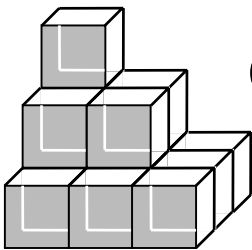


Sync-Time User Guide for HP Nonstop Servers



Genesys Solutions, Inc.

Software to simplify your life!

10479 E. Aberdeen Ave.
Englewood, CO 80111 USA

TEL: 1.888.343.6379
1.303.300.1442
FAX: 1.720.529.1161

<http://www.genesys-solutions.com>

Non-Disclosure statement

Genesys Solutions, Inc. has created this document describing the specifications and details of a software application solely for clients wishing to understand and evaluate this product and its merits. This document is a property of Genesys Solutions, Inc. and contains confidential and/or proprietary information pertaining to Genesys Solutions, Inc. No part of this document may be disclosed outside its intended audience and shall not be duplicated, used or distributed - in whole or in part - for any purpose other than to evaluate and understand the workings of this software application. If, however, a contract is awarded to Genesys Solutions, Inc. as a result of, or in connection with this submission, this document shall be subject to the confidentiality, non-disclosure, proprietary rights and provisions of the resulting contract

HP, Nonstop and S-Series and any respective logos are registered trademarks of HP Computers, Inc.

Objective:

For data centers, it is possible to implement an accurate, reliable, long-term, automated solution to synchronize the system time across all the production HP Nonstop servers that are used primarily in a distributed processing environment. Synchronizing the system time is an important aspect in such a distributed processing environment in order to maintain the integrity of transactions.

This document describes the inner workings of a solution called **SYNC-TIME**, designed and developed by Genesys Solutions, Inc. This solution meets all the requirements put forth by our customers. These requirements are explained below.

Requirements:

1. The proposed solution must run continuously on each HP Nonstop server and while doing so, it must monitor and compare the system time to a common accurate time server located external to the system
2. When the system time gradually falls outside a defined acceptable range (say plus or minus one second) or at certain set intervals (daily, weekly or monthly), the proposed solution must re-set the system time to the common external time
3. The proposed solution must allow for the operations department to monitor its functions through the use of EMS logs as well as SNMP messages
4. There should be a mechanism built into the proposed solution that can provide a real-time comparison of the actual system time on all the production systems along with the time on the external server so that it is possible to verify that the proposed solution actually works
5. In a normal operations environment, the proposed solution must run in a fully automated fashion, requiring no manual intervention
6. The proposed solution must be easily expandable to more HP Nonstop servers as needed

The SYNC-TIME application makes these assumptions:

1. The operations department needs to secure and provide the modules in the proposed solution to execute as a SUPER.* user in order to set the system clock on each HP Nonstop server
2. The firewall needs to be configured to allow access from the HP Nonstop server to either
 - (a) The **time.nist.gov** server set up by United States government to distribute accurate time information over the Internet

Or

(b)The operations department needs to set up an internal time server that provides the same service within the firewall (no need to access the Internet from the HP Nonstop server)

SYNC-TIME package:

The SYNC-TIME solution consists of the following components. All components are located in the \$SYSTEM.SYNCTIME subvolume.

File Name	Description
ADMIN	Menu-driven TACL Macro for performing administrative tasks
MACROS	TACL Macros used by the ADMIN functions
SYNCTIME	Non-stop application that monitors and sets system time
TIMESERV	Continuously running server provides current system time
DDPTIME	Displays current system time on a QS/TCP session
OVTIME	Displays current system time on a Outside View / Telnet session
NETTIME	Application used to reset system time right now
STARTALL	Obey file to start all components
STOPALL	Obey file to stop all components

Startup Parameters:

The application would execute as a process pair (\$TIME). On startup, it would receive the following parameters (located in the STARTALL obey file)

1. The IP address or DNS of the external Network Time Protocol (NTP) server
2. The TCP/IP process name of the HP Nonstop server that should be used to communicate with the external time server
3. The acceptable range of time variance between the external time server and the HP Nonstop server time in seconds
4. Whether the program should report *and* correct the system time or simply report it, to EMS (TEST mode or LIVE mode)
5. How frequently (in minutes) must the system time be compared to the external time source
6. When must the system time be corrected (say at 0145 hours every day)

