



TIME SYNCHRONIZATION WITH NTP

APPLICATION NOTES

— General

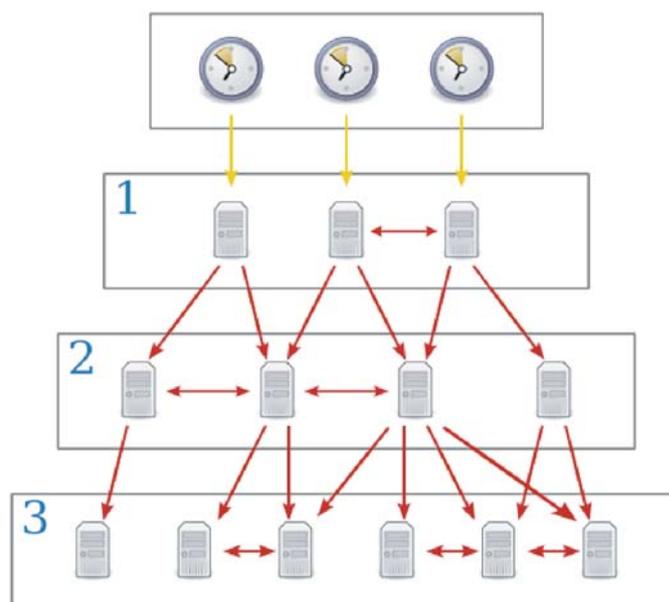
Inside the new structures of distribution networks, protection relays may be used as a reliable and flexible measurement systems as well as for their primary function: they can provide valuable informations on the different nodes of the grid.

With the use of remote units appropriate procedures must be defined to ensure traceability and consistency of the measurements and especially data acquisition continuously synchronized with each other in an extremely accurate (timestamping) is necessary.

— Applications

Of particular relevance is the analysis on integrated systems for good electricity dispatching from renewable or similar and load control with the objective of production and distribution energy optimization of on the basis of real time data through telemetry (active and reactive power flows, environmental conditions, state of industrial processes involved and any storage systems, etc..).

Regarding the protections coordination, solutions based on adaptive protection schemes, where the protective devices, circuit breakers and disconnectors, with capacity for remote communication and synchronization functions, can be controlled to automatically reconfigure the grid in case of faults, are possible.



— Synchronization over Internet network

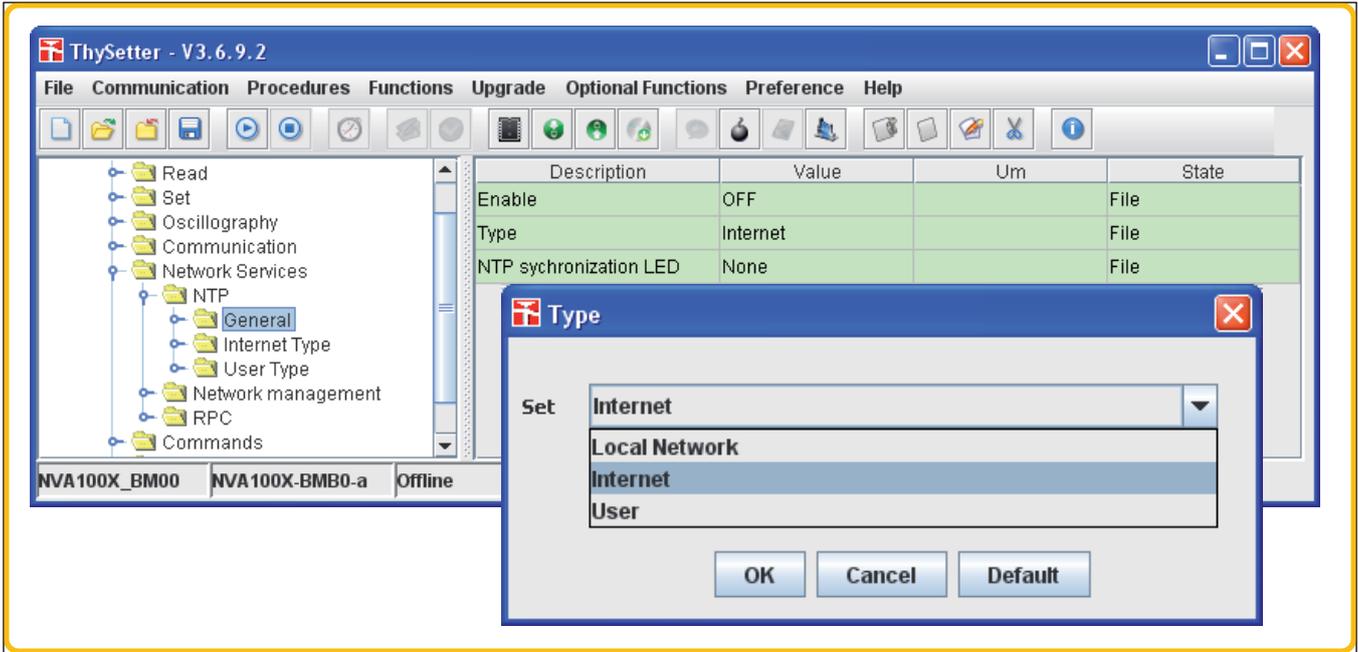
The Pro-N protective relays, (versions equipped with Ethernet network interface) can be synchronized with an NTP server.

