

How's That Work? a Focus on WLM Goal Mode Transaction and Database Management Workloads



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Other SHARE Sessions

- This session (2543) discusses only Batch and Started Task Workloads
- The companion session is Tuesday at 11:00 am:
2542- How's that Work? A Focus on WLM Goal Mode Batch and Started Task Workloads



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Transaction Introduction

This section discusses various aspects of Transaction Workloads in Workload Manager Goals Mode. You will see how these Workloads originate, guidelines for setting up, options for qualifying them, and best practices for defining the associated Service Classes.

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Transaction Agenda

- **Transaction Origins and Categories**
- **Prioritizing Transactions**
- **Recommended Service Classes**
- **Qualifying Transactions**
- **Assessing Your World**



Transaction Origins

- **Typically Regions Run as Started Tasks**
- **Many sites Run Regions as JOBs**
- **Many sites run a combination**
- **Advantages:**
 - ❖ **Different WLM Qualifications available to each type**
 - ❖ **Initiators are not consumed**



Categories

- **CICS Transaction Server**
- **IMS**
- **SAP R/3**
- **CA-Datcom**
- **Websphere/MQ**



Transaction/Online STCs

- **CICS/IMS Regions should be placed in a Service Class with an aggressive goal. Regions not being managed to Transaction Goals will be managed to Region Goals**
- **CICS Regions are typically both Server and Client types of work**
- **Several Service Classes may be needed for:**
 - ❖ **CICS CPSM, CICS Temp Storage Regions, IMS Shared Queue Regions**
 - ❖ **CICS TORs, IMS CNTL Regions**
 - ❖ **CICS AORs, CICS RORs, CICS QORs, IMS MPRs, IMS DLI/SAS**
- **Suggested Goal: Service Class ONLP_VH IMP=1 V=55% or V=60%**
- **Suggested Goal: Service Class ONLP_HI IMP=2 V=50% or V=55%**

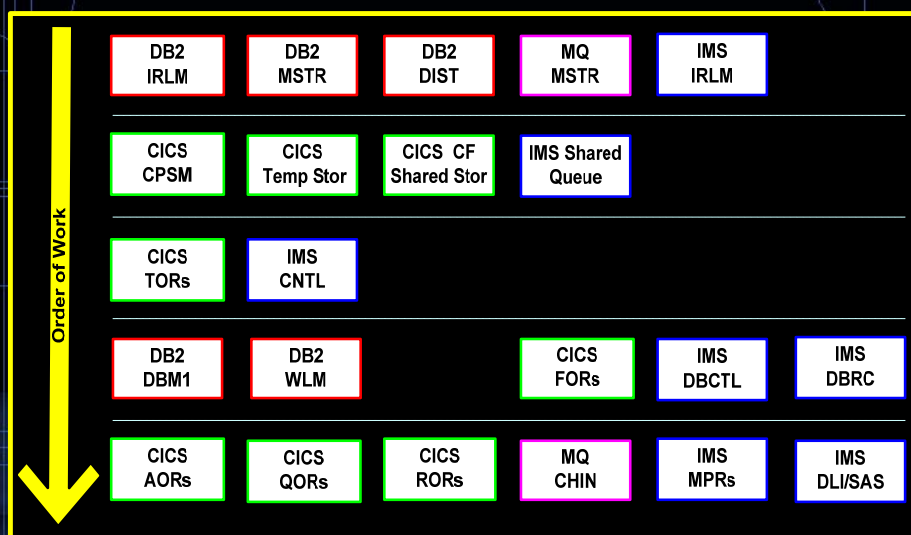


Transaction/Online STCs

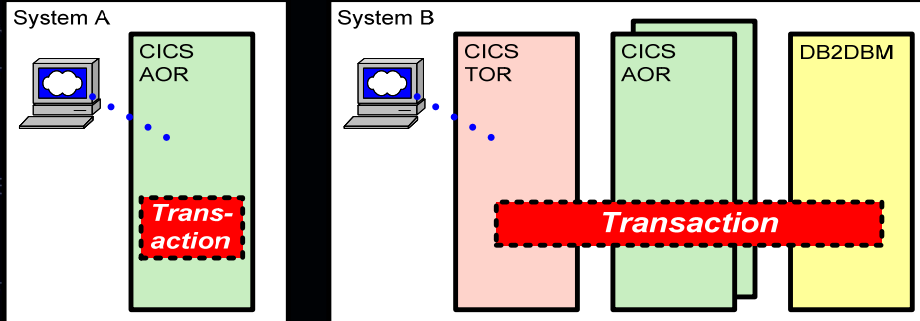
- Suggested Goal: Service Class ONLP_MD
IMP=2 or IMP=3 V=45% or V=50%
- Create additional Service Classes for less important regions (Print Owning Regions, for example) that may have long-running work that looks like Batch
- Non-Production Subsystems may be assigned to less aggressive goals.
- Suggested Goal: Service Class ONLD_HI
IMP=3 V=35% or V=40%
- Multiple Service Classes may be defined for different levels of work (Prod vs. Development, AOR vs. MRO Regions)



