Summary of Publication Updates for OA60650

z/OS MVS Sysplex Services Guide (SA23-1400)

In *z/OS MVS Programming: Sysplex Services Guide > Sysplex Services for Communication (XCF) > Using the Cross-System Coupling Facility (XCF) > Obtaining XCF Information > Using the IXCQUERY Macro > Information Returned Inline to IXCQUERY*, the following additions are made:

The information that IXCQUERY returns when you specify REQINFO=FEATURES is placed in a storage area that you specify with the FEATAREA parameter. The information is mapped by QUREQFEATURES in IXCYQUAA and includes the following:

. . . .

QuReqRfWriteReadMetrics
List and cache structure write/read measurement metrics and IXLMG AMDALEVEL=3 supported on this system

QuReqRfAsyncXi
Support for asynchronous cross-invalidation available on this system.

QuReqRfPctEntryRsv
IXLCONN PCTENTRYRSV keyword supported on this system

QuReqRfCacheResTime
IXLMG cache residency time metrics supported on this system

QuReqRfIxcNoteResiliency
IXCNOTE service support for REQUEST=NOTEPAD REQTYPE=MODIFY and the LOSSCONNDELETE keyword is available on this system.

Connecting to a Lock Structure

Under *Sysplex Services for Data Sharing (XES) > Connection Services > Connecting to a Lock Structure:*

The following description of the PCTENTRYRSV keyword has been added after the RECORD keyword:

RECORD . . .

. . . .

PCTENTRYRSV

Specifies the percentage of the total number of record data entries in the structure that must remain free after completion of a request that attempts to create a record data entry. Use this keyword to ensure that enough free entries remain available to support application and connector recovery scenarios.

The PCTENTRYRSV parameter is meaningful only when the lock structure provides recording capabilities (RECORD=YES), the structure is allocated in a CFLEVEL=25 or higher coupling facility and the z/OS system from which the IXLCONN is issued supports the PCTENTRYRSV keyword.

In the section titled "Determining Whether to Specify Record Data", the following paragraph is added after the first paragraph:

An application can better manage the availability of record data entries and can thereby create a record data entry during application and connector recovery scenarios when deemed necessary (as long as there is a free record data entry in the structure to satisfy the request) by using the IXLCONN PCTENTRYRSV keyword to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. The value for the percentage of entries that must remain free is a composite of the PCTENTRYRSV value specified by all active connectors to the structure. The composite percentage for the structure is the most restrictive (highest) PCTENTRYRSV value specified by an active connector. When needed, an application may indicate on a lock request that attempts to create a record data entry to proceed with creating a record data entry even if the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold (if any) for the structure. For more information on how to use the "reserved" record data entries, see information related to IXLLOCK, IXLRT and IXLYNEPL / IXLSYNCH in *z/OS: MVS Programming: Sysplex Services Reference.*

Using the IXLCONN macro for rebuilds

Under *Sysplex Services for Data Sharing (XES) > Connection Services > Connecting to the new structure > Using the IXLCONN macro for rebuilds:*

In this section, PCTENTRYRSV is added to the LOCK column in the table titled *"Structure attributes that can be changed with rebuild connect."*

Record data entries

Under *Sysplex Services for Data Sharing (XES) > Using Lock Services (IXLLOCK) > Lock Structure Concepts > Record data entries:*

In the section titled "*Capacity Planning for Record Data Entries"*, the following information is added:

. . . By comparing the value of ENTRYCOUNT with the value of the maximum supported number of record data entries, you can anticipate a "structure full" situation and take appropriate actions to avoid the occurrence of such a condition.

When a structure resides in a CFLEVEL=25 CF or higher, you can use the IXLCONN PCTENTRYRSV to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. By setting aside a percentage of record data entries, you can better manage the availability of record data entries and can thereby create a record data entry during application and connector recovery scenarios when deemed necessary as long as there is a free record data entry to satisfy the request.

When a percent entry reserve has been established for the structure, a request will not be permitted to create a record data entry if request processing creates a record data entry and the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold for the structure. A "structure full" condition will be reported, and the request will complete with an error return code of IxlRetCodeEnvError, reason code of IxlRsnCodeRtFull. When needed, an application may indicate that a lock request that attempts to create a record data entry may proceed with creating a record data entry even if the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold. For more information see IXLLOCK Services and IXLRT – lock structure record data processing in *z/OS: MVS Programming: Sysplex Services Reference.*

By comparing the ENTRYCOUNT with the maximum supported number of record data entries less the number of record data entries that represent the amount of record data entry reserve ((CONALOCKMAXRECORDELEMENT x CONALOCKPCTENTRYRSV) / 100), a "structure full" condition can be anticipated as a result of the established percent entry reserve value for the structure. For more information see *"Determining Whether to Specify Record Data."*

Specifying Recovery Information

Under Sysplex Services for Data Sharing (XES) > Using Lock Services (IXLLOCK) > Lock Structure Concepts > Recovery Considerations > Specifying Recovery Information:

Also, at connect time, you indicate whether or not you want to maintain record data entries for the connection. The record data entries can be used to hold recovery data, should the connector fail.

