

Implementing and using SIMETR with STP

This paper discusses implementing and using SIMETR timing mode for systems on a server in STP timing mode, including:

- How to implement STP on a server while concurrently running a multi-system sysplex in SIMETR timing mode.
- Explaining the possible problems and how to avoid and resolve them.

Important: IBM recommends that a SIMETR sysplex is taken down before implementing STP and restarted in STP timing mode. This will avoid the problems discussed in this paper. SIMETR timing mode for systems on a server in STP timing mode should only be used as a migration path until there is a suitable window for a sysplex-wide outage to switch to STP timing mode.

Overview of SIMETR

The use of SIMETR allows a multi-system sysplex to run on a single server that is not in ETR or STP timing mode. This is done by specifying SIMETRID nn in the CLOCKxx parmlib member.

When a sysplex member attempts to join a sysplex running in SIMETR, XCF checks that all systems have consistent timing. This includes ensuring that all LPARs are running on the same CPC and that the TOD clock for all LPARs is identical. An LPAR TOD can differ from the CPC TOD due to the LPAR offset. XCF reads the LPAR offset via an LPAR command and verifies that all LPARs have the same offset.

Implementing STP with SIMETR

STP can be implemented concurrently on a server where systems are running with SIMETR timing mode in a multi-system sysplex. As this will generally introduce a non-zero LPAR offset, IBM recommends that the sysplex is taken down before implementing STP restarted in STP timing mode.

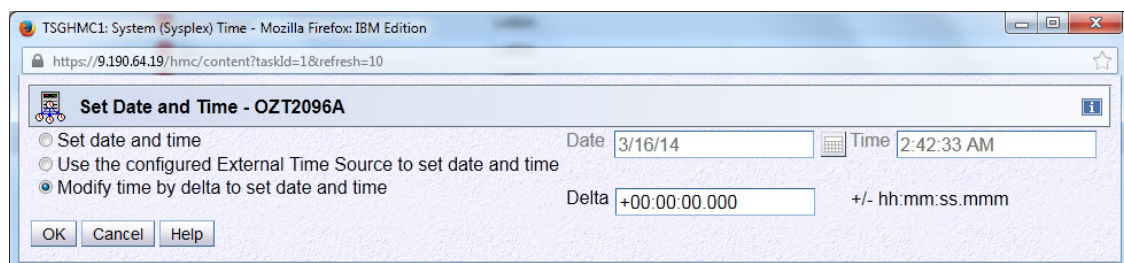
A non-zero LPAR offset due to a clock jump can occur in three different ways:

1. When performing the “Initialize Time” task of the STP implementation.

2. Whenever an STP synchronization check machine check occurs for stratum 2 or stratum 3 servers. This occurs when STP is unable to keep the clocks synchronized to within 50 microseconds via clock steering.
3. When a stratum 2 or stratum 3 server joins the CTN and the CEC's TOD is not within 50 microseconds of the S1 server's TOD.

When a clock jump occurs the LPAR TOD for running systems takes an offset of the opposite amount so that the clock jump is transparent. Systems running in STP timing mode are presented with an STP synchronization check machine check and clear the offset. However, systems running in SIMETR are not enabled for STP machine checks and so the offset is not cleared.

While it is not possible to avoid a non-zero offset when an STP synchronization check occurs or when a stratum 2 or stratum 3 server joins a CTN, it is possible to implement STP without causing a clock jump on the stratum 1 server when the STP time is initialized. This is done by setting a zero delta when performing the “Initialize Time” task as shown in the screenshot below:



Problems running with SIMETR on a server in STP timing mode

As systems running in SIMETR timing mode are not enabled for STP machine checks, the LPAR offset will not be cleared when a clock jump occurs. This does not cause an immediate problem as all LPARs will have an identical offset. In addition, re-IPLing a member of a multi-system sysplex will not cause a problem as the LPAR offset is not cleared at IPL for systems running with SIMETR. This support was introduced and documented via APAR OA26800.

However, the LPAR offset is cleared when an LPAR partition is re-activated. This means that if there has been a clock jump since the sysplex was initialized, the running LPARs will have a non-zero offset while the re-activated LPAR will have a zero offset. When the system is IPLed it will be prevented from joining the sysplex due to inconsistent timing information.

XCF will issue messages:

```
IXC416I SIMETRID IS SUPPORTED ONLY WHEN ALL SYSTEMS IN THE
        SYSPLEX RUNNING ON THE SAME CPC AND ARE USING
        SIMETRID CONSISTENTLY
IXC404I SYSTEM(S) ACTIVE OR IPLING: SC63      SC65      SC70
IXC419I SYSTEM(S) NOT SYNCHRONIZED: SC63      SC65      SC70
IXC420D REPLY I TO INITIALIZE SYSPLEX SANDBOX, OR R TO
        REINITIALIZE
```

To resolve the problem, the LPAR partition for all systems in the sysplex must be re-activated so that all LPARs have a zero offset.

Before re-activating an LPAR in a multi-system sysplex running with SIMETR, the LPAR offset can be checked via IPCS. This is particularly important for a sysplex running on a stratum 2 or stratum 3 server.

The LPAR offset is stored by XCF in the CPLX control block field CPLXEPOCH. The following IPCS commands will display the LPAR offset:

```
IP SETD ACTIVE
IP L 10?+8C?+4?+400 LE(8)
```

If CPLXEPOCH is non-zero value (other than the last byte) then all LPARs must be re-activated if one LPAR needs to be re-activated.