

z/OS Workload Management Update for z/OS V1.11 and V1.12

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August 2, 2010

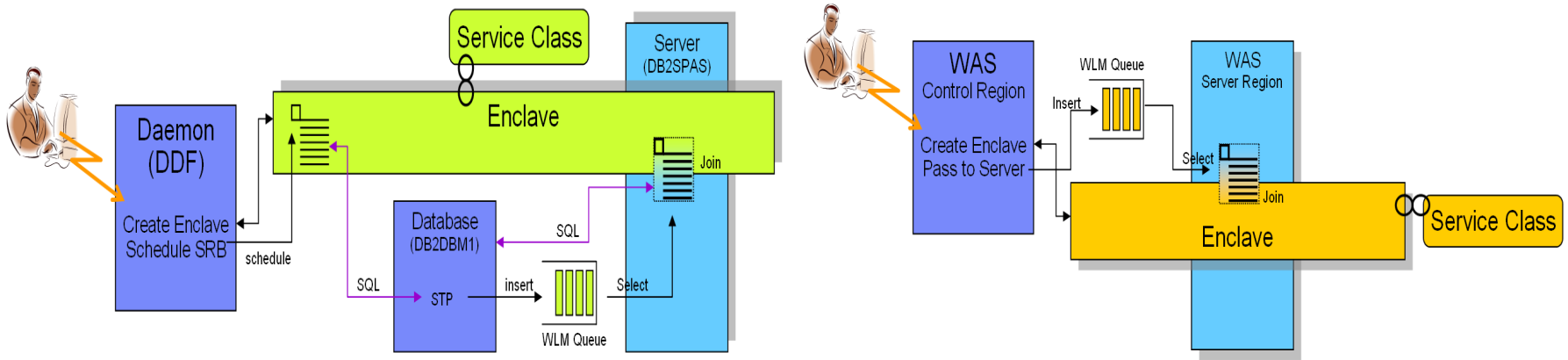


Agenda



- Enclave Enhancements
 - Enclave Server Management
 - Work-Dependent Enclaves
- WLM Management
 - LDAP Support
 - Resource Group Enhancements
 - Do not always honor Skip Clock in Policy Adjustment
- WLM Reporting
 - Extend Number of Report Classes
 - Additional Group Capacity Information in RMF
- Externalized IEAOPT Information
- Hyperdispatch APAR
- WLM support for IBM zEnterprise 196
- z/OSMF Workload Management
- WLM support for zManager
- WLM Tools Overview

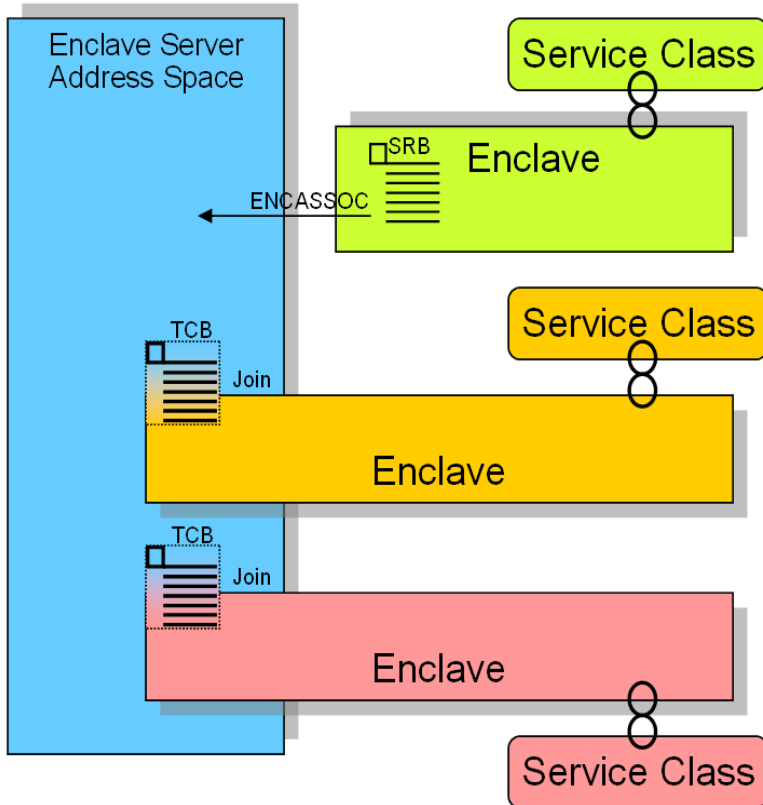
WLM Enclaves – An Overview



- An **enclave** is a transaction that can span multiple dispatchable units (SRBs and tasks) in one or several address spaces and is reported on and managed as one unit
- The enclave is managed separately from the address spaces it runs in
 - CPU and I/O resources associated with processing the transaction represented by the enclave are managed by the transaction's performance goal
 - Storage (MPL level, paging) of the address space is managed to meet the goals of the enclaves it serves (if enclave server address space) or to the performance goal of the address space (if no server address space)

WLM Enclave Server Address Spaces

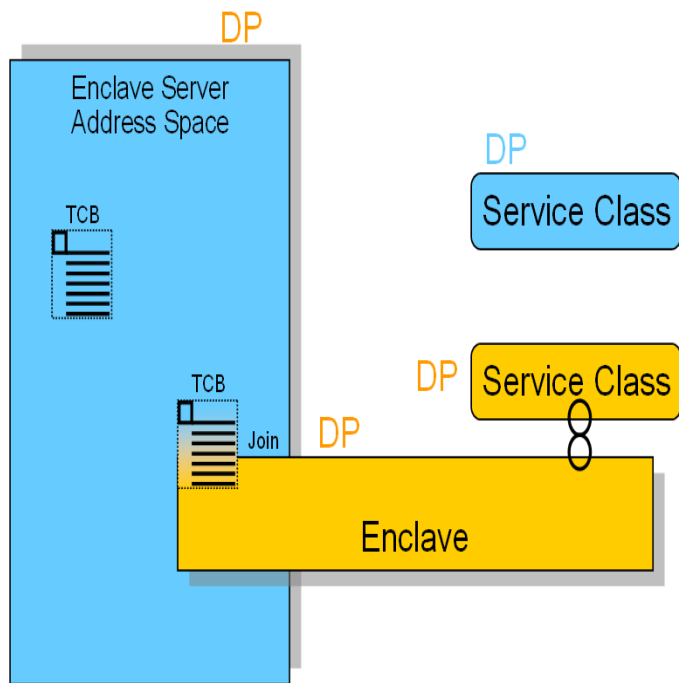
A Short Retrospective



- An address space becomes an enclave server when
 - An enclave SRB issues SYSEVENT ENCASSOC
 - A TCB of the address space joins an enclave, and does not specify ENCLAVESERVER=NO (which is typically not the case)
- Assumption (Programming Model)
 - All work being executed within the address space is related to enclaves
 - That means
 - There is no significant amount of work (TCBs) executing in such address spaces which is not related to enclaves
- Enclave Server Management
 - CPU and I/O DP is derived from service class of most important enclave
 - Meaning: No CPU and I/O management exists for these server address spaces
 - Storage management is done to meet the served enclave's goals