Transaction & DBMs Order of Work



CICS Environments

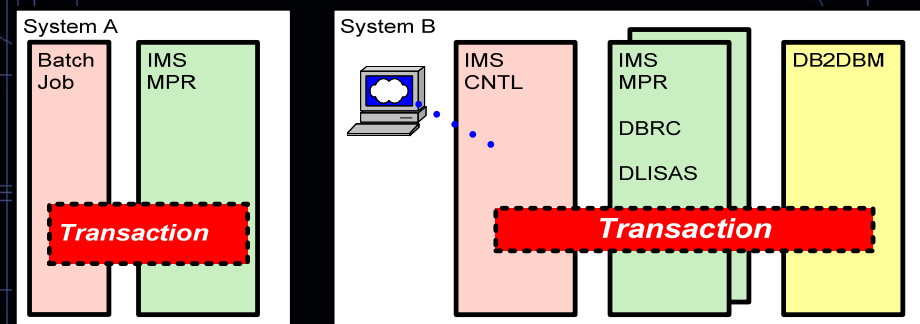


- Simple Environment: AORs only
- Complex Environment: MRO with multiple TORs, AORs, FORs, CP/SM, DBMs, et. al.
- Even More Complex: Both of the Above, Websphere Application Server, Websphere/MQ, Java

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IMS Environments



- Simple Environment: Batch Job
- Complex Environment: CNTL, MPRs, DLISAS, DBMs, DB/CTL, et. al.
- Even More Complex: Both of the Above, Websphere Application Server, Websphere/MQ, Java

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CICS/IMS Environments

- For Simple OR Complex Environments, define 1 set of Transaction Service Classes with attainable Goals
- For Simple AND Complex Environments, define 2 sets of Transaction Service Classes with attainable Goals- Do not mix the Environments in the same Service Class
- Provide separate Service Classes for Region Goals and Transaction Goals

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CICS/IMS Environments

<u>ServiceClass</u>	<u>Imp</u>	<u>Goal</u>	<u>Description</u>
PONL_RVH	2	V=60%	Very-High Priority Production Online Regions (CPSM, CICS Temp Storage, CICS CF Shared Storage, CICS ROR, IMS CQS)
PONL_RHI	2	V=55%	High-Priority Production Online Regions (CICS TORs, IMS CNTL)
PONL_RMD	3	V=45%	Medium-Priority Production Online Regions (CICS AORs, CICS QORs, IMS MPRs, IMS DLI, MQ CHIN)
PONL_RLO	4	V=35%	Low-Priority Production Online Regions (CICS AORs, CICS QORs, IMS MPRs, IMS DLI, MQ CHIN)
PONL_RVL	-/5	Discretionary or V=25%	Very-Low Priority Production Online Regions (CICS AORs with long-running trans.)
DONL_RVH	3	V=40%	Very-High Priority Non-Production Online Regions (CPSM, CICS Temp Storage, CICS CF Shared Storage, CICS ROR, IMS CQS)
DONL_RHI	3	V=35%	High-Priority Non-Production Online Regions (CICS TORs, IMS CNTL)
DONL_RMD	4	V=25%	Medium-Priority Non-Production Online Regions (CICS AORs, CICS QORs, IMS MPRs, IMS DLI, MQ CHIN)
DONL_RLO	5	V=15%	Low-Priority Non-Production Online Regions (CICS AORs, CICS QORs, IMS MPRs, IMS DLI, MQ CHIN)
DONL_RVL	-/5	Discretionary or V=10%	Very-Low Priority Non-Production Online Regions (CICS AORs with long-running trans.)

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CICS Environments

<i>ServiceClass</i>	<i>Imp</i>	<i>Goal</i>	<i>Description</i>
PCIS_THI	2	95% < 1 sec	High-Priority Production Single-Region CICS Transactions
PCIS_TMD	3	85% < 3 sec	Medium-Priority Production Single-Region CICS Transactions
PCIS_TLO	4	50% < 10 sec	Low-Priority Production Single-Region CICS Transactions
PCIM_THI	2	90% < 3 sec	High-Priority Production Multiple-Region CICS Transactions
PCIM_TMD	3	80% < 5 sec	Medium-Priority Production Multiple-Region CICS Transactions
PCIM_TLO	4	50% < 15 sec	Low-Priority Production Multiple-Region CICS Transactions

