different years.

Logo image:

Advanced Time Synchronizer Industrial can display a custom logo in its main window. The logo can be loaded from an image file. The bmp, jpg and gif image formats are supported.

Troubleshooting

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Troubleshooting

Different settings for different users

Advanced Time Synchronizer is optimized for Fast User Switching feature of Windows XP. It keeps settings for different users separately. So, different users of one computer may customize Advanced Time Synchronizer settings by their preferences and run Advanced Time Synchronizer even simultaneously using Fast User Switching.

Local time servers does not start (Address is already in use error)

The "Address is already in use" error means that the server is already started by another instance of Advanced Time Synchronizer or by another application. For example, if you start Advanced Time Synchronizer as service and then start Advanced Time Synchronizer as application, the local time server will not able to start twice and you get "Address is already in use" error, but time servers will work and will be handled by the service. The same happens if you start Advanced Time Synchronizer as multiple users (when Fast User Switching is enabled). The local time servers will be started and executed by the first instance of Advanced Time Synchronizer and all other instances will prompt "Address is already in use" error.

Please review [Frequently Asked Questions](#) for more troubleshooting tips.

Service installation

Service does not start

First of all review **Events Log** form **Control Panel | Administrative Tools**.

If service failed to start due to error, the error will be described there.

Advanced Time Synchronizer service will not start when your trial period is expired.

If you still experiencing troubles please contact our [support service](#).

Service starts but does not work

When Advanced Time Synchronizer is started as service it synchronizes time by intervals and options specified in the settings file. Make sure that the INI-files location is correct in the

Change settings section of the **Service** tab of Advanced Time Synchronizer settings dialog.

Please review [Frequently Asked Questions](#) for more troubleshooting tips.

Command line tool

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Command line tool

Advanced Time Synchronizer includes the command line tool, which can be invoked from the command line. The arguments from command line are used instead of standard Advanced Time Synchronizer settings.

command line:

```
[ -r ] [ -e ] [ -h ] [ -v ] [ -n ] [ -y ] [ time_server:[protocol] ] [ net_protocol ]  
[ daytime_format ] [ samples ] [ timeout ] [ proxy_server:port type [user:pwd] ]  
[ autodial entry [user:pwd] [hangup] ]
```

-r - display ordering information

-e - enter registration key

-h - display this help screen

-v - verbosely

-n - do not change system time (just receive and display difference)

-y - answer YES to all questions

time_server - time server DNS name or IP address

protocol - time server protocol (SNTP | TIME | DAYTIME) (TIME - default)

net_protocol - network protocol (TCP | UDP) (only for TIME and DAYTIME protocol)

daytime_format - syntax of DAYTIME server timestamp (only for DAYTIME protocol)

samples - number of time server samples

timeout - time out in seconds

proxy_server:port - proxy server DNS name or IP address and port number

type - type of proxy server (HTTP | SOCKS4 | SOCKS4A | SOCKS5)

user:pwd - user name and password, if proxy requires authentication

autodial - automatically establish dial-up connection

entry - phone book entry

user:pwd - user name and password for specified phone book entry

hangup - disconnect automatically established connection

Examples:

"contimesync nist1.datum.com" - synchronize local PC clock with nist1.datum.com by TIME protocol

"contimesync nist1.datum.com:SNTP 5 20" - synchronize local PC clock with nist1.datum.com by SNTP protocol, sample server 5 times and use 20 seconds timeout

"contimesync.exe nist1.datum.com:DAYTIME TCP %j_%y-%m-%d_%h:%n:%s_%x_%x_%e_%v_%z(NIST)_* 1 20" - synchronize local PC clock with nist1.datum.com by DAYTIME protocol, sample server 1 time, use 20 seconds timeout and NIST format of server timestamp

"contimesync.exe nist1.datum.com:TIME TCP 2 20 192.168.150.1:3128 HTTP" - synchronize local PC clock with nist1.datum.com by TIME protocol, use HTTP proxy server

"contimesync.exe nist1.datum.com:TIME TCP 2 20 autodial ISP user:password hangup" - synchronize local PC clock with nist1.datum.com by TIME protocol, automatically establish dial-up connection using "ISP" phone book entry

Exit codes:

- 0 Success
- 1 Fatal error
- 2 User cancel
- 3 Request is timed out
- 4 DNS entry not found
- 5 Net down
- 6 Data read error
- 7 Data send error
- 8 Connecting error
- 9 Server data format is unsupported
- 10 Server is not healthy
- 11 Selected proxy type is not supported
- 12 Proxy server requires authentication
- 13 Proxy server authentication failed
- 14 Proxy server error
- 15 Proxy does not support this time protocol
- 16 Proxy uses unknown type of authentication
- 17 Auto Dial-up error

Appendixes

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Appendix A: Time zone abbreviations

The list of time zone abbreviations that can be specified in Daytime protocol timestamp format in Advanced Time Synchronizer:

Abbreviation	Name	Correction
A	Alpha	+1:00
ACDT	Australian Central Daylight Time	+10:30
ACST	Australian Central Standard Time	+9:30
ADT	Atlantic Daylight Time	-3:00
AST	Atlantic Standard Time	-4:00
AEDT	Australian Eastern Daylight Time	+11:00
AEST	Australian Eastern Standard Time	+10:00
AKDT	Alaska Daylight Time (USA)	-8:00
AKST	Alaska Standard Time (USA)	-9:00
ART	Argentina Time	-3:00
B	Bravo	+2:00
BOT	Bolivia Time	-4:00
BET	Bering Standard Time	-11:00
BDT	Bangladesh Time	-6:00
BST	Eastern Brazil Standard Time	-3:00
C	Charlie	+3:00
CDT	Central Daylight Time (USA)	-5:00
CST	Central Standard Time (USA)	-6:00
CEST	Central Europe Summer Time	+2:00
CET	Central Europe Time	+1:00
COT	Colombia Time	-5:00
CUT	Coordinated Universal Time	0
D	Delta	+4:00
E	Echo	+5:00
EDT	Eastern Daylight Time (USA)	-4:00
EST	Eastern Standard Time (USA)	-5:00
EEST	Eastern Europe Summer Time	+3:00

