IBM Education Assistance for z/OS V2R1

Item: Performance Blocks (PB) Above 2G
Element/Component: WLM/SRM

Material is current as of March 2013

Agenda

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Trademarks

- See url http://www.ibm.com/legal/copytrade.shtml for a list of trademarks.

Presentation Objectives

- With z/OS V2R1, WLM introduces 12 new WLM 64bit Execution Delay Monitoring services and 4 are changed to support Performance Blocks (PB) above 2G

- The new 64bit WLM Execution Delay Monitoring services are identical to the 31bit services, with the exception they can also run also in AMODE 64.

- This presentation explains
  - The purpose of the new Execution Delay Monitoring services
  - How to use the new MONTKN64 keyword

Overview

- Problem Statement / Need Addressed
  - Performance Blocks (PB) are allocated in common (sometimes private) storage below 2G, which reduces the size of the private area for applications programs.

- Solution
  - By moving the PBs and PBDEs above 2G, the freed area can be used by application programs.

- Benefit / Value
  - More available storage below 2G for application programs

Overview

- The major change in the 64bit WLM Execution Delay Monitoring services is the introduction of the new MONTKN64 keyword, which is mutually exclusive with the MONTKN keyword.
  - The MONTKN keyword still works, but doesn't support PBs above 2G
  - It is possible to create PBs below 2G with the IWM4MCRE service, even when the MONTKN64 keyword is used. This allows a mixture of old and new WLM Monitoring Environment services.
  - It is possible to convert a MONTKN into a MONTKN64 with the IWM4MXTR service.
  - It is also possible to convert a MONTKN64 into a MONTKN with the IWM4MXTR service, when the monitoring token is allocated below 2G

Overview

- Changed and new WLM services

Changed 31/64bit WLM API name
IWM4ECRE
IWM4MCHS
IWM4MCRE
IWM4MINI

Current 31bit WLM API name	New 31/64bit WLM API name
IWMMABNL	IWM4MABN
IWMMDELE	IWM4MDEL
IWMMEXTR	IWM4MXTR
IWMMNTFY	IWM4MNTF
IWMMRELA	IWM4MRLT
IWMMSTOP	IWM4MSTO
IWMMSTRT	IWM4MSTR
IWMMSWCH	IWM4MSWC
IWMMUPD	IWM4MUPD
IWMMXFER	IWM4MXFR
IWMRPT	IWM4RPT

Usage & Invocation

```
[xlabel]   IWM4MCRE     ┌[ REQTYPE=SINGLE
                        |    ┌ ,MONTKN=[xmontkn]
                        |    └ ,MONTKN64=[xmontkn64]
                        |         ┌[,ALLOCATEBELOW=NO]
                        |         └[,ALLOCATEBELOW=YES]]
                        └[,REQTYPE=MULTIPLE
                              ,AMOUNT=xamount
                          ┌ ,MONTKN_LIST=xmontkn_list
                          └ ,MONTKN64_LIST=xmontkn64_list
                              ┌[,ALLOCATEBELOW=NO]
                              └[,ALLOCATEBELOW=YES]
                          ┌ ,LISTLEN=xlistlen
                          └ ,MONTKN_LISTLEN=xmontkn_listlen]


                        .....
```

Usage & Invocation

New Parameters:

MONTKN64=[xmontkn64]

belongs to a set of mutually exclusive keys. It is the name (RS-type), or address in register (2)-(12), of a 64 bit output which will receive the long delay monitoring token.

[ALLOCATEBELOW=NO|YES]

Is an optional keyword input which indicates whether the virtual storage for the delay monitoring environment is to be obtained below 2 gigabytes. This is especially helpful for callers with 31-bit dependencies.
DEFAULT: NO

Usage & Invocation

MONTKN64_LIST=xmontkn64_list

belongs to a set of mutually exclusive keys. It is the name (RS-type), or address in register (2)-(12), of a character input which specifies an area into which a list of long delay monitoring tokens will be placed.
A single MONTKN64 has a size of 8 byte.