Connectors to the structure can access the record data entries with the IXLRT programming interface. The failed connector, once restarted, can access its former record data entries with the REACQUIRE option of the IXLLOCK programming interface when it reobtains serialization on the specified resource.

When a structure resides in a CFLEVEL=25 CF or higher, you can use the IXLCONN PCTENTRYRSV keyword to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. By setting aside a percentage of record data entries, you can better manage the availability of record data entries and can thereby create a record data entry during application and connector recovery scenarios when deemed necessary as long as there is a free record data entry to satisfy the request. For more information see "*Determining Whether to Specify Record Data.*"

Requesting Ownership of a Resource (REQUEST=OBTAIN)

Under Sysplex Services for Data Sharing (XES) > Using Lock Services (IXLLOCK) > Requesting Lock Services > Requesting Ownership of a Resource (REQUEST=OBTAIN):

The following paragraph is added after the second paragraph under the "Record Data" bullet:

When a structure resides in a CFLEVEL=25 CF or higher, you can use the IXLCONN PCTENTRYRSV to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. By setting aside a percentage of record data entries, you can better manage the availability of record data entries. Using the ALLOWUSERSV keyword, you can access the reserved entries and create a record data entry during scenarios when the creation of a record data entry is deemed necessary, as long as there is a free record data entry in the structure. For more information, see IXLLOCK Services in *z/OS: MVS Programming: Sysplex Services Reference.*

Changing Ownership Attributes (REQUEST=ALTER)

Under Sysplex Services for Data Sharing (XES) > Using Lock Services (IXLLOCK) > Requesting Lock Services > Changing Ownership Attributes (REQUEST=ALTER):

The following paragraph is added after the first sub-bullet under the first paragraph under the "Record Data" bullet:

Record data

- If a record data entry was not associated with this resource previously

. . . .

fields for asynchronous requests.

When a structure resides in a CFLEVEL=25 CF or higher, you can use the IXLCONN PCTENTRYRSV to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. By setting aside a percentage of record data entries, you can better manage the availability of record data entries. Using the ALLOWUSERSV keyword, you can access the reserved entries and create a record data entry during scenarios when the creation of a record data entry is deemed necessary, as long as there is a free record data entry in the structure. For more information, see IXLLOCK Services in *z/OS: MVS Programming: Sysplex Services Reference.*

Using the Synchronous Update Service (IXLSYNCH):

Under Sysplex Services for Data Sharing (XES) > Using Lock Services (IXLLOCK) > Using Exits for Coupling Facility Lock Services > Using the Synchronous Update Service (IXLSYNCH):

The following paragraph is added after the last bullet under "Update the record data associated with a resource:"

– If there is not a record data element currently associated with the resource, then XES attempts to write to an available record data entry. If an available record data entry cannot be found, XES rejects the request and provides error return and reason codes to the requestor.

When a structure resides in a CFLEVEL=25 CF or higher, you can use the IXLCONN PCTENTRYRSV to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. By setting aside a percentage of record data entries, you can better manage the availability of record data entries. Using the NEPLORTWRITE and NEPLORTALLOWUSERSV flags (set ON), you can access the reserved entries and create a record data entry during scenarios when the creation of a record data entry is deemed necessary, as long as there is a free record data entry in the structure.

Using the Lock Cleanup and Recovery Service (IXLRT)

Under Sysplex Services for Data Sharing (XES) > Using Lock Services (IXLLOCK) > Using the Lock Cleanup and Recovery Service (IXLRT) > What You Can Request with IXLRT:

The following paragraph is added after the first paragraph under the "Creating a Record Data Entry"

bullet:

You can use the IXLRT service to create a record data entry in a lock structure by specifying the CREATENTRY keyword. You specify the record data to be written with the RDATAVAL keyword. XES attempts to write the 64 bytes of record data to an available record data entry in the lock structure. If there are no available record data entries, an error return code is provided.

When a structure resides in a CFLEVEL=25 CF or higher, you can use the IXLCONN PCTENTRYRSV to specify the percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry. Using the ALLOWUSERSV keyword, you can access the reserved entries and create a record data entry during scenarios when the creation of a record data entry is deemed necessary, as long as there is a free record data entry in the structure. For more information, see IXLRT – lock structure record data processing in *z/OS: MVS Programming: Sysplex Services Reference.*

z/OS MVS Sysplex Services Reference (SA38-0658)

IXLCONN — Connect to a coupling facility structure

Under the chapter titled *IXLCONN — Connect to a coupling facility structure:*

Understanding IXLCONN version support

- The following keywords are supported by version 9 and subsequent versions of the IXLCONN macro: ASYNCDUPLEX, ASYNCXI, CRITICAL, FUNCTION, PCTENTRYRSV and TERMLEVEL.

Syntax Diagram

For the parameters-4 diagram, the **PCTENTRYRSV** keyword is added *after* RECORD=YES. The remainder of parameters-4 is unchanged.

