Couple Data Sets
Best Practices and Avoiding Disasters

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Under the category of “White Papers.”

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Overview

Couple Data Sets (CDSes) are the cornerstone of sysplex. Careful planning is required to ensure CDSes are always available, never corrupted and never misused such that they trigger a high-impact failure scenario.

This paper documents the best practices for CDSes. The paper also documents known field reported issues associated with CDSes. System programmers can use the paper to update enterprise processes to best practice and avoid disasters through increased understanding of CDS handling.

Best Practice Reminders

Primary, Alternate and Spare CDSes

At a minimum, each CDS type should have a primary CDS in use and an alternate CDS in use. D XCF,COUPLE,TYPE=type will provide information on the current CDSes in use for a given type of CDS. An example of in use SYSPLEX CDSes is shown here:

```
D XCF,COUPLE,TYPE=SYSPLEX
IXC358I 11.00.27 DISPLAY XCF
SYSPLEX COUPLE DATA SETS
PRIMARY DSN: UTCXCF.COUPLE00
    VOLSER: CPLS1A    DEVN: 2176
    FORMAT TOD MAXSYSTEM MAXGROUP(PEAK) MAXMEMBER(PEAK)
    02/24/2012 10:59:55 16 200 (137) 603 (503)
    ADDITIONAL INFORMATION:
    ALL TYPES OF COUPLE DATA SETS ARE SUPPORTED
    GRS STAR MODE IS SUPPORTED
    SYSTEM STATUS DETECTION PROTOCOL IS SUPPORTED

ALTERNATE DSN: UTCXCF.COUPLE01
    VOLSER: CPLS2A    DEVN: 3176
    FORMAT TOD MAXSYSTEM MAXGROUP MAXMEMBER
    02/24/2012 10:59:57 16 200 603
    ADDITIONAL INFORMATION:
    ALL TYPES OF COUPLE DATA SETS ARE SUPPORTED
    GRS STAR MODE IS SUPPORTED
    SYSTEM STATUS DETECTION PROTOCOL IS SUPPORTED
```

A write to the CDS is considered complete when both the primary and alternate have been successfully updated. If the primary becomes unavailable, XCF will automatically make the alternate the primary. Similarly, if the alternate becomes unavailable XCF will
remove the alternate from service. A system programmer may then elect to ACOUPLE a spare CDS into activity to reestablish redundancy and avoid a single point of failure. Thus, best practice includes not only the primary and the alternate but also having a spare. A spare CDS should be formatted and available to be ACOUPLEd into active use should there be an issue with the primary or alternate CDS.

**The alternate must be at least as large as the primary.**

The alternate CDS must be at least as large as the primary. All of the data in the primary must be able to be written into the alternate. The alternate CDS can be larger than the primary. For example, the LOGR CDS contains a number of logstream records, LSRs. If the primary LOGR CDS has 500 LSRs, the alternate must be able to hold at least 500 LSRs. It is perfectly acceptable for the alternate to have more than 500 LSRs. However, if that alternate is eventually promoted to primary, any CDS brought into service to replace it as the new alternate must have at least as many LSRs as the new primary. The same requirement applies for any record in any CDS type. The alternate must contain at least as many records as the primary, and record size in the alternate must be at least as large as the record size in the primary.

**Avoid drastically oversizing CDSes.**

Planning for reasonable expansion does not mean maxing out all of the size definitions for CDSes. The larger the CDS, the more recovery needs to be performed. If the records are all empty, reading them all in induces unnecessary overhead. If a drastically oversized SYSPLEX CDS become the primary SYSPLEX CDS, the only way to reduce the size is via a sysplex IPL pointing at newly formatted smaller SYSPLEX CDSes. The same is true for the CFRM CDS, the only way to reduce the size is via sysplex IPL. Rather than drastically oversize, allocate SYSPLEX CDSes and CFRM CDSes that allow for growth and if necessary define and activate larger SYSPLEX CDSes or CFRM CDSes as needed in the future.

Similarly, SFM, ARM, LOGR, WLM and BPXMCDS should not be drastically oversized for the same reason. A sysplex IPL is not required to bring in smaller CDSes for this set. However, a PSWITCH must be done so that only the primary CDS is in-use. Then the device on which the primary CDS resides must be forced offline. The application exploiting the CDS and functions provided by application may encounter significant failures during this activity.

