z/OS Introduction and Workshop

Sysplex

Parallel Sysplex

Geographically Dispersed
 Parallel Syspex

Unit objectives

After completing this unit, you should be able to:

- Describe difference between Sysplex, Parallel Sysplex, and GDPS

- Describe Coupling Facility

- Describe Server Time Protocol

- List types of GDPS configurations

IBM Z Clustering Terminology

A **sysplex** is a collection of z/OS systems that cooperate, using certain hardware and software products, to process work. It is a clustering technology that can provide near-continuous availability.

A **Parallel Sysplex** is a sysplex that uses multisystem data-sharing technology. It allows **direct, concurrent read/write access to shared data from all processing nodes** (or servers) in the configuration without impacting performance or data integrity. As many as **32** servers can concurrently cache shared data in local processor memory through hardware-assisted cluster-wide serialization and coherency controls. As a result, **work requests** that are associated with a **single workload**, such as business transactions or database queries, can be **dynamically distributed** for parallel execution on nodes in the sysplex cluster based on available processor capacity.

In many ways a **Parallel Sysplex** system appears as a single large system.

Parallel Sysplex Benefits

The primary goal of a Parallel Sysplex is to provide data sharing capabilities, allowing multiple databases for direct reads and writes to shared data. Benefits include:

Help remove single points of failure within the server, LPAR, or subsystems

Application Availability

Single System Image

Dynamic Session Balancing

Dynamic Transaction Routing

Scalable capacity

Parallel Sysplex Key Features

Automatic Restart Manager recovers and restarts critical subsystems, either on the same system or on a different system.

Coupling Facility provides high-speed caching, list processing and locking.

GDPS offers disaster recovery and high availability by using a cluster across two or more sites with data mirroring.

Generic Resource Management helps prevent a single point of failure and balances middleware workloads.

Resource sharing enables physical resources such as files, tape drives, consoles and catalogs to be shared.

Server Time Protocol enables servers and coupling facilities to maintain common time synchronization.

Sysplex Failure Manager specifies a policy for failure detection intervals and recovery actions to be automatically initiated.

z/OS Workload Manager manages workloads via dynamic resource distribution to move workloads to systems with capacity.
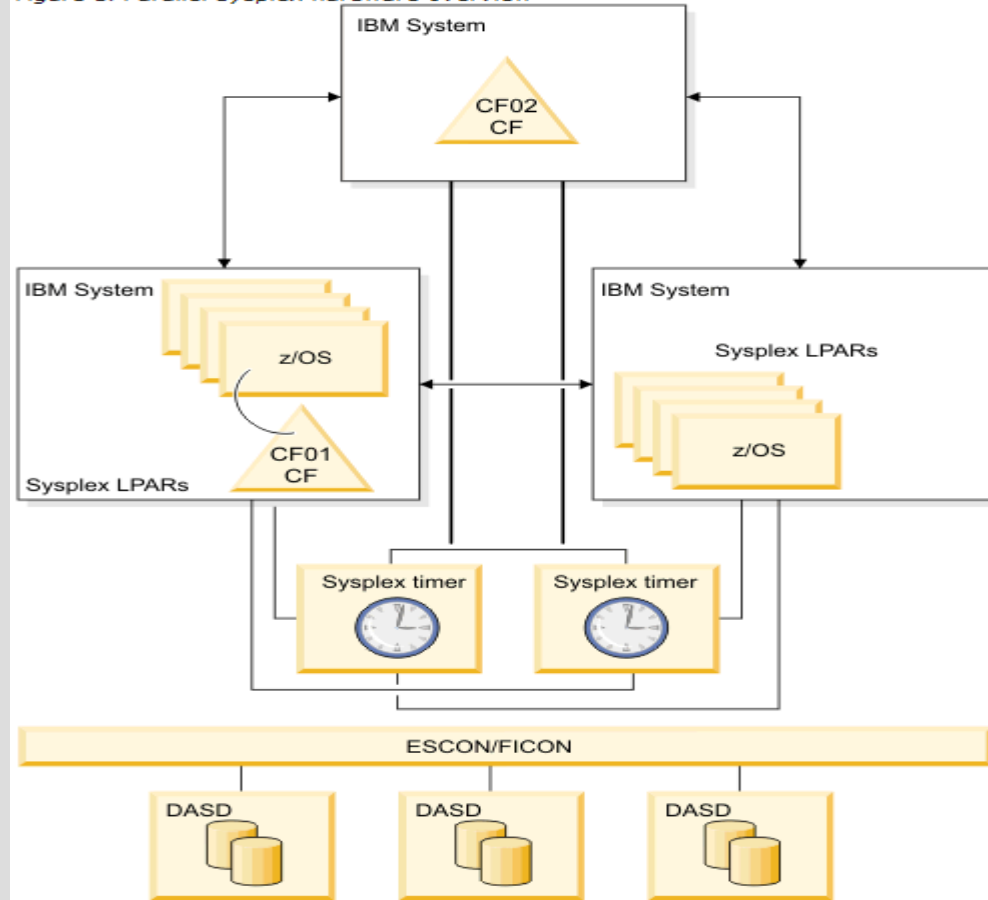
CF (Coupling Facility)

