System Managed Coupling Facility (CF) Structure Duplexing Extends Parallel Sysplex Architecture

Overview
IBM plans to make System Managed CF Structure Duplexing available before the end of 2002. It will be enabled by APAR OW41617 on z/OS™ V1.2, V1.3, and V1.4, and will require:

- Driver 26 at the latest microcode maintenance level, and Coupling Facility Control Code Level 11 for IBM @server 9672 G5 and G6 servers, and the IBM @server 9672 R06 Coupling Facility
- Driver 3G at the latest microcode maintenance level, with Coupling Facility Control Code Level 12 for IBM @server zSeries 900 servers, the z900 Model 100 Coupling Facility, IBM @server zSeries 800 server, or the z800 Model 0CF Coupling Facility

Key Prerequisites
- z/OS V1.2, V1.3, or V1.4 with enablement APAR OW41617, and any APARs included in the CFDuplexing PSP bucket.
- Any of the following:
  - IBM @server 9672 G5 or G6 server with CFCC Level 11
  - IBM @server 9672 R06 Coupling Facility with CFCC Level 11
  - IBM @server zSeries 800 or 900 server with CFCC Level 12
  - IBM @server z900 Model 100 Coupling Facility with CFCC Level 12
  - IBM @server z800 Model 0CF Coupling Facility with CFCC Level 12
- Bi-directional CF-to-CF connectivity via coupling links.
- Additional prerequisites will be listed in the technical paper GM13-0103-3, titled “System Managed CF Structure Duplexing.”

At a Glance
The World Wide Early Support Program for System Managed CF Structure Duplexing began during the first week of June 2002. IBM plans to make System Managed CF Structure Duplexing available before the end of 2002. Those customers who have a business need to use System Managed CF Structure Duplexing earlier should contact their IBM representative for information on the CF duplexing early support program.

For ordering, contact:
Your IBM representative, an IBM Business Partner, or IBM Americas Call Centers at 800-IBM-CALL
Reference: YE001

This announcement is provided for your information only. For additional information, contact your IBM representative, call 800-IBM-4YOU, or visit the IBM home page at: http://www.ibm.com.
A set of architectural extensions to the Parallel Sysplex® is introduced for the support of System-Managed CF structure duplexing of coupling facility structures for high availability. All three structure types (cache structures, list structures, and locking structures) can be duplexed using this architecture. This new set of features is quite extensive and, in total, represents a significant extension to the Parallel Sysplex Architecture.

Support for these extensions will be included in Coupling Facility Control Code (CFCC) Levels 11 and 12, and in z/OS V1.2, V1.3, and V1.4 with enabling APAR OW41617, and any additional APARS as listed in the CFDuplexing PSP bucket. Considerations for key exploiters of this new function will be included in V3 of the technical paper, “System Managed CF Structure Duplexing” (GM13-0103-3). Installing this software and microcode and enabling this new function is designed to:

- Provide the necessary base for highly-available coupling facility structure data through the redundancy of duplexing
- Enhance Parallel Sysplex ease of use by reducing the complexity of CF structure recovery
- Enable some installations to eliminate the requirement for stand alone CFs in their Parallel Sysplex configuration

For those CF structures that support use of System Managed CF Structure Duplexing, customers can dynamically enable (selectively by structure) or disable the use of CF duplexing.

V3 of the IBM technical paper, “System Managed CF Structure Duplexing” (GM13-0103-3), will include information on determining:

- The cost/benefit trade-offs in duplexing
- Which structures should be duplexed in a specific Parallel Sysplex

This paper will be available at either:

http://www.ibm.com/server/eserver/zSeries/psp


The most visible change for CF duplexing is the requirement to connect coupling facilities to each other with coupling links. The required connectivity is bi-directional with a sender and receiver channel attached to each CF for each remote CF connection. For peer-mode links (ISC-3, ICB-3, IC-3), a single channel provides both the sender and receiver capabilities; therefore, only one physical link is required between each pair of CFs. For compatibility mode links, two links are required to establish a connection, with a sender and receiver channel located in each CF. If redundancy is included for availability, then two peer-mode links or four compatibility mode links are required. However, this new connectivity requirement does not necessarily imply any requirement for additional physical links. Peer-mode channels can be shared between one ICF partition and many local z/OS partitions, so existing links between zSeries servers can provide the connectivity between both:

- z/OS partitions and coupling facility images
- Coupling facility images

Support for configuring sender channels (CFS, CBS, and IC5) to a CF is contained in zSeries, G5, G6, and R06, and support for sharing the sender channels between an ICF partition and multiple z/OS partitions is contained in zSeries, G5, and G6.

One of the benefits of System-Managed CF Structure Duplexing is to help hide coupling facility failures and structure failures and to make total loss of CF connectivity transparent to the exploiters of the coupling facility. This is handled by:

- Shielding the active connectors to the structure from the observed failure condition so that they do not perform unnecessary recovery actions.
- Switching to the structure instance that did not experience the failure.
- Re-establishing a new duplex copy of the structure under customer specified conditions. This can occur as quickly as when the CF becomes available again on a third CF in the Parallel Sysplex, or when it’s convenient for the customer.

System messages are generated as the structure reverts to simplex mode for monitoring and automation. Until a new duplexed structure is established, the structure will operate in simplex mode and may be recovered through whatever mechanism is provided for structure recovery before the advent of System Managed CF structure duplexing.

As the two instances of a System Managed Duplexed structure get update requests, they must coordinate execution of the two commands to ensure that the updates are made consistently to both structures. Most read operations do not need to be duplexed.

New operator commands are being extended in z/OS to display the status of the new links for problem determination. In addition, the Resource Measurement Facility (RMF™) as of z/OS 1.2 is designed to provide the performance management aspects about the new CF-CF connectivity and the duplexed structures. Together, these enable the installation to manage and monitor the CF configuration and the new structure instances resulting from System-Managed CF Structure Duplexing.

**Order Now**

Use Priority/Reference Code: YE001

Phone: 800-IBM-CALL
Fax: 800-2IBM-FAX
Internet: ibm_direct@vnet.ibm.com
Mail: IBM Atlanta Sales Center
Dept. YE001
P.O. Box 2690
Atlanta, GA 30301-2690

You can also contact your local IBM Business Partner or IBM representative. To identify them, call 800-IBM-4YOU.

**Note:** Shipments will begin after the planned availability date.

**Trademarks**

zSeries is a trademark of International Business Machines Corporation.
z/OS, RMF, and the e-business logo are trademarks of International Business Machines Corporation in the United States or other countries or both.
Parallel Sysplex is a registered trademark of International Business Machines Corporation in the United States or other countries or both.
Other company, product, and service names may be trademarks or service marks of others.