NTP is a TCP / IP protocol to synchronize time across the network: the current time is requested to a server by a device: the information is used to set its clock as a single reference for the events recording and oscillographic recordings. The difference between the internal reference and the external synchronization message is used to correct the internal clock.

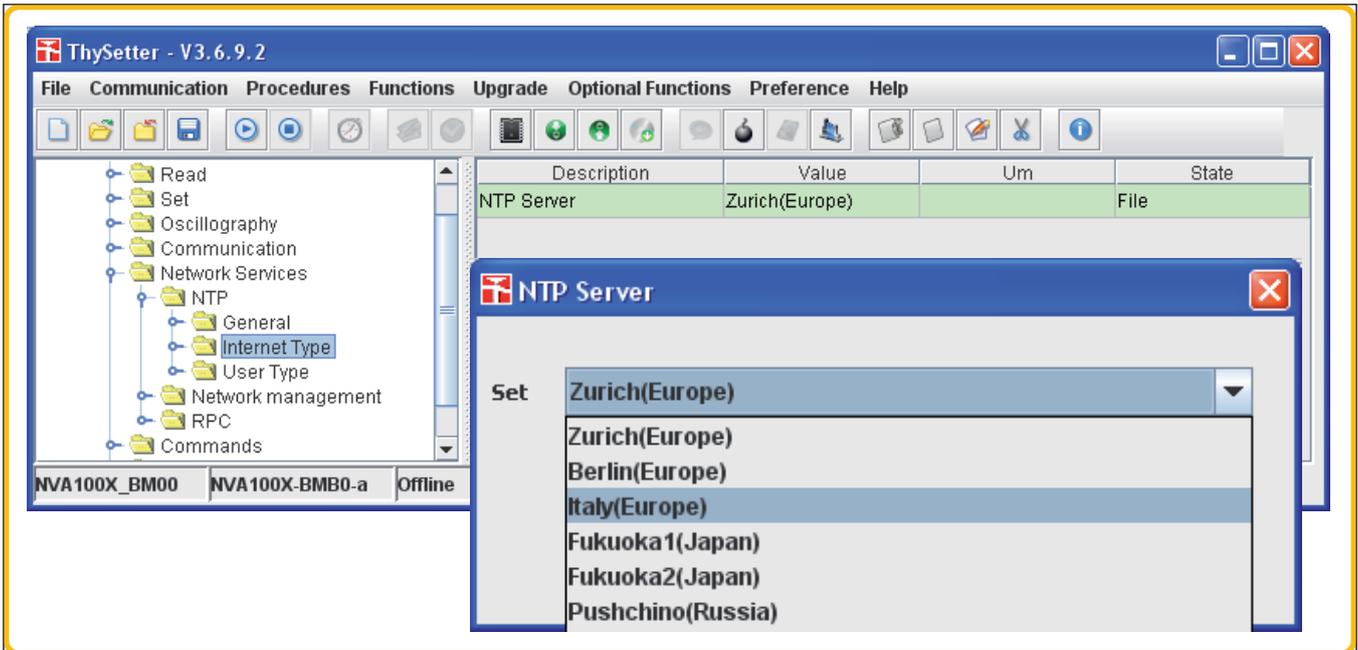
All parameters are adjustable via sw ThySetter.

