Server Time Protocol z/OS Considerations

Agenda

- Timing Network and timing mode perspectives
- z/OS Timing and Synchronization Modes
- CLOCKxx PARMLIB member
- Display information
- z/OS Messages
- When the operating system does not support STP

Timing Network types

- None – No time synchronization between servers.
- ETR – Servers synchronized via direct connections to a Sysplex Timer.
- *Coordinated Time Networks (CTNs)**
  - *Mixed – Servers synchronized via STP and a Sysplex Timer working together.*
  - *STP only – Servers synchronized via STP only.*

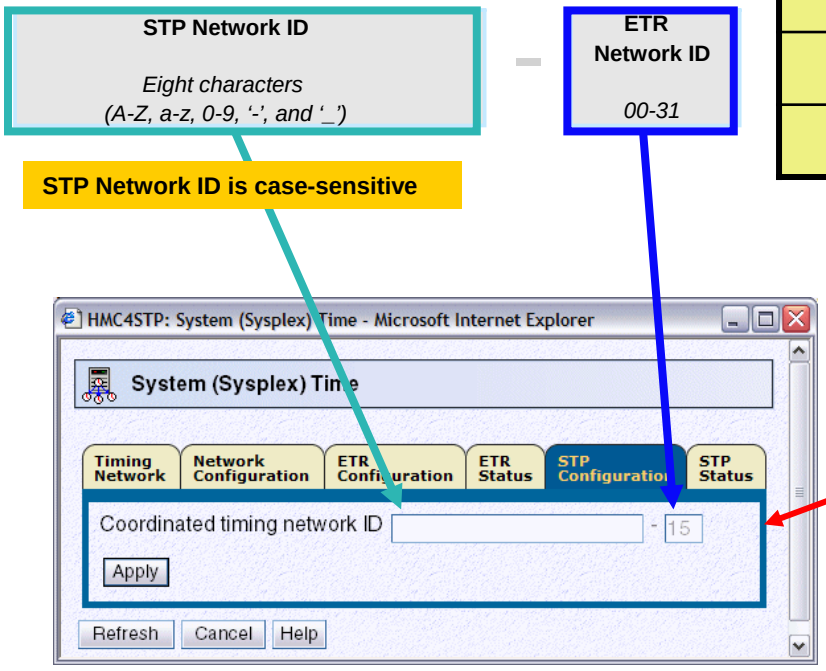
* New with STP

Coordinated Timing Network ID (CTN ID)

- **The CTN ID is an identifier that is used to indicate whether the server has been configured to be part of a CTN. It identifies the CTN.**

- **The CTN ID is made up of two fields**

Timing Network	STP ID	ETR ID	CTN ID
None	Null	Null	
ETR	Null	ETR ID	***15***
Mixed	STP ID	ETR ID	***HMCTEST-15***
STP-Only	STP ID	Null	***HMCTEST***



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Important Network and Synchronization Mode Concepts

- Synchronization mode is often the same for a Server and an image running on that Server, but it **may** be different.
  - "Server synchronization mode" may be ETR mode
  - "Image synchronization mode" may be LOCAL mode
- Different Server synchronization modes may exist within a CTN.
  - Servers synchronized to a 9037 will be in ETR mode
  - Servers synchronized using STP will be in STP mode
- Members of a Sysplex may have different synchronization modes
  - In a mixed CTN there may be ETR mode and STP mode images

z/OS synchronization modes

z/OS Synchronization Mode	Server Timing Mode
Local	Local, ETR, or **STP**
ETR	ETR
SIMETR	Local or ETR
ETR*	ETR – *Stratum 1 (S1) server in a Mixed CTN*
STP*	STP – *Stratum 2 (S2) or Stratum 3 (S3) server in a Mixed CTN* – *All servers in the CTN in an STP-only CTN*
SIMETR*	Local, ETR, or STP – *Mixed CTN or STP-only CTN*

*** New with STP**

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z/OS CLOCKxx statements

- **OPERATOR PROMPT|NOPROMPT**
- **TIMEZONE W|E hh.mm.ss**
- **ETRMODE YES|NO**
- **ETRZONE YES|NO**
- **SIMETRID nn**
- **STPMODE* YES|NO**
  - **Specifies whether z/OS is using STP timing mode**
  - **STPMODE YES default**
- **STPZONE* YES|NO**
  - **Specifies whether the system is to get the time zone constant from STP**
- **ETRDELTA ss | TIMEDELTA* ss**
  - **Indicates the greatest difference, after IPL, between the system image's TOD and the Coordinated Server Time (CST), by which the system image will adjust its TOD, when necessary, to match CST.**
    - **Value Range: 0 to 99 seconds**
    - **Default = 10 seconds**

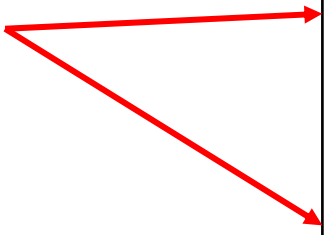
DEFAULT

OPERATOR NOPROMPT
TIMEZONE W.00.00.00
ETRMODE YES
ETRZONE YES
STPMODE YES
STPZONE YES
TIMEDELTA 10

* New statements for STP

CLOCKxx Example

CLOCKxx prior to STP	CLOCKxx after STP
OPERATOR NOPROMPT	OPERATOR NOPROMPT
TIMEZONE W 00.00.00	TIMEZONE W 00.00.00
ETRMODE YES	ETRMODE YES
ETRZONE YES	ETRZONE YES
ETRDELTA 10	ETRDELTA 10
	STPMODE YES
	STPZONE YES
	TIMEDELTA 10



- TIMEDELTA and ETRDELTA are basically aliases, and are not dependent on whether the server is in ETR or STP timing mode.
- If both are specified, z/OS will use the second one—whichever one that is—and reject the first one

Recommendation: It is **strongly** recommended that the value applied to ETRDELTA and TIMEDELTA be left at the default of 10 (seconds). This recommendation is even more important for customers planning a reverse migration. A reverse migration refers to when an STP-Only CTN is concurrently migrated to a Mixed-CTN.