Parameter Descriptions

Under REQTYPE=REBUILDCONNECT

Update the following:

. . .You can also modify the following IXLCONN parameters according to the structure TYPE:

. . .

For a lock structure:

CONNECTIVITY
LOCKENTRIES
NUMUSERS
PCTENTRYRSV

After NUMUSERS, the following is added:

,PCTENTRYRSV=0
,PCTENTRYRSV=*pctentryrsv*

Use this input parameter to specify the percentage of the total number of record data entries in the structure that must remain free after completion of a request that attempts to create a record data entry.

When the composite percent entry reserved value for the structure is non-zero, a request that would create an entry will fail with a return code of IxlRetCodeEnvError, reason code of IxlRsnCodeRtFull if the resulting percentage of free entries would be less than the percent entry reserved value in effect for the structure unless the request expressly overrides the PCTENTRYRSV threshold enforcement.

The percentage of free entries is arrived at by dividing the resulting number of free entries by the total number of entries then multiplying by 100.

The composite percent entry reserved value for the structure is the most restrictive (highest) PCTENTRYRSV value specified by all active connectors to the structure.

Use this keyword to ensure that sufficient free entries remain
available to support application and connector recovery scenarios.
Valid values for PCTENTRYRSV are from 0 to 99. A value of zero
implies that no record data entries are required to remain free after
completion of a request.

When needed, an application may indicate that a lock request that attempts to create a record data entry may proceed with creating a record data entry even if the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold. For more information see the IXLLOCK and IXLRT services.

The PCTENTRYRSV parameter is meaningful only when the lock structure

provides recording capabilities (RECORD=YES), the structure is allocated in a CFLEVEL=25 or higher coupling facility and the z/OS system from which the IXLCONN is issued supports the PCTENTRYRSV keyword.

To determine whether the support for the PCTENTRYRSV keyword is available on the system from which you are connecting, issue IXCQUERY REQINFO=FEATURES. QuReqRfPctEntryRsv indicates whether the support is available. If the support is not available and you connect specifying PCTENTRYRSV, the parameter will be ignored.

Return and reason codes for the IXLCONN macro

The following is added to the return and reason codes for the IXLCONN macro:

Hexadecimal return code	Hexadecimal reason code	Equate symbol meaning and action
8	xxxx089F	Equate symbol: IXLRSNCODEPCTENTRYRSV **Meaning:** Program error. The value that is specified in PCTENTRYRSV is not valid. **Action:** Modify the value of PCTENTRYRSV to be within the range of 0 to 99.

IXLLOCK Services

Under chapter titled ***IXLLOCK Services:***

Syntax Diagram

For the parameters-2 syntax diagram, the **ALLOWUSERSV** keyword is added after RDATAVAL.

For the parameters-5 syntax diagram, the **ALLOWUSERSV** keyword is added after ENTRYCOUNT.

Parameter Descriptions

Under REQUEST=OBTAIN

ALLOWUSERSV is added after ADUPREQSEQNUM

,ALLOWUSERSV=0
,ALLOWUSERSV=*allowusersv*

Use this input parameter to indicate whether to allow a request that attempts to create a record data entry to proceed if the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold (if any) for the structure.

The ALLOWUSERSV parameter is meaningful only when the PCTENTRYRSV parameter is used on an IXLCONN service invocation to establish a non-zero percent entry reserved threshold for the lock structure and the lock structure is allocated in a CFLEVEL=25 or higher coupling facility.

A value of 0 (IxlLockAllowUseRsvNo) indicates that if request processing creates an entry and the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold for the structure, the request is not permitted to create the record data entry and the request will fail with a return code of IxlRetCodeEnvError, reason code of IxlRsnCodeRtFull.

A value of 1 (IxlLockAllowUseRsvYes) indicates that the established percent entry reserved threshold for the structure should be ignored for this request and an entry should be created as long as there is a free record data entry to satisfy the request. Use IxlLockAllowUseRsvYes as the value for AllowUseRsv during application and connector recovery scenarios when using reserve entries to create a record data entry is deemed necessary.

Any other specified value will have the same behavior as specifying a value of 0 (IxlLockAllowUseRsvNo).

DEFAULT: 0

Under REQUEST=ALTER

ALLOWUSERSRV is added after ADUPREQSEQNUM

,ALLOWUSERSV=0
,ALLOWUSERSV=*allowusersv*

Use this input parameter to indicate whether to allow a request that attempts to create a record data entry to proceed if the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold (if any) for the structure.

The ALLOWUSERSV parameter is meaningful only when the PCTENTRYRSV parameter is used on an IXLCONN service invocation to establish a non-zero percent entry reserved threshold for the lock structure and the lock structure is allocated in a CFLEVEL=25 or higher coupling facility.

A value of 0 (IxlLockAllowUseRsvNo) indicates that if request processing creates an entry and the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold for the structure, the request is not permitted to create the record data entry and the request will fail with a return code of IxlRetCodeEnvError, reason code of IxlRsnCodeRtFull.