Inside the *Set \ Network services \ NTP \ General* menu the following settings are available:

- enable/disable by means of the *Enable* parameter,
- type of source *Internet, Rete locale* or *Utente*,
- LED commissioning,
- NTP period (*NTP cycle time*),
- NTP timeout (*NTP message timeout*),

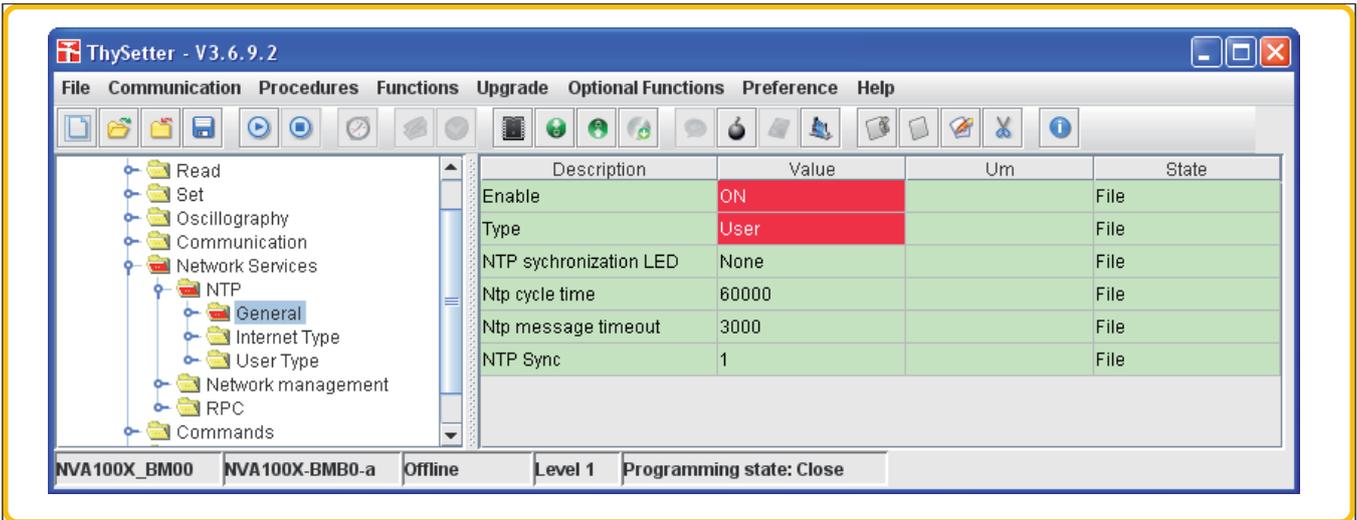


Inside the *Set \ Network services \ NTP \ Internet Type* menu the public server may be select:



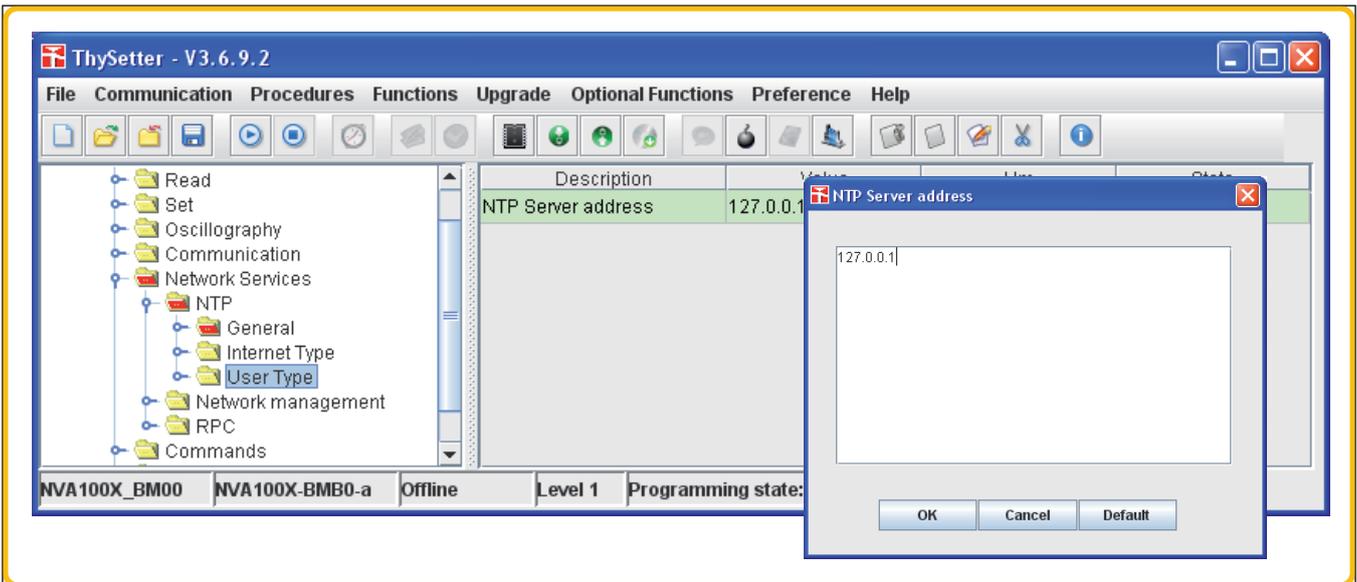
— **Synchronization over local network isolated from the Internet network**