**Failure Isolation Primary CDS and Alternate CDS**

The primary and alternate CDSes should reside on failure isolated volumes. The CDSes should be on different volumes and the volumes should be accessed through distinct control units. XCF healthcheck XCF_CDS_SPOF will check for isolation.
Multiple CDSes can be placed on the same volume

For the sake of space and planning, multiple CDSes can be placed on the same volume.

It is recommended that the primary SYSPLEX CDS and primary CFRM CDS reside on different volumes. XCF healthcheck XCF_CDS_SEPARATION will check to see that the primary SYSPLEX and primary CFRM CDSes are on different volumes. All other primary CDSes can reside on one volume, and all other alternate CDSes can reside on another volume.

Avoid placing “other” data sets on volumes with CDS

Delays in accessing CDSes may trigger delays to applications exploiting sysplex services or the functions provided by the functional CDSes. To minimize the likelihood of IO delays, avoid placing “other” data sets on the volumes with CDSes.

Avoid placing CDSes on volumes subject to RESERVEs

A reserve could lock out a number of systems from being able to update a CDS for a long period of time. Therefore, it is not recommended that CDSes be placed on volumes which are prone to having RESERVEs placed on them.

A given primary / alternate CDS pair can only be used by a set of systems in the same sysplex.

CDSes cannot be shared by systems active in two distinct sysplexes. Data corruption and adverse impacts are likely to occur as a result of such sharing.

Update COUPLExx to current CDSes

If a sysplex IPL is done and upon IPL access to the last known CDSes is desired, please update COUPLExx to point to the last known CDSes. If COUPLExx points to an older sysplex CDS and that sysplex CDS points to other old functional CDSes and those functional CDSes are still accessible, then the information in the CDSes will be backlevel from the last known CDSes. The impact of using backlevel CDSes will vary depending on the type of CDS, as well as, how far backlevel the CDS is. If the CFRM CDS is backlevel, there may be missing or old structure definitions. If the LOGR CDS is backlevel, logger may try to access old offload data sets which have since been deleted or logger may believe the incorrect offload data set is the current offload data set.

If COUPLExx points to the last known SYSPLEX CDS, but does not point to the last known functional CDSes, XCF will prompt the operator to ask which functional CDS to use. The operator will respond to use the functional CDS last known to the SYSPLEX CDS or the functional CDS specified in COUPLExx. To avoid an operator having to make this decision, please keep COUPLExx updated to point to the last known CDSes.
A comment: CDS Format Time and Levels

CDS formats change infrequently. Therefore, the format time for a CDS may appear “old.” The old format time is acceptable as long as all of the functions desired are active in the version of the CDS being used. For example, a new SYSPLEX CDS needs to be formatted and brought into use to exploit system status detection (SSD) protocol. The SSD protocol requires a SYSPLEX CDS formatted with SSTATDET. The new format increases the size of the system records in the CDS to allow XCF to track system information associated with SSD functionality. A CDS formatted with SSD when it was first released would have time stamps in 2010. Again, the important aspect of the format of the CDS is that all of the desired attributes or functions are defined.

System logger uses the z/OS FMID as its format level. Since the LOGR CDS format changes infrequently, the FMID may give the appearance that the LOGR CDS is “out of date.” “Out of date” or “back-level” is only relevant with respect to having the desirable system logger functions available.

If an installation would like to dynamically update the LS_SIZE of a logstream, the LOGR CDS format level must be HBB7705 or higher. If an attempt is made at updating the LS_SIZE while the logstream is in-use and the format level is older than HBB7705, RC8 RSN810 will be returned when IXCMIAPU executes.

Additional Best Practice Documentation
Please see MVS Setting Up a Sysplex 3.1 Considerations for all Couple Data Sets.

