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1 Overview

1.1 What is LanTimeAnalyzer ?



Lan Time Analyzer combines the ability to manage all your [Presentense time clients](#) centrally with the ability to conduct complex error analysis of time servers and clients.

The key features of Lan Time Analyzer include :

- **Remote administration of [Presentense time clients](#)**
Administer all your [PresentenseNT/2000/XP](#) and [Presentense95/98/ME](#) time clients directly via the network. Change operating parameters on individual time clients or update key parameters concurrently on all clients with a single operation.
- **Verification of time clients through external measurements**
Analyze machine times on your [Presentense](#) time clients to the accuracy of milliseconds.
- **Real time analysis of nominal error on time clients**
Analyze the nominal error of time clients against a known true time source on your network.
- **Analysis of time server root dispersion**
Analyze the nominal error of your [Presentense ntp time server](#) against the root time source.
- **Alarm action for specific error conditions**
Configure Lan Time Analyzer to report error conditions or invoke third party applications in response to predefined alarm conditions.
- **Scan network for Presentense Time Clients and Presentense Time Servers**
New to version 1.3. Scan an IP address range to automatically find and add clients to be managed.


Important: Please note that Lan Time Analyzer is designed to work specifically with [Presentense](#) time clients which have been designed from the ground up to be administered over the network. In order to use this product for network time analysis, you will need to download and install [Presentense for Windows NT](#) and/or [Presentense98](#) on your client PC's. You also need access to an [NTP time server](#), either on your local area network or on the public internet.

Please visit www.bytefusion.com for more information.

1.2 Quick Start

Network time analysis involves measuring the machine times at hosts on the network against a true time source and interpreting the results in the context of nominal and statistical errors. Lan Time Analyzer lets you verify the accuracy of your ntp/sntp time server and time clients, and lets you adjust operating parameters on clients to meet your time keeping requirements.



To get started, you need to

- [Configure a true time server](#)
- [Add your time clients](#) to the database
- Click the  **fetch remote times** button on the tool bar

Lan Time Analyzer then synchronizes the PC on which it operates to the configured true time source and measures clients against this benchmark. It also determines the nominal error of the true time source. Please refer to [Interpreting the User Interface](#) for details.

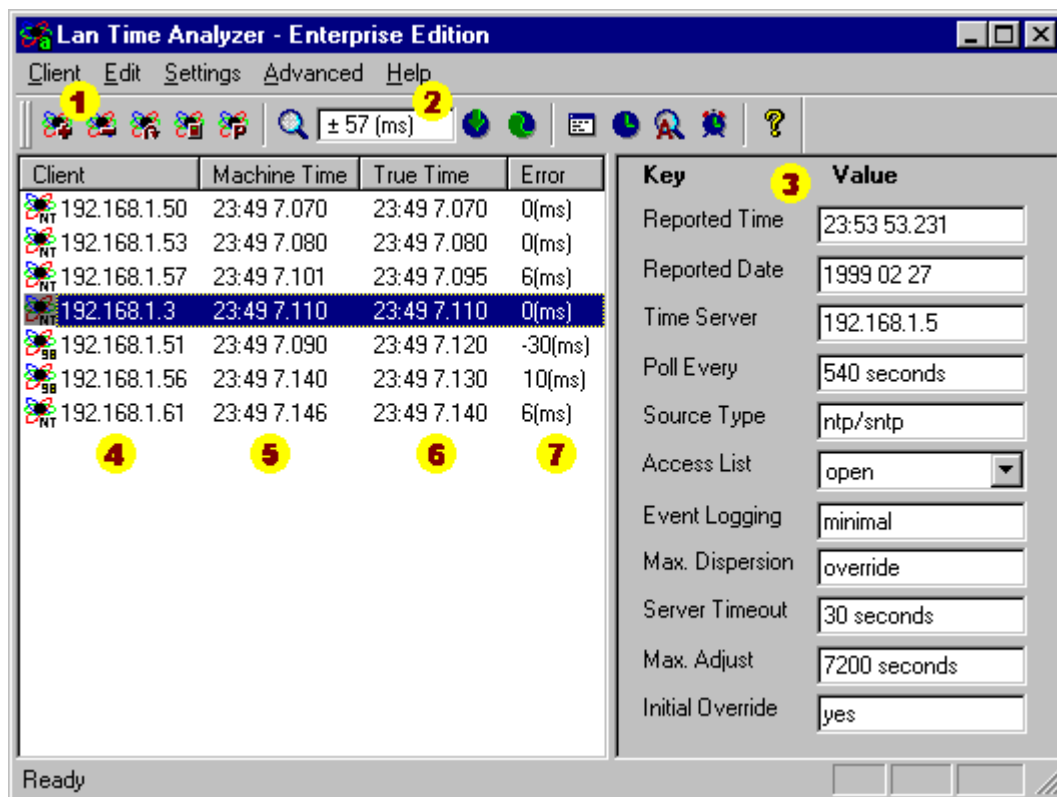
Clients that exceed acceptable error limits may need to be [configured](#) to [synchronize to a different server](#), use a [different time protocol](#), or simply [poll their time server more often](#) to compensate for excessive BIOS clock drift.

Once your network operates within established parameters, you may wish to [define alarm conditions](#) and [configure alarm actions](#) to be carried out when alarm conditions are met.

You may restart time services on Presentense time clients via the network, by clicking the  **remote restart** button on the tool bar. To force time clients to synchronize to their time server, click the  **remote synchronize** button.

1.3 Interpreting the User Interface

The screenshot below shows the output of a typical session with Lan Time Analyzer. Key user interface components are identified by number and explained in the legend at the bottom of this page.



1. Tool bar

The tool bar can be used to add time clients to the database of Lan Time Analyzer, remove time clients, change the operating parameters at each client, and to configure Lan Time Analyzer itself.

