z/OS® V1R10

GRSRNL=EXCLUDE migration

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GRSRNL EXCLUDE migration

Session objectives

- Explain why it was done

- Identify new and changed installation procedures

- Explain any migration issues or concerns

- Explain how to use it

- Indicate list of publications and references

GRSRNL EXCLUDE migration

Overview

- Problem statement / need addressed:
  - GRS does not provide the ability to change from GRSRNL=EXCLUDE mode to regular RNLs without a complete complex wide outage/re-IPL.
  - Some STAR mode customers required that GRS allow the change without a Sysplex wide outage.

- Solution:
  - Migrating from a GRSRNL=EXCLUDE environment to full RNLs no longer requires a sysplex-wide IPL for certain environments. A "FORCE" option for the SET GRSRNL=xx processing will now dynamically switch to the specified RNLs and move all previous requests to the appropriate scope (SYSTEM or SYSTEMS) as if the RNLs were in place when the original ENQ requests were issued.

- Benefit:
  - You do not lose your entire Sysplex

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GRS does the provide the ability to change RNLs dynamically but if a system is IPLed in GRSRNL=EXCLUDE then a dynamic RNL change can not be performed. Customers wanting to migrate from GRSRNL=EXCLUDE to full RNLs required that it be done without a complex sysplex outage.

GRSRNL=EXCLUDE migration to full RNLs

- GRS will now allow the migration from GRSRNL=EXCLUDE to full RNLs without a Sysplex wide IPL/Outage
  - GRSRNL=EXCLUDE indicates that all Global ENQs with RNL=YES are excluded to local ENQs by GRS
  - The SET GRSRNL command can be used to Force RNL changes when there is only one GRSRNL=Exclude STAR mode system in the sysplex
    - Based on the new RNLs, GRS will move local ENQs to the global queues as needed. This is required because many outstanding ENQs (SYSDSN for example) will never be released.
  - The only way to go back to GRSRNL=EXCLUDE is a sysplex wide re-IPL/Outage. Once to full RNLs, RNLs can dynamically be changed and RNL wild carding can be used as an exclude all alternative.
- Rolled back to V1R8 and V1R9 with APAR OA22578

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GRSRNL=EXCLUDE is a strange environment where GRS will create a GRS complex but it will exclude all Global ENQs to a SYSTEM scope unless they specify RNL=NO on the ENQ/ISGENQ API. Applications must insure that if they use RNL=NO or any other ENQ issuer for a specific resource use RNL=NO that all must use RNL=NO.

In non-GRSRNL=EXCLUDE environments, RNLs can be changed without this support. However, for data integrity reasons, GRS will not allow the change to take place if an outstanding ENQ is affected by the new RNLs and the ENQ is not released in a reasonable amount of time. This support, with its limiting restrictions (that is, must be GRSRNL=EXCLUDE mode) will allow the RNLs to be changed even if a holder is affected by the change. Any outstanding System (or local) level ENQ that the new RNLs say should now be global (SYSTEMS) will be changed by GRS without the ENQ having to be released/re-obtained. This can be done only by insuring that one system is in the sysplex.

In GRS Star mode before the SET GRSRNL=xx migration begins message ISG880D will prompt for the FORCE option to continue if required.

Care must be taken when changing RNLs as any errors in their configuration can lead to deadlocks or data integrity errors. Note also that once migrating to the specified RNLs, the only way to move back to GRSRNL=EXCLUDE requires a sysplex-wide outage. Additionally note that there is no FORCE option from changing from the specified RNLs to another set of RNLs therefore long held resources could delay such a change indefinitely requiring cancellation of jobs or even a sysplex-wide outage to complete.

A rebuild of the ISGLOCK structure is initiated as the final step in the migration and must succeed to complete. You should test that a rebuild of the ISGLOCK structure will succeed.

GRS RNL=EXCLUDE migration to full RNL

- **The following restrictions are required for data integrity:**
  - *Can only be issued in a single system GRS STAR Sysplex with GRSRNL=EXCLUDE.*
  - *No ISGNQXIT or ISGNQXITFAST exit routines can be active nor requests that were affected by one.*
  - *No ISGNQXITBATCH or ISGNQXITBATCHCND exit routines can be active.*
  - *No local resource requests can exist that must become global where that global resource is already owned. This could result if some requests were issued with RNL=NO.*
  - *No resources with a MASID request can exist where only some of the requesters will become global. This could result if some requests were issued with RNL=NO or if some requests were issued with different scopes.*
  - *No RESERVEs can be held that were converted by the ISGNQXITBATCH or ISGNQXITBATCHCND exit that do not get converted by the new RNLs. This could result if a resource was managed globally by an alternative serialization product before the migration, but afterwards is to be serialized by device RESERVE.*