The startup file called STARTALL looks like this.

```
#DEFINEDELETEALL
ADD DEFINE =EMSCOLL, CLASS MAP, FILE $EMST

COMMENT =====
COMMENT PLEASE REFER TO THE SYNCTIME USER GUIDE BEFORE CHANGING THESE VALUES
COMMENT =====

PARAM RUN-MODE                TEST
PARAM SET-SYS-TIME-AT         0130
PARAM VARIANCE-IN-SECONDS    5
PARAM COMPARE-FREQUENCY-MINUTES 2
PARAM TCPIP-PROCESS-NAME     $ZTCO
PARAM IP-ADDRESS-NTP         TIME.NIST.GOV

[ #IF NOT [#PROCESSEXISTS $EMST] | THEN |
  EMSACOLL /NAME $EMST, NOWAIT, CPU 4/ BACKUP 1, LOGSUBVOL $SYSTEM.SYNCTIME, &
  ROTATEFILES ON, EXT (200,200), ALLOCATE
]

RUN SYNCTIME /NAME $TIME, NOWAIT, CPU 2, TERM $PWNL, PRI 185/
```

Each parameter is explained below:

PARAM RUN-MODE:

This parameter has two possible values **TEST** or **LIVE**. This parameter tells the SYNC-TIME application whether the systems manager wishes to monitor the system time without actually changing it (TEST mode) or whether the system manager wishes to synchronize the system time at regular intervals (LIVE mode) to the timestamp value indicated by the NTP server.

Default value: TEST
Recommended value: TEST for 1 week and then change to LIVE

PARAM SET-SYS-TIME-AT:

This parameter is used in conjunction with the RUN-MODE parameter. If the system manager wishes to synchronize the system time at regular intervals, then this parameter tells when the system time should be adjusted. This parameter is a 24-hour military time.

Default value: 0100 (which is 01:00 AM)
Recommended value: Set this to the time when the system is least busy

PARAM VARIANCE-IN-SECONDS:

This parameter is used in conjunction with the RUN-MODE parameter. If the system manager wishes to synchronize the system time at regular intervals, then this parameter defines the allowable tolerance for the system time to diverge from the NTP server time. If the variance is greater than the value

defined here, then the system time will be changed at the pre-defined time, depending on RUN-MODE.

Default value: **5** (system time must be within +/- 5 seconds)

Recommended value: Set this to the variance defined by audit committee

PARAM COMPARE-FREQUENCY-MINUTES:

This parameter defines how often (in minutes) the system time should be compared with the external NTP server timestamp. Note that although the system time will be compared regularly to the NTP server time at pre-defined intervals for reporting purposes, but the system time will be changed **only** if the RUN-MODE is LIVE **and** the variance is greater than the allowable variance **and** at the pre-defined time as determined by the system manager (see SET-SYS-TIME-AT).

Default value: **60** (Compare once every hour)

Recommended value: Depending on your comfort level. Set this value to be 2 minutes in the beginning and then increase it to 60 or more later.

PARAM TCPIP-PROCESS-NAME:

This parameter defines which TCP-IP process should be used by the SYNC-TIME application to communicate with the external NTP server.

Default value: **\$ZTC0**

Recommended value: As per the system manager

PARAM IP-ADDRESS-NTP:

This parameter defines the IP Address of the external NTP Server. This can be a DNS name (say TIME.NIST.GOV) or an IP Address (201.32.5.198).

Default value: **TIME.NIST.GOV**

Recommended value: As per the system manager

Inner workings:

Once the \$TIME application starts up, it will open the TCP/IP process on the HP Nonstop server and establish a connection to the external NTP time-server. Once this session is established, it will request the timestamp from the external NTP source and compare it to the system time. If the time variance is greater than the defined allowable variance *and* if the program is authorized to change the system time *and only at the specified time*, the system time will be changed appropriately. All such events will be reported promptly to EMS/SNMP consoles. After this, the TCP/IP session to the external server will stay connected and the program will stay in a suspended state (take up no more active CPU cycles) until it is activated at the pre-defined interval to perform this comparison all over again.