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Assessing Your World

- **Classification is only needed for the CICS TOR Regions and IMS Control Regions**
- **In the MRO Environment, Access is typically through the TOR and Control Regions**
- **You may need additional Classifications if access is available through an AOR or through Batch TMPs**
- **Transaction Qualification should be kept Simple and Straight forward- LESS is MORE**
 - ❖ High/Medium/Low Priority
 - ❖ Short/Medium/Long Transactions
- **Complex vs. Simple Transactions**
- **CPU vs. I/O Intensive Transactions should be Classified separately**
- **Reality Check: can you really achieve a 95% < .2 secs Goal, if Large Databases are involved, or multiple Regions are involved?**

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SAP R/3 Environments

- Previously difficult to manage
- 8 Enclaves mapped to specific SAP R/3 processes are established when the ICLI Server is started:
 - ❖ Batch, Dialog, Enqueue, Generic, Spool, Update, Update2, Unknown
- Isolate SAP Subsystem to unique Service Classes
- Define Single-Period Velocity Goals
- Useable Qualifiers are:
 - ❖ UI (ICLI Started Name)
 - ❖ TN (8 Transaction Names)
 - ❖ PK (Package Name, Database Attach Name)
 - ❖ SPM (Subsystem Parameter, Host Name)
 - ❖ PR (procedure Name, R/3 System Number)

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SAP R/3 Environments

ServiceClass	Imp	Goal	Description
PSAP_TVH	2	V=70%	Very-High Priority Production Online Transactions (Update2)
PSAP_THI	2	V=60%	High-Priority Production Online Transactions (Update, Dialog, Enqueue)
PSAP_TMD	3	V=50%	Medium-Priority Production Online Transactions (Batch)
PSAP_TLO	4	V=40%	Low-Priority Production Online Transactions (Spool, Generic)
PSAP_TVL	-	Discretionary	Very-Low Priority Production Online Transactions (Unknown)
DSAP_TVH	3	V=50%	Very-High Priority non-Production Online Transactions (Update2)
DSAP_THI	3	V=40%	High-Priority non-Production Online Transactions (Update, Dialog, Enqueue)
DSAP_TMD	4	V=30%	Medium-Priority non-Production Online Transactions (Batch)
DSAP_TLO	5	V=20%	Low-Priority non-Production Online Transactions (Spool, Generic)
DSAP_TVL	-	Discretionary	Very-Low Priority nonProduction Online Transactions (Unknown)

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SAP R/3 Environments

Subsystem-Type	Xref	Notes	Options	Help

Modify Rules for the Subsystem Type				Row 1 to 8 of 8
Command ==>				SCROLL ==> CSR
Subsystem Type . : SAP Fold qualifier names? Y (Y or N)				
Description . . . SAP R/3 Process Enclaves				
Action codes: A=After C=Copy M=Move I=Insert rule				
B=Before D=Delete row R=Repeat IS=Insert Sub-rule				
More ==>				
-----Qualifier-----				
Action	Type	Name	Start	-----Class-----
				Service Report
				DEFAULTS: PSAP_TVL RC_PSAP
___	1	UI	I CLIPROD ___	
___	2	TN	UPDATE2 ___	PSAP_TVH RC_PSAP
___	2	TN	UPDATE ___	PSAP_THI RC_PSAP
___	2	TN	DIALOG ___	PSAP_THI RC_PSAP
___	2	TN	ENQUEUE ___	PSAP_THI RC_PSAP
___	2	TN	BATCH ___	PSAP_TMD RC_PSAP
___	2	TN	SPOOL ___	PSAP_TLO RC_PSAP
___	2	TN	GENERIC ___	PSAP_TLO RC_PSAP

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CA-Datcom

- > Not WLM aware
- > Classify as High-Priority Online Region
- > Classify with Aggressive Goal (IMP=2, Velocity=50 or 60%)
- > Avoid using SYSSTC
- > On Very Busy Systems, Assign a High Importance, and CPU-Critical

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Websphere/MQ

- **Classify MQxxCHIN as a High-Priority Application Online Region**
- **Classify with Aggressive Goal (IMP=2, Velocity=50%)**
- **Classify MQxxMSTR in SYSSTC**



Database Management Introduction

This section discusses various aspects of Database Management Workloads in Workload Manager Goals Mode. You will see how these Workloads originate, guidelines for setting up, options for qualifying them, and best practices for defining the associated Service Classes.



Database Management Agenda

- **Database Management Origins and Categories**
- **Enclaves**
- **Prioritizing Database Management Units of Work**
- **Recommended Service Classes**
- **Qualifying Database Management Units of Work**



Database Management Origins

- **DB2 Subsystems Run as Started Tasks**
- **Many sites Run other Regions as JOBS**
- **Many sites run a combination**



Categories

- **DB2**
- **CA-IDMS**
- **Oracle, Oracle Gateway**



Data Base Management STCs

- **DB2 Subsystems and other DBMs (IMS DBCTL, CA-IDMS) should be placed in a Service Class with an aggressive goal**
- **DBMs are typically Server types of work**
- **Suggested Goal: Service Class DBMP_HI
IMP=2 V=55% or V=60%**
- **Assign DB2MSTR, DB2IRLM to SYSSTC**



What is that Enclave Thing?