2. Root Dispersion Window

The root dispersion window shows the nominal error of time stamps received from the NTP server with respect to the true time source, e.g. atomic clock, GPS clock, etc. This value is important in interpreting the nominal error of individual time clients. Principally, the nominal error of each time client only bears significance when it exceeds the nominal error of the true time server.

3. Key-Value Pane

The key-value pane shows the operating parameters in effect at the Presentense time client selected in the left window pane. These include time server, time protocol, and security parameters.

4. Presentense Time Client Column

This column shows all Presentense time clients administered by Lan Time Analyzer. You can add additional clients here or remove clients from the database. Note that the icon indicates the operating system the time client is operating on. In this context, the "98 symbol", indicates that the Presentense time client is operating on either a Windows 95 or a Windows 98 system. While the "NT symbol" indicates a Windows NT based system.

5. Machine Time Column

This column details the time reported by each client in 24 hour time format. Seconds are indicated to the third digit of accuracy. Thus a time stamp of the format "**08:32 3.463**" indicates that the time at the client was 8:32 am, 3 seconds, and 463 milliseconds when Lan Time Analyzer last queried the client.

6. True Time Column

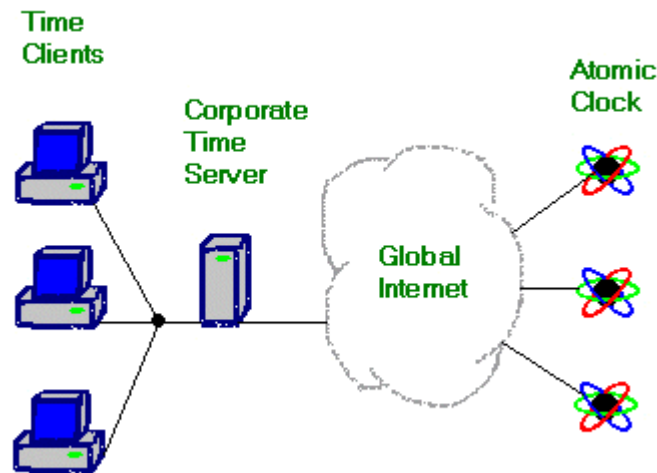
This column shows the time the client was last queried. Lan Time Analyzer synchronizes the system clock of the PC it operates on at the beginning of each session. Thus the difference between Machine Time and True Time is used to compute the nominal error at each client.

7. Error Column

This column indicates the nominal error of each time client. It is computed as the difference between reported Machine Time and known True Time.

1.4 Network Time Synchronization

A typical network time synchronization scenario is depicted in the diagram shown below.



Each workstation synchronizes to a central time server on the corporate LAN. This guarantees a coherent propagation of time to all clients. The corporate time server synchronizes to one or more atomic clocks on the global internet using the Network Time Protocol and offers time services to clients/workstations. Time services may be offered according to one or more of the common time protocols depending on the accuracy desired.

1.5 Time Protocols and Accuracy

A number of time protocols are widely used to synchronize computer clocks with a network time server. These are :

- **NTP (Network Time Protocol)**

"Network Time Protocol". NTP has the ability to synchronize computers across multiple time servers while compensating for network jitter and other statistical errors. Because of this ability, it is generally suitable for the synchronization of a corporate time server to an atomic clock on the global internet to within tens of milliseconds.

This protocol is defined in the Internet standard RFC 1305.

- **SNTP (Simple Network Time Protocol)**

"Simple Network Time Protocol". SNTP is a subset of the Network Time Protocol. SNTP is able to compensate for network round trip delay and take account of nominal dispersion to the root time source, but normally depends on a single time server at any given time. Because of this, it is generally suitable for synchronization of clients to a known time source on a corporate intranet.

Accurate synchronization between client and server to the order of microseconds is attainable on local area networks using SNTP.

This protocol is defined in the internet standard RFC 2030.

- **TIME, UDP**

The UDP/TIME protocol permits synchronization of clients approximately to the nearest second. It provides no mechanisms to compensate for network round trip delay or similar sources of error.

This protocol is defined in the internet standard RFC 868.

- **TIME, TCP**

The TCP/TIME protocol is a variant of UDP/TIME which utilizes the Transmission Control Protocol (TCP) for delivery of data between client and server. While the use of TCP as a communications protocol provides no general enhancements to the synchronization between client and server, it is generally held to be more reliable than UDP.

1.6 System Requirements

System Requirements :

- A Personal Computer with a 486/100 MHz CPU or higher.

- Microsoft Windows NT / 2000 / XP, or Windows 95 / 98 / ME. The use of Windows NT / 2000 / XP is strongly recommended to satisfy the real-time requirements of Lan Time Analyzer. Windows 95 is likely to produce adequate results, while Windows 98 will suffice only for very basic network time analysis.

- Mouse or compatible pointing device

- 1 MB of hard-disk space

Server/Client Requirements :

- Lan Time Analyzer works only with Presentense time clients. Presentense time clients are available in two versions : Presentense for Windows NT / 2000 / XP and Presentense98 for Windows 95, Windows 98, Windows ME.

- Lan Time Analyzer requires access to a time server that offers time services over either the NTP or SNTP protocol suite.


Also Required:

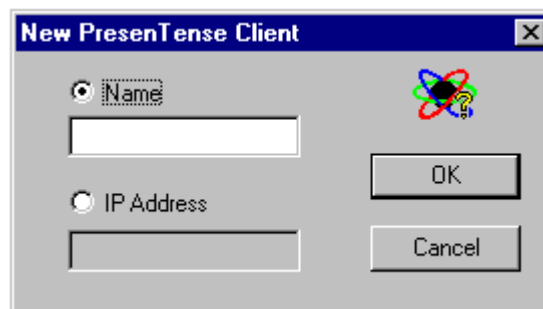
- TCP/IP networking must be installed and configured.