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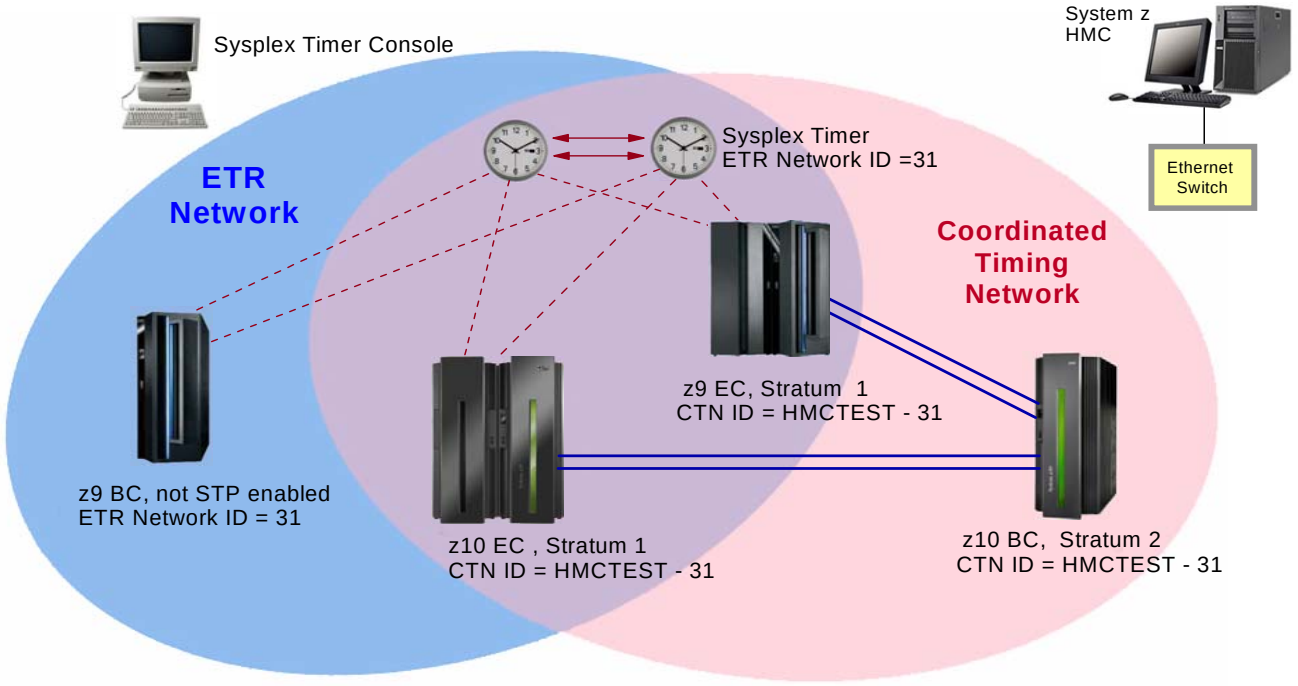
D ETR command – Mixed CTN



Issued from:
Non STP- enabled server
(z9 BC)

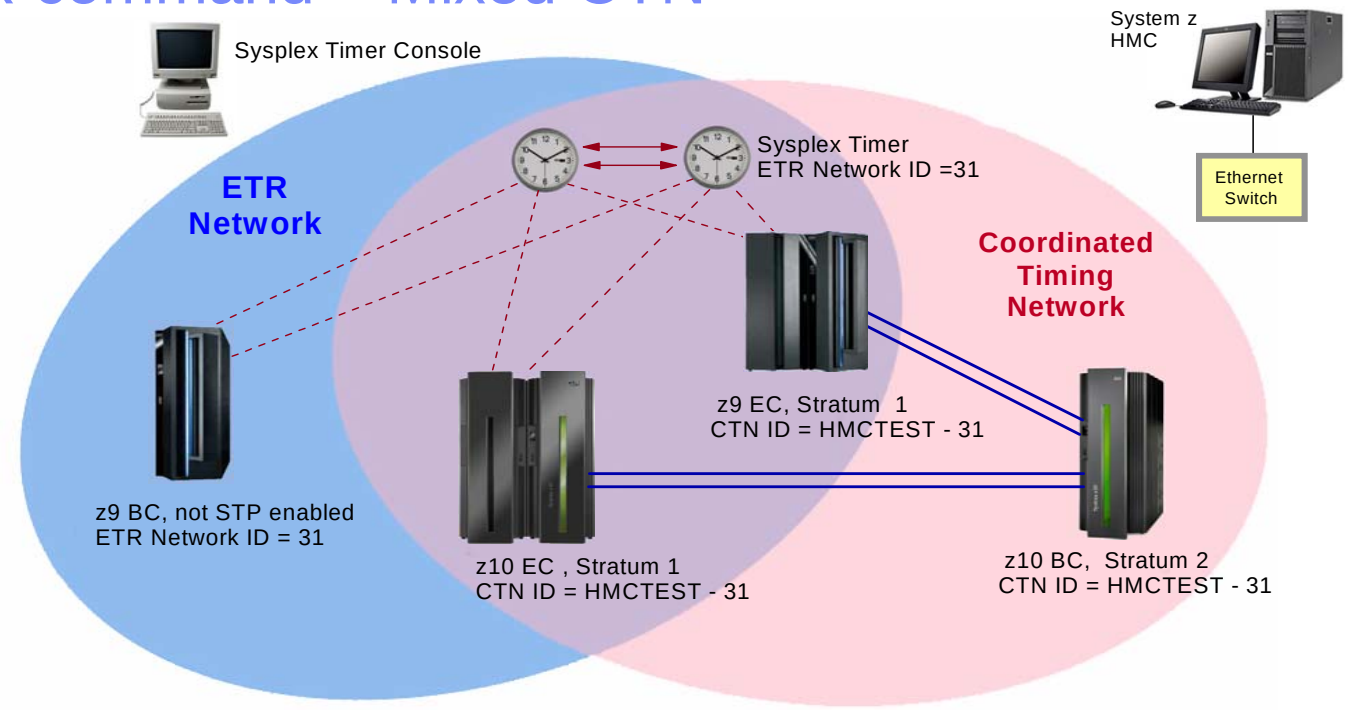
z9 BC is in ETR network

IEA282I 19.24.52 TIMING STATUS 004

SYNCHRONIZATION MODE = ETR

CPC PORT 0 <== ACTIVE	CPC PORT 1
OPERATIONAL	OPERATIONAL
ENABLED	ENABLED
ETR NET ID=31	ETR NET ID=31
ETR PORT=01	ETR PORT=01
ETR ID=01	ETR ID=00

D ETR command – Mixed CTN



Issued from:
S1 Servers
(z9 EC, z10 EC)