A value of 1 (IxlLockAllowUseRsvYes) indicates that the established percent entry reserved threshold for the structure should be ignored for this request and an entry should be created as long as there is a free record data entry to satisfy the request. Use IxlLockAllowUseRsvYes as the value for AllowUseRsv during application and connector recovery scenarios when using reserve to create a record data entry is deemed necessary.

Any other specified value will have the same behavior as specifying a value of 0 (IxlLockAllowUseRsvNo).

DEFAULT: 0

Return and reason codes

The following reason code meaning for the IXLLOCK macro has been updated.

Hexadecimal return code	Hexadecimal reason code	Equate symbol meaning and action
C	xxxx0C0B	**Equate Symbol**: IXLRSNCODERTFULL **Meaning:** Environmental error. Record portion of the lock structure is full. This reason code may also be issued

		when the creation of a record data entry would result in the percentage of free entries being less than the percent entry reserved value in effect for the structure. Action: If your protocol allows, attempt to rebuild the lock structure, alter its size so that additional record data might be available, or if the structure has a percent entry reserved threshold established, specify the ALLOWUSERSV keyword on the IXLLOCK request

IXLRT – Lock structure record data processing

Syntax Diagram

For parameters-1, ALLOWUSERSV has been added after RDATATYPE

Parameter Descriptions

Add ALLOWUSERSV before ANSAREA

,ALLOWUSERSV=0
,ALLOWUSERSV=*allowusersv*

Use this input parameter to indicate whether to allow a request that attempts to create a record data entry to proceed if the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold (if any) for the structure.

The ALLOWUSERSV parameter is meaningful only when the PCTENTRYRSV parameter is used on an IXLCONN service invocation to establish a non-zero percent entry reserved threshold for the lock structure and the lock structure is allocated in a CFLEVEL=25 or higher coupling facility.

A value of 0 (IxlLockAllowUseRsvNo) indicates that if request processing creates an entry and the resulting percentage of free entries at the completion of the request would be less than the established percent entry reserved threshold for the structure, the request is not permitted to create the record data entry and the request will fail with a return code of IxlRetCodeEnvError, reason code of IxlRsnCodeRtFull.

A value of 1 (IxlLockAllowUseRsvYes) indicates that the established percent entry reserved threshold for the structure should be ignored for this request and an entry should be created as long as there is a free record data entry to satisfy the request. Use IxlLockAllowUseRsvYes as the value for AllowUseRsv during application and connector recovery scenarios when using reserve entries to create a record data entry is deemed necessary.

Any other specified value will have the same behavior as specifying a value of 0 (IxlLockAllowUseRsvNo).

DEFAULT: 0

Return and reason codes

The following reason code meaning for the IXLRT macro has been updated:

Hexadecimal return code	Hexadecimal reason code	Equate symbol meaning and action
C	xxxx0C0B	**Equate Symbol**: IXLRSNCODERTFULL **Meaning:** • The Record portion of the lock structure is full and cannot accommodate the CREATENTRY request. This reason code may also be issued when the creation of a record data entry would result in the percentage of free entries being less than the percent entry reserved value in effect for the structure. • All other request types: Not

		applicable Action: Rebuild or alter the structure to allow for more record data entries. If the structure has a percent entry reserved threshold established, specify the ALLOWUSERSV keyword on the IXLRT request

IXLSYNCH – Synchronous update to a lock structure

Return and reason codes

The following reason code is added to the IXLSYNCH macro:

Hexadecimal return code	Hexadecimal reason code	Equate symbol meaning and action
8	xxxx08A4	**Equate Symbol**: IXLRSNCODEBADNEPLORTACTION **Meaning:** An invalid NEPL record data action (NeplORtAction) was specified. NeplORtAllowUseRsv was specified without indicating to write record data (NeplORtWrite). Action: If NeplOrtAllowUseRsv is set to '1'B', NeplORtWrite must also be set to '1'B to indicate that a write of record data is requested.
8	xxxx0C0B	**Equate Symbol:** IXLRSNCODERTFULL **Meaning:** Record structure full. This reason code may also be issued when the creation of a record data entry would result in the percentage of free entries

		being less than the percent entry reserved value in effect for the structure. **Action:** If your protocol allows, attempt to rebuild the lock structure so that additional record data might be available. If the structure has a percent entry reserved threshold established, set NeplOrtAllowUseRsv to '1'B in the Notify Exit Parameter List (IXLYNEPL) to indicate that the percent entry reserve threshold value should be ignored and a record data entry should be created as long as there is a free record table entry to satisfy the request.