Windows NT/2000/XP and Windows 95/98/ME are registered trademarks of Microsoft Corporation.

2 Configuration

2.1 Adding and Removing Clients

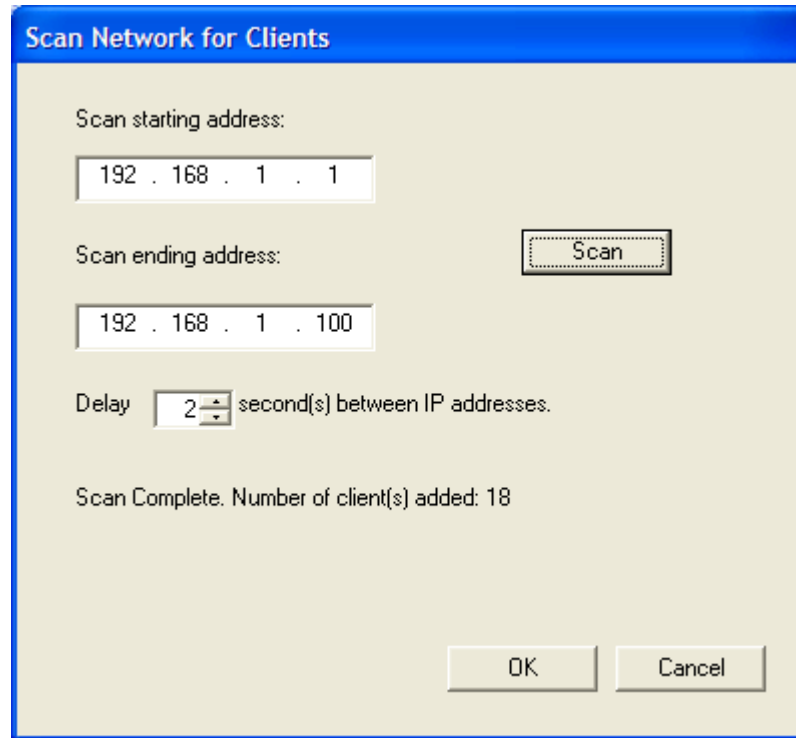
You can add and remove Presentense time clients to the database of Lan Time Analyzer using the tool bar or the application menu. To add a client via the tool bar click the  button. This will invoke the **New Presentense Client** dialog. You may specify either a DNS name, NETBIOS hostname, or the IP address of the time client. Ensure that you have name resolution configured on your network if you use either DNS or NETBIOS hostnames.



Click the  button on the tool bar to remove selected clients from the database.

Automatically Adding Time Clients


To automatically scan your network for [Presentense Time Clients](#), Click the Advanced menu and choose Scan. Enter the starting and ending IP addresses and click Scan. Note: You can only scan address ranges in the fourth octet (class C) of the IP address.

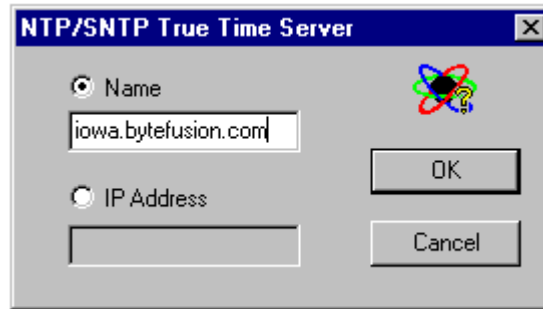


Hint: If your network has a high load or you are scanning a remote network, increase the delay time between IP addresses to allow clients to respond.


2.2 True Time Server

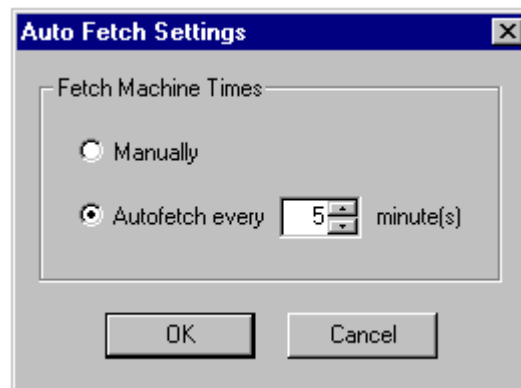
The **True Time Server** is used to synchronize the PC Lan Time Analyzer operates on to "true time". Lan Time Analyzer does this at the beginning of each session and each time it queries clients for their machine times. The true time server should be a full NTP or SNTP time server. Please ensure that your server maintains the nominal root dispersion to the root time source.

To configure the true time server, click the  button on the tool bar. This will invoke the **NTP/SNTP True Time Server** dialog. You may specify either the hostname or the IP address of the server.



2.3 Auto Fetch

Auto Fetch mode controls how and when Lan Time Analyzer queries clients for time information. In *manual mode* the operator initiates fetching of time stamps from clients, in *auto fetch mode* Lan Time Analyzer does this automatically at predefined intervals. To configure auto fetch mode, click  on the tool bar. This will invoke the **Auto Fetch Settings** dialog.