LPAR microcode serving as shared memory for all participating z/OS environments

Server Time Protocol

Synchronize clocks of all member systems

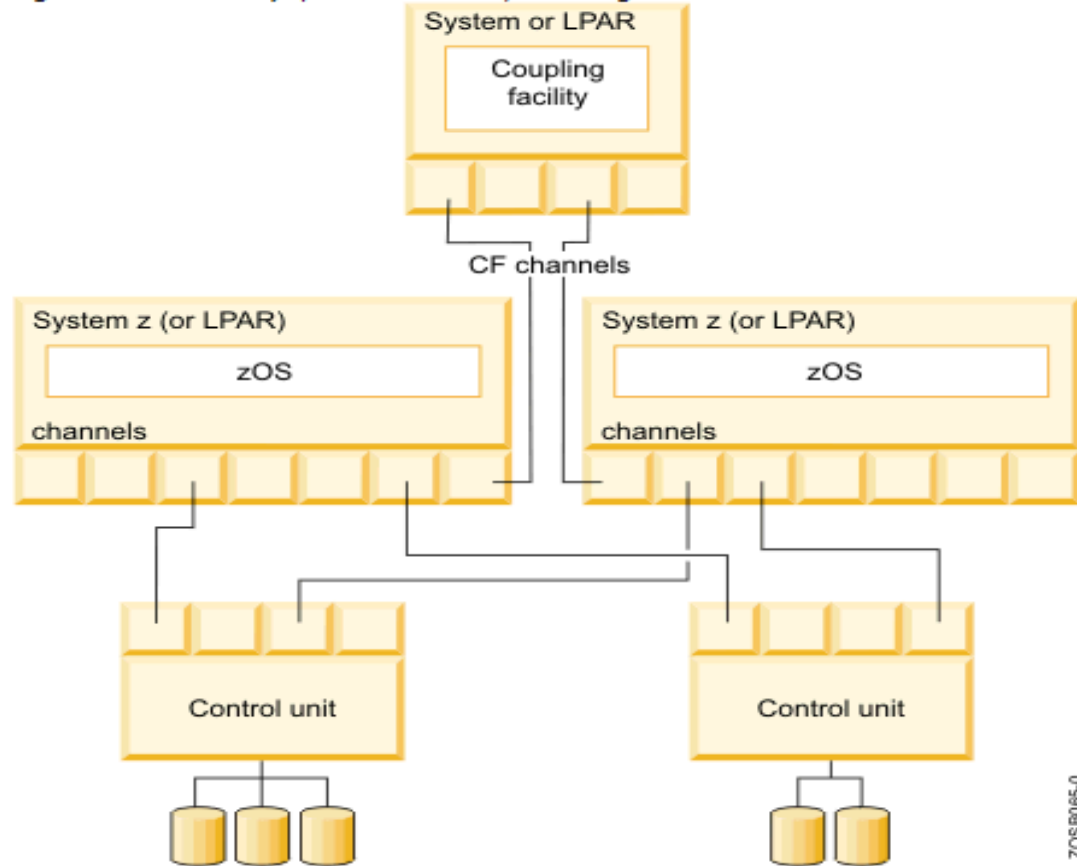Figure 1. Parallel Sysplex hardware overview

LPAR

Logical Partition enable sharing of processors and channels (not memory)

Coupling Facility

Has memory accessible to all participating members using CF channels for communication between participating members

Figure 2. Parallel Sysplex with two z/OS images

GDPS – Highest Availability

Geographically Dispersed Parallel Sysplex (**GDPS**) is an extension of Parallel Sysplex of mainframes located, potentially, in different cities.