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IXC360I

Explanation

In the message, *text* is:

....

```
STORAGE CONFIGURATION       ALLOCATED       MAXIMUM    %
 ACTUAL SIZE:               actualsize u    maxsize u  pct
[AUGMENTED SPACE:             iuaugspc u  emxaugspc u  pct]
[STORAGE-CLASS MEMORY:           iuscm u     maxscm u  pct]
[ENTRIES:                       scment     emxscment   pct]
[ELEMENTS:                     scmelem     emxscmelem  pct]

. . . .

For lock structures with record data:
  STR PCTENTRYRSV: actpctentryrsv
  SPACE USAGE        IN-USE      TOTAL    %
   ENTRIES:          [iuent     totent    iupct]
   [AVAILABLE:       iuavail   totavail   iupct]
   [RESERVED:          iursv     totrsv   iupct]
   [TOTAL:             iuent     totent   iupct]
  [LOCKS:                       totlock]
  [DUPLXCNTLS:       [iudpx]     totdpx [iupct]]

. . . .

TERMLEVEL:          termlevel
CRITICAL:           critical
ALLOW ALTER:        allowalter
    USER ALLOW RATION: userratio
    USERMINENTRY: userminentry
    UNSERMINELEMENT: userminelement
```

```
    UNSERMINEMC: userminemc
USYNCH WAIT: usyncwait
[NUMUSERS numusers]
[USER PCTENTRYRSV: userpctentrsv]
[MAXCONN({USER | DEFAULT}): maxconn]
```

In the message text:

```
. . . .
actpctentryrsv
     The actual percentage of record data entries that are reserved
     as returned from the CF where the structure is allocated

. . . .

iuavail
     The number of in-use record data entries residing in CF real
     storage that are not reserved. Connectors can request reserved
     record data entries by specifying a non-zero value for
     PCTENTRYRSV on the IXLCONN invocation

totavail
     The total number of record data entries residing in CF real
     storage that are not reserved. Connectors can request reserved
     record data entries by specifying a non-zero value for
     PCTENTRYRSV on the IXLCONN invocation.

iursv
     The number of in-use record data entries residing in CF real
     storage that are reserved. Connectors can request reserved
     record data entries by specifying a non-zero value for
     PCTENTRYRSV on the IXLCONN invocation.

totrsv
     The total number of record data entries residing in CF real
     storage that are reserved. Connectors can request reserved
     record data entries by specifying a non-zero value for
     PCTENTRYRSV on the IXLCONN invocation

userpctentryrsv
     The PCTENTRYRSV specified or defaulted to by the connection.
     This will only be displayed for a lock structure with
     record data.
```

IXC585E

Explanation

In the message, *text* is:

```
IXC585E STRUCTURE strname IN COUPLING FACILITY cfname
PHYSICAL STRUCTURE VERSION physver1 physver2
IS AT OR ABOVE STRUCTURE FULL MONITORING THRESHOLD OF thresh%
SPACE USAGE IN-USE TOTAL % [CHANGED %]
ENTRIES: iuent totent iupct [chgdent chgdpct]
RESERVED: iuresent totresent iupct
ELEMENTS: iuelem totelem iupct [chgdelem chgdpct]
EMCS: iuemc totemc iupct

XCF has detected that a structure is at or above its structure full
monitoring threshold in terms of one or more of the structure
objects that the structure contains. The current in-use and total
counts for entries will always be presented when IXC585E is issued.
The counts for elements and EMCs will only be presented for a
structure that contains those types of objects. The counts for
reserved entries will only be presented for a lock structure that
is allocated with reserved record data entries. Note that the
counts for all applicable structure objects that the structure
contains will be presented, not just those structure objects which
are over the threshold.


In the message text:

strname

    The structure name of the structure that is over the
    threshold.

. . .

totent
```

The total number of entries allocated to the structure and available for use by any request.

For a list structure or cache structure this will represent all entries allocated to the structure. For a lock structure this will represent all record data entries that are not reserved. Reserved record data entries are intended to be used by the lock structure exploiter during recovery scenarios when the creation of record data entries must be satisfied. Connectors can request reserved record data entries by specifying a value for the PCTENTRYRSV keyword on the IXLCONN macro to reserve a percentage of the total number of record data entries. When PCTENTRYRSV is zero, this value will represent the total number of record data entries allocated to the structure. For more information see the IXLCONN service.

. . .

chgdpct

The percentage of the total number of the applicable structure object type (entries or elements) that are changed.

iuresent

The number of in-use reserved entries.

totresent

The total number of reserved entries allocated to the structure.

iurespct

The percentage of the total number of reserved entries that are in use.

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- Updated for new field in IXCYQUAA sub mapping QUASTRUSER

Table 249. Structure QUASTRUSER

```
------------------------------------------------------------------------------
OFFSET
DEC     HEX   TYPE       LENGTH  NAME (DIM)              DESCRIPTION
------------------------------------------------------------------------------

. . .

92      (5C)  BITSTRING   1      QUASTRUSERFLG4(0)       Flags for rebuild
                                                         information for a user
Bit definitions
 . . .
93      (5D)  CHARACTER   1                              Reserved

94      (5E)  SIGNED      1      QUASTRUSERPCTENTRYRSV   PCTENTRYRSV specified by
                                                         this connector for a lock
                                                         structure
95      (5F)  BITSTRING   1      QUASTRUSERTERMLEVEL     Connector termination
                                                         level. See
                                                         QuaStrUserTermLevel_xxx
                                                         constants below
```