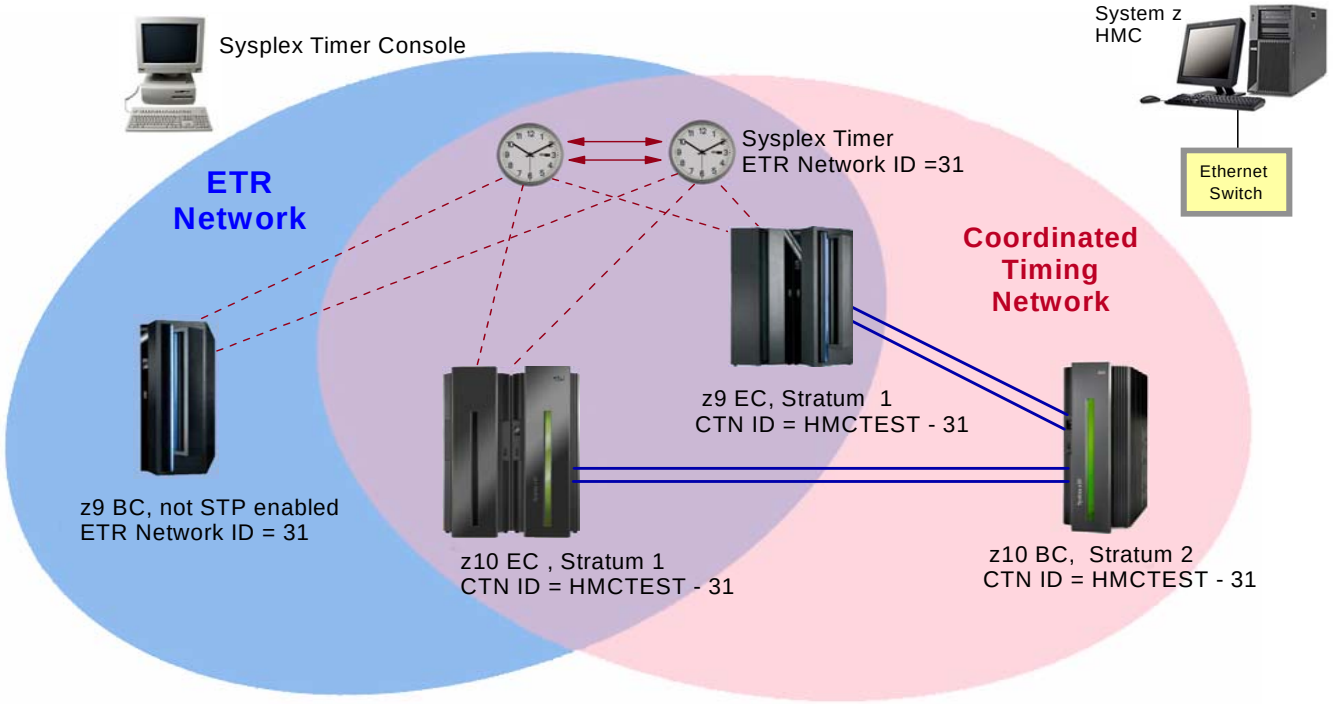
IEA282I 19.24.52 TIMING STATUS 004

SYNCHRONIZATION MODE = ETR

CPC PORT 0 <== ACTIVE	CPC PORT 1
OPERATIONAL	OPERATIONAL
ENABLED	ENABLED
ETR NET ID=31	ETR NET ID=31
ETR PORT=01	ETR PORT=01
ETR ID=01	ETR ID=00

THIS SERVER IS PART OF TIMING NETWORK HMCTEST -31

D ETR command – Mixed CTN



Issued from:
S2 Server
(z10 BC)

SP7A IEA386I 10.35.32 TIMING STATUS 637

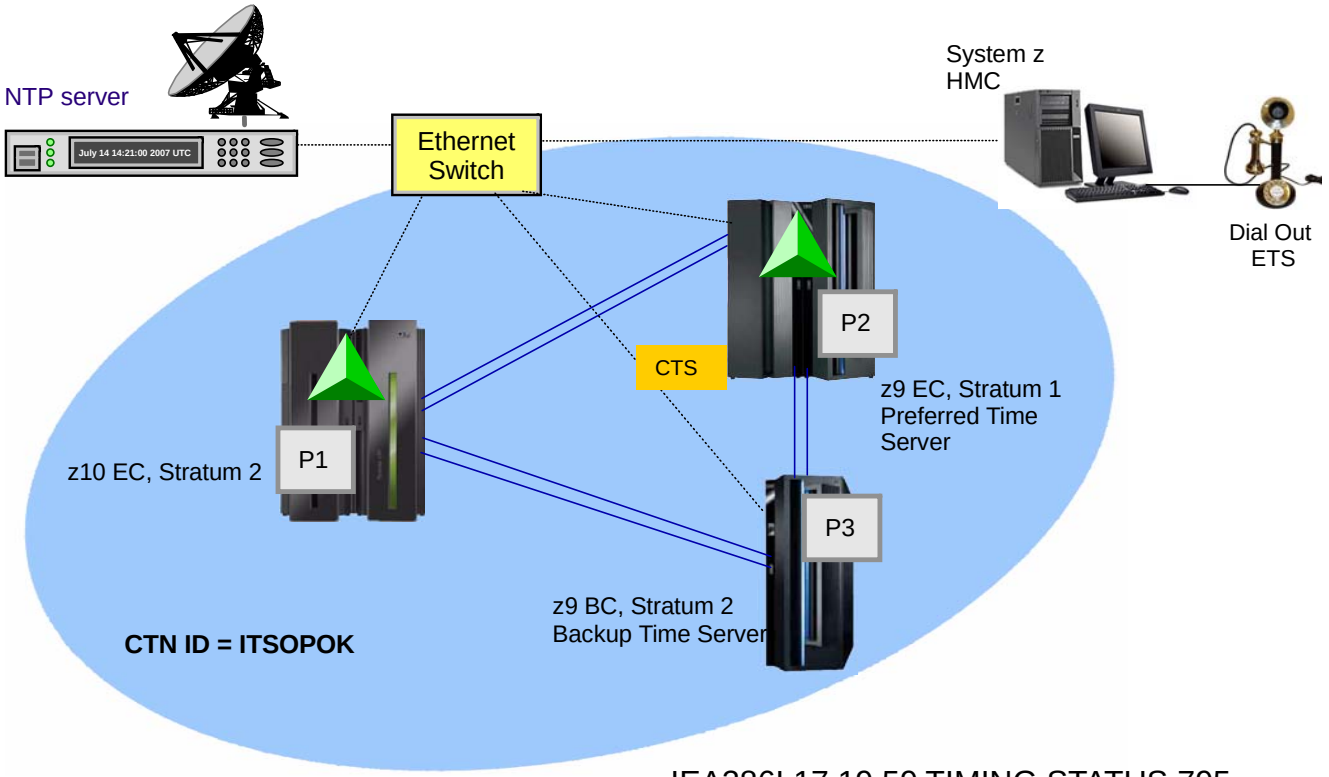
SYNCHRONIZATION MODE = STP

THIS SERVER IS A STRATUM 2

CTN ID = HMCTEST-31

NUMBER OF USABLE TIMING LINKS = 4

D ETR command – STP-Only CTN



P1, P2, P3 are systems in a Parallel Sysplex

Issued from:
CTS, S1 Server (z9 EC)