Avoiding Disasters

A sysplex impacting disaster may occur if CDSes encounter IO delays or permanent errors, CDSes are mishandled during data migration activities or a copy is of a CDS is misused. Avoiding IO delays or IO failures to CDSes is desirable. Extreme care must be taken to avoid corrupting CDSes during data migration activities. Similarly, extreme caution must be exercised if a copied or mirrored CDS is to be used.
**IO Delays**

IO delays for couple data sets may surface for a variety of reasons. If there are very active data sets placed on the same volumes and CDSes, IO delays may result. If there is a microcode issue, IO delays may result. If all the CDSes end up in a group to be synchronously mirrored and there is a delay in the mirroring, IO delays will result.

The following messages may occur if IO delays persist long enough to force XCF to take action and remove a CDS.

XCF will issue messages warning about the I/O delays, IXC246E.

```
*IXC246E CFRM COUPLE DATA SET
SYSLEX.CFRM.NIC ON VOLSER RS0X01,
DEVN 3402, HAS BEEN EXPERIENCING I/O DELAYS FOR 60 SECONDS.
```

Depending on when the IO delay surfaces, incomplete records may be written to a CDS.

```
SYSB  2013098 07:28:02.83
*IXC219E CFRM COUPLE DATA SET
SYSLEX.CFRM.NIC
ON VOLSER SOHL03 DEVN 3284
IXCLOACP RECORD NUMBER 1
WAS INCOMPLETELY WRITTEN BY SYSTEM FGNA.
READ IS WAITING FOR REPAIR.
```

Enough time passes that we decide to stop waiting for the repair and initiate the switch to the alternate CFRM.

```
SYSC  2013098 07:33:03.60
IXC253I PRIMARY COUPLE DATA SET
SYSLEX.CFRM.NIC FOR CFRM
IS BEING REMOVED BECAUSE OF AN I/O ERROR
DETECTED BY SYSTEM SYSA
```

All of the systems in the sysplex must acknowledge the switch. If there is a delay in responding, message IXC256A will be issued periodically until all systems respond.

```
SYSA  2013098 07:45:53.21
*IXC256A REMOVAL OF PRIMARY COUPLE DATA SET
SYSLEX.CFRM.NIC FOR CFRM
CANNOT FINISH THE COMPLETE PHASE UNTIL
THE FOLLOWING SYSTEM(S) ACKNOWLEDGE THE REMOVAL:
SM07  NICB  FGNB  SMTB  FGN  SYSC  SYSB  SMUB
SM08  SYSD  SMTA  SMUA  NICA
```
IXC263I is issued when the CDS has been removed from active use.

SYSA 2013098 07:48:53.60
IXC263I REMOVAL OF THE PRIMARY COUPLE DATA SET
SYSLEX.CFRM.NIC FOR CFRM IS COMPLETE

Adhering to the best practices and periodically monitoring the IO to the devices on which CDSes reside will minimize the likelihood of CDSes being impacted by IO delays. Installations may also elect to automate on the above messages related to IO delays or removal of CDSes.

Data Migration Activities

**Be extremely careful when using products which migrate (move) the physical location of critical system datasets, including CDSes.**

XCF establishes its CDS usage when the first system in the sysplex is IPLed based on the contents of COUPLExx and the SYSLEX CDS. XCF CDS usage may be modified by PCOUPLE, ACOUPLE or PSWITCH. PCOUPLE can be used to activate a primary CDS if there is currently no primary CDS of the particular type (CFRM, LOGR, ARM, etc). ACOUPLE can be used at any time to activate a new alternate CDS. The location of the CDS is established upon IPL, PCOUPLE or ACOUPLE and subsequently maintained within XCF internally.

Some products migrate critical system or sysplex data sets. Transparent Data Migration Facility (TDMF) is one such product. There are other products available which perform similar functions. Careful planning and extreme caution must be used when electing to use such products against CDSes. Similar careful planning and caution is required for other critical data sets such as, but not limited to, SYSRES, PARMLIBs, JES2 checkpoint data set, system logger offload data sets or files shared by major subsystems such as IMS, DB2, VSAM, etc.

If the physical location of the CDS changes out from under XCF and no PSWITCH or ACOUPLE was initiated to notify XCF of the change in data sets, then XCF would NOT have any knowledge of the change. If all of the systems in the sysplex are aware of the change in physical location such that they all cease to update the “old” physical CDSes and start using the “new” physical CDSes at the same instant the sysplex will continue on without incident. If some systems in the sysplex start using the “new” physical CDSes while other systems continue to write to the “old” physical CDSes then data corruption or CDS inconsistencies may result.