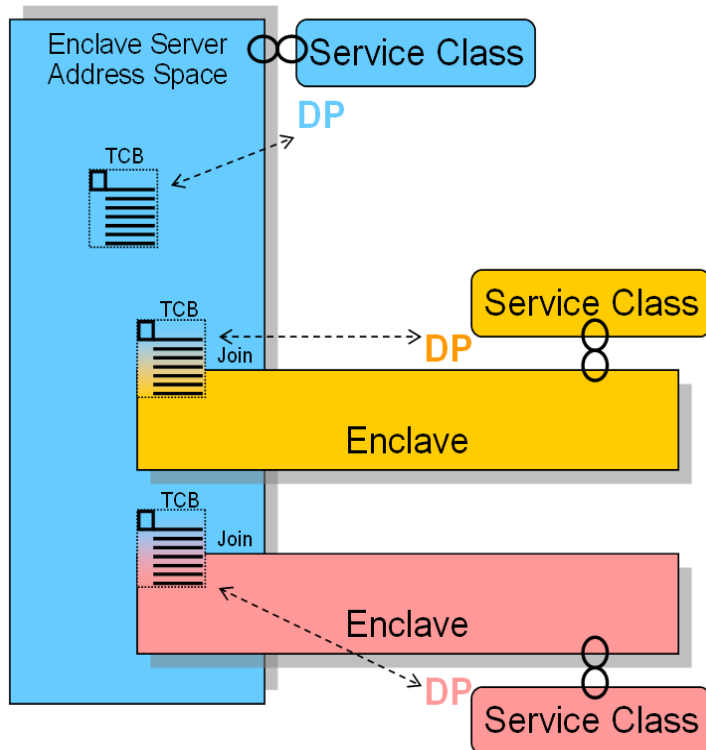
WLM Enclave Server Management

Is There a Possible Problem?



- What if the programming model does not hold true?
 - What happens if there is significant work running in TCBs not associated with enclaves?
 - Example: Garbage collection for a JVM (WAS)
 - Example: Common routines which provide service for the enclave TCBs
 - Is it sufficient to manage this work in the same way as the enclaves?
- What happens if no enclaves are running in server address spaces ?? (this applies to queue servers only)
 - And the address space is swapped out?
 - A mechanism exists to swap in the address space but this mechanism assumes that the swap in is only for a queue server task which wants to select a unit of work and then joins the enclave. If no enclave is joined, the address space is again swapped out
 - And even if the address space stays swapped in?
 - The TCBs running within the address space just stay with the DP and IOP from the last enclave being associated with the address space
 - No CPU or I/O adjustment is performed

WLM Enclave Server Management Changes with z/OS 1.12

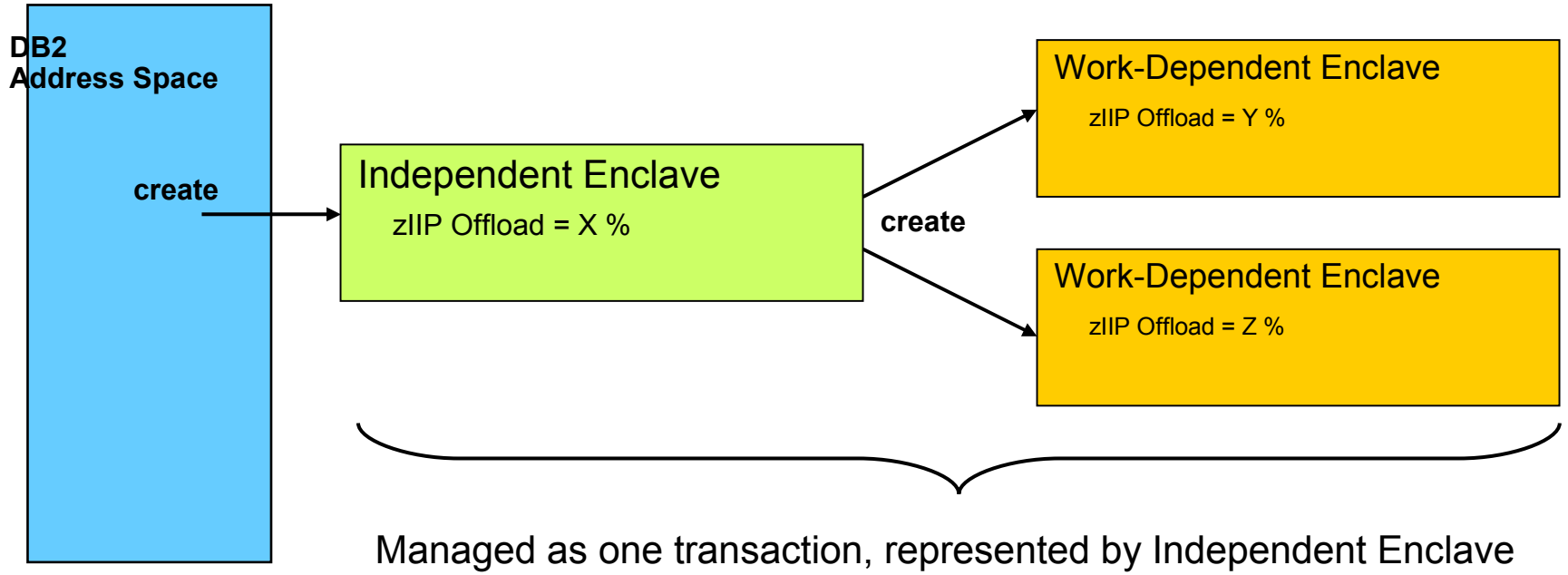


- New IEAOPT Parameter
 - ManageNonEnclaveWork = {No|Yes}
 - Default: No (no change to previous releases)
 - Causes everything in the address space, which is not associated to an enclave, to be managed towards the goals of the external Service Class to which the address space has been classified to
- Advantages
 - Enclave (Queue) server address spaces in which no enclave is running will be managed as usual address spaces
 - The importance and goal of the service class for the address space now has a meaning
- Note: With ManageNonEnclaveWork =Yes the importance and goal of the service class for the address space is more important than it used to be
 - Verify goal settings for server address spaces

Work-Dependent Enclaves

- Background
 - zIIPs allow middleware components to run a certain percentage of their work “offloaded” from regular processors
 - The offload percentage is an attribute of the enclave under which the unit of work runs
 - The offload percentage is defined by the middleware component via a (not generally published) WLM interface
- Limitations
 - It is not possible to specify different offload percentages for different units of work running under the same enclave
- Intended Use Case
 - DB2/DDF wants to specify different offload percentages for the different units of work of a parallel query,
 - AND still wants to maintain the transactional context to run the units of work under the same “SRM Transaction” (enclave)

Work-Dependent Enclaves



- Solution

Implement a new type of enclave named "Work-Dependent" as an extension of an Independent Enclave. A Work-Dependent enclave becomes part of the Independent Enclave's transaction but allows to have its own set of attributes (including zIIP offload percentage)

Work-Dependent Enclaves

Reporting in SDSF Enclave Panel and RMF Monitor III

```

Display Filter View Print Options Search Help
-----
SDSF ENCLAVE DISPLAY SYS1 ALL LINE 1-8 (8)
COMMAND INPUT ==> █ SCROLL ==> CSR
PREFIX=* DEST=(ALL) OWNER=* SYSNAME=SYS1
NP NAME Status Type SrvClass Per RptClass CPU-Time OwnerAS Re
28000000006 ACTIVE IND VEL_1 1 RC_2 0.00 36
2C000000008 ACTIVE WDEP VEL_1 1 RC_2 0.83 36
30000000007 ACTIVE WDEP VEL_1 1 RC_2 0.83 36
34000000009 ACTIVE WDEP VEL_1 1 RC_2 0.83 36
3800000000A ACTIVE WDEP VEL_1 1 RC_2 0.83 36
3C00000000B ACTIVE WDEP VEL_1 1 RC_2 0.83 36
24000000002 INACTIVE DEP SYSSTC 1 RC_0 0.00 22
20000000001 INACTIVE DEP SYSTEM 1 RC_0 0.00 7
  