IEA386I 17.19.59 TIMING STATUS 795

SYNCHRONIZATION MODE = STP

THIS SERVER IS A STRATUM 1

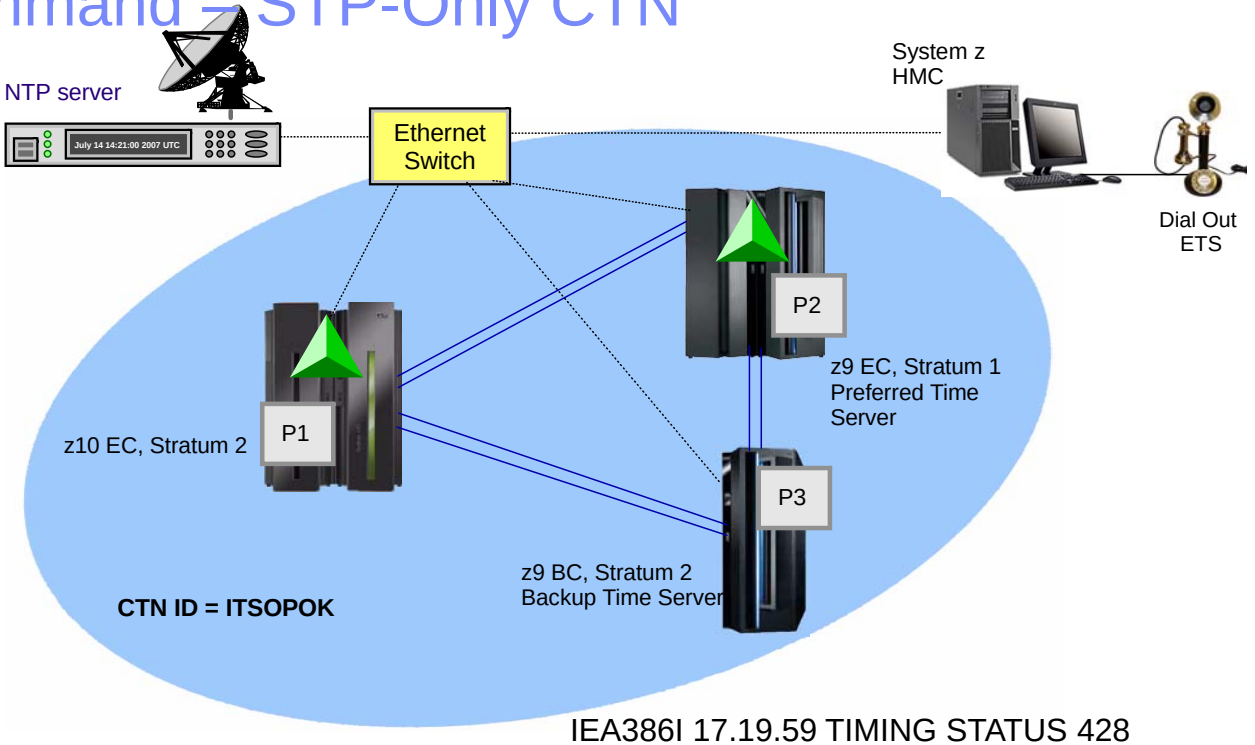
CTN ID = ITSOPOK

THE STRATUM 1 NODE ID = 002094.S18.IBM.02.00000002991E

THIS IS THE PREFERRED TIME SERVER

THIS STP NETWORK HAS NO SERVER TO ACT AS ARBITER

D ETR command – STP-Only CTN



P1, P2, P3 are systems in a Parallel Sysplex

Issued from:
S2 Server, BTS (z9 BC)

IEA386I 17.19.59 TIMING STATUS 428

SYNCHRONIZATION MODE = STP

THIS SERVER IS A STRATUM 2

CTN ID = ITSOPOK

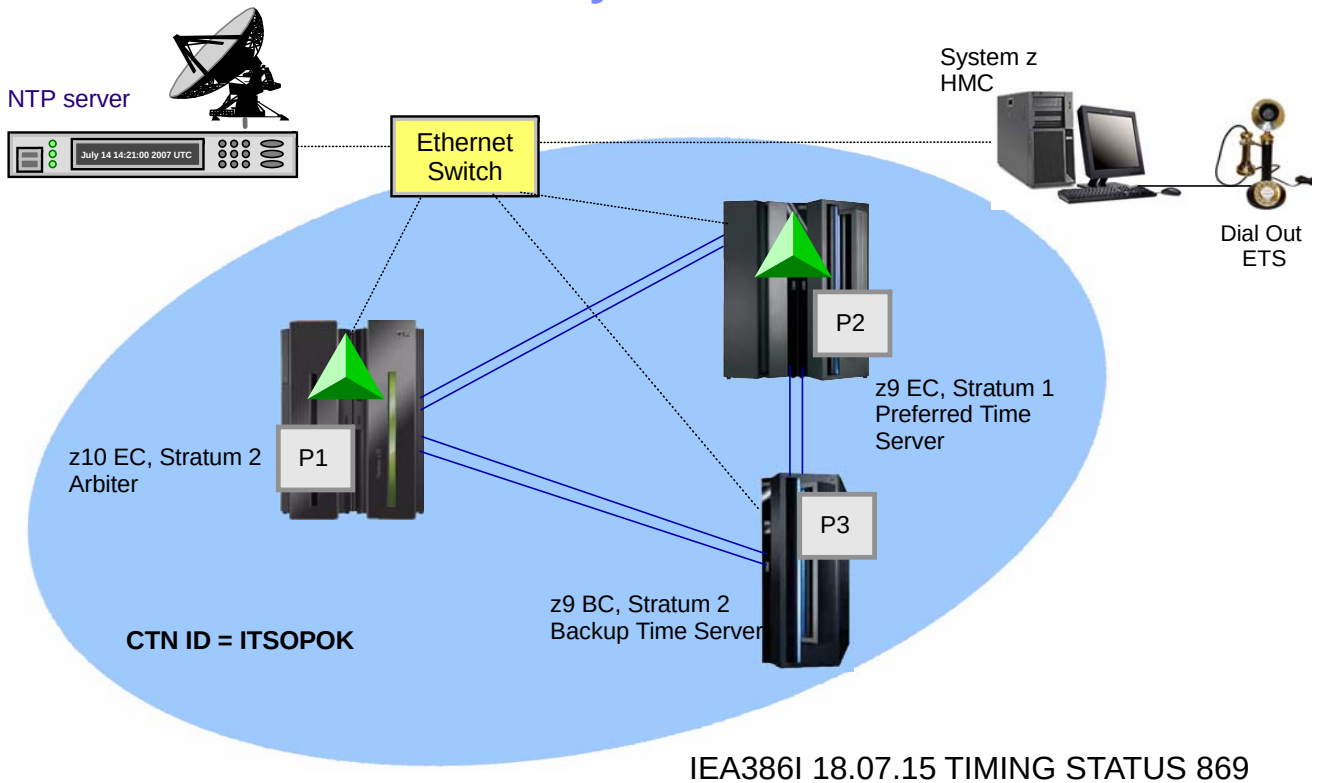
THE STRATUM 1 NODE ID = 002094.S18.IBM.02.00000002991E

THIS IS THE BACKUP TIME SERVER

NUMBER OF USABLE TIMING LINKS = 4

THIS STP NETWORK HAS NO SERVER TO ACT AS ARBITER

D ETR command – STP-Only CTN



P1, P2, P3 are systems in a Parallel Sysplex

Issued from:
S2 Server, Arbiter (z10 EC)