The impact of “splitting” XCF’s knowledge of the CDSes varies depending on what updates are done during the timeframe of the split. Known potential impacts include: WLM wait state WAIT08C-5 if WLM detects a data inconsistency, WAIT0A2-194 if GRS is unable to update its critical member status, structure connection hangs, inability
to re-ipl systems into the sysplex, invalid XCF group member tokens, unknown structure
connectors, failures to start applications, incomplete clean up efforts, etc.

The CDS split is detected when the adverse impacts start to surface. To determine if
CDSes have been “split,” issue RO *ALL,D XCF,COUPL and compare the output to
ensure all systems are accessing the same CDSes. If DUMPs with SDATA COUPLE
were acquired, IP COUPLE SYSPLEX DETAIL will provide similar CDS information.
A sample of IP COUPLE SYSPLEX DETAIL output depicting CDS “split” is shown
here. SYS1 is accessing SYSPLEX CDS SYS1.NHANPLEX.XCFA on device A00C
while SYS2 is accessing SYSPLEX CDS SYS1.NHANPLEX.XCFA on device B004!

<table>
<thead>
<tr>
<th>SYS1:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type: SYSPLEX (IXCLKMD)</td>
</tr>
<tr>
<td>Primary Data Set: SYS1.NHANPLEX.XCFA</td>
</tr>
<tr>
<td>Volume Serial: NH$44</td>
</tr>
<tr>
<td>DDName: SYS00001</td>
</tr>
<tr>
<td><strong>Device Number: A00C</strong></td>
</tr>
<tr>
<td>MAXSYSTEM: 32</td>
</tr>
<tr>
<td>Alternate Data Set: SYSI.NHANPLEX.XCFB</td>
</tr>
<tr>
<td>Volume Serial: NH$45</td>
</tr>
<tr>
<td>DDName: SYS00008</td>
</tr>
<tr>
<td>Device Number: A201</td>
</tr>
<tr>
<td>MAXSYSTEM: 32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SYS2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type: SYSPLEX (IXCLKMD)</td>
</tr>
<tr>
<td>Primary Data Set: SYSI.NHANPLEX.XCFA</td>
</tr>
<tr>
<td>Volume Serial: NH$44</td>
</tr>
<tr>
<td>DDName: SYS00007</td>
</tr>
<tr>
<td><strong>Device Number: B004</strong></td>
</tr>
<tr>
<td>MAXSYSTEM: 32</td>
</tr>
<tr>
<td>Alternate Data Set: SYSI.NHANPLEX.XCFB</td>
</tr>
<tr>
<td>Volume Serial: NH$45</td>
</tr>
<tr>
<td>DDName: SYS00014</td>
</tr>
<tr>
<td>Device Number: A201</td>
</tr>
<tr>
<td>MAXSYSTEM: 32</td>
</tr>
</tbody>
</table>

**Procedural Circumvention:** Consider circumventing this issue. To circumvent the need
for or avoid data set migration for CDSes, it is possible to leverage ACOUPLE and
PSWITCH commands to move the location of the CDSes and ensure XCF knows about the change in location. The moves could be coordinated with the products running performing migration such that CDSes never reside on the volumes as migration occurs.

**Caution:** Every precaution must be taken when using TDMF or other products which migrates data sets. If there are “agents” or subsystems associated with the product, the “agent” or subsystem must be active on all systems in the sysplex to avoid opening a window to CDS corruption.

**Recovery:** A sysplex IPL with newly formatted CDSes is the ONLY way to ensure all of the corruption in the CDSes is cleaned up.

- It is not reasonable to guarantee any recovery action other than a sysplex IPL. While the sysplex may still be active, it may be the case that an issue will not arise until an application tries to access or use corrupted CDS data. Further, applications may have stored away information from the CDSes to be used later. An issue may not arise until the application tries to use the bad data.
- The possibility of potential recovery without a sysplex wide IPL truly depends on the extent of the corruption, what data was corrupted, the amount of time an enterprise is willing to spend doing recovery as well as the amount of risk an enterprise is willing to take.
- If only the alternate CDSes were adversely impacted by the CDS “split” a new alternate can be ACOUPLEd into use. During the ACouple processing the alternate will be synchronized with the primary.

