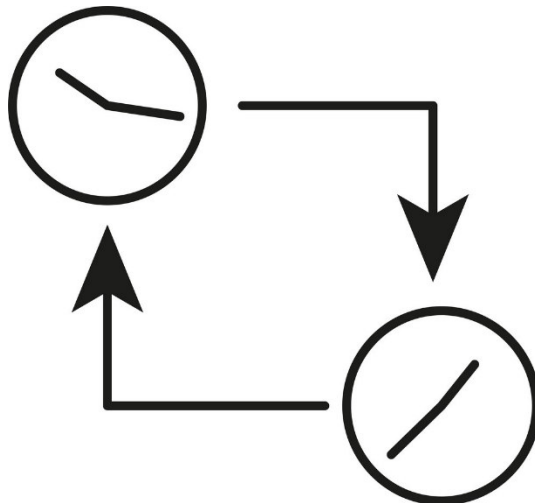




Time Synchronization

Setup between stations



Inhalt

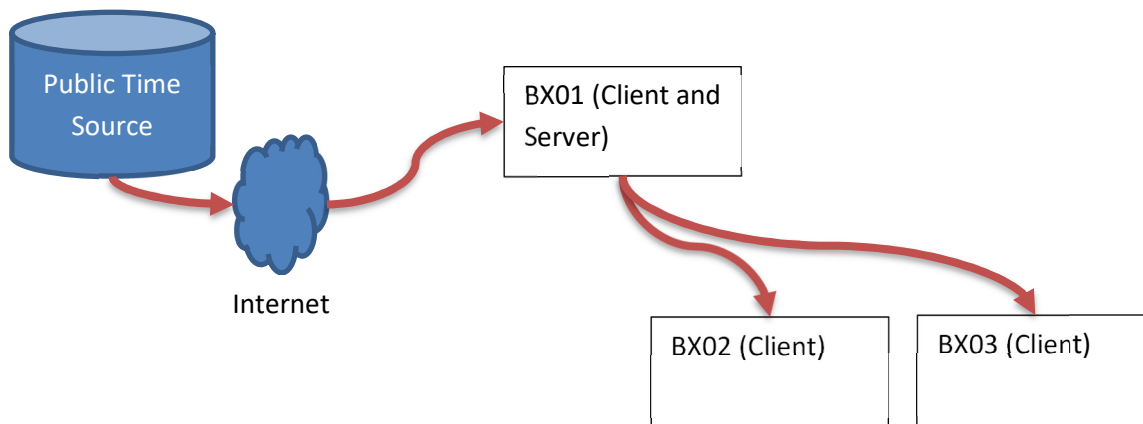
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1 General

This manual describes the process of Time synchronization between the BatchXpert Stations. This process is specially important when the “BatchXpert Synch Service” is used to synchronize data between BatchXpert Stations. This application synchronizes the databases and some important files between all BatchXpert stations. Since this applications must timestamp the respective file changes, it relies on the fact, that all Stations agree an the same System Time. If the system time would be different on one or some stations, these syncronization can not work.

Generally the esiest way to synchronize the System Times between the servers is by using the NTP (Network Time Protokoll). Ths Protocoll is supported by all Windows Versions since Windows NT and is even supported by most PLC’s (including Simatic S7 and Vipa Speed 7). This protocol automatically synchronizes the System Times of an “Client” with the System Time of an “Time Source” or “Server”. A “Server” or “Timesource” is usually an reliable source for Timekeeping and nowadays usually is an Publically available server connected to the Internet, such as “Time.Google.com” or similar.

Every Windows Station can act as Client, meaning it will Synchronize its System time based on an Reference time from an Time source. Most PLC’s can also act as Clients, and thus can synchronize their system time to an Reference Time source. Windows PC, also have the option to also act as an “Server” or “Time Source” and thus becoming the “Reference Time Source” for an Network. On Windows, an Station can even be an Client AND and Source at the same time. This allows you to configure the network the following way:



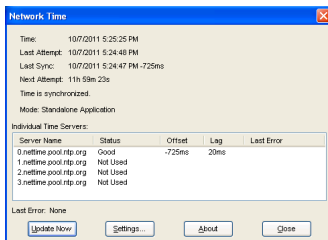
As seen in the diagram, BX01 acts as an client to an public “Timesource” and synchronizes its time periodically to it. If no Internet conectivity is available, this step can also be omitted. All other BatchXpert stations synchronize their time to the Bx01, which in turn is synchronized to an Public time Source. This means that the “Reference Time” is realy on “Bx01” which optionally can be set to synchronize to the Internet.