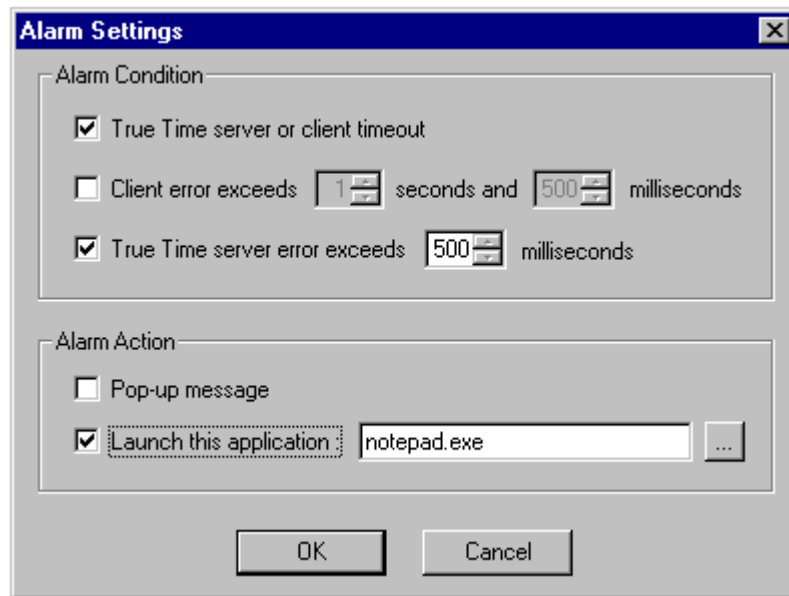


2.4 Alarm Settings

Alarm settings determine what action Lan Time Analyzer takes when one or more parameters exceed preset boundaries.

One possible scenario is the failure of a GPS clock resulting in an error condition on the associated network time server. If Lan Time Analyzer is configured to verify the nominal root dispersion on the time server, an alarm condition will result if the time server is unable to reestablish communication with the GPS clock before its own BIOS clock drift exceeds the preset limit on the nominal root dispersion. One possible response to this error is to launch a third party application that notifies your system administrator of the alarm condition, via phone, fax, email, pager, etc. At a minimum, you might wish create an error report on the local system.

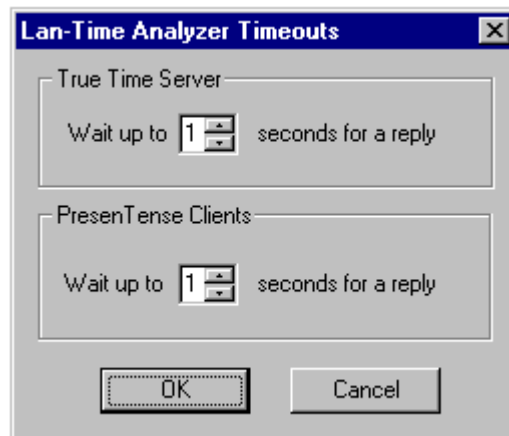
To configure the alarm settings, click the  button on the tool bar. This will invoke the **Alarm Settings** dialog.



2.5 Default Timeouts


The **Default Timeouts** determine how long Lan Time Analyzer waits for responses from network time clients or servers. The "factory presets" are acceptable in most cases, but you may wish to increase the timeout values if you have a congested network or operate over a wide area network connection.

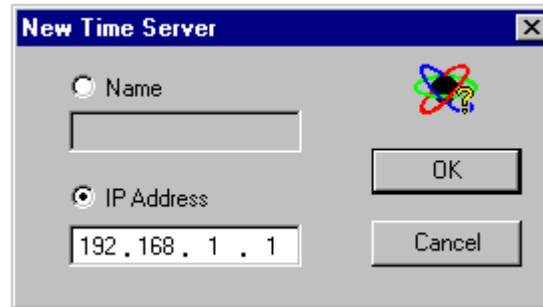
To configure default timeouts, select **Settings** from the main menu, and then **Default Timeouts** from the drop-down menu. This will invoke the **Lan Time Analyzer Timeouts** dialog.





2.6 PresenTense Time Clients

Remote configuration of PresenTense time clients with Lan Time Analyzer is easy. The most commonly accessed operating parameters may be set on multiple clients simultaneously directly from the tool bar. To change the time server for all clients, for instance, mark all clients in the window using

your mouse pointer, then click the  button on the tool bar. This will invoke the **New Time Server** dialog.




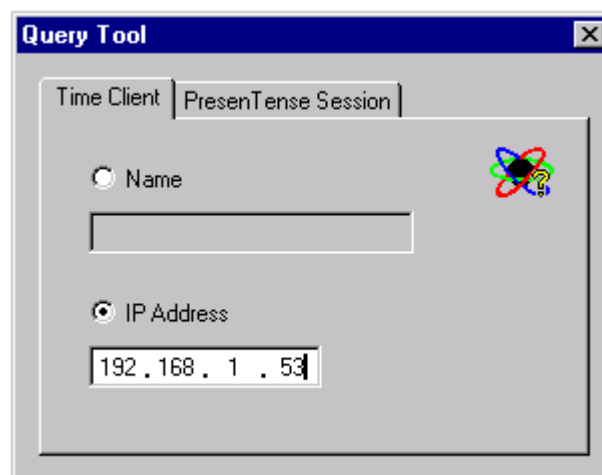
Lan Time Analyzer will automatically update the changes on selected clients and remote-restart all time services. Similarly, click the  polling rate button to set the intervals at which Presentense clients poll their time server or the  protocol button to set the protocol used by Presentense time clients to synchronize to their respective time servers.

3 Query Tool

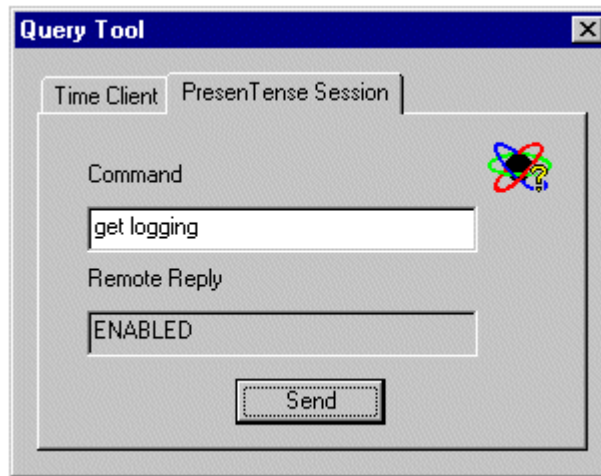
3.1 Using the Query Tool

The **Query Tool** gives the user of Lan Time Analyzer access to the full command set of Presentense time clients. This command set constitutes the foundation of inter-process communication between **Lan Time Analyzer** and **Presentense** time clients.