By means Thysetter the following parameters must be set inside the *Set \ Network services \ NTP \ General* menu:



Enable an LED if a visual signal is desired when synchronization occurs.

Inside the *Set \ Network services \ NTP \ User Type* menu the IP address of NTP server must be set (in this case the IP address of the PC where the NTP server will be enabled)



Close the calibration session as usual to save and apply the settings.

NTP server activation on Personal Computer - example of a procedure with the Windows 7 operating system

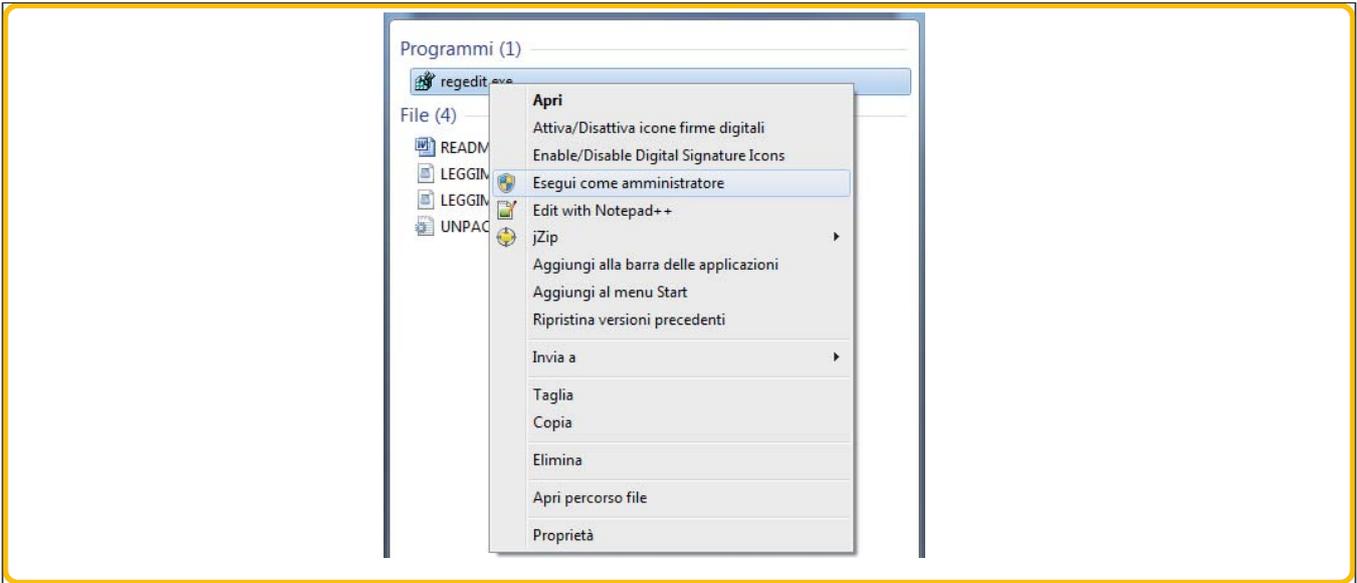


CAUTION

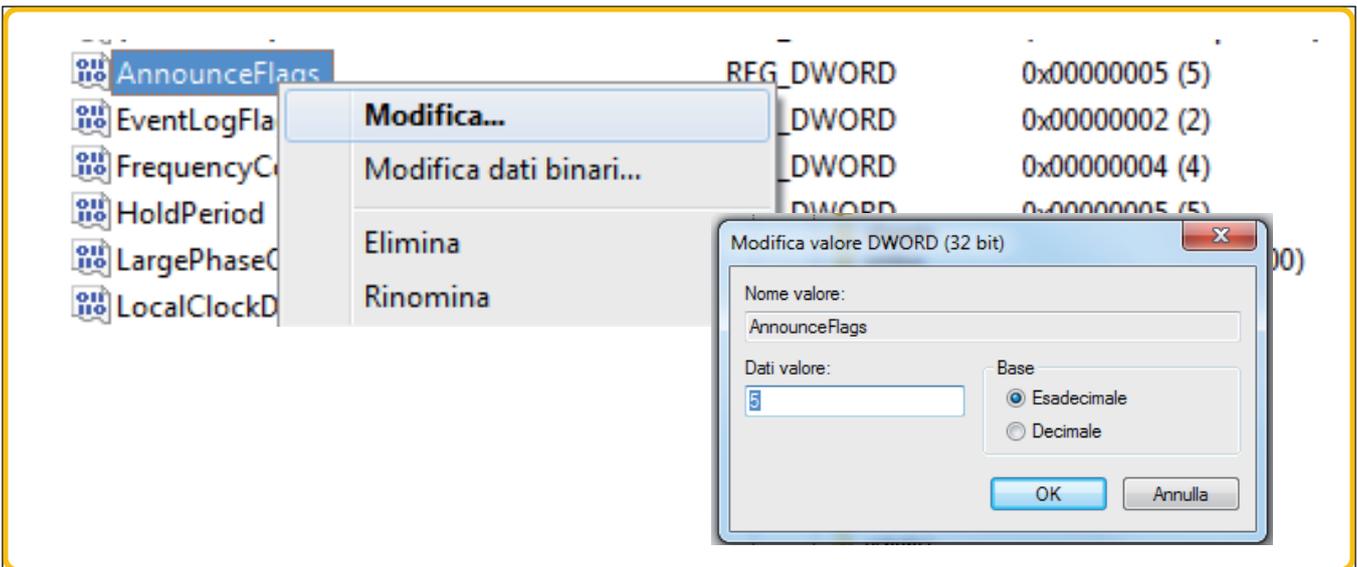
Changes in the System register can lead to unexpected problems whose resolution may require the Windows reinstallation! Thytronic assumes no responsibility for problems of any kind arising from errors resulting from these changes.

N.B. The procedure requires administrator permissions

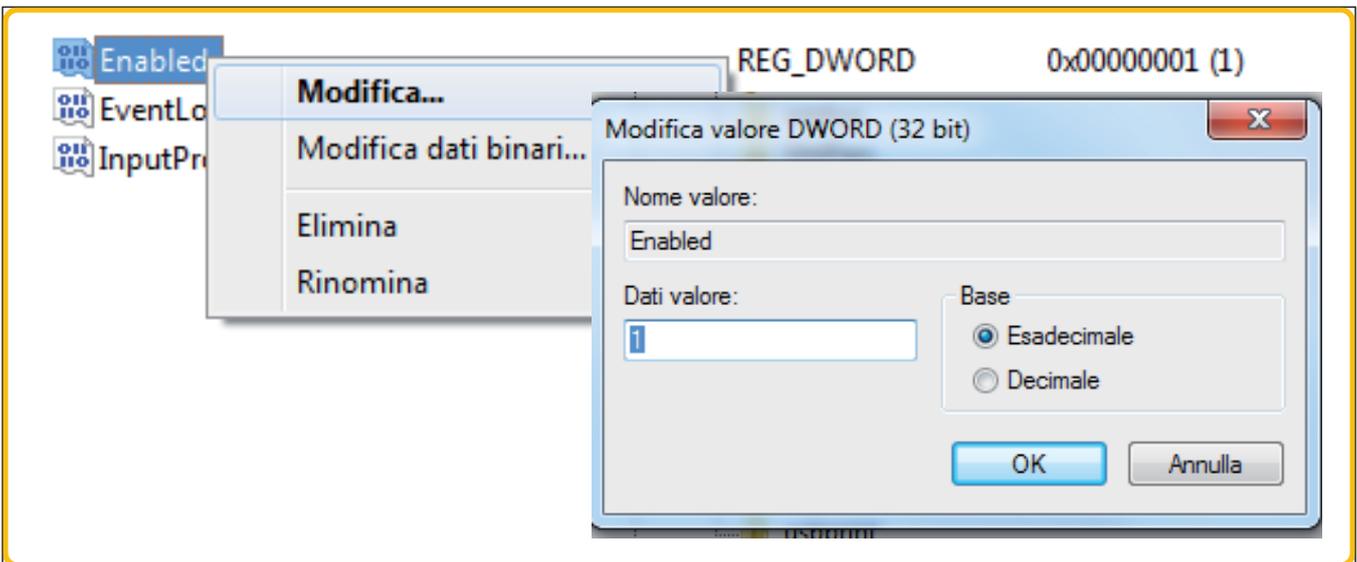
- 1) Open the system register
- 2) Click with the right mouse button on *regedit.exe* and select "Esegui come amministratore"