**Note:** Throughout the remainder of this paper the phrases “production sysplex” and “DR sysplex” are used to denote any two distinct sysplexes. All of the scenarios and procedural enhancements apply whether the actual sysplexes involved are production, development, test, sandbox, DR, etc.

**Copying or Mirroring CDSes**

**Copying CDSes** - refers to making a point-in-time copy of a data set to disk or tape backup.

**Mirroring CDSes** – refers to a hardware solution that duplicates data from one disk to another disk, synchronously or asynchronously.

**Evolution of Copying or Mirroring CDSes**

Over time high availability solutions have evolved.

- Local system
- Monoplex
- Base sysplex
Parallel Sysplex
Truck and driver disaster recovery (DR) solutions
Geographically Dispersed Parallel Sysplex (GDPS)

As part of the evolution, the guidelines governing CDSes have matured. In the past, the hard rule was never copy or mirror CDSes. Some implementations now have a design point to copy or mirror CDSes. Today, the strong preference is, whenever possible having freshly-formatted CDSes, not copies, is recommended.

Only the LOGR CDS should ever be mirrored synchronously.

To allow applications to restart and access data in the logstreams without encountering a loss of data, the LOGR CDS information for the DR site sysplex must be current. To ensure the LOGR CDS is fully up to date it may be synchronously mirrored. The other types of CDSes contain policy information which change much less frequently or information that exploiting address spaces clean up themselves if deemed stale when they start. Thus, synchronously mirroring the other CDSes is not necessary.

Using copied CDSes, what could go wrong??

Today, installations copy or mirror CDSes to minimize recovery time at the DR site. The general theory is, make the DR site sysplex look as much like the production site sysplex as possible. Thus, make sure all of the latest definitions (including CDSes) are available at the DR site sysplex to enable applications to restart as swiftly as possible. If the copied or mirrored path is taken, great precautions must also be taken to avoid triggering a disaster!

If CDSes are to be mirrored or copied system programmers need to be aware of the following high impact pitfalls. Further, it is recommended that system programmers establish procedures to safe guard against encountering each of the known issues to avoid disasters.

1. Carefully consider the consequences of responding to IXC405D to avoid having the sysplex CDSes stolen from the production sysplex.

   **IXC405D** REPLY I TO INITIALIZE THE SYSPLEX, J TO JOIN SYSPLEX PLEX1, OR R REINITIALIZE XCF

   Issue: XCF will continue on with the IPL if the response is I. If a DR site system is being IPLed pointing at the sysplex CDSes actively being used by the production site sysplex and the response I is given when the first DR system IPLs, the sysplex CDSes will cease to be used by the production site systems and all systems in the production sysplex will waitstate 0A2-10.
Procedural Enhancements:

If the sysplex CDSes are being copied ensure the DR sysplex systems do not have physical access to the production site DASD when the DR systems are IPLed.

The most common reason system programmers respond I to the IXC405D is to bring the systems at the DR site up as swiftly as possible. The reason the IXC405D WTOR is being issued is because XCF believes there is a problem and is asking the operator if the system should continue to IPL. Respond I to the IXC405D if and only if the DR sysplex CDSes are distinct from the production site CDSes.

2. Carefully consider the consequences of responding to the IXC247D to avoid having a functional CDS stolen from the production sysplex.

```
IXC248E COUPLE DATA SET
SYS1.PFUNCT.CTTEST ON VOLSER FDSPKP
FOR CFRM MAY BE IN USE BY ANOTHER SYSPLEX.
IXC247D  REPLY U TO ACCEPT USE OR D TO DENY USE OF THE COUPLE DATA SET
FOR CFRM.
R 0,U
IEE600I REPLY TO 00 IS;U
IXC248E COUPLE DATA SET
SYS1.AFUNCT.CTTEST ON VOLSER FDSPKA
FOR CFRM MAY BE IN USE BY ANOTHER SYSPLEX.
IXC247D  REPLY U TO ACCEPT USE OR D TO DENY USE OF THE COUPLE DATA SET
FOR CFRM.
```

Issue: System programmers may become accustomed to responding “U” to IXC247D because the message can be issued in “normal” situations. The system issues this message because it cannot determine whether the situation is expected and normal, or whether it is truly a case of use by another sysplex. If, for example, the CFRM CDSes are being used by the production sysplex and U is replied to IXC247D on a DR system, the CFRM CDS is instantaneously stolen from the production sysplex. Major subsystem outages to system outages may occur.