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EET	Eastern Europe Time	+2:00
F	Foxtrot	+6:00
G	Golf	+7:00
GMT	Greenwich Mean Time	0
H	Hotel	+8:00
HAA	Heure Avancée de l'Atlantique (french)	-3:00
HAC	Heure Avancée du Centre (french)	-5:00
HAE	Heure Avancée de l'Est (french)	-4:00
HAP	Heure Avancée du Pacifique (french)	-7:00
HAR	Heure Avancée des Rocheuses (french)	-6:00
HAT	Heure Avancée de Terre-Neuve (French)	-2:30
HAY	Heure Avancée du Yukon (french)	-8:00
HNA	Heure Normale de l'Atlantique (french)	-4:00
HNC	Heure Normale du Centre (french)	-6:00
HNE	Heure Normale de l'Est (french)	-5:00
HNP	Heure Normale du Pacifique (french)	-8:00
HNR	Heure Normale des Rocheuses (french)	-7:00
HNT	Heure Normale de Terre-Neuve (french)	-3:30
HNY	Heure Normale du Yukon (french)	-9:00
HDT	Hawaiian Daylight Time (USA)	-9:30
HST	Hawaiian Standard Time (USA)	-10:00
I	India	+9:00
IST	Irish Summer Time	+1:00
JST	Japan Standard Time	+9:00
K	Kilo	+10:00
L	Lima	+11:00
M	Mike	+12:00
MDT	Mountain Daylight Time (USA)	-6:00
MST	Mountain Standard Time (USA)	-7:00
MED	Middle European Daylight	+2:00
MESZ	Mitteeuropäische Sommerzeit (german)	+2:00
MEST	Middle European Summer	+2:00
MET	Middle European Time	+1:00
METDST	Middle European Daylight Savings Time	+2:00
MEWT	Middle European Winter Time	+1:00

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MEZ	Mitteeuropäische Zeit (german)	+1:00
MEX	Mexico Time	-6:00
N	November	-1:00
NDT	Newfoundland Daylight Time	-2:30
NFT	Newfoundland Time	-3:30
NST	Newfoundland Time	-3:30
NT	Nome Time (USA)	-11:00
O	Oscar	-2:00
P	Papa	-3:00
PDT	Pacific Daylight Time (USA)	-7:00
PST	Pacific Standard Time (USA)	-8:00
Q	Quebec	-4:00
R	Romeo	-5:00
S	Sierra	-6:00
SBT	Solomon Islands Time	+11:00
T	Tango	-7:00
THAT	Tahiti Time	-10:00
TUC	Coordinated Universal Time (french)	0
U	Uniform	-8:00
UTC	Coordinated Universal Time	0
V	Victor	-9:00
W	Whiskey	-10:00
WEST	Western Europe Summer Time	+1:00
WETDST	Western Europe Summer Time	+1:00
WESZ	Westeuropäische Sommerzeit (german)	+1:00
WET	Western Europe Time	0
WEZ	Westeuropäische Zeit (german)	0
WST	Western Standard Time (Australia)	+8:00
X	X-ray	-11:00
Y	Yankee	-12:00
YDT	Yukon Daylight Time	-8:00
YST	Yukon Standard Time	-9:00
Z	Zulu	0

Appendix B: The list of public time servers

This appendix contains [the list of public primary \(stratum 1\) time servers](#) and [the list of public primary \(stratum 2\) time servers](#).

As the load on the hosts supporting NTP primary (stratum 1) time service is heavy and always increasing, clients should avoid using the primary servers whenever possible. In most cases the accuracy of the NTP secondary (stratum 2) servers is only slightly degraded relative to the primary servers and, as a group, the secondary servers may be just as reliable.

The list of primary (stratum 1) and secondary (stratum 2) designates the NTP time servers available for public access under stated restrictions. Each entry gives the country code, state (US only), host name, Internet address, approximate location and geographic coordinates (if available), synchronization source (stratum, type of radio or satellite receiver and host type), suggested service area, access policy (as notified) and responsible person name and e-mail address. Most servers indicate the NTP version as well. It is always wise to consult the DNS to verify host addresses, which are changed from time to time. When more than one address is given, preference should be given to each in order.

Please respect the access policy as stated by the responsible person. It is very important that potential clients avoid use of servers not listed as open access, unless approved first by the responsible person. This especially includes indiscriminate use of servers not listed in the list, since this can be disruptive. The responsible person should always be notified upon establishment of regular operations with servers listed as open access. Servers listed as closed access should NOT be used without prior permission, since this may disrupt ongoing activities in which these servers are involved.

All primary and secondary servers listed have no access restrictions, so that service is available for any client with a valid IP address. Where noted, some servers enforce a limit on the number of clients from any one network other than the server network itself. Where noted, some servers provide a cryptographic authentication service. Contact the responsible person for further details.

[The List of Public Primary \(stratum 1\) Time Servers](#)

[The List of Public Primary \(stratum 2\) Time Servers](#)