```

```

RMF V1R12 Enclave Report
Command ==> █
Samples: 100 System: SYS1 Date: 02/23/10 Time: 03.06.40
Current options: Subsystem Type: ALL
                  Enclave Owner:
                  Class/Group:
  
```

Enclave	Attribute	CLS/GRP	P	Goal	% D X	EAppl%	TCPU
*SUMMARY						0.812	
ENC000006		VEL_1	1		5 W	0.163	2.530
ENC000002		VEL_1	1		5 W	0.163	2.532
ENC000004		VEL_1	1		5 W	0.162	2.528
ENC000005		VEL_1	1		5 W	0.162	2.519
ENC000003		VEL_1	1		5 W	0.162	2.518
ENC000001		VEL_1	1		5 W	0.000	0.007

F1=help F2=SPLIT F3=
 F7=UP F8=DOWN F9=
 MA c

Enclave Enhancements: Availability

Function	z/OS V1.12	z/OS V1.11	z/OS V1.10	Older Releases
Non Shell Server Management	+			
Work-dependent Enclaves	+	+	OA26104	OA26104 → z/OS 1.8

- Non Shell Server Management
 - New OPT Parameter ManageNonEnclaveWork=YES/NO. Default is NO, meaning the function is not yet enabled
- Work-Dependent Enclaves
 - New function available with WLM APAR OA26104
 - DB2 exploitation with APAR PK76676
 - SDSF support with APAR PK74125
 - RMF support with z/OS 1.11

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WLM Management: LDAP Subsystem is supported

	LDAP
Accounting Information	
Collection Name	
Connection Type	
Correlation Information	
EWLM Service Clas	
EWLM Transaction Class	
LU Name	
Netid	
Package Name	
Perform	
Plan Name	
Priority	
Procedure Name	
Process Name	
Scheduling Environment Name	
Subsystem Collection Name	
Subsystem Instance	●
Subsystem Parameter	
Sysplex Name	●
System Name	
Transaction Class/Job Class	
Transaction Name/Job Name	●
Userid	

- Work requests include all work processed by the z/OS LDAP server
- Supported Work Qualifiers
 - Subsystem Instance (SI)
The z/OS LDAP server's job name. Needed to distinguish between different LDAP servers
 - Transaction Name/Job Name (TN)
The z/OS LDAP server's enclave transaction name. "GENERAL" for all LDAP work that is not assigned a user-defined exception class. Any transaction name that is also defined in the configuration file of the directory server
- For further information see
z/OS IBM Tivoli Directory Server Administration and Use for z/OS (SC23-5191-XX)

WLM Management:

Subsystems supported by the WLM Administrative Application

	A S C H	C B	C I C S	D B 2	D D F	E W L M	I M S	W E B	J E S	L D A P	S F M	M Q	N E T V	O M V S	S O M	S T C	T C P	T S O	S Y S H
Accounting Information	●			●	●				●					●		●		●	
Collection Name		●		●	●										●				
Connection Type				●	●														
Correlation Information				●	●														
EWLM Service Class						●													
EWLM Transaction Class																			
LU Name			●	●	●		●						●						
Netid				●	●		●												
Package Name				●	●														
Perform				●				●								●		●	
Plan Name				●	●														
Priority				●				●				●	●						
Procedure Name				●	●							●							
Process Name				●	●							●							
Scheduling Environment Name				●				●											
Subsystem Collection Name				●	●			●											
Subsystem Instance		●	●	●	●		●	●	●	●	●	●	●				●		
Subsystem Parameter				●	●			●				●			●	●			
Sysplex Name	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●
System Name	●													●		●		●	●
Transaction Class/Job Class	●	●		●			●	●	●		●	●							
Transaction Name/Job Name	●	●	●	●			●	●	●	●	●	●	●			●	●		
Userid	●	●	●	●	●		●	●	●			●	●	●	●	●		●	

Not relevant anymore

Latest supported subsystems

WLM Management: Do Not Always Honor “Skip Clock”

- What is the skip clock ?
 - If WLM cannot help a service class it sets a skip clock to not assess it in the next 3 policy adjustment cycles
 - This is done for efficiency reasons and to help other work
- Is this always a good thing to do ?
 - Usually yes!
 - But if only very few service classes miss their goals it is not beneficial to no longer assess a service class for 3 consecutive policy adjustment cycles
 - Especially when it might be possible to help the work with IRD Weight Changes. In this event the situation on another LPAR can change and might make it possible to help a service class in the next policy adjustment cycle
- Solution introduced with z/OS 1.11



The skip clock will no longer be honored if 5 or less service class periods do not meet their performance objectives.

WLM Management Availability

Function	z/OS V1.12	z/OS V1.11	z/OS V1.10	Older Releases
New Resource Groups (Type 2 and Type 3)	+	+	+	z/OS 1.8
8 digit resource group minimum and maximum (for Type 1)	+	OA29704	OA29704	
Change in skip clock processing	+	+		
LDAP Support	+	+		

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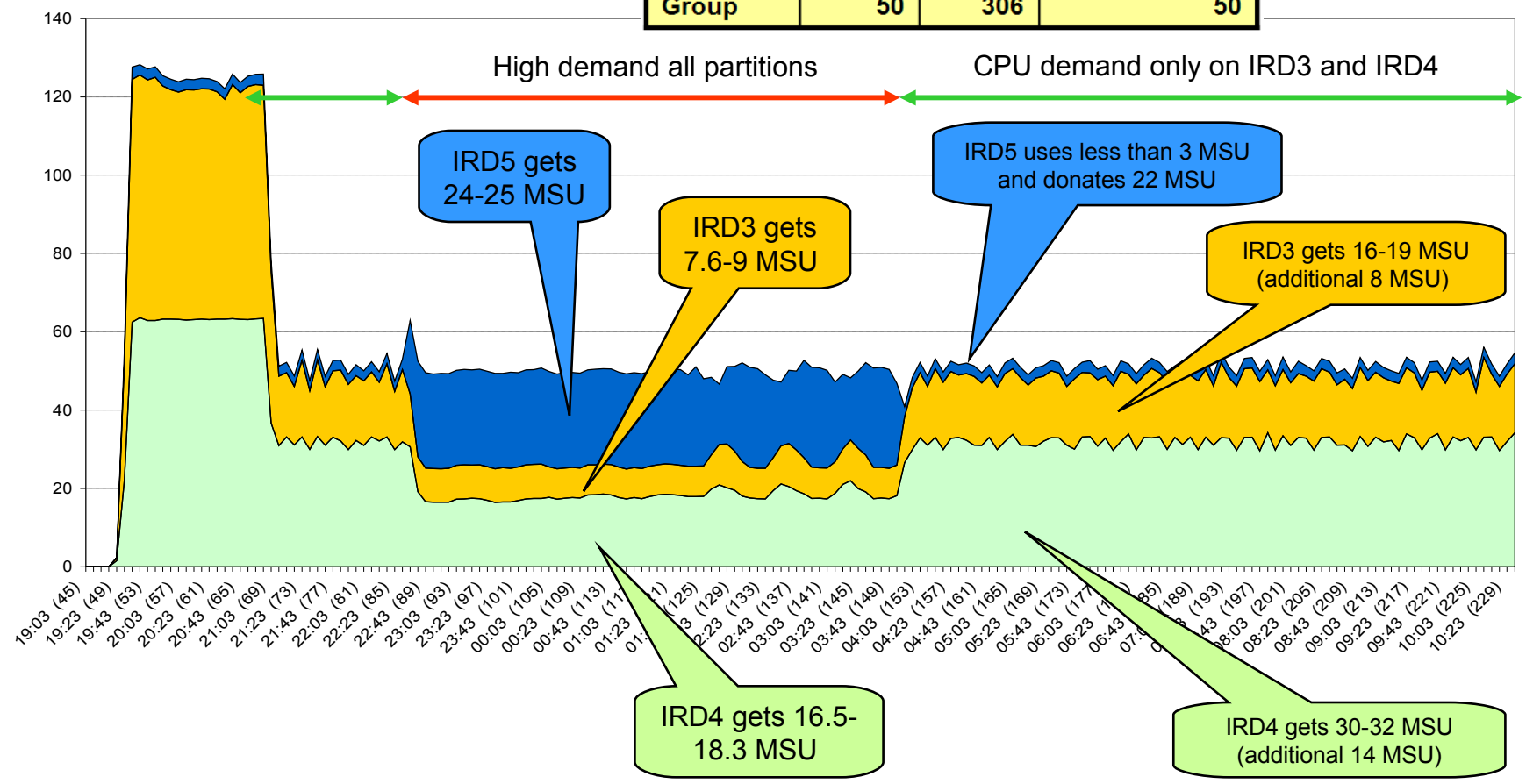