[ALLOCATEBELOW=NO|YES]

Is an optional keyword input which indicates whether the virtual storage for the delay monitoring environment is to be obtained below 2 gigabytes. This is especially helpful for callers with 31-bit dependencies.
DEFAULT: NO

Usage & Invocation

LISTLEN=xlistlen

belongs to a set of mutually exclusive keys. It is the name (RS-type), or address in register (2)-(12), of a fullword input which specifies the length (in bytes) of the area identified by the MONTKN_LIST / MONTKN64_LIST keyword.

Size of this area must be at least the size of one monitoring token (see MONTKN / MONTKN64 keyword) times AMOUNT. If the user specified area is not large enough to return the delay monitoring tokens, a specific return/reason code will be returned and the request will not be processed.

Usage & Invocation

In most new / changed 64bit WLM Execution Delay Monitoring services only the MONTKN64 keyword is new. Like in the IWM4MDEL service below.

```
[xlabel]   IWM4MDEL   ┌  MONTKN=xmontkn
                      └ ,MONTKN64=xmontkn64
                       [,RETCODE=xretcode]
                       [,RSNCODE=xrsncode]
                       [,PLISTVER=xplistver|IMPLIED_VERSION]
                      ┌[,MF=S]
                      |[,MF=(L,xmfctrl,xmfattr|0D)]
                      └[,MF=(E,xmfctrl,COMPLETE)]
```

Interactions & Dependencies

- Software Dependencies
  - None
- Hardware Dependencies
  - None
- Exploiters
  - DB2/DDF

Migration & Coexistence Considerations

- When your applications use the IWMMRELA / IWMMXFER WLM services, you have to plan your migration to the new services carefully.