Procedural Enhancements: System programmers should know which CDSes the IPLing image is to use. Do not move quickly or recklessly through any XCF WTOR during IPL.

3. Avoid using copied or mirrored SYSPLEX and CFRM CDSes in a DR sysplex which has physical connectivity to the production CFs.

Issue: If the SYSPLEX and CFRM CDSes are copies of the production sysplex CDSes (which requires that the two sysplexes have the same name), the authority checking used to validate ownership of CFs is effectively defeated. If DR sysplex systems have physical connectivity to the production sysplex CFs, the production CFs will be stolen.
from the production sysplex without any warning! Depending on what structures were in use in the production CFs, major outages of subsystem or system scope will occur.

**Procedural Enhancements:** Ensure that the DR sysplex systems do not have physical connectivity to the production CFs.

4. **Avoid sharing any CDSes with systems outside of the sysplex.**

**Issue:** If some DR sysplex systems have access to the production sysplex DASD with the CDSes on them, a DR sysplex system could unintentionally IPL into the sysplex with the production site systems and start sharing CDS(es). The consequences of this situation vary depending on what the DR sysplex systems do when they come into the sysplex. Known impacts include data corruption, stolen CDSes and systems outages.

**Procedural Enhancement:** Ensure DR sysplex systems do not have access to production sysplex CDSes.

5. **Carefully consider the consequences of responding to messages IXC501A and IXC560A.**

**Issue:** When (1) the sysplex name in the DR sysplex is distinct from the sysplex name in the production sysplex, (2) the CFRM policy in the DR sysplex contains a CF definition with a matching node description to the CF used at the production sysplex, and (3) the DR system has physical connectivity to the production sysplex CF, then upon IPL the DR sysplex operator will be prompted to confirm the usage of the production sysplex CFs with messages IXC501A and IXC560A.

Similar to the IXC405D and IXC247D, XCF issues the IXC501A / IXC560A because the environment does not seem quite right. XCF is prompting the operator, asking the operator if processing should continue. It is the operator’s decision as to whether or not XCF should continue. An incorrect response may cause disastrous results.

In the following sequence of messages, NICPLEX is the production sysplex name and DRPLEX is the DR sysplex name. CF1 is the name of the CF in both CFRM policies and CF1 has the same node descriptor information in both policies. Further, the DR sysplex systems have physical connectivity to CF1.
If an operator responds Y to the IXC501A and the IXC560A and the CF was in use by the production sysplex, the CF will be stolen from the production sysplex. Depending what structures were in-use in the CF at the time it was stolen, major outages of subsystem or system scope will occur. If there is another accessible CF, the production sysplex may survive the loss of the CF. Applications may suffer significant delays during the recovery of structures which were lost on the CF.

If the sysplex survives the loss of the CF, the production sysplex will receive IXC518I.

The production sysplex operator will then be prompted with the IXC501A followed by the IXC560A. The IXC501A / IXC560A will be issued on every system in the production sysplex. Rebuilds and associated recovery are held up until the IXC501A and IXC560A are responded to. The IXC501A / IXC560A must be responded to on all systems.

Procedural Enhancements:
(a) Avoid this issue entirely by ensuring the policy in use by the production sysplex describes only CFs to be used by the production sysplex and to which the production sysplex has connectivity. Similarly, the policy in use by the DR sysplex should describe only the CFs to be used by the DR sysplex and to which the DR sysplex has connectivity. There should be no overlap between the two sets of CFs.
(b) Ensure the CFRM policy contains the correct definitions for the CFs which should be used.
(c) Ensure DR sysplex systems do not have physical connectivity to production sysplex CFs.
(d) Only respond to the IXC501A / IXC560A with Y if it is absolutely the intention to use the CF noted in the IXC500I.
(e) Update AUTOWTOR policy to reply to the IXC501A after 60 seconds with N.