To activate the **query tool**, click the  query tool button on the tool bar. This will invoke the **query tool** dialog with the focus on the **Time Client** tab.



Enter the name or IP address of the time client you wish to connect to. Then click the **Presentense Session** tab to begin issuing commands to the client.



The basic command syntax is **<command> <parameter> <value>**. To check if logging is enabled on the time client, you would enter "**get logging**" in the **Command** field as indicated above and click **Send**. The client's response is indicated in the **Remote Reply** field. In the event that network communication cannot be established, the **Remote Reply** field will show "**- no reply -**".

Please refer to the [Command Dictionary](#) for details on individual query commands.

3.2 Command Dictionary

You can query all major operating parameters of PresenTense servers and clients via the LanTimeAnalyzer query tool. This feature is useful in performing remote diagnostic tasks or setting operating parameters over the network.

- **Diagnostic Commands**

[ECHO](#)
[GET TIME](#)
[GET DATE](#)
[GET TYPE](#)
[GET SERVER](#)
[GET REDUNDANTSERVER](#)
[GET LOGGING](#)
[GET LOGLEVEL](#)
[GET EMAIL](#)
[GET SMTP](#)
[GET MEMTRIM](#)
[GET DISPOVERRIDE](#)
[GET MAXOVERRIDE](#)
[GET INTERVAL](#)
[GET MAXADJUST](#)
[GET MAXDISPERSE](#)
[GET TIMEOUT](#)
[GET ADMINS](#)

- **Control Commands**

[SET TIME](#)
[SET DATE](#)
[SET TYPE](#)

SET SERVERIP
SET REDUNDANTSERVERIP
SET SERVERNAME
SET REDUNDANTSERVERNAME
SET LOGGING
SET LOGLEVEL
SET EMAIL
SET SMTP
SET MEMTRIM
SET DISPOVERRIDE
SET MAXOVERRIDE
SET INTERVAL
SET MAXADJUST
SET MAXDISPERSE
SET TIMEOUT
SET ADMIN
SET DELADMIN
RECYCLE
SYNC

4 Diagnostic

4.1 echo

- **Syntax :**

ECHO <argument>

- **Parameters :**

Any string value

- **Returns :**

Echoes argument.

Use this command to verify connectivity to the client and determine remote operating system.

Example: echo hi

Returns "hi" on Presentense for Windows NT or

"98 hi" on Windows 95/98.

4.2 get time

- **Syntax :**

GET TIME

- **Parameters :**

none

- **Returns :**

Returns the time at the Presentense client / server

4.3 **get date**

- **Syntax :**

GET DATE

- **Parameters :**

none

- **Returns :**

Returns the date at the Presentense client / server

4.4 **get type**

- **Syntax :**

GET TYPE

- **Parameters :**

none

- **Returns :**

Returns the type of server the Presentense client / server presently synchronizes to. Possible values are ntptime, udptime, and tcptime. The value ntptime includes sntp.

4.5 **get server**

- **Syntax :**

GET SERVER

- **Parameters :**

none

- **Returns :**

Returns the name or IP address of the server the Presentense client / server presently synchronizes to.

4.6 get redundantserver

- **Syntax :**

GET REDUNDANTSERVER

- **Parameters :**

none

- **Returns :**

Returns the name or IP address of the fail over server the Presentense client / server presently synchronizes to.

4.7 get logging

- **Syntax :**

GET LOGGING

- **Parameters :**

none

- **Returns :**

Returns ENABLED if event logging is presently enabled on the Presentense client / server, otherwise returns DISABLED.

4.8 get loglevel

- **Syntax :**

GET LOGLEVEL

- **Parameters :**

none

- **Returns :**

Returns the numeric identifier for the loglevel - valid only if logging is enabled. Possible values are:

- 1 = minimal
- 2 = detailed
- 3 = errors only

4.9 get email

- **Syntax :**

GET EMAIL

- **Parameters :**

none

- **Returns :**

Returns the administrator email address Presentense uses to report critical error messages

4.10 get smtp

- **Syntax :**

GET SMTP

- **Parameters :**

none

- **Returns :**

Returns the address of the SMTP server used to send administrator error messages

4.11 get memtrim

- **Syntax :**

GET MEMTRIM

- **Parameters :**

none

- **Returns :**

Returns the setting for memory management. Possible values are AGGRESSIVE and MODERATE.

4.12 get dispooverride

- **Syntax :**

GET DISPOVERRIDE

- **Parameters :**

none

- **Returns :**

Returns "YES" if maximum root dispersion override is enabled, otherwise returns "NO".

4.13 **get maxoverride**

- **Syntax :**

GET MAXOVERRIDE

- **Parameters :**

none

- **Returns :**

Returns "YES" if maximum clock adjustment override is enabled, otherwise returns "NO".

4.14 **get interval**

- **Syntax :**

GET INTERVAL

- **Parameters :**

none

- **Returns :**

Returns the polling rate in seconds. This value indicates how often the client synchronizes to the time server.

4.15 **get maxadjust**

- **Syntax :**

GET MAXADJUST

- **Parameters :**

none

- **Returns :**

Returns the maximum number of seconds by which the client may adjust the system clock. This is a safety mechanism to prevent "rogue" server time stamps from destabilizing the system.