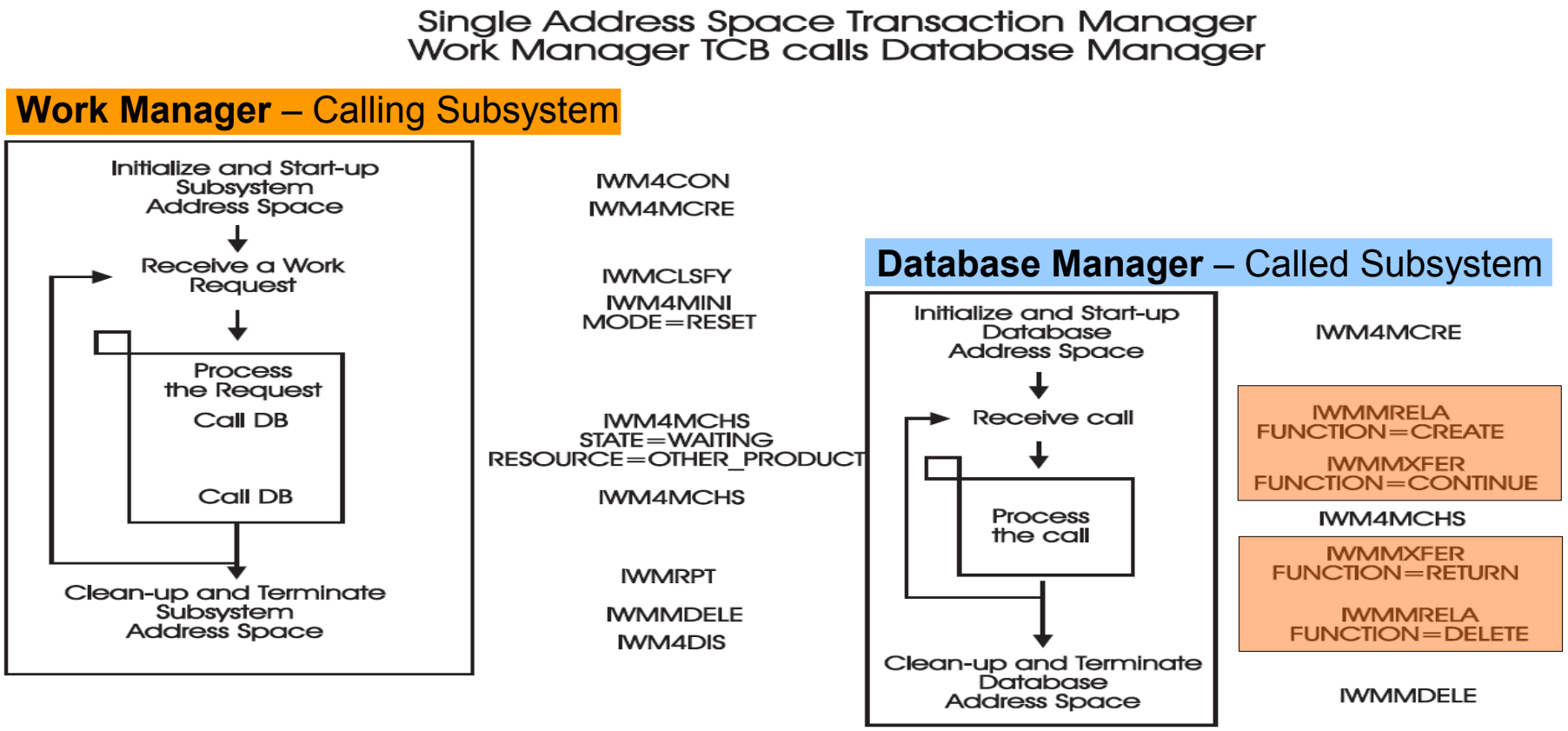

Figure 4. Services for a work manager that uses a database manager.

Migration & Coexistence Considerations

- **Work Manager** – Calling Subsystem
  - Caller may use new APIs (but not create PB above) at any time without synchronizing with called subsystems
    - PB / PBDE must be allocated below 2G
      ?IWM4MCRE MONTKN64(token) AllocateBelow(YES)
    - Passed MONTKN (Parent) can be changed to MONTKN64 only, if called subsystem can handle a 64bit MONTKN
  - Caller may use new APIs and create PB above, when called subsystem has compiled with new 64-bit macros

- **Database Manager** – Called Subsystem
  - Can fully exploit the new function (move PBs above 2G), if it does not call another subsystem where Relate / Transfer is used
    - WMM4REL updates own PB with the parent PB / PBDE address
    - IWMM4XFR updates parent PB with the own PB / PBDE address

Presentation Summary

- With z/OS V2R1 WLM introduces new WLM API's, which allow to allocate the Performance blocks above 2G.
- The allocation of Performance Blocks above 2G frees up storage below 2G, which can then be used by applications.

Appendix

- Publications:
  - z/OS V2R1 MVS Programming: Workload Management Services (SA22-7619)
    - Chapter IWM4ECRE – Create an Enclave
    - Chapter IWM4MABN – Record Abnormal Event
    - Chapter IWM4MCHS – Change State of Work Request
    - Chapter IWM4MCRE – Create Monitoring Environment
    - Chapter IWM4MDEL – Delete Monitoring Environment
    - Chapter IWM4MXTR – Delay Monitoring Extract Service
    - Chapter IWM4MINI – Monitor Environment Extract Service
    - Chapter IWM4MNTF – Notify of Work Execution
    - Chapter IWM4MRLT – Relate Monitoring Environment
    - Chapter IWM4MSTO – Stops a Work Unit
    - Chapter IWM4MSTR – Indicate the Start of a Work Unit

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- Chapter IWM4MSWC – Switch Monitoring Environment
- Chapter IWM4MUPD – Updates Data of a Work Unit
- Chapter IWM4MXRF – Transfer Monitoring Environment
- Chapter IWM4RPT – Report on Work Request

– z/OS V2R1 MVS Programming: Assembler Services Reference IAR-XCT (SA22-7607)

- Chapter ITZEVENT – Transaction Trace EVENT Record
- Chapter ITZQUERY – Transaction Trace Query