**Recovery:** If a CF is incorrectly stolen from the production sysplex, the IXC501A is subsequently issued in the production sysplex and there is another CF in the production sysplex, respond N. The N response will allow rebuilds from the lost CF to the surviving CF to continue. After all of the duplexing failovers and simplex rebuilds complete, delete the CF definition from the active CFRM policy and then add it back. See OA41019 for details.

6. **IPLed with a copied CFRM CDS and now there are structures pending deallocation.**

If a DR sysplex system is IPLed using the production sysplex CFRM CDSes and there is no physical connectivity to production sysplex CFs, XCF will find the structures in the active CFRM policy and then try to clean them up. Since the production sysplex CFs are not accessible, the structure definitions cannot be automatically cleaned up by XCF. The structures will enter a pending deallocation state. The structures cannot be allocated nor used by applications at the DR sysplex until they are successfully cleaned up.

```
D XCF,STR,STRNAME=STRNIC
IXC3601  09.44.13  DISPLAY XCF
STRNAME: STRNIC
STATUS: Allocated
EVENT MANAGEMENT: POLICY-BASED
POLICY INFORMATION:
POLICY SIZE : 175000 K
POLICY INITSIZE: 150000 K
POLICY MINSIZE : 112500 K
FULLTHRESHOLD : 85
ALLOWAUTOALT : YES
REBUILD PERCENT: N/A
DUPLEX : DISABLED
ALLOWREALLOCATE: YES
PREFERENCE LIST: CFCOB
ENFORCEORDER : NO
EXCLUSION LIST IS EMPTY

STRUCTURE PENDING DEALLOCATION
---------------------------------
REASON PENDING : DEALLOCATING SYSTEM LOST CONNECTIVITY
ALLOCATION TIME: 02/12/2012 14:17:42
CFNAME : CF2 NO SYSTEMS CONNECTED TO COUPLING FACILITY
COUPLING FACILITY: 002094.IBM.02.0000000xxxxx
PARTITION: 01 CPCID: 00
ACTUAL SIZE : N/A
STORAGE INCREMENT SIZE: N/A
PHYSICAL VERSION: C3BCEB25 ACA4B401
SYSTEM-MANAGED PROCESS LEVEL: NOT AVAILABLE
EVENT MANAGEMENT: POLICY-BASED
```
**Procedural Enhancement:** Similar to the prior scenarios, this situation can be avoided by ensuring that the DR sysplex uses CDSes which are not copies of the production CDSes. If the scenario is encountered, SETXCF FORCE,PNDSTR,CFNAME=cfname can be used to clean up the structures pending deallocation. After the XCF has cleaned up the old instance of the structure, a new instance of the structure can be allocated by applications in the DR sysplex.

7. **CFRMPOL keyword is not honored.**

If there was a CFRM policy active when the sysplex CDS was used previously, upon IPL systems will try to use the last known CFRM CDS and last known CFRM CDS policy. The CFRMPOL keyword will only be honored if the CFRM CDS is newly formatted.

The impact of the CFRMPOL keyword not being honored will vary. Depending on the contents of the last used policy and CF connectivity, the system may WAIT0A3-BC when the system fails to allocate the ISGLOCK structure, the system may IPL but be unable to allocate structures, the system may IPL and access the incorrect CFs, the system may IPL and access the CFs intended to be used.

**If the DR sysplex system enters a WAIT0A3 or cannot connect to the CF, see FLASH10786.**

In summary, using copied or mirrored CDS can lead to high impact disasters. Whenever possible, use newly formatted CDSes at the DR sysplex to avoid the potential to adversely impact the production sysplex.

**Conclusion**

While couple data sets have been around for years, their significance in maintaining sysplex high availability remains. Whenever a sysplex configuration grows, evolves or changes careful consideration for maintaining the health of the CDSes and avoiding disasters is imperative.

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**Feedback**

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