4.16 **get maxdisperse**

- **Syntax :**

GET MAXDISPERSE

- **Parameters :**

none

- **Returns :**

Returns the maximum root dispersion in milliseconds (nominal error at the time server) that the client will accept.

4.17 get timeout

- **Syntax :**

GET TIMEOUT

- **Parameters :**

none

- **Returns :**

Returns the network timeout in seconds - how long Presentense will wait for a server reply.

4.18 get admins

- **Syntax :**

GET ADMINS

- **Parameters :**

none

- **Returns :**

Returns a list of IP addresses representing the administrators that are allowed to make changes to the operating parameters on this client.

5 Control

5.1 set time

- **Syntax :**

SET TIME <hh:mm:ss>

- **Parameters :**

Time in 24 hour format. hh:mm:ss

- **Comments :**

Sets the system time at the client in 24 hour time format.
Example: set time 23:15:30 sets the time to 11:15pm and 30 seconds.

- **Returns :**

SUCCESS or ERROR

5.2 set date

- **Syntax :**

SET DATE <yyyy:mm:dd>

- **Parameters :**

Date as four digit year, month, day

- **Comments :**

Sets the system date at the client.

Example: set date 1999:02:22 sets the date to February 22nd, 1999.

- **Returns :**

SUCCESS or ERROR

5.3 set type

- **Syntax :**

SET TYPE udptime|tcptime|ntptime

- **Parameters :**

True time source time. Possible values are the string literals :

udptime or

tcptime or

ntptime

Date as four digit year, month, day

- **Comments :**

Sets the time server protocol type

Example: set type ntp time configures Presentense to synchronize to a server that operates on the ntp/sntp protocol suite.

This setting does not effect the type of time service offered by Presentense server.

- **Returns :**

SUCCESS or ERROR

5.4 set serverip

- **Syntax :**

SET SERVERIP <ip address of new time server>

- **Parameters :**

IP V4.0 IP address

- **Comments :**

Sets a new time server by IP address.

- **Returns :**

SUCCESS or ERROR

5.5 set redundantserverip

- **Syntax :**

SET REDUNTANTSERVERIP <ip address of new time server>

- **Parameters :**

IP V4.0 IP address

- **Comments :**

Sets a new fail-over time server by IP address.

- **Returns :**

SUCCESS or ERROR

5.6 set servername

- **Syntax :**

SET SERVERNAME <hostname>

- **Parameters :**

Fully qualified domain name of new time source

- **Comments :**

Sets a new time server by dns name. Overrides [SERVERIP](#)

- **Returns :**
SUCCESS or ERROR

5.7 set redundantservername

- **Syntax :**
SET REDUNDANTSERVERNAME <hostname>
- **Parameters :**
Fully qualified domain name of new fail-over time source
- **Comments :**
Sets a new fail-over time server by dns name. Overrides [REDUNDANTSERVERIP](#)
- **Returns :**
SUCCESS or ERROR

5.8 set logging

- **Syntax :**
SET LOGGING yes | no
- **Parameters :**
String literals
yes *or*
no
- **Comments :**
Enables or disables event logging on Presentense.
- **Returns :**
SUCCESS or ERROR

5.9 set loglevel

- **Syntax :**

SET LOGLEVEL 1|2|3

- **Parameters :**

Possible values : 1,2 or 3

- **Comments :**

Sets the log level on the client.
Valid only if logging is enabled. Possible values are:

1 = minimal
2 = detailed
3 = errors only

- **Returns :**

SUCCESS or ERROR

5.10 set email

- **Syntax :**

SET EMAIL <email address>

- **Parameters :**

email address

- **Comments :**

Sets the administrator email address to receive critical error messages.

- **Returns :**

SUCCESS or ERROR

5.11 set smtp

- **Syntax :**

SET SMTP <IP address or DNS host name>

- **Parameters :**

IPV4 IP address or fully qualified DNS host name of SMTP server to use in mailing error messages to the administrator

- **Comments :**

none

- **Returns :**

SUCCESS or ERROR

5.12 set memtrim

- **Syntax :**

SET MEMTRIM <moderate | aggressive>

- **Parameters :**

String literal MODERATE or AGGRESSIVE.

- **Comments :**

Sets memory management policy. AGGRESSIVE results in a smaller memory footprint but higher number of swaps to virtual memory on disk.

- **Returns :**

SUCCESS or ERROR

5.13 set dispooverride

- **Syntax :**

SET DISPOVERRIDE <yes | no>

- **Parameters :**

String literal YES or NO.

- **Comments :**

Enables / disables maximum root dispersion override.

- **Returns :**

SUCCESS or ERROR

5.14 set maxoverride

- **Syntax :**

SET MAXOVERRIDE <yes | no>

- **Parameters :**

String literal YES or NO.

- **Comments :**

Enables / disables maximum clock adjustment override.

- **Returns :**

SUCCESS or ERROR

5.15 set interval

- **Syntax :**

SET INTERVAL <seconds>

- **Parameters :**

Number of seconds

- **Comments :**

Sets the polling rate in seconds. This value determines how often the client synchronizes to the time server.

- **Returns :**

SUCCESS or ERROR

5.16 set maxadjust

- **Syntax :**

SET MAXADJUST <seconds>

- **Parameters :**

Number of seconds

- **Comments :**

Sets the maximum number of seconds by which the client may adjust the system clock. This is a safety mechanism to prevent "rogue" server time stamps from destabilizing the system.

- **Returns :**

SUCCESS or ERROR

5.17 set maxdisperse

- **Syntax :**

SET MAXDISPERSE <milliseconds>

- **Parameters :**

Number of milliseconds

- **Comments :**

Sets the maximum root dispersion in milliseconds (nominal error at the time server) that the client will accept.