Group Capacity: Summary

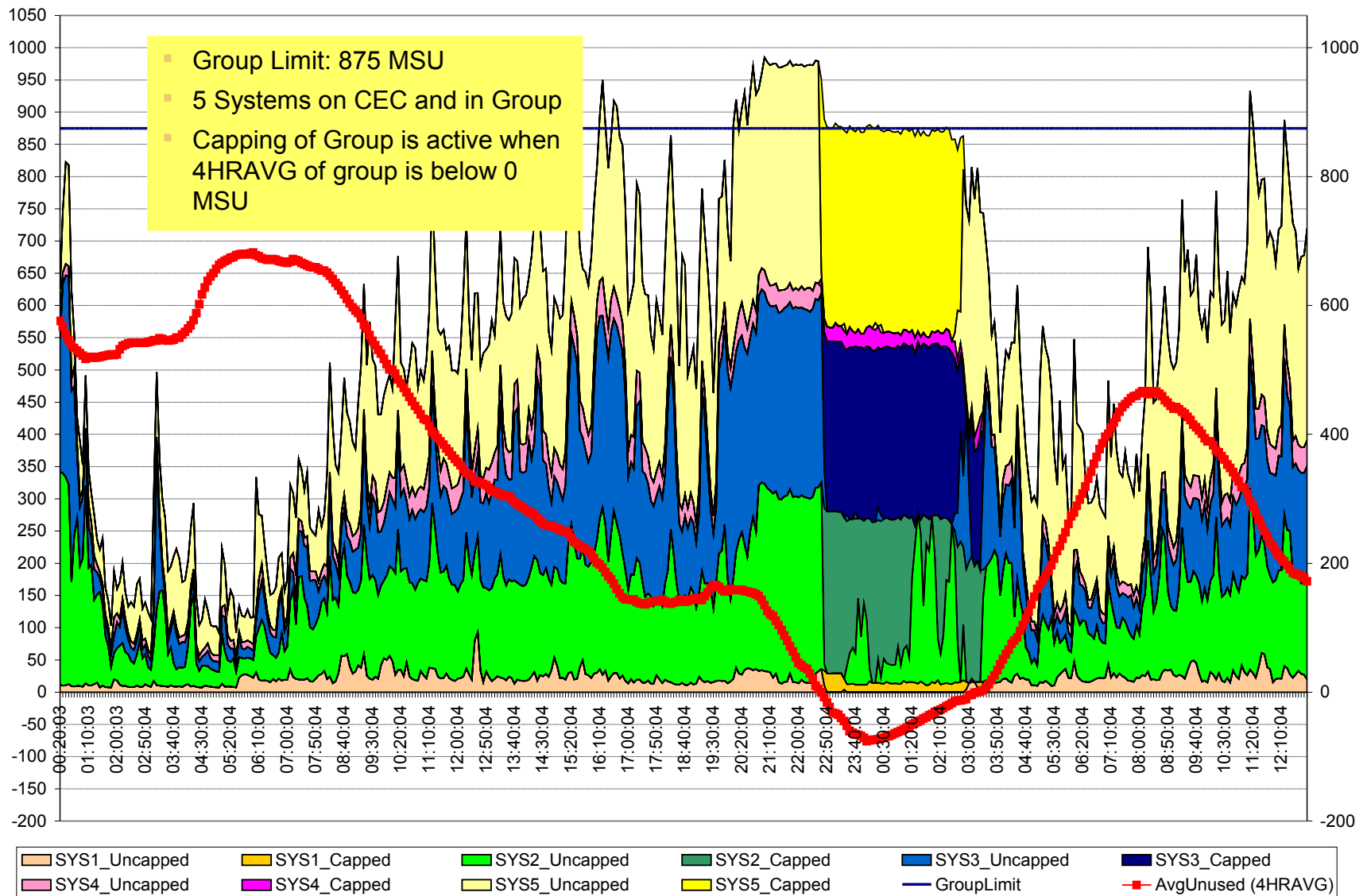
- Is based on defined capacity
 - Each partition obtains information for the other partitions of the group from PR/SM
 - Calculates the group consumption and whether the group should be capped
 - If the group becomes subject to capping
 - The partition calculates whether it is above or below of its entitlement
 - If it is above its entitlement the partition must apply capping (phantom weight or cap pattern)
- The entitlement of a partition is its share based on its weight within the group (named target MSU)
 - In addition if not all partitions use their entitlement the partition can obtain unused MSUs
 - The partition can always use its target MSU value assuming the overall LPAR definitions allow it
- Group Capacity and Defined Capacity can be combined
 - The z/OS system will always honor the smaller of both capacity limits
- It is possible to define multiple capacity groups on a CEC
 - A partition can only belong to one group
- Working with IRD CPU Weight Management
 - Defined and Group Capacity work with IRD but Weight Changes are only possible for partitions which are not being capped (or subject to capping)
- Restrictions: Defined and Group Capacity
 - A partition must not be defined with dedicated processors
 - The partition must be defined with shared processors and WAIT Completion = NO
 - Initial Capping must not be defined
 - z/OS must not run as a VM guest
- PR/SM capping works within $\pm 3.6\%$ from the defined capping value

Group Capacity: Demo Scenario

Partition	Limit	Weight	Target MSU
IRD3	n/a	52	~8.5
IRD4	n/a	102	~16.7
IRD5	n/a	152	~24.8
Group	50	306	50



Group Capacity: Customer Example

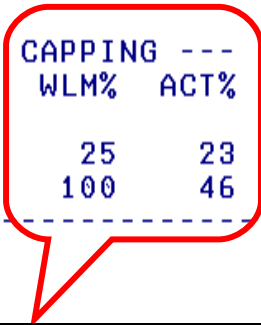


RMF z/OS 1.11 Enhancements for Group Capacity...