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The restrictions are enforced to insure data integrity. The migration will be canceled if any of these requirements are not met and GRSRNL=EXCLUDE will remain in effect. When in GRS Ring mode the ISG248I message will be issued indicating that SET GRSRNL is not accepted in a GRSRNL=EXCLUDE environment

Usage and invocation

- The support is invoked by:
  - ▶ Issuing the existing SETGRS RNL=(xx) command to change the RNLS. New confirmation message ISG880D is displayed to insure that you want to proceed.
- ISGLOCK structure rebuild must work:
  - ▶ Ensure and test that a rebuild of the ISGLOCK structure will succeed. Possible CFRM policy and CF memory changes may be required.
- New or changed external messages:
  - ▶ ISG880D WARNING: GRSRNL=EXCLUDE IS IN USE. REPLYING FORCE WILL RESULT IN THE USE OF SPECIFIED RNLS. REPLY C TO CANCEL
  - ▶ ISG881I SET GRSRNL COMMAND CANCELED. *reason*
  - ▶ ISG882I GRSRNL STOPPING RESOURCE IS QNAME=qname. RNAME=rname.
  - ▶ Other messages ISG883I, ISG367I , ISG323A ISG373W
- New or changed external wait states:
  - ▶ WAIT0A3 reasons 0D0, 0C4, 0C4, and 0EE were modified or added.

See the z/OS MVS System Messages, Vol 9 (IGF-IWM), SA22-7627 and z/OS MVS System Codes, SA22-7626 manuals for more information on the messages.

A ISGLOCK structure rebuild is performed by the system as the final step in the migration. As such, you must make sure that the rebuild will succeed. An unsuccessful rebuild will result in a system waitstate. You should review the z/OS V1R9.0 MVS Setting Up a Sysplex and *z/OS V1R9.0 MVS Planning: Global Resource Serialization manuals for information related to rebuilding the GRS lock structure (ISGLOCK). The* "SETXCF START,REBUILD,STRNAME=ISGLOCK" can be used to test the rebuilding of the structure. Rebuilding to and from a new structure before issuing the SETGRS RNL command to migrate is suggested. This would insure that your CFRM policy and CF configuration (memory requirements) are correct.

Note that failure of the test rebuilds will result in the system continuing to use the old structure. Failure during the migration will result in a waitstate.

Interactions and dependencies

- Hardware dependencies
  - ▸ The rebuild must succeed. Check CFRM policy and CF memory, connectivity, and so on.

- Software dependencies
  - ▸ None

- Exploiters
  - ▸ N/A

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Migration and coexistence considerations

- See the previous foils related to restrictions

- As with any RNL change, you must carefully plan the new RNLs
  - ▸ Nat Stevenson III (stevensn@us.ibm.com) from the WSC has assisted other customer who have migrated
    - The function is shipped disabled in the V1R8 and V1R9 SPE. Nat must be contacted in order to be given a key that will enable the function

- You must plan the removal of the other systems in the sysplex and their IPL back into the sysplex. This may include
  - ▸ moving workloads, shutting some down, and so on
  - ▸ Adding capacity to the remaining system and then moving back after the other systems have IPLed back into the sysplex

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The new RNLs will reside in a SYS1.PARMLIB(GRSRNLxx) member. Make sure that you test the migration and RNLs on a test system first. See the GRS Planning Guide for information on RNLs and using the RNL syntax checker.

The SPE versions of this function is shipped disabled by default and a DIAGxx setting is be required to enable it. Specifics on enabling this function

can be obtained from the IBM Washington Systems Center by sending Nat Stevenson and e-mail at stevensn@us.ibm.com.

Please consider these questions before contacting the Washington Systems Center:

 * Are you sharing any resources (DASD) outside of the sysplex?

 * Do you use an alternate serialization product?

 * Do you have a need to perform this migration without a

   sysplex-wide outage?

Installation

- No change

Session summary

- If you ever wondered how you would get off of GRSRNL=EXCLUDE, then now is your chance!

Appendix

- List additional related materials for quick reference
  - ▸ Publications:
    - *z/OS V1R9.0 MVS Planning: Global Resource Serialization*
    - z/OS V1R9.0 MVS Setting Up a Sysplex
    - z/OS MVS System Messages, Vol 9 (IGF-IWM), SA22-7627
    - z/OS MVS System Codes, SA22-7626
    - Application publications for information related to changing RNLs
  - ▸ Contact Nat Stevenson III from the WSC for possible assistance with doing migrations.

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