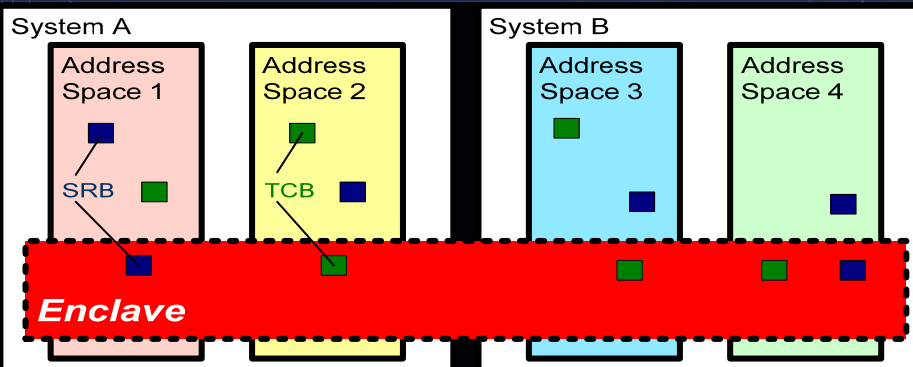
- Simply put, an Enclave is a Construct that represents a Business Unit of Work
- It is an Anchor used for Resource Accumulation by a Transaction, no matter where it executes
- It appears as the End-user's perception of a Transaction
- It can traverse many Server Address Spaces (even across Members of a Sysplex), and is managed Independently
- It is classified by the creating Subsystem, and can be assigned to a Service Class and/or a Report Class

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Enclave



➤ 2 Types of Enclaves

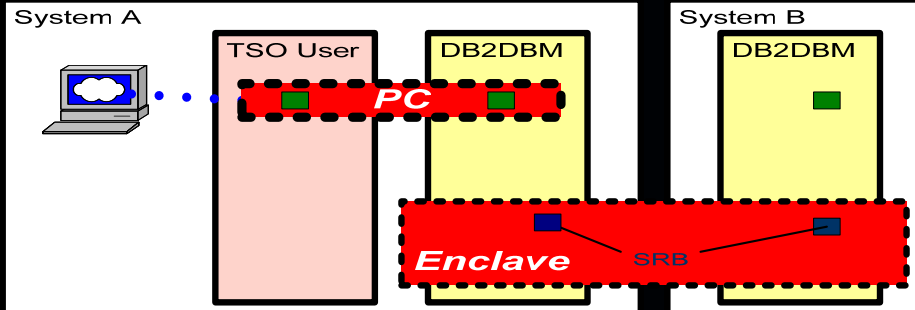
- ❖ **Dependent-** a continuation of a transaction already executing
- ❖ **Independent-** a new standalone transaction

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Dependent Enclave



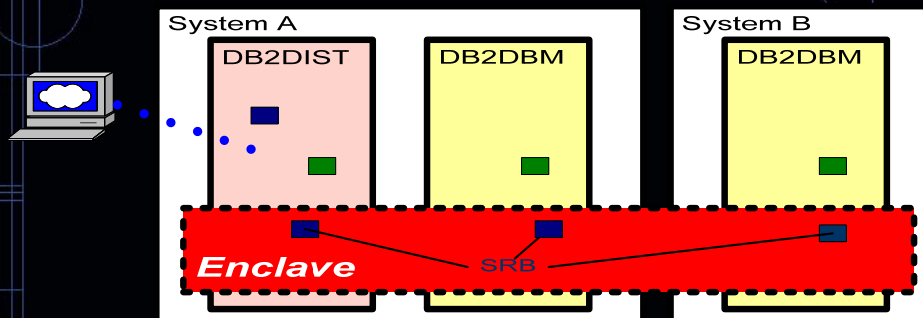
- TSO User issues a Database Call (PC) to DB2DBM
- DB2DBM creates the Dependent Enclave (to execute a SQL Query)
- TSO User Classification (and related Service Attributes) continues with the Enclave

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Independent Enclave



- DB2DIST recognizes DDF Request (Network) from Outside the System
- Creates the Independent Enclave
- Schedules Enclave SRB targeted to DB2DBM
- Needs to be Classified under DDF Subsystem (otherwise assigned to SYSOTHER)