GROUP CAPACITY REPORT

z/OS V1R11 SYSTEM ID TRX1 DATE 02/26/2009 INTERVAL 05.00.000
 RPT VERSION V1R11 RMF TIME 11.00.00 CYCLE 1.000 SECONDS

GROUP-CAPACITY NAME	LIMIT	PARTITION	SYSTEM	-- MSU --		WGT	--- CAPPING ---	ENTITLEMENT -			
				DEF	ACT			DEF	WLM%	ACT%	MINIMUM
RMFGRP	60	TRX1	TRX1	100	4	400	NO	25	23	40	60
	3	TRX2	TRX2	100	13	200	NO	100	46	20	60
----- TOTAL					17	600					

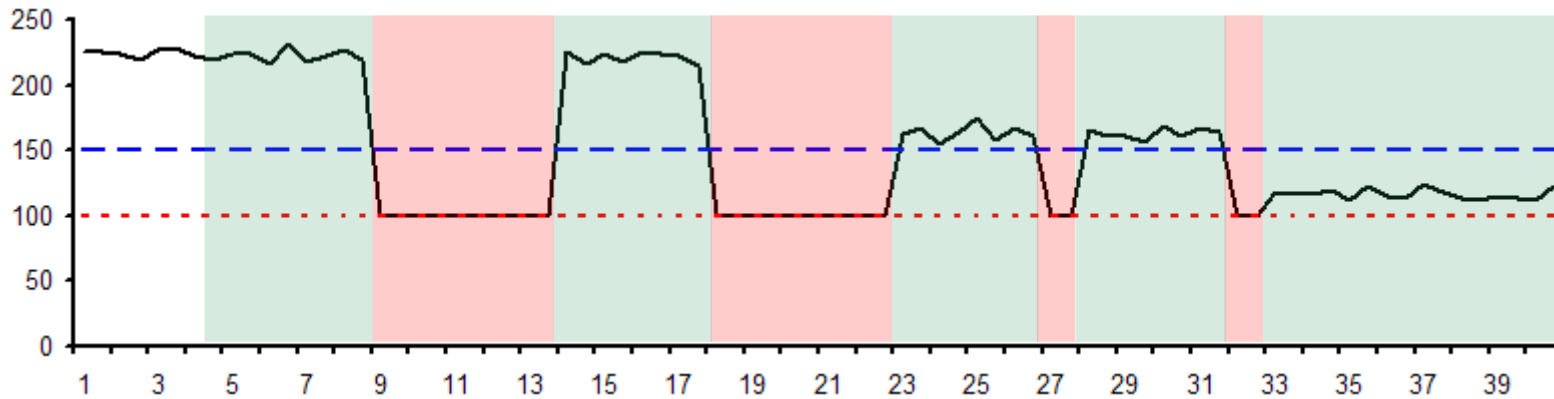


Field Heading	Meaning
CAPPING WLM%	Percentage of time when WLM considers to cap the partition
CAPPING ACT%	Percentage of time when capping actually limited the usage of processor resources for the partition

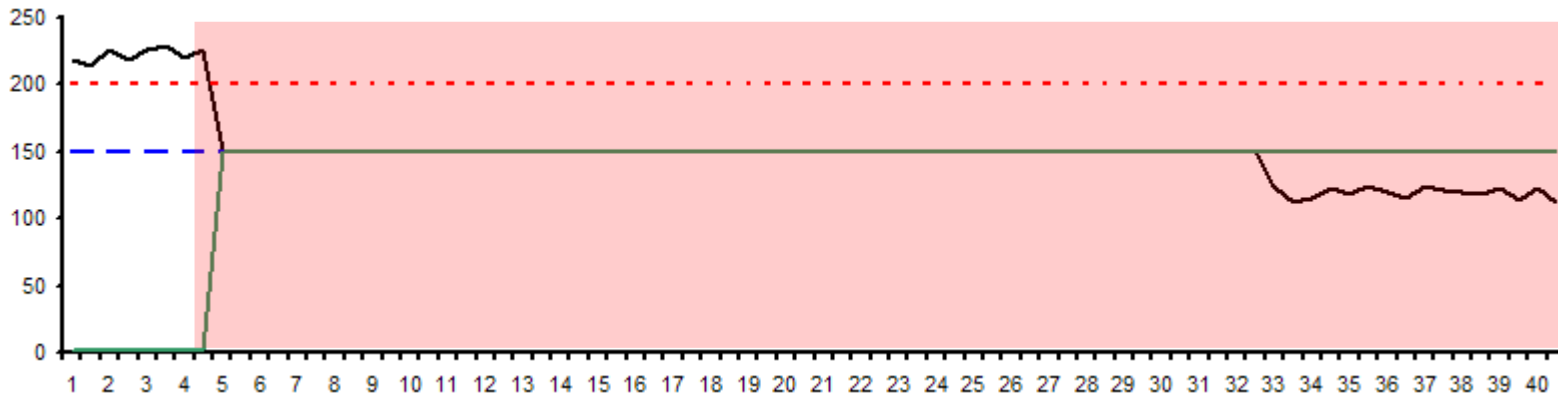
WLM Capping

Cap Pattern vs. Phantom Weight

Capping with **Cap Pattern** (when Soft Cap > MSU@LparWeight)



Capping using a **Phantom Weight** (when Soft Cap < MSU@LparWeight)



--- Soft Cap

..... MSU @ LPAR Weight

— MSU with Phantom Weight

RMF z/OS 1.11 Enhancements for Group Capacity...

Capping WLM% versus ACT%

- Capping WLM% = $SMF70NSW * 100 / SMF70DSA$
 - SMF70NSW is incremented for each sample with the WLM-capped flag ON. The flag is ON if the LPAR was capped via Diagnose 0304.
- Capping ACT% = $SMF70NCA * 100 / SMF70DSA$
 - SMF70NCA is incremented for each sample which indicates an actual-MSU-consumption below the MSU-at-weight factor
 - The pricing management adjustment weight of the LPAR (aka phantom weight) is added to the total of all active-logical-partition weights to compute the fraction of processor resources that the LPAR may use (MSUatWgt)
 - The actual MSU consumption of the LPAR is computed from the total dispatch time measured between two Diagnose samples
 - Following calculations done in RMF:

$$MSUatWeight = \frac{\text{Current LPAR weight} * \text{CPC capacity in MSUs}}{\text{Total weight} + \text{PMA weight}}$$

$$ActualMSU = \frac{\text{Dispatch time delta} * 3600 * 16}{\text{Time range} * \text{Phys CPU adjustment factor}}$$

If ActualMSU >= MSUatWeight-5% Then LPAR is actually capped

RMF z/OS 1.11 Enhancements for Group Capacity...