The SYNC-TIME startup script can be added to the main system startup script so that the SYNC-TIME application can be started / stopped along with the rest of the critical system components. This simple startup environment ensures that the SYNC-TIME application will not require the use of SQL, ENSCRIBE, TMF or Pathway component of the HP Nonstop server.

Management tools:

The accompanying TACL Macros can be started up as follows.

- LOGON SUPER._____
- VOLUME \$SYSTEM.SYNCTIME
- RUN ADMIN

The following screen should appear.

```
*****
Rel Dt: 12 Sep '05                               Version 1.0.01
                Network Time Synchronization

**** MONITOR OPTIONS ****                        **** CONTROL OPTIONS ****

A - Check status of processes                    1 - Stop all processes
B - Check system time                            2 - Start all processes
C - Start EMS Console                            3 - Change Parameters
D - View parameters                              4 - Adjust system time NOW
E - View system time using QS/TCP
F - View system time in Telnet / OV

                                0 - Exit to TACL

*****
Please select a function key:
```

Options **A** through **F** can be used without any password. Options **1** through **4** require a password. The following section describes each of these options.

A – Check status of processes

Indicates whether all the components are presently up and running

B – Check system time

Displays the current system time as compared to the external NTP server time. This is a one-time only display of the system time (not scrolling continuously).

C – Start EMS Console

Displays messages from the EMS collector called \$EMST. The messages can be forwarded to SNMP and monitored at a central console if needed. This option is used to monitor the overall health of the SYNC-TIME application.

D – View parameters

This option displays the program parameters without letting the user modify any of them. This option gives the user an idea of the current settings.

E – View system time using QS/TCP emulator

The user can use the QS/TCP emulator and select this option in order to view the system time across all HP nonstop servers in a continuous mode. The system time is refreshed every 5 seconds. If the QS/TCP session terminates abruptly for any reason, then the application will shut down automatically without affecting anything. The system time will continue to be monitored even if the QS/TCP session is terminated.

F – View system time using Telnet or OV

The user can use a telnet session or Outside View and select this option in order to view the system time across all HP nonstop servers in a continuous scrolling mode. The system time is refreshed every 30 seconds. If the Telnet session terminates abruptly for any reason, then the application will shut down automatically without affecting anything. The system time will continue to be monitored even if the Telnet session is terminated.

1 – Start all processes

This option requires a password. Use this option to startup all the components of SYNC-TIME. Alternatively (without using this ADMIN menu) the components can be started up as follows:

- LOGON SUPER._____
- VOLUME \$SYSTEM.SYNCTIME
- OBEY STARTALL

2 – Stop all processes

This option requires a password. Use this option to stop all the components of SYNC-TIME. Alternatively (without using this ADMIN menu) the components can be stopped as follows:

- LOGON SUPER._____
- VOLUME \$SYSTEM.SYNCTIME
- OBEY STOPALL

3 – Change parameters

This option requires a password. Use this option to modify any of the startup parameters for SYNC-TIME. This option starts an EDIT session on the STARTALL file and requires that the user be familiar with EDIT commands before using this option.

Once you change the parameters you need to stop and start all the components of SYNC-TIME, which usually takes less than a minute.

4 – Adjust system time now

This option requires a password. Use this option to set the system time **UNCONDITIONALLY** to the current NTP server time. This option is provided for system managers as a convenience and is for a one-time use only. It is not anticipated that there may be a need to use this option on a regular basis.

Error and exception handling:

1. In case the external NTP server is unreachable, the application will simply report this problem to EMS and take no action to correct the system time.
2. If the TCP/IP process that it uses to communicate with the external server is unavailable, then the application will simply report this problem to EMS and take no action to correct the system time.
3. If the application encounters any error while writing to EMS, it will attempt to report the same messages to its home terminal and if it is unsuccessful in doing so, it will continue processing, including set the system time if needed. Although EMS may be down, each time the application has an event to report, it will attempt to write it to EMS, in order to detect whether EMS is operational again.
4. In case of a CPU failure, the backup process will automatically recover and take over from the Primary process without any interruption of service.

Technical support:

Genesys Solutions, Inc. will provide free technical support during regular business hours (Mountain Time). Additional 7x24 technical support can be provided at a nominal cost.

For technical support:

Via phone (888) 343 6379

Via email techsupt@genesys-solutions.com