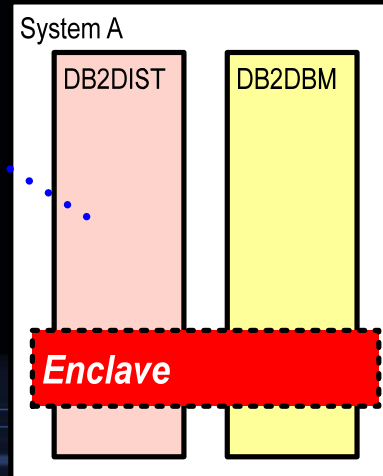
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DB2 DDF

- Define Multiple Service Classes as needed (Production, Development)
- Be sure to define a Default Service Class
- Define Multiple Periods to allow “quick” work to complete at a higher priority than “long” work



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DB2 DDF

ServiceClass	Imp	Goal	Description
PDDF_THI	2 3	P1 90% < 5 sec DUR=1000 P2 V=40%	High-Priority Production DataBase Management Enclaves (DB2 DIST)
PDDF_TMD	3 4	P1 80% < 5 sec DUR=1000 P2 V=30%	Medium-Priority Production DataBase Management Enclaves (DB2 DIST)
PDDF_TLO	3 4 -5	P1 80% < 5 sec DUR=1000 P2 V=30% DUR=10K P3 Discretionary or V=20%	Low-Priority Production DataBase Management Enclaves (DB2 DIST)
DDDF_THI	3 4	P1 80% < 5 sec DUR=1000 P2 V=30%	High-Priority Non-Production DataBase Management Enclaves (DB2 DIST)
DDDF_TMD	4 5	P1 50% < 10 sec DUR=1000 P2 V=20%	Medium-Priority Non-Production DataBase Management Enclaves (DB2 DIST)
DDDF_TLO	4 5 -	P1 50% < 10 sec DUR=1000 P2 V=20 DUR=10K P3 Discretionary	Low-Priority Non-Production DataBase Management Enclaves (DB2 DIST)

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DB2 Stored Procedures

- Established to help manage Distributed Data Access
- Established to help Performance of Distributed Data Access
- Used by Local Client Applications, Distributed Relational Database Architecture (DRDA), or remote DB2 Data Services
- Initially Implemented in a Single Address Space (DB2SPAS)
- Now Implemented in Multiple Address Spaces (DB2WLM) with Application Environments



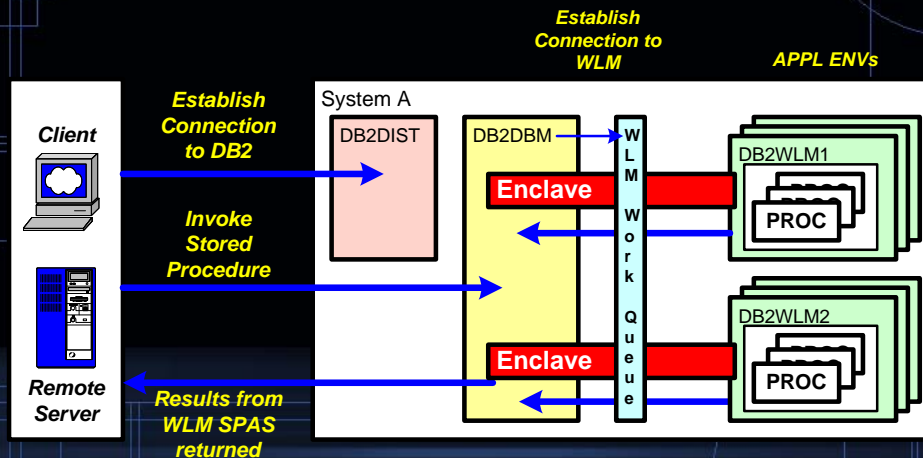
DB2 Stored Procedures

WLM-Managed Address Spaces

- Uses extended Enclave Support
- WLM assigns dispatching priorities based on Service Class Goals
- WLM manages the number of SPAS address spaces based on Service Class Goals (via APPLENVs)
- WLM manages the distribution of Stored Procedures to multiple address spaces based on business and performance needs



DB2 Stored Procedures Multiple Address Spaces



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DB2 Stored Procedures WLM-managed Address Spaces

- **Note: WLM creates at least 1 address space for each combination of APPL ENV and Service Class encountered. Example- 5 APPL ENVs with 3 unique Service Classes creates a minimum of 15 Address Spaces**
- **WLM manages Service Classes based on the originator of the Procedure Call (IMS, CICS, TSO, or DDF)**

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DB2 Stored Procedures Multiple Address Spaces

```
Application-Environment  Notes  Options  Help
-----
                          Create an Application Environment
Command ===> _____

Application Environment . . . DB2WLM1_____ Required
Description . . . . . WLM SPAS 1 for DB2 Subsystem____
Subsystem Type . . . . . DB2_ Required
Procedure Name . . . . . DB2WLM1_
Start Parameters . . . . . DB2SSN=DB2, NUMTCB=40, APPLENV=DB2WLM1_____

Limit on starting server address spaces for a subsystem instance:
1  1. No limit
   2. Single address space per system
   3. Single address space per sysplex
```