PARTITION DATA REPORT

z/OS V1R11

SYSTEM ID TRX1
RPT VERSION V1R11 RMF

DATE 02/26/2009
TIME 11.00.00

INTERVAL 05.00.000
CYCLE 1.000 SECONDS

MVS PARTITION NAME	TRX1	NUMBER OF PHYSICAL PROCESSORS	24	GROUP NAME	RMFGRP
IMAGE CAPACITY	60	CP	3	LIMIT	60
NUMBER OF CONFIGURED PARTITIONS	58	AAP	1	AVAILABLE	43
WAIT COMPLETION	NO	IFL	18		
DISPATCH INTERVAL	DYNAMIC	ICF	1		
		IIP	1		

----- PARTITION DATA -----							-- LOGICAL PARTITION PROCESSOR DATA --				-- AVERAGE PROCESSOR UTILIZATION PERCENTAGES --				
-----MSU----- -CAPPING--							PROCESSOR- ----DISPATCH TIME DATA----				LOGICAL PROCESSORS		--- PHYSICAL PROCESSORS ---		
NAME	S	WGT	DEF	ACT	DEF	WLM%	NUM	TYPE	EFFECTIVE	TOTAL	EFFECTIVE	TOTAL	LPAR MGMT	EFFECTIVE	TOTAL
TRX1	A	400	100	4	NO	0.0	3.0	CP	00.00.11.049	00.00.11.371	1.23	1.26	0.04	1.23	1.26
H05LP45	A	10	0	2	NO	0.0	2	CP	00.00.04.720	00.00.05.690	0.79	0.95	0.11	0.52	0.63
TRX2CFA	A	100	0	1	YES	0.0	1	CP	00.00.02.958	00.00.03.078	0.99	1.03	0.01	0.33	0.34
H05LP59	A	100	0	1	NO	0.0	3	CP	00.00.02.700	00.00.03.501	0.30	0.39	0.09	0.30	0.39
H05LP60	A	10	0	9	NO	0.0	2	CP	00.00.23.742	00.00.26.331	3.96	4.39	0.29	2.64	2.93
TRX2	A	200	100	13	NO	0.0	3.0	CP	00.00.37.219	00.00.37.721	4.14	4.19	0.06	4.14	4.19
PHYSICAL										00.00.23.659			2.63		2.63

Field Heading	Meaning
AVAILABLE	Long-term average of CPU service units which would be allowed by the limit of the capacity group but are not used by its members. If the value is negative, this capacity group is subject to capping.

RMF z/OS 1.11 Enhancements for Group Capacity...

RMF Data Portal - Mozilla Firefox: IBM Edition

http://boetrx2.boeblingen.de.ibm.com:8803/

RMF Monitor III Data Portal for z/OS

RMF Report [,TRX2,MVS_IMAGE] : CPC (Central Processor Complex)

Time Range: 03/18/2009 08:46:00 - 03/18/2009 08:47:00

Partition Name: TRX2	CPU Type: 2097	CPU Model: 704	CPC Capacity (MSU/h): 401
Weight % of Max: 19.9	4h MSU Average: 2	Capacity Group Name: RMFGRP	Image Capacity: 60
WLM Capping %: 0.0	4h MSU Maximum: 3	Capacity Group Limit: 150	Less than 4h in Capacity Group: N
Proj Time until Capping: 14400	Proj Time until Group Capping: 14400	4h Unused Group Capacity Average: 142	CPC sequence number: 000000000001EBAE
# CP Processors: 4	# ICF+IFL+AAP Processors: 0	# AAP Processors: 1	# ICF Processors: 2
# IFL Processors: 18	# IIP processors: 1	Configured Partitions: 58	Wait Completion: NO
% Capacity Used: 7	# Dedicated CPs: 0	# Dedicated AAPs: 0	# Dedicated IIPs: 0
# Shared physical CPs: 4	# Shared physical AAPs: 1	# Shared physical IIPs: 1	Vary CPU management available: NO
WLM LPAR management enabled: YES	Physical Total % of shared CPs: 5.1	Physical Total % of shared AAPs: 0.0	Physical Total % of shared IIPs: 0.0
Physical Total % of shared ICFs: 61.1	Physical Total % of shared IFLs: 0.0		

Monitor III CPC report in Monitor III Data Portal displays the projected remaining time until image/group capping in the report header

Average available capacity for the group during last 4 hours

LPAR Name	Defined MSU/h	Actual MSU/h	Capping Option	# Logical Processors Online	Logical Effective %	Logical Total %	LPAR Mgmt %	Physical Effective %	Physical Total %	Line Type	# Online Processors Shared	# Online Processors Dedicated	Current LPAR Weight	Logical Processor Share %	Hiper Dispatch: # High	Dispatch: # Medium	Hiper Dispatch: # Low	Operating System Name	LPAR Cluster Name	Initial Weight	Mir We
*CP				14.0			2.5	4.8	7.3	CS	14	0	820								
H05LP45	0	1	NO	2.0	0.4	0.5	0.1	0.2	0.3	CP	2	0	10	2.4	N/A	N/A	N/A	BOEH0545			
H05LP59	0	1	NO	3.0	0.3	0.4	0.1	0.2	0.3	CP	3	0	100	16.2	N/A	N/A	N/A	BOEH0559			
H05LP60	0	8	NO	2.0	3.8	4.1	0.2	1.9	2.1	CP	2	0	10	2.4	N/A	N/A	N/A	BOEH0560			
TRX1	50	4	NO	3.0	1.2	1.3	0.0	0.9	1.0	CP	3	0	415	51.2	1	2	0	TRX1	TRX1PLEX	400	9
TRX2	60	4	NO	3.0	1.3	1.4	0.0	1.0	1.0	CP	3	0	185	90.2	0	1	2	TRX2	TRX1PLEX	200	9
TRX2CFA	0	2	YES	1.0	2.1	2.1	0.0	0.5	0.5	CP	1	0	100	48.7	N/A	N/A	N/A				
PHYSICAL									2.2	CY											
*ICFPOOL				1.0			1.4	56.8	58.2	IS	198	1	0								

Group Capacity: Availability

Function	z/OS V1.12 as previewed 2/2010	z/OS V1.11	z/OS V1.10	Earlier Releases
Group Capacity plus OA24096 Enhancements	+	+	OA24096 OA23230	OA24096 OA23230 (z/OS 1.8)
RMF Reporting Enhancements for Group Capacity	+	+		
z/OS Capacity Provisioning	+	+	OA20824	

- OA24096
 - Changes the behavior when then group limit is changed according to the behavior for an individual defined capacity limit
- OA23230
 - Corrects a storage overlay which will occurs when SMF 99 data is collected and a partition is dynamically activated via HCD
- Short Comings of the existing Group Capacity Report
 - Reporting was not sufficient to understand capping of partitions within a group
 - Resolved with z/OS 1.8 RMF Reporting Enhancements
- Related z/OS Functions
 - z/OS Capacity Provisioning allows to activate additional CPU capacity via OOCoD in a controlled manner.

