

Hardware Management Console (HMC) STP Panel Enhancements

Initialize Time Panel

- Enhanced to list time zone and leap second offset as well as indicates if the system time was set; this enables users to quickly check fields during CTN configuration

Set Date and Time Panel

- Enhanced to encourage use of External Time Source to set CTN time

Time Zone

- Enhanced with confirmation messages when setting STP time zone via adjust Time Zone panel on Current Time Server (CTS); also lists scheduled switch times for leap seconds and time zone/daylight savings time on Timing Network Tab

View-Only Mode

- Added support for view-only STP panels

These enhancements are available exclusively on IBM z13.

Service Element (SE) Time Accuracy

As a continuation of the zEnterprise 196 (z196) timing accuracy improvements for an STP-only CTN, namely, SE/CPC hourly clock steer and synch, the zEnterprise EC12 and zEnterprise BC12 have expanded these enhancements by allowing the SE to access an STP panel-configured External Time Source (ETS), even when the CPC is powered off or has not been IMLed. The SE achieves this by invoking the ETS-configured NTP servers to obtain the ETS-SE time difference and steers the SE clock towards the ETS clock. During IML, the more accurate SE clock time transfers to the CPC clock, maximizing the CPC timing accuracy.

This feature is available exclusively on zEnterprise EC12 and zEnterprise BC12.

Network Time Protocol (NTP) client support

The external time source (ETS) function of STP can provide accurate time relative to an external time standard for data processing applications. The ETS function is only available when an STP-only CTN is configured. The external time source can be configured by dialing out from the HMC to an available time service such as Automated Computer Time Service (ACTS). Dialing out provides time accuracy for the z Systems timing network only. This function has been generally available since January 31, 2007 when STP became generally available.

An alternative method to obtain accurate time is from an NTP server. Simple Network Time Protocol (SNTP) client support is added to the Server Time Protocol code to interface with NTP servers. NTP client support can provide the same time across heterogeneous platforms in an enterprise with a time accuracy of 100 milliseconds.

A complete description of NTP can be found at the Web site:

NTP client support is available starting on System z9 servers configured in an STP-only Coordinated Timing Network. The IBM System z9 must be at EC Driver level 67L in order to configure the NTP client support. When all the latest MCLs available for the driver are installed you can configure the ETS to use the NTP client support available on System z9 servers. The installation of these MCLs is non-disruptive.

Hardware Management Console (HMC) STP Panel Enhancements

The z990 and z890 do not support configuration of NTP as an external time source. However, z990 and z890 servers can participate in an STP-only CTN that has a System z9 configured to use NTP as an external time source, and they can be configured to use dial-out from the HMC in the event that they become a Current Time Server.

The implementation of SNTP client supports:

- NTP V3 (RFC-1305), NTP V4 (no RFC)
- SNTP V4 (RFC-4330)
- IPv4

There is no encryption used from the NTP client on the Support Element to communicate with the NTP server. The NTP server can be either an external time source device available from several timekeeping manufacturers, or it can be a local NTP server.

Enhanced accuracy to an External Time Source:

The time accuracy of an STP-only CTN has been improved by adding the capability to configure an NTP server that has a pulse per second (PPS) output signal as the ETS device. This type of ETS device is available worldwide from several vendors that provide network timing solutions.

STP has been designed to track to the highly stable, accurate PPS signal from the NTP server, and maintain an accuracy of 10 microseconds as measured at the PPS input of the z Systems server. A number of variables such as accuracy of the NTP server to its time source (GPS, radio signals for example), and cable used to connect the PPS signal will determine the ultimate accuracy of STP to Coordinated Universal Time (UTC).

In comparison, the IBM Sysplex Timer is designed to maintain an accuracy of 100 microseconds when attached to an ETS with a PPS output. If STP is configured to use a dial-out time service or an NTP server without PPS, it is designed to provide a time accuracy of 100 milliseconds to the ETS device.

For this enhancement, the NTP output of the NTP server has to be connected to the Support Element (SE) LAN, and the PPS output of the same NTP server has to be connected to the PPS input provided on the External Time Reference (ETR) card of the System z10 or System z9 server.