DB2 Parallel Sysplex Query

- Reduces the Elapsed Time for long-running Queries
 - ❖ May be I/O Intensive (scanning large amounts of data)
 - ❖ May be CPU Intensive (sorts, multiple table joins, grouping, ordering, etc.)
- Requires DB2 Data Sharing



DB2 Parallel Sysplex Query

- The Query (such as `Select * CustINFO`) beings on a DB2 COORDINATOR subsystem
- The Query may be sent to any number of DB2 Assistant subsystems
- A given DB2 Subsystem may assume the role of Coordinator or Assistant from Query to Query

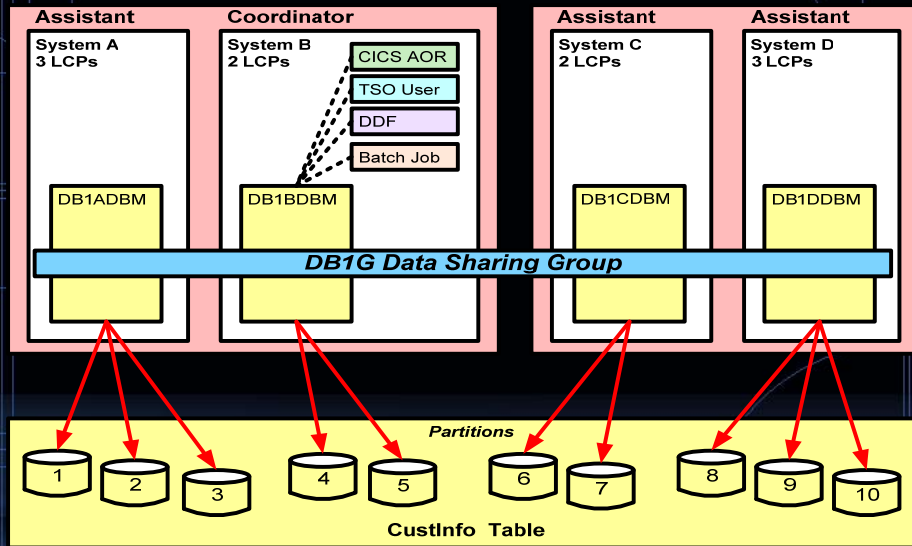


DB2 Parallel Sysplex Query

- The part of the Query running on the Coordinator Subsystem runs as a Dependent Enclave
- The originator of the Query (CICS, TSO, DDF, Batch) determines the Service Class of the Query
- The part of the Query running on the Assistant Subsystems run as an Independent Enclave
- The Query is classified under the DB2 Subsystem
- The Subsystem Qualifiers are defined based on the Query's originating Subsystem (example: UI and AI are valid for TSO Queries)
- The assigned Service Class may be the same for both Coordinator and the Assistant



DB2 Parallel Sysplex Queries



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DB2 Parallel Sysplex Queries

ServiceClass	Imp	Goal	Description
TSO_HI	2 4	P1 90% < 1 sec DUR=1000 P2 V=40%	High-Priority TSO, Trivial High-Priority TSO, Non-Trivial
TSO_MD	2 4	P1 90% < 2 sec DUR=1000 P2 V=30%	Medium-Priority TSO, Trivial Medium-Priority TSO, Non-Trivial
TSO_LO	2 4 -	P1 90% < 2 sec DUR=1000 P2 V=30% DUR=10K P3 Discretionary	Low-Priority TSO, Trivial Low-Priority TSO, Non-Trivial Low Priority TSO, Long
DBAT_WPQ	3 4 -	P1 80% < 5 sec DUR=10K P2 V=30% DUR=100K P3 Discretionary	Development Parallel DB2 Query Jobs- WLM INITs
PBAT_WPQ	2 3 -4	P1 90% < 5 sec DUR=10K P2 V=30% DUR=100K P3 Discretionary or V=20%	Production Parallel DB2 Query Jobs- WLM INITs

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DB2 Parallel Sysplex Queries

<u>Subsystem=DB2</u>	<u>SI=CICS</u>	<u>SI=DDF</u>	<u>SI=JES</u>	<u>SI=TSO</u>
Account Information (AI)			Y	Y
Collection Name (CN)		Y		
Collection Type (CT)		Y		
Correlation Information (CI)		Y		
Package Name (PK)		Y		
Procedure Name (PR)		Y		
Plan Name (PN)		Y		
Transaction /Job Class (TC)			Y	
Transaction/Job Name (TN)	Y		Y	
UserID (UI)	Y		Y	Y