2 Install NTP as Client

Unfortunately most Windows implementations do not use NTP as it is not enabled in many situations. One of those situations is a non-domain joined server, which is the usual configuration for BatchXpert stations. An unjoined system can function as both a NTP server and client, but it doesn't do either by default.

There exist several different options for setting up NTP (Network Time Protocol) clients on a Windows computer. The one recommended here is by using a tool called "NetTime". This tool can act as an NTP Client, as well as a Server. This tool is free, open source and available on: <http://www.timesynctool.com/>

2.1 Installation



The installation is fairly easy and will not need any specific explanation. Download the installer and install the application as "Windows Service". This way it runs automatically in the background and automatically syncs the time with the configured stations. After installation the NetTime is available as an icon in the taskbar next to the time and date.

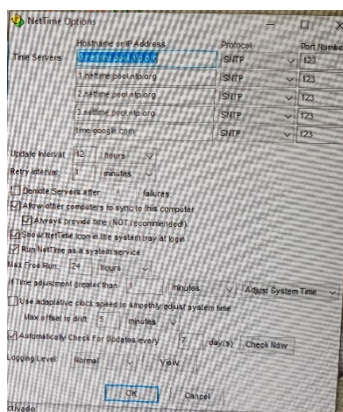
2.2 Required Ports and Firewall Exceptions

The application uses the standard NTP port which is by default UDP Port 123. In order for this application to work as a client, this port must be allowed as an outgoing connection.

By default the installer of NetTime adds a Firewall exception to allow "NetTime" to open outgoing connections to sync time. This means, no further configuration is necessary for the BatchXpert Station to work as a Client.

2.3 Configuration

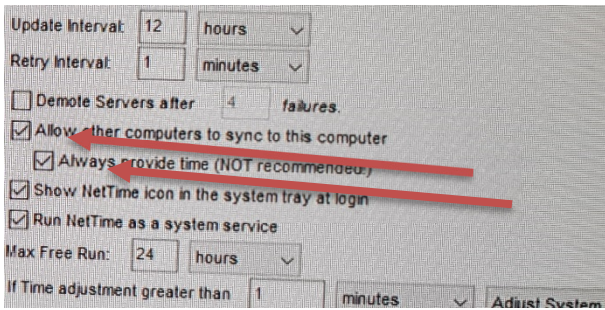
As described above, there exist usually two scenarios. If the station has internet access, then the predefined default Time servers should be working and enough for this application to work.



INFO: some company internal networks, do not allow NTP into the public internet. In this case, the name of the network's time server must be asked from the network administrators and added to the client list accordingly.

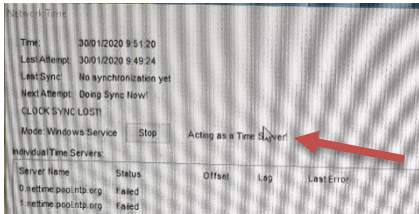
If the station does not have internet access, and should sync its time from one of the BatchXpert stations, usually BX01, then one must add the server name to the Timeserver list of NetTime. To do this, you open the detail window by clicking on the icon in the taskbar (left of the date and time to the right of the taskbar of windows). The settings can be opened by clicking "Settings". The name of the BatchXpert station or the IP address should be added to the server list. After adding the server, you can use "Update Now" to test the time synchronization.

3 Install NTP as Server



The NetTime utility can also work as an Time server, even at the same time as acting as a client. Usually the BatchXpert Station “BX01” should be set up as Time server, and also as Time client to update its local time from an public time source.

To activate the Time server, you have to open the detail window by clicking the NetTime task bar icon and on there on the “Settings” button.



In the settings you only have to activate “Allow other computers to sync to this computer” and “Always provide Time”. Activating both options, makes the tool act as an Time server which can be added to the other clients.

When the Time server is set up and running, an message appears that shows the status of the server.