- **Returns :**

SUCCESS or ERROR

5.18 set timeout

- **Syntax :**

SET TIMEOUT <seconds>

- **Parameters :**

Number of seconds

- **Comments :**

Returns the network timeout in seconds - how long the client will wait for a server reply.

- **Returns :**

SUCCESS or ERROR

5.19 set admin

- **Syntax :**

SET ADMIN <ip address>

- **Parameters :**

IPV4 IP Address

- **Comments :**

Adds an IP address to the list of administrators

permitted to make configuration changes on this Presentense time server / client.

- **Returns :**

SUCCESS or ERROR

5.20 set deladmin

- **Syntax :**

SET DELADMIN <ip address>

- **Parameters :**

IPV4 IP Address

- **Comments :**

Deletes an IP address from the list of administrators permitted to make configuration changes on this Presentense time client / server.

- **Returns :**

SUCCESS or ERROR

5.21 recycle

- **Syntax :**

RECYCLE

- **Parameters :**

none

- **Comments :**

Restart the service, re-reading registry settings. This is necessary after changing any of the operating parameters.

- **Returns :**

SERVICE RECYCLED
-no reply-

5.22 sync

- **Syntax :**

SYNC

- **Parameters :**

none

- **Comments :**

Synchronize to true time source now.

- **Returns :**

NTPSNTP ACK
TCP ACK
UDP ACK
-no reply-

6 About

6.1 About Lan Time Analyzer



Lan Time Analyzer
Version 1.3
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6.2 About Presentense Time Server



Presentense Time Server - Advantages at a glance

- **Accurate and reliable** (microsecond accuracy, 24/7 availability)
- **Easy to install and maintain** (most users up and running in less than a minute)
- **Versatile** (able to use almost any reference time source including GPS and internet time servers)
- **Low total cost of ownership** (support included meaning no yearly support fees)

Presentense Time Server is a multi protocol time server designed for Presentense time clients. Presentense Server incorporates both client as well as server components. This means you can use Presentense Server to synchronize your PC to a primary time source such as an atomic clock on the internet and offer time services to clients on your local area network. Presentense server also allows synchronization to GPS receivers via RS-232 and the NMEA 0183 protocol.

Presentense Server operates three server components concurrently on the ports shown below :

1. Port 123 UDP (SNTP - RFC 2030)
2. Port 37 UDP (TIME - RFC 868)
3. Port 37 TCP (TIME - RFC 868)
4. Port 123 UDP (NTP3 / NTP4 - RFC 1305) **Free Plug-In**

This feature enables you to operate time clients on your network using different time protocols simultaneously depending on your requirements for accuracy. To obtain the latest version of our NTP4 plug-in for Presentense Server free of charge at any time, kindly email us at support@bytefusion.com.

Presentense Server features include :

- **Multi Protocol Support**

When operating as a secondary time server, Presentense Server can synchronize to primary, network time servers of the following protocol families :

1. NTP/SNTP
2. Network Time UDP
3. Network Time TCP

- **GPS Receiver Support**

When operating as a primary time server, Presentense Server can synchronize to GPS receivers via the PC's serial port and the NMEA 0183 protocol. In order to be compatible with Presentense Server, GPS receivers must emit the GPRMC NMEA sentence (recommended minimum coordinates) at one or two second intervals. Special support is included for the Garmin GPS 2 Plus and the Garmin 38 hand held GPS receivers. You may use either Presentense Server's native GPS support or the GPS support furnished by the NTP4 plug-in's reference clock support.

- **Redundancy**

An automatic fail-over mechanism switches to a redundant network time source if the primary time source becomes unavailable (only available when synchronizing to a primary network time server).

- **Email Alarm Action**

Presentense Server can notify you by email if the time source becomes unavailable or critical errors are encountered during operation (SMTP only) .

- **NT Service**

Presentense Server operates as an NT service - invisibly in the background. Configuration changes are made via the Presentense Server applet in the system control panel.

- **Highly Customizable**

Presentense Server features advanced configuration options, including the ability to evaluate the accuracy of its time source to within milliseconds.

- **Security**

Initial setup and later configuration via the control panel require administrator privileges. This minimizes the risk of tampering with system parameters by unauthorized users.

- **Remote Monitoring and Administration**

Presentense Server may be administered fully by remote and monitored over the network to ensure accurate time keeping. Please check www.bytefusion.com for availability of monitoring software.

Please note that while Presentense Server should work with other time clients that comply with the relevant RFCs, the software has only been tested with Presentense time clients, and no support is available for the operation of Presentense Server with non Presentense time clients.

Trademarks

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6.3 About Presentense Client NT/XP/2000/2003



Presentense Time Client - Advantages at a glance

- **Accurate and reliable** (microsecond accuracy, runs as a service)
- **Easy to install and maintain** (most users up and running in less than a minute)
- **Versatile** (able to connect to almost any NTP or SNTP time server)
- **Low total cost of ownership** (support included meaning no yearly support fees)
- **Supports Free Run** to keep your clock correct even when a time server is not available

Presentense Time Client is a network time client for Windows NT / 2000 / XP. It synchronizes your PC system clock to a network time server. The features of Presentense include :

- **Multi Protocol Support**

Time sources of all major protocol families are supported :



1. SNTP/NTP (RFC 2030)
2. Free Plug-In (NTP 3 & 4) (RFC 1305)
3. Network Time UDP (RFC 868)
4. Network Time TCP (RFC 868)

- **Redundancy**

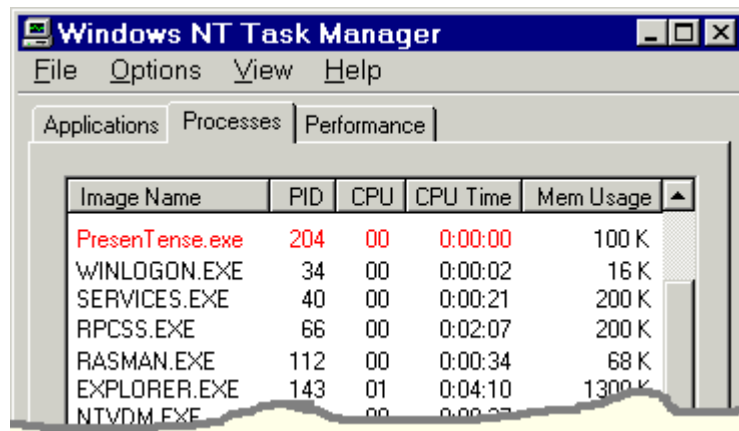
An automatic fail-over mechanism switches the time client to a redundant time server if the primary time server becomes unavailable.