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DB2 Parallel Sysplex Queries

Modify Rules for the Subsystem Type Row 1 to 5 of 5
 Command ==> _____ SCROLL ==> CSR

Subsystem Type . . : TSO Fold qualifier names? Y (Y or N)
 Description . . . : TSO Interactive Environments

Action codes: A=After C=Copy M=Move I=Insert rule
 B=Before D=Delete row R=Repeat IS=Insert Sub-rule

More ==>

Action	-----Qualifier-----			-----Class-----	
	Type	Name	Start	Service	Report
_____ 1	UI	PDBA*	_____	DEFAULTS: TSO_MD	RC_TSO
_____ 1	UI	PUSER*	_____	PBAT_WPQ	_____
_____ 1	UI	GUSER*	_____	PBAT_WPQ	_____
_____ 2	AI	PSQL100*	_____	DBAT_WPQ	_____
_____ 1	UI	PUSER*	_____	PBAT_WPQ	_____
_____ 1	UI	PUSER*	_____	PBAT_WPQ	_____

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DB2 Parallel Sysplex Queries

```

Modify Rules for the Subsystem Type      Row 1 to 13 of 13
Command ==> _____ SCROLL ==> CSR

Subsystem Type . . : DB2          Fold qual ifier names?  Y (Y or N)
Description . . . : DB2 Appli cati on Envi ronments

Action codes:  A=After      C=Copy      M=Move      I=Insert rule
                B=Before    D=Delete row R=Repeat  IS=Insert Sub-rule
                More ==>

Action  -----Qual ifier-----          -----Cl ass-----
Type   Name      Start          Service      Report
-----
_____ 1 PR      PDAGWLM* _____  DEFAULTS:  DBDI STMD  RC_SERV
_____ 1 PR      PDBGWLM* _____  DBDI STHI  RC_APPA
_____ 1 PR      DDAGWLM* _____  DBDI STMD  RC_APPB
_____ 1 PR      DDBGWLM* _____  DBDI STHI  RC_APPA
_____ 1 SI      CICS           _____  DBDI STMD  RC_APPB
_____ 2 TN      PCICS*         _____  DBAT_WPQ   _____
_____ 1 SI      TSO            _____  DBAT_WPQ   _____
_____ 2 UI      PDBA*          _____  PBAT_WPQ   _____
_____ 2 UI      PUSER*         _____  PBAT_WPQ   _____
_____ 1 SI      JES            _____  DBAT_WPQ   _____
_____ 2 TC      P              _____  PBAT_WPQ   _____
_____ 1 SI      DDF            _____  DBAT_WPQ   _____
_____ 2 PN      PPQ*          _____  PBAT_WPQ   _____
    
```

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CA-IDMS, Oracle, Oracle Gateway

- Not WLM aware
- Classify as High-Priority Database Management Subsystem
- Classify with Aggressive Goal (IMP=2, Velocity=60 or 70%)
- Avoid using SYSSTC
- On Very Busy Systems, Assign a High Importance and CPU-Critical

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Other Transaction-like Environments

- **Websphere Application Server**
- **Websphere/MQ Workflow**



NetView Environments

- **Previously un-managed**
- **Available for NetView Subtasks and System Automation (SA) Subtasks (Tivoli NetView for z/OS)**
- **NetView Subtasks created as Enclaves if enabled at startup**
 - ❖ **If enabled at startup, and not classified, defaults to SYSOTHER**
- **Define Single-Period Velocity Goals**
- **Define SA Subtasks at a higher Velocity and Importance than NetView Subtasks**
- **Useable Qualifiers are LU, PRI, SI, TC, TN and UI**



NetView Environments

<u>ServiceClass</u>	<u>Imp</u>	<u>Goal</u>	<u>Description</u>
PNET_THI	2	V=60%	High-Priority Production System Automation (SA) Transactions
PNET_TMD	3	V=50%	Medium-Priority Production NetView Transactions
DNET_THI	3	V=40%	High-Priority non-Production System Automation (SA) Transactions
DNET_TMD	4	V=30%	Medium-Priority non-Production NetView Transactions