IEA386I 18.07.15 TIMING STATUS 869

SYNCHRONIZATION MODE = STP

THIS SERVER IS A STRATUM 2

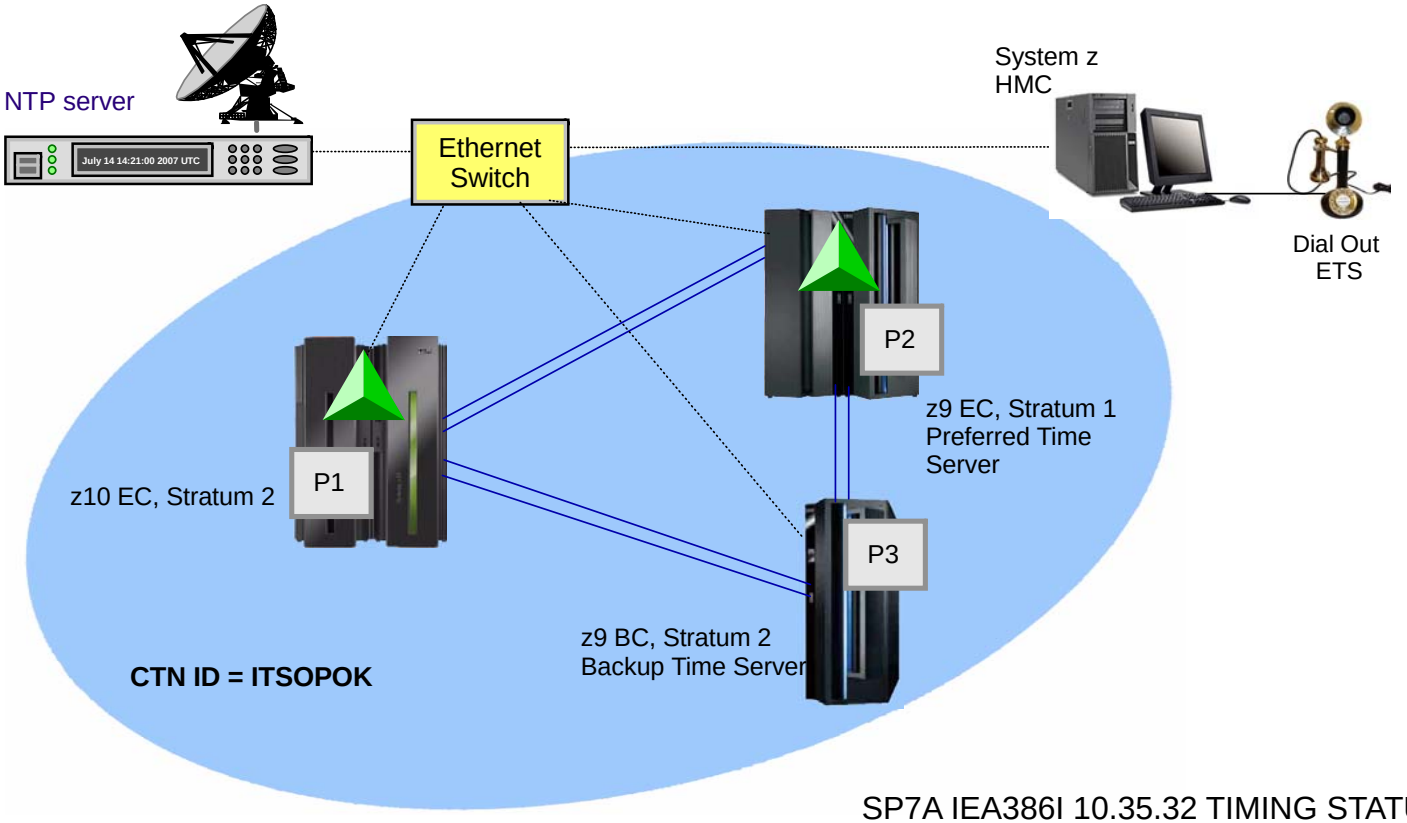
CTN ID = ITSOPOK

THE STRATUM 1 NODE ID = 002094.S18.IBM.02.00000002991E

THIS IS THE ARBITER SERVER

NUMBER OF USABLE TIMING LINKS = 4

D ETR command – STP-Only CTN



P1, P2, P3 are systems in a Parallel Sysplex

Issued from:
S2 Server (z10 EC)
No server role

SP7A IEA386I 10.35.32 TIMING STATUS 637

SYNCHRONIZATION MODE = STP

THIS SERVER IS A STRATUM 2

CTN ID = ITSOPOK

THE STRATUM 1 NODE ID = 002094.S18.IBM.02.00000002991E

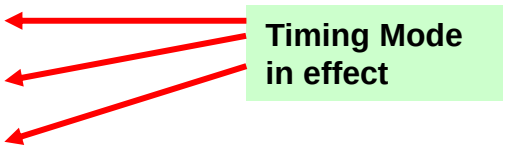
NUMBER OF USABLE TIMING LINKS = 4

DISPLAY XCF,SYSPLEX, ALL

The **DISPLAY XCF,SYSPLEX,ALL** command displays system status and last recorded system status monitor time stamp for each system in the sysplex

Mixed CTN Example

```
D XCF,S,ALL
IXC335I 17.31.31 DISPLAY XCF 375
SYSTEM TYPE  SERIAL LPAR  STATUS TIME          SYSTEM  STATUS
SC80   2097  DE50   01    11/22/2007 17:31:28  ACTIVE  TM=STP
SC74   2094  991E   01    11/22/2007 17:31:29  ACTIVE  TM=STP
SC75   2084  6A3A   15    11/22/2007 17:31:30  ACTIVE  TM=ETR
```



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STP Messages

- There are many IEAxxx and IXCxxx messages which report current and changed timing status.
- As an example, the following reports the result of a successful migration from a mixed CTN to an STP-only CTN.

IXC438I COORDINATED TIMING INFORMATION HAS BEEN UPDATED

FOR SYSTEM: sysname

PREVIOUS CTNID: IBM_NET1-15

CURRENT CTNID: IBM_NET1

z/OS Messages

- **In general, there are no z/OS messages that are posted *only* on the PTS, BTS, or Arbiter.**
- **Certain messages will not appear on the CTS since it is the time source**
  - IEA382I THIS SERVER HAS ONLY A SINGLE LINK AVAILABLE FOR TIMING PURPOSES.
  - IEA383I THIS SERVER RECEIVES TIMING SIGNALS FROM ONLY ONE OTHER NETWORK NODE.
  - IEA281I STP SYNC CHECK THRESHOLD EXCEEDED. CPC CONTINUES IN LOCAL MODE.
  - IEA390I TOD CLOCKS DYNAMICALLY ADJUSTED TO MAINTAIN STP SYNCHRONISM.
- **Following message may not appear on some special role servers**
  - IEA388I THIS SERVER HAS NO CONNECTION TO THE nnnnnnnnn
    - Where nnnnnnnnnnn = 'PREFERRED '| 'BACKUP '| 'ARBITER '
  - For example,
    - IEA388I THIS SERVER HAS NO CONNECTION TO THE BACKUP will never appear on a z/OS system running on the BTS.