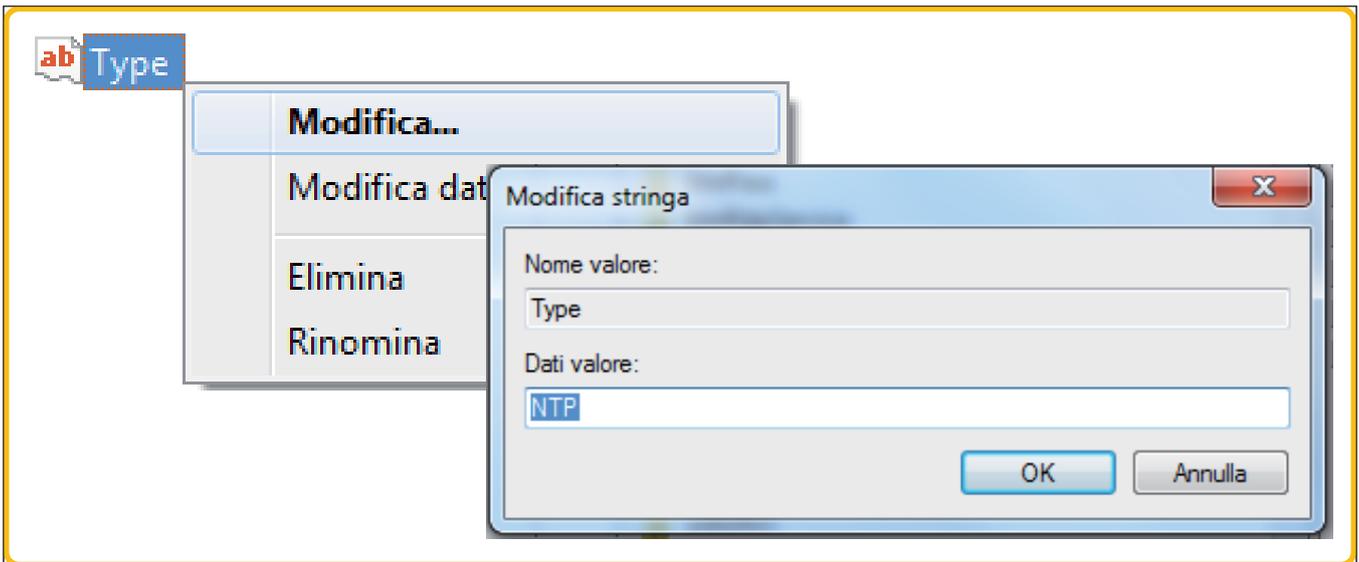
- 3) search for the "HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\W32Time" folder:
- 4) inside the "Config" subdirectory set the "AnnounceFlags" key to 5



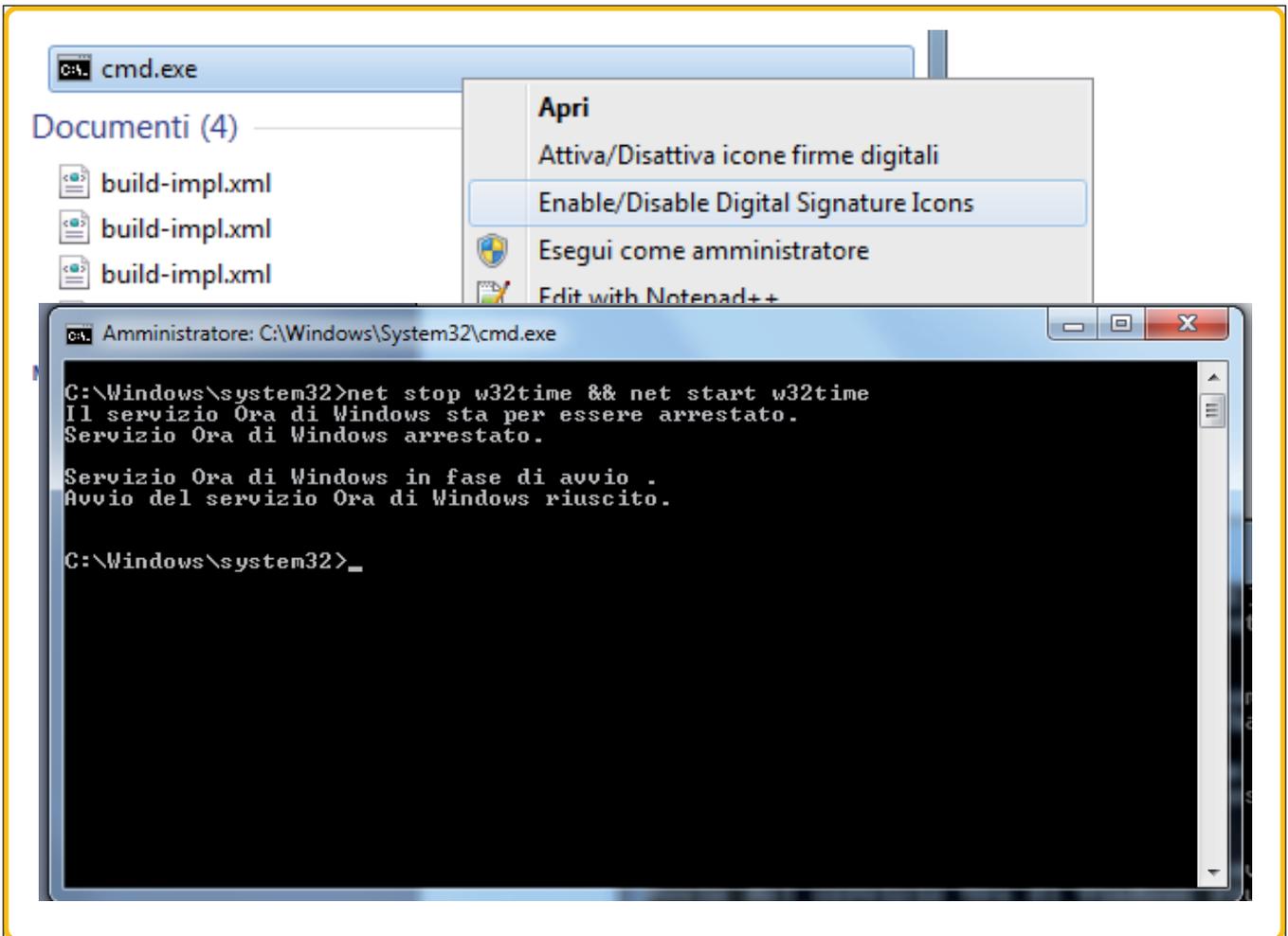
- 5) inside the "TimeProviders\WtpServer" subdirectory set the Enabled key to 1



6) inside the "Parameters" subdirectory set the "Type" key to NTP



Restart the "Ora di Windows" service by opening a command prompt as an administrator (click on *Start*, enter *cmd*, click with the right mouse button on *cmd.exe* and select "Esegui come amministratore"; in the new window type "net stop w32time && net start w32time" followed by a carriage return.



If there are any problems receiving the clock synchronization signal is recommended to disable any firewall or to create a rule to allow the service "Windows Time" to create connections without blocks.