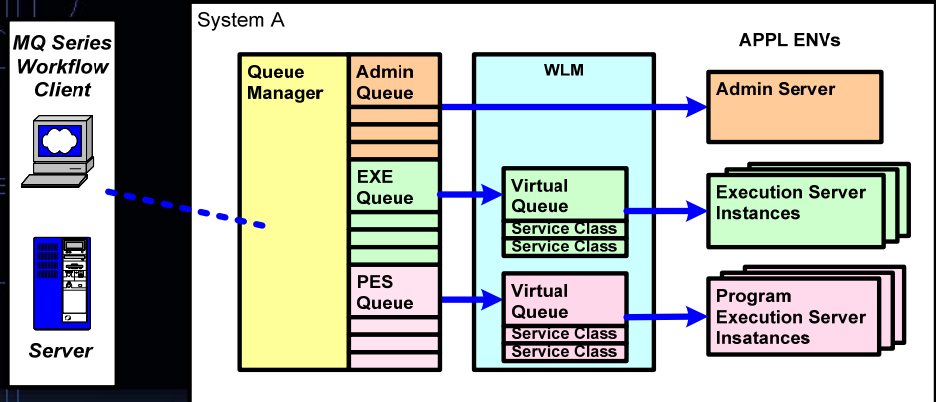


MQ Series Workflow

- **Business Process Management System**
- **Works in conjunctions with WebSphere**
- **Uses WLM to:**
 - ❖ **Dynamically manage Workflow Server Instances (via APPL ENVs)**
 - ❖ **Classify Queued Workflow Requests**
- **Service Definitions can be defined for:**
 - ❖ **Administrative Server**
 - ❖ **Execution Server Instances**
 - ❖ **Program Execution Server Instances**



MQ Series Workflow



- Server Regions managed by WLM via APPL ENVs (Type=MQ)
- MQ Qualifiers are Priority (PRI), Process Name (PC), Subsystem Instance (SI), Subsystem Parameter (SPM), Transaction Class (TC), Transaction Name (TN), UserID (UI)

MQ Series Workflow

ServiceClass	Imp	Goal	Description
PMQW_THI	2	90% < 5 sec or V=60%	High-Priority MQ Production Application Enclaves
PMQW_TMD	3	V=50%	Medium-Priority MQ Production Application Enclaves
PMQW_TLO	4	V=30%	Low-Priority MQ Production Application Enclaves
DMQW_THI	3	80% < 10 sec or V=40%	High-Priority MQ Development Application Enclaves
DMQW_TMD	4	V=20%	Medium-Priority MQ Development Application Enclaves
DMQW_TLO	-	Discretionary	Low-Priority MQ Development Application Enclaves

MQ Series Workflow

```

Modify Rules for the Subsystem Type      Row 1 to 2 of 2
Command ==> _____ SCROLL ==> CSR

Subsystem Type . : MQ                    Fold qualifier names?  Y (Y or N)
Description . . . MQ Series Workflow APPLENVs Enclaves

Action codes:  A=After      C=Copy      M=Move      I=Insert rule
                B=Before    D=Delete row R=Repeat  IS=Insert Sub-rule
                More ==>

-----Qualifier-----
Action  Type      Name      Start
-----
  1 TN      FMCIPGST
  1 TN      FMC*

-----Class-----
Service      Report
DEFAULTS:  DMQW_LO  RC_SERV
           PMQW_HI  RC_SERV
           PMQW_MD  RC_SERV
    
```



MQ Series Workflow

APPLENV Name	Subsys Type	Proc Name	Start Parms	Server Limit
PMQWFEXE	MQ	PMQWFSRV	WLMAE=PMQWFEXE, WLMSN=&IWMSSNM, SRVEP=FMCEMAIN,SRVNO=1	No Limit
PMQWFPES	MQ	PMQWFSRV	WLMAE=PMQWFPES/25/1, WLMSN=&IWMSSNM, SRVEP=FMCMXMAIN,SRVNO=1	No Limit
DMQWFEXE	MQ	DMQWFSRV	WLMAE=DMQWFEXE, WLMSN=&IWMSSNM, SRVEP=FMCEMAIN,SRVNO=1	No Limit
DMQWFPES	MQ	DMQWFSRV	WLMAE=DMQWFPES/25/1, WLMSN=&IWMSSNM, SRVEP=FMCMXMAIN,SRVNO=1	No Limit



Conclusion

- **Sites are using more Program Products and Product Functions that exploit WLM functionality**
- **Need to understand how Complex Product Integration relates to WLM involvement**
- **Need to revisit Service Policy on a periodic basis**



References

- **Publications**
 - ❖ Planning: Workload Management
 - ❖ WLM Implementation and Exploitation
 - ❖ "Planning" and "Administration" Guides for CICS, DB2, IMS, MQ, USS, WAS
 - ❖ "Reference" Guides for JES2, JES3
 - ❖ Initialization and Tuning Reference
 - ❖ Red Books, White Papers
- **Web Sites**
 - ❖ www.ibm.com/s390/wlm
 - ❖ www.share.org
- **Presentations**
 - ❖ Share Presentations: What's New in RMF? What's New in WLM?
- **Classes**
 - ❖ Peter Enrico's "Advanced z/OS Workload Manager and Re-evaluation of Goals"
- **Health Checks and Assessments**
 - ❖ Norman Hollander's Performance Health Check, and Workload Manager Health Check