Improved System Management with new z/OS messaging

- **Previously**
  - If ETS failure condition is detected ***OR***
  - When BTS takes over as CTS
    - Hardware message generated
    - No z/OS message generated, possibly delaying problem determination and correction

- **System management enhancement**
  - A z/OS message will be issued when an STP alert is raised
    - Message indicates event that caused the alert
  - z/OS V1.11 (rolled back to z/OS V1.10 and z/OS V1.9)

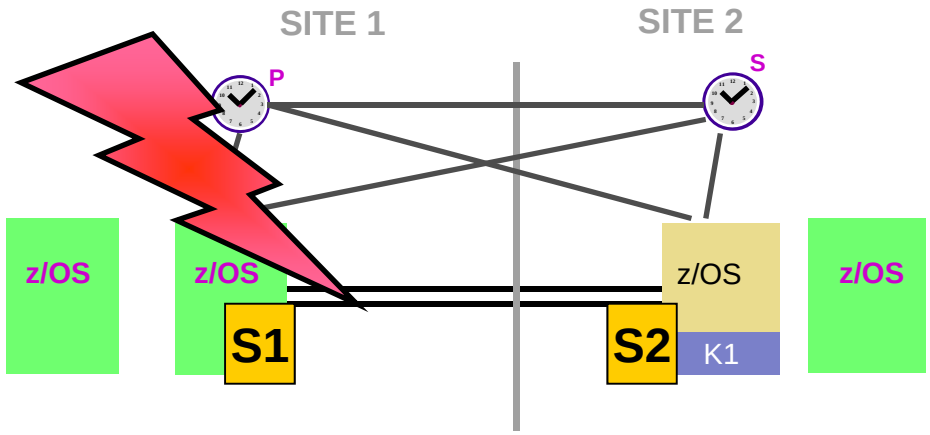
STP Enhancements

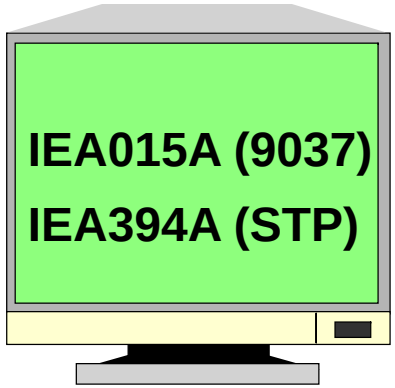
- New IEA031I messages are all ETS-related:
  - IEA031I STP ALERT RECEIVED. STP ALERT CODE = nn
    - Alert code is x'01' to x'84‘
  - If you are using an External Time Source with STP, these messages should be added to your automation.

- New message IEA395I
  - IEA395I THE CURRENT TIME SERVER HAS CHANGED TO THE ccccccccccc
    - *(where ccccc is BACKUP or PREFERRED)*
  - This message may not require any action, however ensure that it generates an alert and that the staff responsible for STP are aware of the change.

- Note that both of these messages will be issued on every member of the sysplex, so be careful not to have automation take some action on more than one system.

GDPS/PPRC Enhanced Timer Support





- Allows K-sys to continue processing in local time if time source lost (ETR or STP)
- Protects K-Sys so it can
  - Complete Freeze and HyperSwap processing
  - Aid with situation analysis
    - Allows time for problem determination before responding to WTORs on production systems
- z/OS R11 (rollback to R9).

Changes in support of GDPS K System

- The normal course of action when a system loses time synchronization is to either issue a synchronous WTOR or to enter a wait state.
- However, the most important role of a GDPS K system is to manage recovery in case of a failure:
  - **If the GDPS K system is stopped it can't drive the recovery processing**
- The need for time synchronization is to protect integrity of the shared data.
  - However, because the K system should never access any data that is used by the managed systems, it should be OK for the K system to run in local time mode for a short time.
- The intent is that the system will be available to complete any Freeze or HyperSwap actions it has initiated and to help you check the status of sysplex resources.

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When the Operating System does not support STP

- Customers are increasingly implementing STP to provide accurate timestamp to operating systems that *DO NOT* support STP
  - Pre z/OS 1.7
    - z/OS 1.4, z/OS 1.5, z/OS 1.6
  - z/OS 1.7+
    - STPMODE=NO *or* SIMETR synchronization mode
  - z/VM, z/VSE, Linux, z/TPF
- Operating systems that do not support STP and all active LPARs on servers in the STP-only CTN can also benefit from the time accuracy provided by using the ETS function.

NOTE: OS-xyz refers to any operating system that does not support STP

OS-xyz Limitations

- Even though time accuracy can be maintained by using ETS to compensate for oscillator drift, there are instances that could result in a time difference between z/OS systems supporting STP and an OS-xyz running on STP-configured server
  - **z/OS supporting STP can handle this instances**
  - **OS-xyz will not be able to handle these instances**
- Synchronization check
- Leap seconds
- STP related operating system messages

OS-xyz Limitations (Sync Checks)

- Clocks may differ more than can be steered by STP due to unexpected activity or events (e.g. unplugging a cable)
- Server and all z/OS 1.7+ systems may be able to correct delta but OS-xyz will not know that delta exists

Resolution

- To remedy OS-xyz
  - Deactivate LPAR for OS-xyz
  - Activate it again
  - Re-IPL OS-xyz

OS-xyz Limitations (Leap Seconds)

- If using leap seconds, OS-xyz will not be able to recognize Leap Seconds offset changes, because OS-xyz will not receive the appropriate interrupt

Resolution

- When STP time is initialized, set Leap Seconds to zero
  - When ETS is used, it already includes leap seconds
  - At this point, server time matches ETS time
  - However, the next time a leap second occurs, user should **NOT** schedule a Leap Seconds offset change
  - STP will steer out time difference when the next ETS access occurs

OS-xyz Limitations (Messages)

- STP messages will not be seen by OS-xyz
- However, HMC will post microcode/firmware messages

Resolution

- STP messages not being posted by OS-xyz images will only impact customer environment if
  - They depend on monitoring the system with messages from OS-xyz

References

z/OS Publications

- *z/OS MVS System Commands*
- *z/OS MVS System Messages*
- *z/OS MVS Assembler Services Reference, Vol 2*

Redbooks

- *Server Time Protocol Planning Guide*, SG24-7280
- *Server Time Protocol Implementation Guide*, SG24-7281
- *Server Time Protocol Recovery Guide, SG24-7380*

Techdocs and WSC Flashes

- http://www.ibm.com/support/techdocs/atsmastr.nsf/Web/Techdocs
  - Search on “STP”