GDPS includes **configurations** for single site or multiple site configurations:

HyperSwap Manager (peer-to-peer copy, same data center)

PPRC (peer-to-peer copy, up to 120 miles data center separation)

XRC (extended remote copy, no distance restrictions, recovery process must be initiated)
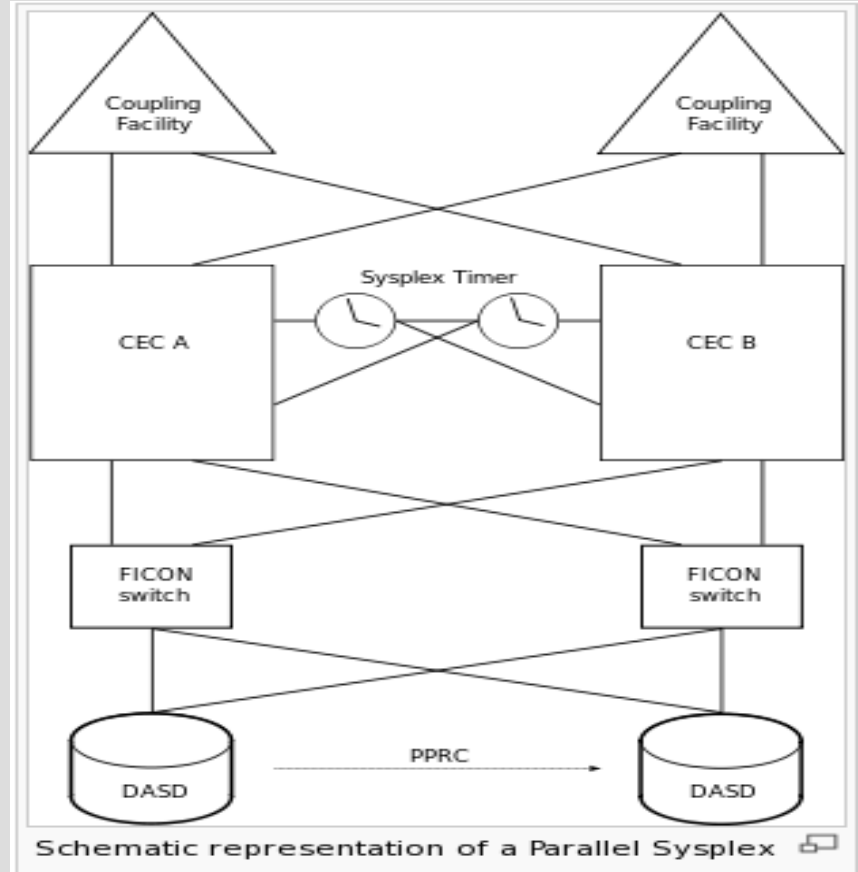
GM (global mirroring, designed to recover from total failure)

MGM (more than two sites)

Active-Active (continuous availability, multiple sites, load balancing)

GDPS

Processing memory and disk storage updates are maintained protecting against failures

Schematic representation of a Parallel Sysplex

Parallel Sysplex Documentation & Information

+ z/OS MVS

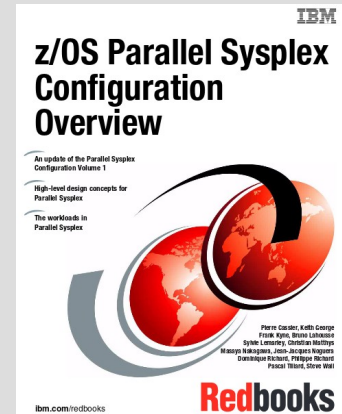|				
z/OS MVS Programming: Sysplex Services Guide	SA23-1400-40	10 Jul 2019	PDF	ieai600_v2r4.pdf (4.7MB)
z/OS MVS Programming: Sysplex Services Reference	SA38-0658-40	10 Jul 2019	PDF	ieai700_v2r4.pdf (6.18MB)

IBM

z/OS Parallel Sysplex Configuration Overview

An update of the Parallel Sysplex Configuration Volume 1

High-level design concepts for Parallel Sysplex

The workloads in Parallel Sysplex

Pierre Cassier, Keith George
Frank Kyne, Bruno Lahousse
Sylvie Lemercy, Christian Matthys
Masaya Nakagawa, Jean-Jacques Noguera
Dominique Richard, Philippe Richard
Pascal Tillard, Steve Wall

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Unit summary

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