WLM Reporting: Extend Number of Report Classes

- The WLM-supported maximum on the number of defined report classes (999) has become insufficient for large installations
- Solution
 - Extend number of report classes in multiple steps:
 - First Step (z/OS 1.11):
 - Extend to 2047 Report Classes
 - Expand internal data structures to be able to deal with 4095 report classes
- Remarks
 - New WLM functionality level in z/OS 1.11: LEVEL023
 - For Service Definitions in XML format, the corresponding XML namespace is <http://www.ibm.com/xmlns/prod/zwlm/2009/09/ServiceDefinition.xsd>

Extended Number of Report Classes Availability

Function	z/OS V1.12	z/OS V1.11	z/OS V1.10	Older Releases
2047 Report Classes	+	+		

New Programming Interface for Monitors

Control Block: IRARMCTZ

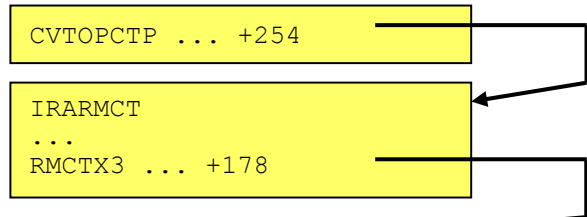
- New extension to SRM Control Table (PI) for information which is of interest for externalization
 - For example all information related to RMF's Monitor II OPT report is included in this table

```

boewlm1 - wc3270
RMF - OPT Settings
Line 1 of 29
Command ==>
Scroll ==> PAGE
CPU= 4 UIC= 65K PR= 0 System= WLM1 Total

OPT: 00 Time: N/A
-- Parameter -- Default -- Value -- Unit ----- Description -----
ABNORMALTERM Yes Yes Y/N Abnormal terminations in routing
BLWLINTHD 20 20 sec Time blocked work waits for help
BLWLTRPCT 5 5 0/00 CPU cap. to promote blocked work
CCCAWMT 12000 12000 usec Alternate wait management time
ZAAPAWMT 12000 12000 usec AWM time value for zAAPs
ZIIPAWMT 12000 12000 usec AWM time value for zIIPs
CNTCLIST No No Y/N Clist commands count individually
CPENABLE 10,30|0,0 10,30 % Threshold for TPI (low,high)
DVIO Yes Yes Y/N Directed VIO is active
ERV 500 500/CB SU Enqueue residency CPU Service/DP
HIPERDISPATCH No No/No Y/N Hiperdispatch is desired/active
IFAHONORPRIORITY Yes Yes Y/N Allows CPs to help zAAPs
IIPHONORPRIORITY Yes Yes Y/N Allows CPs to help zIIPs
INITIMP 0 0/FE # INITIMP value/DP for initiators
IRA405I 70,50,50 70,50,50 % Fixed storage of <16M,16M-2G,tot
MAXPROMOTETIME 6 6 *10s Holder allowed to run promoted
MCCAFCTH 400,800 400,800 # Threshold for storage (low,ok)
MCCFXEPR 92 92 % Fixed storage threshold < 16 MB
MCCFXTPR 80 80 % Fixed online storage threshold
PROJECTCPU No No Y/N CPU projection for zAAPs, zIIPs
RCCFXET 82,88 82,88 % Physical MPL threshold (low,high)
RCCFXIT 66,72 66,72 % Logical MPL threshold (low,high)
RMPTTOM 1000|3000 3000 msec SRM invocation interval
RTPIFACTOR 100 100 % PI affects server routing weights
STORAGENSWDP Yes Yes Y/N Sets non-swap. ASID non-dispatch.
STORAGEWTOR Yes Yes Y/N WTOR to cancel AS in shortage
VARYCPU Yes Yes Y/N VARYCPU is enabled
VARYCPUMIN 1 1 # VARYCPUMIN value
WASROUTINGLEVEL 0 0 # WebSphere routing level

F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=SORT
F7=UP F8=DOWN F9=SWAP lis F10=LEFT F11=RIGHT F12=RETRIEVE
4B X T IPY$1C09 002/015
    
```



IRARMCTZ Map

Offsets		Type/Value	Len	Name (Dim)	Description
Dec	Hex				
0	(0)	STRUCTURE	0	RMCTZ	
0	(0)	CHARACTER	8	RMCTZ_NAME	control block acronym > IRARMCTZ <
8	(8)	BITSTRING	1	RMCTZ_VERSION	
9	(9)	BITSTRING	1		Rmctz version
10	(A)	SIGNED	2	RMCTZ_LENGTH	Reserved
12	(C)	BITSTRING	1	RMCTZ_LPARG_FLAGS	Size of RMCTZ
					(0)
					LPAR Management flags updated by SRM.
					RMCTZ_LPARGMGMT_ENABLED
					"X80" ON if WLM LPAR Management Processing is enabled
					RMCTZ_LPARGM_VARYCPU_ENABLED
					"X40" ON if VARYCPU option is turned on either by default or is explicitly set to 'on'
					RMCTZ_FLAG1
13	(D)	CHARACTER	1	RMCTZ_FLAG1	RMCTZ Flag 1
					(0)
					RMCTZ_ABN_OPT
					"X80" ABNORMALTERM option set
					RMCTZ_FLAG1_RSVD1
					"X7F" reserved
14	(E)	CHARACTER	1	RMCTZ_FLAG2	RMCTZ Flag 2
					(0)
					RMCTZ_VCM_OPT
					"X80" 1:=VCM specified
					RMCTZ_VCM
					"X40" 1:=Running in vertical CP management mode
					RMCTZ_FLAG2_RSVD1
					"X3F" reserved

New Programming Interface for Monitors: Availability

Control Block: IRARMCTZ

Function	z/OS V1.12 <small>as previewed 2/2010</small>	z/OS V1.11	z/OS V1.10	Earlier Releases
RMF Monitor II OPT Display	+	+		
WLMOPT Tool (bundled with WLMQUE Tool)	No longer extended <small>Still bundled with WLMQUE but on z/OS 1.10 level</small>		+	Since z/OS 1.8
IRARMCTZ	+	OA31201	OA31201	

- **RMF Monitor II OPT Display**
 - Replaces WLMOPT Tool
 - Bundled with WLMQUE Tool but no longer extended (remains on z/OS 1.10 level)
 - WLMQUE Tool is still valid (see also WLM Tools summary)
- **New data interface for Monitors**
 - Introduced with z/OS 1.12, Rollback to z/OS 1.10

Hiperdispatch: WLM APARs

APAR	Description	Close Date	Remark
OA31733	Corrects calculation of capacity for medium processors	04/2010	Affects larger configurations

Agenda

- Enclave Enhancements
 - Enclave Server Management
 - Work-Dependent Enclaves
- WLM Management
 - LDAP Support
 - Resource Group Enhancements
 - Do not always honor Skip Clock in Policy Adjustment
- WLM Reporting
 - Additional Group Capacity Information in RMF
 - Extend Number of Report Classes
- Externalized IEAOPT Information
- Hyperdispatch APAR
- WLM support for IBM zEnterprise 196
- z/OSMF Workload Management
- WLM support for zManager
- WLM Tools Overview



WLM Support for IBM zEnterprise 196

- IBM zEnterprise 196 (z196)
 - STSI instruction no longer returns the alternate CPU capability
 - CPU adjustment factors are now calculated based on the Model Capacity Ratings by the machine
 - CSRSI does no longer provide alternate CPU capability
 - Supplies additional information about speed changes
- WLM
 - uses the new MSU values to calculate pricing adjustment factors
 - introduces message IWM064I to explain the reason for a processor speed change
 - makes new HW information available via public data areas IRARCT, IRARMCT, IRARMCTZ and via SYSEVENT QVS

WLM Support for IBM zEnterprise 196

New Pricing Adjustment Factors

- z196 provides MSU values instead of the alternate CPU capability together with MP factors table as base for pricing factors
- WLM uses the new MSU values to calculate pricing adjustment factors on z196
 - Add more granular new pricing adjustment factors RCTPCPUA_actual and RCTPCPUA_nominal plus a scaling factor RCTCPCPUA_scaling_factor
 - Maintain existing RCTPCPUA for compatibility
- Values are also available in SMF30 and SMF89
 - SMF30_RCTPCPUA_xxxxxx, SMF30_Capacity_F...
 - SMF89_RCTPCPUA_xxxxxx