WSC FLASH 10631

- “When the Operating System does not support STP”
  - http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/FLASH10631

IBM Implementation Services for System z – Server Time Protocol (6948-J56)

Offering Description	• **This offering is designed to assist clients to quickly and safely implement Server Time Protocol within their existing environments. STP provides clients with the capability to efficiently manage time synchronization within their multi-server infrastructure. Following best practices and using detailed planning services, IBM helps clients identify various implementation models and engage in the appropriate configuration required to effectively support STP for driving a more responsive business and IT infrastructure.**
Program, Play, Industry Alignment	• **Infrastructure Improvement; Energy Efficiency; Better performance and lower operational cost**
Client Value ***(enables customers to...)***	• **Swift and secure implementation of STP for improved availability, integrity and performance** • **Improves multi-server time synchronization without interrupting operations** • **Enables integration with next generation of System z infrastructure**
Target Audience	• **Primarily core, Large Enterprise customers.** • **Existing z midrange clients**
Key Competitors	• **In house staff**
Competitive Differentiation	• **Leverages best practices with secure implementation** • **Short implementation time – lower risk** • **Provides support and facilitates knowledge sharing through IBM's mainframe expertise**
Proof Points & Claims for Client Value / Differentiation	• **Need to safely implement a reliable replacement for Sysplex Timer® while maintaining continuous operations** • **Cost of providing and maintaining hardware, floor space and solution support for additional Sysplex Timer intermediate site** • **Lack of in-house expertise, skills and resources for implementing Server Time Protocol**
Engagement Portfolio	• **http://spimweb1.boulder.ibm.com/services/sosf/dyno.wss?oid=50423&loc=All&langcd=en-US#1**
Offering Manager	• **Anna Lee/Southbury/IBM, 512-590-8914, T/L: 268-9318**

IBM Announces –
IBM Implementation Services for System z – Server Time Protocol

Implementation of STP for improved availability and performance

Offering

Assist clients to quickly and safely implement Server Time Protocol within their existing environments. IBM helps clients identify various implementation models and engage in the appropriate configuration required to effectively support STP for driving a more responsive business and IT infrastructure

Customer Value:

- Improves multi-server time synchronization without interrupting operations
- Enables integration with next generation of System z infrastructure
- Swift and secure implementation of STP for improved availability, integrity, and performance
- Reduces hardware maintenance and power costs while eliminating intermediate site requirements for Sysplex Timer

Reference Material - Terminology

APAR	Authorized Program Analysis Report
ARB	Arbiter
BTS	Backup Time Server
CF	Coupling Facility
CTS	Current Time Server
CTN	Coordinated Timing Network
DWDM	Dense Wave Division Multiplexer
ETR	External Time Reference
ETS	External Time Source
FC	Feature Code
HMC	Hardware Management Console
HCA	Host Channel Adapter
ICB	Integrated Cluster Bus
IPL	Initial Program Load
ISC	InterSystem Coupling Channel
LAN	Local Area Network
LIC	Licensed Internal Code
LPAR	Logically Partition
NTP	Network Time Protocol
PR/SM	Processor Resource / Systems Manager
PSIFB Infiniband	Parallel Sysplex
PTF	Temporary Program Fix
PTS	Preferred Time Server
SW and	Software (programs operating systems)
SE	Support Element
TPF	Operating System
UTC	Coordinated Universal Time
zVM	Operating System
zVSE	Operating System
z/OS	Operating System
z/VM	Operating System

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- **What are your questions?**

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Notes:

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BACKUP SLIDES

STP changes in support of GDPS K System

- GDPS 3.6 (together with z/OS 1.11) adds support to let a K system run for up to 80 minutes in local time mode. Requires:
  - **GDPS 3.6**
  - **z/OS 1.11 or APARs OA28323 and OA26085 on z/OS 1.9 and 1.10**
- This support applies to both STP and ETR modes.
- The intent is that the system will be available to complete any Freeze or HyperSwap actions it has initiated and to help you check the status of sysplex resources.

STP changes in support of GDPS K System

- Normally the system would issue synchronous WTOR IEA015A or IEA394A when the time signal is lost.

- New code in XCF checks to see if this is the GDPS K system:
  - If not, the normal synchronous WTOR is issued.
  - If it IS, **one** of the following messages will be issued:
    - ***IEA261I NO ETR PORTS ARE OPERATIONAL. CPC CONTINUES TO RUN IN LOCAL MODE***

    or
    - ***IEA381I THE STP FACILITY IS NOT USABLE. SYSTEM CONTINUES IN LOCAL MODE***
    - And the Master K system keeps running

- When time synchronization is restored, the following message is issued:
  - ***IXC438I COORDINATED TIMING INFORMATION HAS BEEN UPDATED FOR SYSTEM sysname***

STP ETR Messages - Supervisor

- **IEA031I** STP ALERT RECEIVED. STP ALERT CODE = nn
  - Alert code is x'01' to x'84‘
- **IEA380I** THIS SYSTEM IS NOW OPERATING IN STP MODE.
- **IEA381I** THE STP FACILITY IS NOT USABLE. SYSTEM CONTINUES IN LOCAL MODE.
- **IEA382I** THIS SERVER HAS ONLY A SINGLE LINK AVAILABLE FOR TIMING PURPOSES.
- **IEA383I** THIS SERVER RECEIVES TIMING SIGNALS FROM ONLY ONE OTHER NETWORK NODE.
- **IEA384I** SETETR COMMAND IS NOT VALID IN STP TIMING MODE.
- **IEA385I** CLOCKxx ETRDELTA & TIMEDELTA BOTH SPECIFIED. yyyyyyy IGNORED.
- **IEA387I** STP DATA CANNOT BE ACCESSED. SYSTEM CONTINUES IN yyyyy TIMING MODE.
- **IEA388I** THIS SERVER HAS NO CONNECTION TO THE nnnnnnnnn
- **IEA389I** THIS STP NETWORK HAS NO SERVER TO ACT AS nnnnnnnnn
- **IEA392I** STP TIME OFFSET CHANGES HAVE OCCURRED.
- **IEA393I** ETR PORT n IS NOT OPERATIONAL. THIS MAY BE A CTN CONFIGURATION CHANGE.
- **IEA394A** THIS SERVER HAS LOST CONNECTION TO ITS SOURCE OF TIME.
- **IEA395I** THE CURRENT TIME SERVER HAS CHANGED TO THE ccccccccccc
  - (where cccccc is BACKUP or PREFERRED)

STP ETR Messages - XCF

- **IXC434I** SYSTEM sysname HAS TIMING DEFINITIONS THAT ARE NOT CONSISTENT WITH THE OTHER ACTIVE SYSTEMS IN SYSPLEX sysplex-name.
  - EFFECTIVE CLOCK VALUES ARE NOT CONSISTENT
  - SYSTEM: sysname IS RUNNING IN LOCAL MODE
  - SYSTEM: sysname IS USING ETR NET ID: xx
  - SYSTEM: sysname IS USING CTN ID: yyyyyyyy-xx
  - SYSTEM: sysname IS USING CTN ID: yyyyyyyy
  - where:
    - xx = ETR NET ID in use by system sysname
    - yyyyyyyy = CTN ID in use by system sysname
    - yyyyyyyy-xx = CTN ID in use by system sysname

- **IXC435I** ALL SYSTEMS IN SYSPLEX sysplexname ARE NOW SYNCHRONIZED TO THE SAME TIME REFERENCE.
  - SYSTEM: sysname IS USING ETR NETID: ee
  - SYSTEM: sysname IS USING CTNID sssssss-ee
  - SYSTEM: sysname IS USING CTNID sssssss

STP ETR Messages – XCF (continued)

- **IXC437I** - SYSTEMS CAN NOW ENTER THE SYSPLEX USING
  - COORDINATED SERVER TIME CTNID=ssssssss-ee
  - COORDINATED SERVER TIME CTNID=ssssssss

- **IXC438I** COORDINATED TIMING INFORMATION HAS BEEN UPDATED FOR SYSTEM: sysname
  - PREVIOUS ETR NETID: ee
  - PREVIOUS CTNID: ssssssss-ee
  - PREVIOUS CTNID: ssssssss

  - CURRENT ETR NETID: ee
  - CURRENT CTNID: ssssssss
  - CURRENT CTNID: ssssssss-ee
  - CURRENT TIMING: LOCAL

- **IXC439E** ALL SYSTEMS IN SYSPLEX sysplexname ARE NOT SYNCHRONIZED TO THE SAME TIME REFERENCE.
  - SYSTEM: sysname IS USING ETR NETID: ee
  - SYSTEM: sysname IS USING CTNID sssssss-ee
  - SYSTEM: sysname IS USING CTNID sssssss
  - SYSTEM: sysname IS RUNNING IN LOCAL MODE

- **IXC468W** XCF IS UNABLE TO ACCESS THE CTN AND HAS PLACED THIS SYSTEM INTO NON-RESTARTABLE
  - WAIT STATE CODE: 0A2 REASON CODE: 158

STP ETR Messages – XES

- **IXL160E** CF REQUEST TIME ORDERING: REQUIRED AND NOT-ENABLED
  - COUPLING FACILITY SIMDEV.IBM.EN.CF0100000000
    - PARTITION: 00 CPCID: 00
  - REASON: ETR NETID MISMATCH - CF ETR NETID: 0F
  - REASON: ETR NOT CONNECTED TO COUPLING FACILITY
  - REASON: MESSAGE TIME ORDERING FUNCTION FAILURE

  - REASON: TIME ORDERING FUNCTION NOT INSTALLED ON THE CF
  - REASON: TIME ORDERING FUNCTION NOT INSTALLED ON THIS SYSTEM
  - REASON: CF IS OUT OF SYNC WITH TIMING NETWORK
  - REASON: CTNID MISMATCH - CF CTNID: CTNNET01 0F

- **IXL162E** CF REQUEST TIME ORDERING: REQUIRED AND WILL NOT BE ENABLED
  - COUPLING FACILITY SIMDEV.IBM.EN.CF0100000000
    - PARTITION: 00 CPCID: 00
  - REASON: CTNID MISMATCH - CF CTNID: CTNNET01 0F

STP ETR Messages – Automation

The following messages are relevant to automation alerts

- **IEA381I** THE STP FACILITY IS NOT USABLE. SYSTEM CONTINUES IN LOCAL MODE.
- **IEA382I** THIS SERVER HAS ONLY A SINGLE LINK AVAILABLE FOR TIMING PURPOSES.
- **IEA383I** THIS SERVER RECEIVES TIMING SIGNALS FROM ONLY ONE OTHER NETWORK NODE.
- **IEA387I** STP DATA CANNOT BE ACCESSED. SYSTEM CONTINUES IN yyyyy TIMING MODE.
- **IEA388I** THIS SERVER HAS NO CONNECTION TO THE nnnnnnnnnn
- **IEA389I** THIS STP NETWORK HAS NO SERVER TO ACT AS nnnnnnnnnn
- **IEA394A** THIS SERVER HAS LOST CONNECTION TO ITS SOURCE OF TIME.

- **IXC434I** SYSTEM sysname HAS TIMING DEFINITIONS THAT ARE NOT CONSISTENT WITH THE OTHER ACTIVE SYSTEMS IN SYSPLEX sysplex-name.
  - EFFECTIVE CLOCK VALUES ARE NOT CONSISTENT
  - SYSTEM: sysname IS RUNNING IN LOCAL MODE
  - SYSTEM: sysname IS USING ETR NET ID: xx
  - SYSTEM: sysname IS USING CTN ID: yyyyyyyy-xx
  - SYSTEM: sysname IS USING CTN ID: yyyyyyyy
  - where:
    - xx = ETR NET ID in use by system sysname
    - yyyyyyyy = CTN ID in use by system sysname
    - yyyyyyyy-xx = CTN ID in use by system sysname

STP ETR Messages – Automation (continued)

- **IXC439E** ALL SYSTEMS IN SYSPLEX sysplexname ARE NOT SYNCHRONIZED TO THE SAME TIME REFERENCE.
  - SYSTEM: sysname IS USING ETR NETID: ee
  - SYSTEM: sysname IS USING CTNID sssssss-ee
  - SYSTEM: sysname IS USING CTNID sssssss
  - SYSTEM: sysname IS RUNNING IN LOCAL MODE

- **IXC468W** XCF IS UNABLE TO ACCESS THE CTN AND HAS PLACED THIS SYSTEM INTO NON-RESTARTABLE
  - WAIT STATE CODE: 0A2 REASON CODE: 158

- **IXL160E** CF REQUEST TIME ORDERING: REQUIRED AND NOT-ENABLED
  - COUPLING FACILITY SIMDEV.IBM.EN.CF0100000000
    - PARTITION: 00 CPCID: 00
  - REASON: ETR NETID MISMATCH - CF ETR NETID: 0F
  - REASON: ETR NOT CONNECTED TO COUPLING FACILITY
  - REASON: MESSAGE TIME ORDERING FUNCTION FAILURE
  - REASON: TIME ORDERING FUNCTION NOT INSTALLED ON THE CF
  - REASON: TIME ORDERING FUNCTION NOT INSTALLED ON THIS SYSTEM
  - REASON: CF IS OUT OF SYNC WITH TIMING NETWORK
  - REASON: CTNID MISMATCH - CF CTNID: CTNNET01 0F

- **IXL162E** CF REQUEST TIME ORDERING: REQUIRED AND WILL NOT BE ENABLED
  - COUPLING FACILITY SIMDEV.IBM.EN.CF0100000000
    - PARTITION: 00 CPCID: 00
  - REASON: CTNID MISMATCH - CF CTNID: CTNNET01 0F