- Updated for new field in IXCYQUAA sub mapping QUREQFEATURES

Table 257. Structure QUREQFEATURES

```
--------------------------------------------------------------------------------
OFFSET
DEC     HEX   TYPE       LENGTH  NAME (DIM)              DESCRIPTION
--------------------------------------------------------------------------------

0       (0)   STRUCTURE   32     QUREQFEATURES           Data for Query
                                                         REQINFO=FEATURES

...

3       (3)   BITSTRING    1     QUREQFEATURES1D

Bit definitions
....

4       (4)   BITSTRING    4   QUREQFEATURES2(0)         Second word of features flag
```

```
4       (4)    BITSTRING    1    QUREQFEATURES2A(0)

               1... ....         QUREQRFPCTENTRYRSV          "'80'" IXLCONN PCTENTRYRSV
                                                             keyword supported on this
                                                             system
               1... ....         QUREQRFCACHERESTIME         "'80'" IXLMG cache residency
                                                             time metrics supported on this
                                                             system

               .1.. ....         QUREQRFIXCNOTERESILIENCY    "'40'" IXCNOTE service support
                                                             for REQTYPE=MODIFY and
                                                             LOSSCONNDELETE is available on
                                                             this
```

Table 258. Cross Reference for IXCYQUAA

Name	Offset	Hex Tag
QUASTRUSERPCTENTRYRSV	5E	
QUREQRFCACHERESTIME	4	80
QUREQRFPCTENTRYRSV	4	80

- Updated for new field in IXLYAMDA sub mapping IXLYAMDSTRL2

Table 338. Structure IXLYAMDSTRL2

```
--------------------------------------------------------------------------------------
OFFSET
DEC     HEX    TYPE       LENGTH  NAME (DIM)                DESCRIPTION
--------------------------------------------------------------------------------------
428     (1AC) BITSTRING   1       IXLYAMDSTRL2_FLAGS
Bit definitions:

...

429     (1AB)  SIGNED     1       IXLYAMDSTRL2_PCTENTRYRSV  Composite percent entry
                                                            reserve for the structure
                                                            (LEVEL25). A value of zero
                                                            means that no percent entry
                                                            reserve is established for the
                                                            structure or the CF where the
                                                            structure is allocated does
                                                            not support percent entry
                                                            reserve threshold. NOT
                                                            applicable when
                                                            IxlyamdStrL2_AsynchDupSec
                                                            is ON.
```

- Updated for new fields in IXLYAMDA sub mapping IXLYAMDSCSC1

Table 347. Structure IXLYAMDSCSC1

```
--------------------------------------------------------------------------------
OFFSET
DEC     HEX    TYPE        LENGTH  NAME (DIM)                DESCRIPTION
--------------------------------------------------------------------------------
. . .

128     (80)   SIGNED       4       IXLYAMDSCSC1_WMWSC        Write Miss Write Suppression
                                                             Counter (CF LEVEL17, SL 10.13)

132     (84)   CHARACTER    4                                 Reserved

136     (88)   UNSIGNED     8       IXLYAMDSCSC1_DART         Data-Area Residency Time. A
                                                             64-bit unsigned binary integer
                                                             that approximates in
                                                             microseconds via a moving
                                                             weighted average the elapsed
                                                             time a data area resides in a
                                                             storage class before it is
                                                             reclaimed (CF LEVEL25)
144     (90)   UNSIGNED     8       IXLYAMDSCSC1_DERT         Directory-Entry Residency
                                                             Time.  A 64-bit unsigned
                                                             binary integer that
                                                             approximates in microseconds
                                                             via a moving weighted average
                                                             the elapsed time a directory
                                                             entry actively resides in a
                                                             storage class before it is
                                                             reclaimed (CF LEVEL25)
```

Table 355. Cross Reference for IXLYAMDA

Name	Offset	Hex Tag
IXLYAMDSCSC1_DART	88	
IXLYAMDSCSC1_DERT	90	
IXLYAMDSTRL2_PCTENTRYRSV	1AB	

- Updated for constant values in IXLYCON

Table 383. Structure

```
OFFSET     OFFSET
DEC        HEX       TYPE      LENGTH  NAME (DIM)             DESCRIPTION
--------------------------------------------------------------------------------
----- Constants for use with IXLLOCK and IXLRT services ---------
          IXLLOCK AllowUseRsv constants. Refer to IXLLOCK
          for detailed usage description.

  0        (0)        X'0'        0    IXLLOCKALLOWUSERSVNO      "0"
```

0	(0)	X’1’	0	IXLLOCKALLOWUSERSVYES	“1”

Reason Codes -- IxlRetCodeParmError
(Note that the reason codes are of the form "xxxxYYYY" where "xxxx" is used to contain internal diagnostic information)

OFFSET DEC	OFFSET HEX	TYPE	LENGTH	NAME (DIM)	DESCRIPTION
. . .					
0	(0)	BITSTRING	0	IXLRSNCODEPCTENTRYRSV	”X'0000089F'” The value specified in the PCTENTRYRSV keyword is not valid. A value in the range of 0 to 99 must be specified.
0	(0)	BITSTRING	0	IXLRSNCODEBADNEPLORTACTION	”X'000008A4'” An invalid NEPL record data action (NeplORtAction) was specified. NeplORtAllowUseRsv was specified without indicating to write record data (NeplORtWrite)
. . . .					

Reason Codes -- IxlRetCodeEnvError
(Note that the reason codes are of the form "xxxxYYYY" where "xxxx" is used to contain internal diagnostic information)

OFFSET DEC	OFFSET HEX	TYPE	LENGTH	NAME (DIM)	DESCRIPTION
0	(0)	BITSTRING	0	IXLRSNCODERTFULL	“X'00000C0B'” Record portion of Lock structure is full. This reason code may also be issued when the creation of a record data entry would result in the percentage of free entries being less than the percent entry reserved value in effect for the structure.

. . . .

```
  CFLEVEL constants
-------------------------------------------------------------------------------------
0         (0)    X'19'     0    IXLCFLEVEL25      25  "CFLEVEL25"
```

- Updated for new fields in IXLYCSCS

Table 393. Structure CSCS

OFFSET DEC	HEX	TYPE	LENGTH	NAME (DIM)	DESCRIPTION
. . .					
116	(74)	SIGNED	4	CSCSWMWSC	Write Miss Write Suppression Counter. Number of write requests that specified LOCALREGCNTL=YES that were suppressed due to the local cache being the only registered interest in the directory entry and the data entry did not have cached subsystem data. Valid when the cache structure resides in a CFLEVEL=18 or above coupling facility
120	(78)	UNSIGNED	8	CSCSDART	Data-Area Residency Time. A 64-bit unsigned binary integer that approximates in microseconds via a moving weighted average the elapsed time a data area resides in a storage class before it is reclaimed. Valid when the cache structure resides in a CFLEVEL=25 or above coupling facility
128	(80)	UNSIGNED	8	CSCSDERT	Directory-Entry Residency Time. A 64-bit unsigned binary integer that approximates in microseconds via a moving weighted average the elapsed time a directory entry actively resides in a storage class before it is reclaimed. Valid when the cache structure resides in a CFLEVEL=25 or above coupling facility

Table 394. Cross Reference for IXLYCSCS

Name	Offset	Hex Tag
CSCSDART	78	
CSCSDERT	80	

- Updated for new fields in IXLYDSCC

Table 429. Structure DSCC

OFFSET DEC	HEX	TYPE	LENGTH	NAME (DIM)	DESCRIPTION
. . .					
128	(80)	CHARACTER	128	DSCCRECLAIMVEECTOR	Reclaiming vector - The number of reclaims for named data items in the specified storage class. Bytes 128-255
256	(100)	CHARACTER	168		Reserved - Internal Bytes 256-423
424	(1A8)	UNSIGNED	8	DSCCDATARESIDENCYTIME	Data-area residency time (DART). Bytes 424-431
432	(1B0)	UNSIGNED	8	DSCCDIRENTRESIDENCYTIME	Directory entry residency time (DERT). Bytes 432-439
440	(1B8)	CHARACTER	72		Reserved Bytes 440-511

Table 394. Cross Reference for IXLYDSCC

Name	Offset	Hex Tag
DSCCDATARESIDENCYTIME	1A8	
DSCCDIRENTRESIDENCYTIME	1B0	

- Updated for new field in IXLYNEPL

Table 469. Structure IXLYNEPL

```
------------------------------------------------------------------------------------------
OFFSET
DEC     HEX    TYPE        LENGTH  NAME (DIM)           DESCRIPTION
------------------------------------------------------------------------------------------
. . .

272     (110)  BITSTRING    1      NEPLORTACTION(0)     Input area to indicate what to do with
                                                        Record data
Bit definitions:
```

```
                1... ....           NEPLORTWRITE        "X'80'" Input area to indicate write the
                                                         Record data in NeplORtData
                .1.. ....           NEPLORTDELETE       "X'40'" Input area to indicate delete
                                                         the currently associated Record data
                                                         entry
                ..1. ....           NEPLORTALLOWUSERSV  "X'20'" Input area to indicate whether
                                                         to allow the creation of a record data
                                                         entry to proceed if the resulting
                                                         percentage of free entries at the
                                                         completion of the request would be
                                                         less than the established
                                                         percent entry reserved threshold (if
                                                         any) for the structure. 0 -> Do not
                                                         allow creation if the resulting
                                                         percent free is less than
                                                         established threshold. 1 -> Allow
                                                         creation - ignore threshold. Record
                                                         data entry should be created as long as
                                                         there is a free record table entry to
                                                         satisfy the request. Valid when
                                                         NeplORtWrite set ON
                ...1 1111       NEPLORTACTIONRSV        "X'1F'" Reserved, set to 0
```

Table 471. Cross Reference for IXLYNEPL

Name	Offset	Hex Tag
NEPLORTALLOWUSERSV	110	20

z/OS MVS Setting up a Sysplex (SA23-1399)

Under Chapter 4. Managing coupling facility resources > Planning a coupling facility policy > Monitoring structure utilization:

Monitoring structure utilization
One type of monitoring used by the system in a Parallel Sysplex environment is structure full monitoring, which is described here. See “Duplexing rebuild monitoring” on page 72 for a description of the monitoring done by the system for structures that have been enabled by the installation to be duplexed.

. . .

In general, structure full monitoring will be discontinued for a structure in all cases where a structure instance transitions from an “active” to “inactive” state, or where the structure instance is deallocated. If structure full monitoring is discontinued for a structure instance for any reason while there is an outstanding IXC585E message, highlighted message IXC587I is issued to the console and to the system message logs. Message IXC585E is deleted.

For Lock structures with record data, an application can reserve a percentage of the total number of record data entries that are to remain free (reserved) after completion of a request that attempts to create a record data entry by specifying a non-zero PCTENTRYRSV value on IXLCONN. See IXLCONN – Connect to a coupling facility structure in *z/OS: MVS Programming: Sysplex Services Reference* for more information. When monitoring a lock structure with reserved record data entries, structure full monitoring will only consider record data entries that are not reserved when determining the percentage full value for the record data entries.

. . .

Structure full avoidance
A system-initiated alter for an eligible structure may begin when structure full monitoring determines that a structure contains monitored objects (e.g., entries, elements, or EMCs) that are at or above structure full threshold specified by FULLTHRESHOLD. For cache structures, structure full monitoring will only consider changed or locked-for-castout objects, since unchanged/unlocked objects are eligible for reclaiming, and therefore do not contribute to a possible structure full condition. For Lock structures with reserved record data entries, structure full monitoring will only consider record data entries that are not reserved. For all structure types, each object type will be considered independently within that structure. Therefore, a structure can be above the structure full threshold in terms of one structure object type and be under structure full threshold for another structure object type.

Under the section titled “Understanding the coupling facility level (CFLEVEL)”, the ***CFLEVEL and operating system level coexistence*** table has been updated for CFLEVEL 25 coexistence and exploitation.

CFLEVEL and operating system level coexistence

. . . .

- A operating system release “coexistence” support row of the table with an APAR number indicates required service in addition to the operating system product code to allow the operating system to use existing operating system and CF functions, but not exploit new functions that are contained in a particular CFLEVEL.

. . . .

  - Example: A system at z/OS V2R2 can coexist with a coupling facility up to and including CFLEVEL 21 without additional service, but it requires the service provided by APAR OA52058 to coexist with CFLEVEL 22 and all higher CFLEVELs. Higher CFLEVELs may require additional service as noted in the table. In particular, although there is no service specifically listed for CFLEVEL 23, all APARs listed in corresponding cells to the left of the blank cell are required for coexistence.

- An operating system release “exploitation” support row of the table with text (an ‘X’ or an APAR number) indicates exploitation of the functions contained in a particular CFLEVEL by the operating system release.

  . . . .

  - Example: A system at z/OS V2R2 can exploit all function provided by CFLEVELs up to and including CFLEVEL 20, requires additional service to exploit CFLEVELs 21 – 24 functions, and cannot exploit functions provided by CFLEVEL 25.

Table 2 CFLEVEL summary table

Release	CFLEVEL					
	Support	21	22	23	24	**25**
z/OS V2R2	Coexistence		OA52058		OA56345	OA60275
	Exploitation	OA47796	OA51862	OA54688	OA56774	
z/OS V2R3	Coexistence				OA56345	OA60275
	Exploitation	x	x	OA54688	OA56774	OA60650
z/OS V2R4	Coexistence					OA60275
	Exploitation	x	x	x	OA56774	OA60650
z/OS V2R5	Coexistence					OA60275
	Exploitation	x	x	x	x	OA60650

Notes:

1. All operating system releases listed in *Table 2 CFLEVEL summary table* can *e*xploit all function

provided by CFLEVELs up to and including CFLEVEL 20.

The functions that are provided by each CFLEVEL are described briefly. For detailed information, see PR/SM Planning Guide.

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. . . .

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With a PTF for APAR OA60650, in conjunction with CFCC CFLEVEL 25, functions include:

- Read Retry Buffer Extensions

  Read retry buffer support extended to the set of non-idempotent CF cache and lock structure commands thus reducing the likelihood of encountering indeterminate status results from coupling facility commands.

- Structure Full Threshold

  Allowance for the designation of a percentage of the total number of lock structure record data entries that must remain free after completion of a command to create a record data entry, in order for a creation operation to proceed. To improve connector application resiliency, such as when recovery actions need to allocate structure resources, lock structure connectors can request that the CF reserve a percentage of resources from general mainline application usage until the application explicitly asks for the reserved resources to be used to satisfy structure requests.

- Cache Residency Time Metrics

  Availability of cache structure data and directory residency statistics which indicate how long data area and directory entries reside in a cache structure before they are reclaimed. This information can be used to improve structure sizing and apportionment.

The DISPLAY CF command will always display the actual CFLEVEL of the coupling facility. This might differ from what the application understands to be the operational level of the coupling facility. The operational level refers to the architectural level required to perform the necessary operations against the structure.