WLM Support for IBM zEnterprise 196

New Message IWM064I

- Depending on the reason for the speed change one of the following message accompanies
IWM063I WLM POLICY WAS REFRESHED DUE TO A PROCESSOR SPEED CHANGE
 - IWM064I THE SYSTEM IS RUNNING AT NOMINAL CAPACITY.
 - IWM064I THE SYSTEM IS RUNNING AT NOMINAL CAPACITY; MODEL CONVERSION OCCURRED.
 - IWM064I THE SYSTEM IS RUNNING WITH REDUCED CAPACITY BECAUSE OF A MANUAL CONTROL SETTING.
 - IMM064I THE SYSTEM IS RUNNING WITH REDUCED CAPACITY BECAUSE OF A MACHINE EXCEPTION CONDITION.
 - IWM064I THE SYSTEM IS RUNNING WITH REDUCED CAPACITY BECAUSE OF A NON-EXCEPTION MACHINE CONDITION.
 - IWM064I THE SYSTEM IS RUNNING WITH REDUCED CAPACITY BECAUSE OF AN EXCEPTION CONDITION EXTERNAL TO THE MACHINE.

WLM Support for IBM zEnterprise 196 Enhanced API

- Query Virtual Server interface can be used to query a server's capacity status
 - Called by Sysevent QVS (assembler interface) or IWMQVS (C interface)
- The Output is mapped by IRAQVS (assembler mapping) or IWMQVS.H (C header file)
 - New data field QvsCecCapacityStatus has been added to indicate if the machine is running at nominal or reduced capacity
 - Version QvsVer has been incremented to QvsVer2

WLM Support for IBM zEnterprise 196

Extended Data Areas

- IRARMCTZ
 - RMCTZ_Capacity_Change_Time
 - Time when the capacity was last changed
 - RMCTZ_Capacity_Adjustment_Indication
 - When zero, the indication is not reported. When in the range 1-99, some amount of reduction is indicated. When 100, the machine is operating at its normal capacity. Primary CPUs and all secondary-type CPUs are similarly affected
 - RMCTZ_Capacity_Change_Reason
 - Indicates the reason which is associated with the present value contained in RMCTZ_Capacity_Adjustment_Indication
 - RMCTZ_CAI_IPL
 - Capacity adjustment indication at IPL
 - RMCTZ_CCR_IPL
 - Capacity change reason at IPL
 - RMCTZ_nominal_CPMP
 - Nominal CPU adjustment factor (similar to RMCTCPMP but for nominal speed)
- IRARCT
- IWMWRCAA
 - RCAAADJCCPU CPU adjustment factor
 - RCAAADJCCPUNOM nominal CPU adjustment factor
 - RCAAADJCCEC CEC adjustment factor

WLM Support for IBM zEnterprise 196 Availability

Function	z/OS V1.12	z/OS V1.11	z/OS V1.10	z/OS V1.9
New message, API enhancements	OA30968	OA30968	OA30968	
Support for new MSU computation/reporting	OA30968	OA30968	OA30968	OA30968

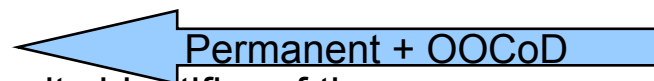
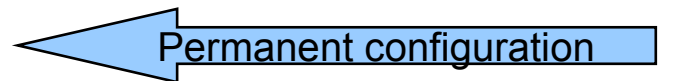
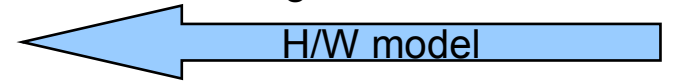
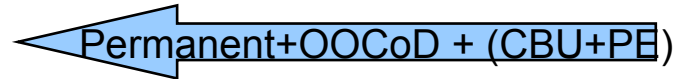
Temporary Capacity Reporting via SYSEVENT REQLPDAT

- **SYSEVENT REQLPDAT** was changed to return capacity information about IBM z10 (and later) capacity settings:
 - permanent capacity information
 - The base capacity of the machine
 - temporary capacity data
 - Replacement Capacity: Capacity Backup (CBU), or Planned Event (CPE)
 - Additional Capacity: On/Off Capacity on Demand (OOCOD)
 - *The differentiation is relevant for potential license cost or entitlement impact*

Temporary Capacity Reporting via SYSEVENT REQLPDAT

■ IRALPDAT new data fields

- LPDATMODELCAPIIDENT
 - The 16-character EBCDIC model-capacity identifier of the configuration.
- LPDATMODEL
 - The 16-character EBCDIC model identifier of the configuration. If not valid, field LPDatModelCapIdent represents both the model-capacity identifier and the model.
- LPDATMODELPERMCAPIIDENT
 - The 16-character EBCDIC model-permanent capacity identifier of the configuration.
- LPDATMODELTEMPCAPIIDENT
 - The 16-character EBCDIC model-temporary capacity identifier of the configuration.



Overview

▪ IRALPDAT new data fields

- LPDATMODELCAPRATING

- When non-zero, an unsigned integer whose value is associated with the model capacity as identified by the model-capacity identifier. There is no formal description of the algorithm used to generate this integer.

Permanent+OOCOD + (CBU+PE)

- LPDATMODELPERMCAPRATING

- When non-zero, an unsigned integer whose value is associated with the model-permanent capacity as identified by the model-permanent- capacity identifier

Permanent configuration

- LPDATMODELTEMPCAPRATING

- When non-zero, an unsigned integer whose value is associated with the model-temporary capacity as identified by the model-temporary- capacity identifier.

Permanent + OOCOD

REQLPDAT Sample with Active Temporary Capacity

▪ Example output

```
LPDatModelCapIdent      : 714
LPDatModel              : E26
LPDatModelPermCapIdent  : 709
LPDatModelTempCapIdent  : 711
LPDatModelCapRating     : 00000473
LPDatModelPermCapRating : 00000324
LPDatModelTempCapRating : 000003B0
```

▪ Meaning

- The base model is 709
- This model has active OOCoD capacity
 - It temporarily has a capacity like a model 711
- This model also has active CBU capacity
 - In total it temporarily has a capacity like a model 714

Agenda

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- z/OSMF Workload Management
- WLM support for zManager
- WLM Tools Overview



z/OSMF Workload Management

The new WLM Control Center in z/OSMF V1.12

- Policy editor
 - Simplified creation and editing of WLM policies supported by best practice checks
 - Support for review and investigation of WLM policies
- Policy repository
 - WLM policies are stored in a repository integrated in the z/OSMF file system
 - Policies can be exported to the local workstation or a host data set as well as imported from a file or a host data set
 - Policies or best-practice recommendations can be printed for further study
 - Integrated operation history makes manual tracking superfluous
- Installation and activation of WLM policies
- Monitoring of the WLM status in the sysplex
- Administration and operation tasks can be performed simultaneously
 - Simplified migration: Policy elements can be copied from one service definition to another
 - Simplified operation: You can start to edit a policy, interrupt the editing to activate a policy, and then continue with the editing without losing the context
- z/OSMF Workload Management synchronizes automatically with z/OS WLM

z/OSMF Workload Management Service Definition Repository

- Integrated repository for service definitions
- Service definitions can be
 - Imported
 - Exported
 - Printed
 - Viewed or edited
 - