

White Paper:

Spectracom Presentense Software

Presentense is a network management tool that can synchronize all of the Windows PCs and other devices on your network, maintain this synchronization for maximum interoperability, and provide accuracies measured in milliseconds.

Windows 2000, XP, Vista and Windows 2003 have a free built-in time service known as W32Time — so why would you need Spectracom's Presentense Software Package? The answer is simple. W32Time is the *MINIMUM* requirement to meet the needs of Window's Kerberos network authentication protocol. Kerberos is designed to provide strong authentication for client/server applications, using secret-key cryptography. Kerberos was not designed to keep network systems and devices accurately time synchronized to an external reference. Many applications, including public safety, financial, government, and security systems, require a much higher level of time accuracy than W32Time can provide.

Microsoft confirms that the W32Time Service is not designed to provide this level of time synchronization capability. In the April, 2001 article, *Windows Time Service*, Microsoft states, "W32Time meets the requirements specified by the Kerberos authentication protocol to provide clock values that are loosely synchronized across a network. This service is not designed for use by applications that require greater precision."

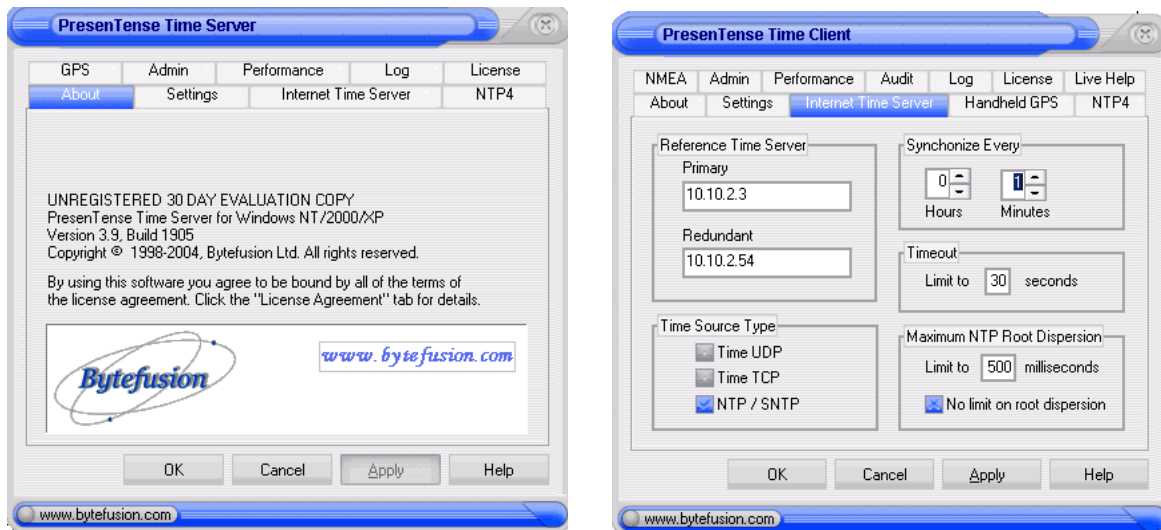
Presentense is a network management tool that can synchronize all of the Windows PCs and other devices on your network, maintain this synchronization for maximum interoperability, and provide accuracies measured in milliseconds. Compared to W32Time, which has one set time synchronization interval for Windows 2000 (once every eight hours ONLY — XP SP1 synchronizes once every seven days), Presentense offers user-specified intervals as often as once per minute. W32Time disregards PC clock drifts or jumps between each synchronization interval, but Presentense continually monitors network time synchronization for any discrepancies.

Presentense simplifies the synchronization of your Windows 95/98/NT/2000/XP workstations. Windows 95/98/ME PCs do not have "services," so there is no built-in program to synchronize these PCs. The only way to provide network synchronization is very crude. This involves using the Net Time program to direct the PC to a server at boot-up. This involves modifying log-on batch files for each and every workstation on the network. Presentense eliminates this problem by providing a program that automatically allows these PCs to sync to a server without having to change log-on scripts. Windows NT does not have a built-in time service, so one has to be installed on these PCs as well. Presentense can be used for this application.

Presentense also has the exclusive ability to provide an RS-232 connection as well as NTP to a Windows 2000/2003/XP PC. The entire family of Spectracom NetClocks has the ability to output RS-232 data to a PC. Without Presentense software, the RS-232 is not capable of synchronizing these versions of Windows. Presentense has a built-in driver that recognizes the RS-232 data from a Spectracom NetClock, allowing a server to synchronize to a NetClock without the requirement of an NTP Server. While NTP is the best method of providing time to a network, this feature provides an alternative method for synchronizing Windows 2000/2003/XP.

Presentense is a suite of software consisting of a Server program (Presentense Server) and two client programs (Presentense Client 98 and Presentense Client NT), a network monitoring program (LAN Time Analyzer) and an auditing tool (NTP Auditor). Each of these programs is described in detail in the following pages of this document.

PresenTense Time Server and Time Client Programs



PresenTense provides redundancy on the network by supporting multiple NTP time servers. W32Time allows only one NTP server on the network. PresenTense Server allows two isolated NTP Servers to be placed on the network to provide redundancy in case of failure. If one NTP server is not available, PresenTense automatically selects the next NTP server in the list. W32Time does not have this capability.

The PresenTense Time Server program is recommended to be installed on one PC located on the network (typically the Domain Controller) to synchronize that particular PC to the NTP time server(s) co-located on the network. The server software also enables other Window clients and servers running the PresenTense Time Client software to synchronize to that PC as either the primary or backup time reference for each PC. The Time Client program is installed on all other Windows PCs to allow them to synchronize to the PC running the Time Server program, or to the NTP Time Server on the network (One is primary and the other is an automatic backup).

NOTE: PresenTense clients will ONLY synchronize to another PC if that PC is running the PresenTense Server software. Without PresenTense Server installed on a PC, the network clients can only sync to an NTP Server. NTP server allows for the network to have a backup time reference in case the NTP server is unavailable.

The two PresenTense Client programs from Spectracom can be site-licensed so that they can be installed on every Windows PC in your facility. Installation is easy and takes only a few moments at each PC. Most importantly installing the software DOES NOT require a reboot of the server or workstations.

W32Time is command line driven. There is no Graphic User Interface (GUI). PresenTense is user friendly and GUI driven for ease of configuration. Unlike W32Time, which makes limited error logs in Event Viewer, PresenTense has its own logs that record successful time synchronization information and any errors. W32Time provides only limited alarm entries mixed with all of the other PC alarm indications. The PresenTense Client and Server software also support Syslog, so all logs can be sent to a designated Syslog server for safe/secure storage and retrieval.

PresenTense can alert you to a time synchronization problem on the network through an email message. If a time reference becomes unavailable or critical errors are encountered during operation, an email is sent to alert you to the issue. The only real way to know that W32Time has a problem is for a user to notice that the time is not correct — at which point it may already be too late.

PresenTense provides redundancy on the network, supporting multiple NTP time servers.

Remote installation (pushing-out) of PresenTense Client software to all PCs on the network

PresenTense Time Client (site license only), can be remotely installed in one of four ways:

1. Remote Installer Module, Pre-Configured

Two files are distributed to each PC on which PresenTense Time Client is to be installed. One file PTC-Remote.exe is the software load and the other file bfoptions.dat is the configuration file. Once PTC-Remote.exe is executed on the remote computer, PresenTense Time Client is silently installed and configured as determined by the configuration file. No user interaction is required on the remote computer and the user does not have to log off or reboot. The software is simply installed and starts running.

2. Remote Installer Module, not Pre-Configured

Similar to above but only one file is distributed (PTC-Remote.exe) which when executed will install PresenTense Time Client with the default settings. No reboot or log off required. Configuration of PresenTense Time Client must be accomplished via some other method. All settings are stored as registry keys so these can be modified using Microsoft Systems Management Server (SMS) or an ADM template and Group Policy.

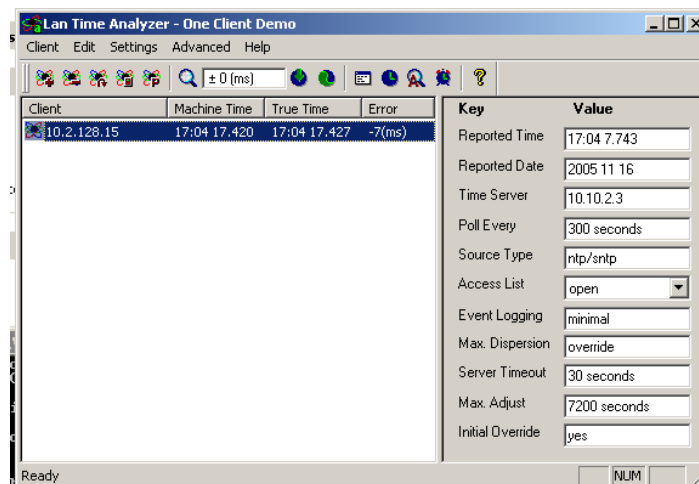
3. Windows Installer (.msi), Pre-Configured

One file, PTCRemote.msi is provided which is pre-configured. Via Active Directory (AD) and Group Policy (GP), PTCRemote.msi is assigned to the required computers on your network and it will be automatically installed and configured when the computer next reboots.

4. Windows Installer (.msi), not Pre-Configured

Same as above but the file PTCRemote.msi file does not contain network specific configuration. Configuration of PresenTense Time Client must be accomplished via some other method. All settings are stored as registry keys so these can be modified using Microsoft Systems Management Server (SMS) or an ADM template and Group Policy.

PresenTense LAN Time Analyzer



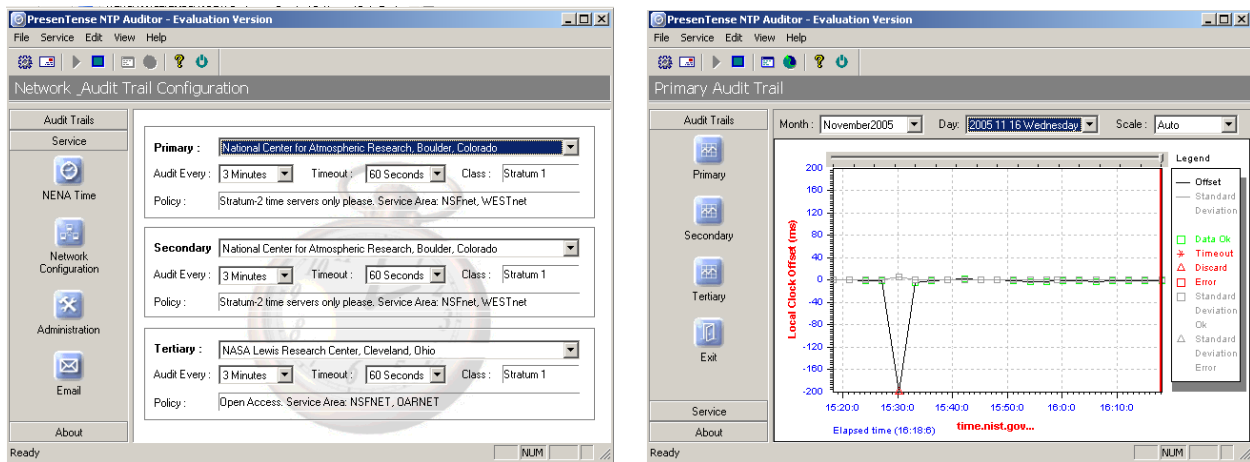
PresenTense provides a means of centrally verifying that all PCs on the network are synchronized to a reference. The available LAN Time Analyzer program provides a management tool for checking the dispersion of each PC on the network from one location, instead of having to go to each PC to check the time synchronization accuracy.

LAN Time Analyzer can scan the network to locate all PCs on the network which are running PresenTense Client or Server software. All PCs running PresenTense software are listed in the LAN Time screen. At a user specified interval, all PCs in this list are synchronized to the time reference they are configured to synchronize to, and then the time of each PC is compared to a user-specified time reference (such as the Spectracom NTP time server). The time difference between the PC and the time reference is displayed in the LAN Time Analyzer screen.