- **Email Alarm Action**

Presentense can notify you by email if the time server becomes unavailable (SMTP only) .

- **Lightweight Design**

The RAM footprint of Presentense is approximately 100 Kilobytes. This makes Presentense unobtrusive and versatile. It operates with minimum impact on other applications.



- **NT Service**

PresenTense operates as an NT service - invisibly in the background. Configuration changes are made via the PresenTense Manager (PTM) applet in the system control panel.

- **Highly Customizable**

PresenTense features advanced configuration options, including the ability to evaluate the accuracy of server time stamps to within milliseconds.

- **Security**

Initial setup and later configuration via the control panel require administrator privileges. This minimizes the risk of tampering with system parameters by unauthorized users.

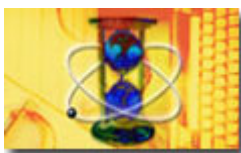
- **Remote Monitoring and Administration**

PresenTense clients may be administered fully by remote and monitored over the network to ensure accurate time keeping. Please check www.bytefusion.com for availability of monitoring software.

Trademarks

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6.4 About PresenTense Client 95/98/ME



Presentense98 is a network time client for Windows 95 / 98 / ME. It synchronizes your PC system clock to a network time server. The features of Presentense98 include :

- **Multi Protocol Support**

Time sources of all major protocol families are supported :



1. NTP/SNTP
2. Network Time UDP
3. Network Time TCP

- **Lightweight Design**

The idle time RAM footprint of Presentense98 is approximately 100 kilobytes. This makes Presentense98 unobtrusive and versatile. It operates with minimum impact on other applications.

- **Windows 95/98 System Service**

Presentense98 operates as an Windows 95/98 system service, invisibly in the background, similar to Windows NT system services. Specifically, this means that Presentense98 launches before user log-on and survives user log-off. Configuration changes are made via the Presentense98 Manager (PTM) applet.

- **Redundancy**

An automatic fail-over mechanism switches to a redundant time server if the primary time server becomes unavailable.

- **Email Alarm Action**

Presentense can notify you by email if the time source becomes unavailable (SMTP only) .

- **Highly Customizable**

Presentense98 features advanced configuration options, including the ability to evaluate the accuracy of server time stamps to within milliseconds.

- **Remote Monitoring and Administration**

Presentense98 clients may be administered fully by remote and monitored over the network to ensure accurate time keeping. Please check www.bytefusion.com for availability of monitoring software.

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6.5 About Presentense NTP Auditor



Presentense NTP Auditor monitors your computer's built-in clock and compares it's time to the real time. Most computer clocks lose or gain time so within a few days, your computer does not show the real time. Many software packages claim to synchronize your computer to atomic clocks or satellite clocks on the internet but how do you really know that your computer's clock is correct? Presentense Auditor allows you to monitor and record your computer's time and graph the difference between it and up to three national reference clocks on the internet. Presentense NTP Auditor gives you the assurance that your synchronization software keeps the correct time, all the time. The features of Presentense NTP Auditor include :

- **Legal Accounting of Computer System Time**

Presentense NTP Auditor creates a primary, secondary and tertiary audit log of local system time with respect to legal sources of UTC and automatically archives logs according year and month.

- **NASD - Order Audit Trail System (OATS) & SEC**

Presentense Auditor allows companies to comply with the time auditing requirements of [NASD Rule 6950 - 6957](#) as specified by the [National Association of Securities Dealers](#) and the Securities and Exchange Commission ruling [SEC Rule 71a-4](#) on records keeping. If [Presentense Time Server](#) and [Presentense Time Clients](#) are installed, complete time compliance can be maintained. See also NASD OATS Regulatory Compliance.

- **UTC Traceability**

The [National Emergency Number Association \(NENA\)](#) identifies time keeping requirements for **Public Safety Answering Points (PSAP)** such as 911 call centers. These requirements include continuous accuracy of 100 milliseconds to UTC. Presentense NTP Auditor actively monitors your computer for conformance to the NENA standard.

- **NENA Time Display**

Presentense NTP Auditor allows the display of [National Emergency Number Association \(NENA\)](#) compliant time.

- **Real-Time Receipts**

Presentense NTP Auditor supports the generation of real-time logs to a dedicated line printer, creating an official record of system time at configurable intervals or in response to time changes between intervals. Paper logs are created in real-time to safeguard against data loss. See also NASD OATS Regulatory Compliance.

- **Synchronization Software Watchdog**

Presentense NTP Auditor actively monitors your time synchronization software and raises an alarm condition if your time server or time client is not operating.

- **Email Alarm Action**

Presentense NTP Auditor can 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.

- **Advanced Statistical Filters**

Presentense NTP Auditor employs advanced statistical algorithms to evaluate clock measurements and mitigate the effects of network jitter and other statistical errors.

6.6 About Bytefusion Ltd.



Visit us at : <http://www.bytefusion.com>
Contact Support : support@bytefusion.com
Contact Sales : sales@bytefusion.com