Continuous Availability of NTP servers used as External Time Source:

Improved External Time Source (ETS) availability can now be provided if you configure different NTP servers for the Preferred Time Server (PTS) and the Backup Time Server (BTS). Only the PTS or the BTS can be the Current Time Server (CTS) in an STP-only CTN. Prior to this enhancement, only the CTS calculated the time adjustments necessary to maintain time accuracy. With this enhancement, if the PTS/CTS cannot access the NTP Server or the pulse per second (PPS) signal from the NTP server, the BTS, if configured to a different NTP server, may be able to calculate the adjustment required and propagate it to the PTS/CTS. The PTS/CTS in turn will perform the necessary time adjustment steering.

Hardware Management Console (HMC) STP Panel Enhancements

This avoids a manual reconfiguration of the BTS to be the CTS, if the PTS/CTS is not able to access its ETS. In an ETR network when the primary Sysplex Timer is not able to access the ETS device, the secondary Sysplex Timer takes over the role of the primary - a recovery action not always accepted by some customers. The STP design provides continuous availability of ETS while maintaining the special roles of PTS and BTS assigned by the customer.

The availability improvement is available when the ETS is configured as an NTP server or an NTP server using PPS.

NTP Server on Hardware Management Console:

Improved security can be obtained by providing NTP server support on the HMC. If an NTP server (with or without PPS) is configured as the ETS device for STP, it needs to be attached directly to the Support Element (SE) LAN. The SE LAN is considered by many users to be a private dedicated LAN to be kept as isolated as possible from the intranet or Internet.

Since the HMC is normally attached to the SE LAN, providing an NTP server capability on the HMC addresses the potential security concerns most users may have for attaching NTP servers to the SE LAN. The HMC, via a separate LAN connection, can access an NTP server available either on the intranet or Internet for its time source. Note that when using the HMC as the NTP server, there is no pulse per second capability available. Therefore, you should not configure the ETS to be an NTP server using PPS.

Enhanced STP recovery when Internal Battery Feature is in use:

Improved availability can be obtained when power has failed for a single server (PTS/CTS), or when there is a site power outage in a multi-site configuration where the PTS/CTS is installed (the site with the BTS is a different site not affected by the power outage).

If an Internal Battery Feature (IBF) is installed on your z Systems server, STP now has the capability of receiving notification that customer power has failed and that the IBF is engaged. When STP receives this notification from a server that has the role of the PTS/CTS, STP can automatically reassign the role of the CTS to the BTS, thus automating the recovery action and improving availability.

STP configuration and time information saved across Power on Resets (POR) or power outages: This enhancement delivers system management improvements by saving the STP configuration across PORs and power failures for a single server STP-only CTN. Previously, if the server was PORed or experienced a power outage, the time, and assignment of the PTS and CTS roles would have to be reinitialized. You will no longer need to reinitialize the time or reassign the role of PTS/CTS across POR or power outage events. This enhancement is also available on the z990 and z890 servers.

Application Programming Interface (API) to automate STP CTN reconfiguration:

The concept of "a pair and a spare" has been around since the original Sysplex Couple Data Sets (CDSs). If the primary CDS becomes unavailable, the backup CDS would take over. Many sites have had automation routines bring a new backup CDS online to avoid a single point of

Hardware Management Console (HMC) STP Panel Enhancements

failure. This idea is being extended to STP. With this enhancement, if the PTS fails and the BTS takes over as CTS, an API is now available on the HMC so you can automate the reassignment of the PTS, BTS, and Arbiter roles. This can improve availability by avoiding a single point of failure after the BTS has taken over as the CTS.

Prior to this enhancement, the PTS, BTS, and Arbiter roles had to be reassigned manually using the System (Sysplex) Time task on the HMC. For additional details on the API, please refer to z Systems Application Programming Interfaces, SB10-7030-11.

NTP Authentication

Security is enhanced when using the HMC as an NTP client to help ensure the time stamps are untampered. The HMC now adds Symmetric Key and Autokey authentication to help improve security when the HMC goes through the firewall to access time stamps from an NTP server.