If the time error of any PC exceeds the user-definable alarm threshold error level, either a message box can open on the LAN Time analyzer PC, or the PC can automatically run a desired .exe program (such as Notepad for example). For example, the alarm threshold is set for 1 second. If one of the clients is 1.2 seconds off when compared to the time reference, the alarm threshold has been exceeded so the alarm conditions (a notification window opens and/or a program runs) as configured.

LAN Time Analyzer can also be used to remotely configure the PresenTense server and Client programs running on the network PCs. The query tool in LAN Time Analyzer contains a list of many commands that can be remotely issued to the individual clients to retrieve their current time and date, read or change their configured time references, read or change current logging, set the SMTP configurations, etc.

PresenTense NTP Auditor Software Allows You to “Capture” Legally Traceable Time™



PresenTense Client and Server software programs synchronize the time of the PCs on your network — but how can you *PROVE*, beyond a shadow of a doubt, that your Ethernet Time Server is accurate, that the PC was not manually set by a user, or that the PC was synchronized to a valid time reference even a year later? The answer is NTP Auditor.

PresenTense NTP Auditor is used to provide an “audit trail” for each PC on the network. Once this program is installed on each desired PC, it can compare the PC’s time (in addition to the NetClock time standard being used for the network) with other timing sources for verification as well as providing a recorded (hard-copy) history of the computer’s network time accuracy at any given moment. This is done by sourcing up to 3 independent NTP time servers against which to compare the time of the PC and the network and the network time servers. The three “audit” NTP time servers can be additional NetClock time servers on the network, or if your firewall policy allows it, internet time servers could be used, just for verification purposes only, i.e. your network time standard would continue to be from the NetClock.

The PC’s time is synchronized to the NetClock, Ethernet Time Server, or the domain Controller using PresenTense Server and Client software. At user specified intervals (intervals between 3 and 30 minutes), the three selected Internet Time Servers are contacted via NTP (port 123 only) for their current UTC time. The offset between the PC’s time and each of the three Internet time servers is calculated and the results graphed and stored in a text file by month and date for later retrieval (each Internet time server has its own graph and text files). If the time of the PC agrees with the replies from the time server, you have *PROVEN* that the PC and its NetClock or Ethernet Time Server NTP reference were accurate at any given moment.

What if time is set manually on a PC between PresenTense synchronization intervals? NTP Auditor is the perfect solution to this very realistic concern. It continuously monitors the PC’s time “ticks.” If a user were to manually set the time of the PC, the ticks would no longer agree with the new PC time. NTP Auditor detects this discrepancy and performs an unscheduled poll of all three time servers. The results of these polls are graphed and stored in the text file to show the precise difference compared to UTC. All of the side-by-side comparison results can be sent to a local printer, which allows you to make a permanent record that can be stored and retrieved to provide proof of timed events even years after the fact.

PresenTense NTP Auditor can also notify you by email if the computer system time drifts beyond the limits specified in the NENA 911 standard, if your time synchronization software fails, or if audit trails cannot be created.

PresenTense NTP Auditor Features:

- **Legal Accounting of Computer System Time**
Creates primary, secondary, and tertiary audit logs with respect to legal UTC sources
- **NASD — Order Audit Trail System (OATS) & SEC**
Permits compliance with NASD Rule 6950-6957, as specified by the National Association of Securities Dealers and the Securities and Exchange Commission ruling SEC Rule 71a-4
- **UTC Traceability**
Actively monitors for conformance to National Emergency Number Association (NENA) standard
- **NENA Time Display**
Permits display of NENA-compliant time
- **Real-Time Receipts**
Supports generation of real-time logs to dedicated printer, creating official backup record
- **Synchronization Software Watchdog**
Actively monitors your time synchronization software and raises alarm if server or client fail
- **Email Alarm Action**
Generates email alarms to specified addresses
- **Advanced Statistical Filters**
Employs advanced statistical algorithms to evaluate clock measurements and mitigate effects of network jitter and other errors

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May 19, 2011 - WP05-101(G)