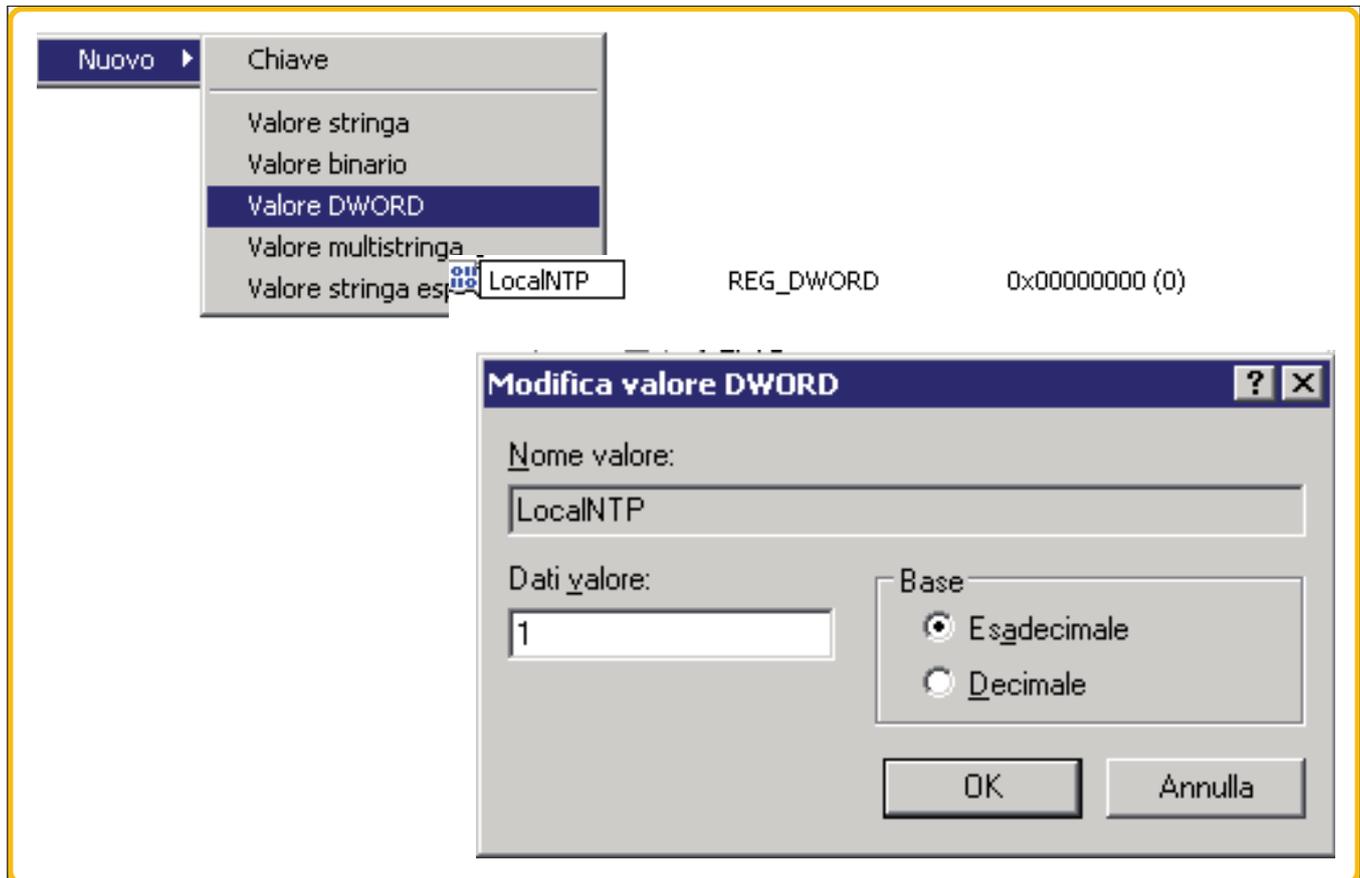


CAUTION

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- 1) click on *Start*, then *esegui*, type *regedit* and press *OK*.
- 2) open the path "*HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\services\W32Time\Parameters*"
- 3) change the "*LocalNTP*" key and set to 1. If the key is not present, create it by right-clicking and create a new key *DWORD*



- 4) restart the Personal Computer.

If there are any problems receiving the clock synchronization signal is recommended to disable any firewall or to create a rule to allow the service "*Windows Time*" to create connections without blocks.