DAYLIGHT SAVING TIME OPTIONS IN SAP SYSTEM

WHITE PAPER

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SAP®

Applies to:

SAP NetWeaver, BC-ABA-LA Syntax, Compiler, Runtime, BC-SRV-TIM Time and Scheduling functions.

Summary

There are three ways to deal with Daylight Saving Time:

A   Two hour downtime method: Completely avoid running SAP system during this double hour.

B   One hour downtime method: See Note 102088

C   Zero downtime method: Use the default "stretched time".

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What is the problem?

For time zones with daylight saving time (DST), at the end of DST, you are required to move your clock one hour backwards. For example, in Europe, on the last Sunday in October, the clock at DST 2:59:59 will be reset in the next second to winter time 2:00:00. The hour running from 2:00:00 to 2:59:59 "on the wall" (local time) will be run twice.

Like all the software that deal with local time will be confused when the computer clock traverses twice through the same points in time, SAP system is no exception. With many delivered SAP systems, the "system time", that is, "wall clock time", accessible via SY-UZEIT, SY-DATUM, is used for control-relevant timestamps. With double hours this could lead to consistency problems. If, for example, timestamp1 is taken at point 2:30 summer time and timestamp2 is taken at point 2:15 winter time, the timestamp comparison

    timestamp1 > timestamp2

leads to an incorrect result.

These inconsistent records are stored in the database, and cannot be solved by system reboot.

Example:

We know, for example, that there is a problem with generating ABAP caused by the "double hours". A DDIC object, which should be regenerated, may not be triggered.

Similar cases exist in APAP applications as well.

The first suggestion from SAP was, to shut down SAP system for the entire duration of the double hour, and bring it up only after the double hour has passed. Thus, the SAP Kernel does not have to deal with any possible mismatch of standard time and local time.

However, we know that many customers don't do this. The inconsistencies that arose were solved by support colleagues, presumably without ever having found out the real reason for them.

Therefore, SAP has invented the so-called "stretched time" method. Here, the system time is slowed down the time by half, during the double hour, so that the 2 hour period is treated as one hour. The "double hour" is in this case just one continuous half-speed hour.

"Stretched time" has the advantage that it is continuous and the inconsistency problems mentioned above cannot occur.

But it has a disadvantage. It is not the correct time. It does not match the "wall clock time". Two types of error can occur:

1. Applications that synchronize the stretched time with an external "wall clock time", eg
       -by RFC in other systems (SAP or non-SAP)
       -by data storage (file, DB, ...), which was filled by others (non-SAP) applications
       -
2. Applications where the time must be correct, for example:
       -Hospital: The time when a patient arrived at a hospital must be correct (a real example for a
         hospital in Austria)

However, we have decided to make the "stretched time" the default. All customers have this setting, so that the inconsistency problems no longer occur.

Solutions

There are three ways to deal with Daylight Saving Time. The method that you adopt will depend on your specific environment well as your tolerance for system downtime.

A   Two hour downtime method: Completely avoid running SAP system during this double hour.

B   One hour downtime method: See Note 102088

C   Zero downtime method: Use the default "stretched time".

For customers who choose the way A, a switch is provided to shut off the stretched time. For details please see Note 102088.

As the "stretched time" is set as the default, all customers should decide for themselves whether they can accept the disadvantages of the "stretched time". If they can, the system can continue to run.

If not, the customer needs to choose way either A or B.

Be aware of that, "stretched time" is first introduced since release 46C. For older releases there is no such a choice.

How to code with "stretched time" by your own, so that it could run during the "double hours", please see the "Information for the ABAP Developer".

We know of at least one example of an application which cannot work with the "stretched time":

Component "IS-H," SAP Patient Management (see customer message 0000298268 120 050 410 2005).

"Letting the "double hours" run first, and then dealing with any possible errors" is a rather risky approach. Type 1) errors are not very likely to occur, but type 2) errors are almost certain to occur. You need to analyze your situation exactly in order to choose the right method for you.

Information for the ABAP Developer

In general, most of the ABAP components should work with the retarded time model. In theory, there are some cases where this may lead to problems. These cases are listed below.

Serious Problems:

Statically stored offsets of the system time to any other time not containing the retarded time model;

Comparison of time spans of system time stamps (retarded time) with UTC time stamps;

Transformations from UTC time stamps to system time stamps (retarded time) lead to the "wrong" results. This should not happen very frequently, since the information about the system time zone is not easy to find (table TTZCU);

Real time problems (statistics, timeout checks) ;

Comparisons of system times or time stamps (retarded time) and external local times:
Examples:

1. storing the difference between SY-TIMLO and SY-UZEIT and thinking it will remain constant.
2. comparing SY-UZEIT with times yielded from ABAP time zones:
   a. using "GET TIME STAMP FIELD tstmp TIME ZONE anytimezone"
   b. then converting time stamp "tstmp" to a date/time pair with "CONVERT TIME STAMP tstmp INTO DATE date TIME time.".
   c. Finally, calculating the difference between "time" and SY-UZEIT, thinking that it will remain constant.

Minor Defects:

presentation of the system time (retarded time) to the user

selections within the system time (retarded time)

If you detect more problems like the above that may also affect other components please do not hesitate to contact us.

What Every ABAP Developer Should Do

Please refer to the ToDo-List for the serious problems mentioned above.

After that you should consider whether the minor defects mentioned above might be relevant.

Class CL_ABAP_TSTMP may help

In the class CL_ABAP_TSTMP you will find a few static methods that may help you if you have encountered problems in your project, that is.:

IsDoubleInterval: Method to detect the "Double Interval"

SystemTstmp_Syst2Loc: Method to convert from retarded (system) time to local wall clock time

SystemTstmp_Loc2Syst: Method to convert from local wall clock time to retarded (system) time

SystemTstmp_UTC2Syst: Method to convert from UTC time to retarded (system) time

SystemTstmp_Syst2UTC: Method to convert from retarded (system) time to UTC time.

If you need even more functionality please do not hesitate to contact us.

Useful links for the ABAP Developer

NetWeaver doc: DST Safe Kernel (SAP Library - SAP High Availability)

Blogs: SAP Network Blog: ABAP Geek 8 – Summertime (Blues) …

Wiki: SAP CDT - DateTime

Code sample: SAP Global Data Types Retrieval Tool

Related SAP Notes

Note 7417 - Conversion between winter time and daylight saving time

Note 102088 - Reducing downtime when changing from summer to winter time

Note 398374 - Problems when converting summer time <-> winter time

Note 950114 - Profile parameter zdate/DSTswitch_contloctime

Note 438660 - End of daylight-saving time coming soon, be ready!

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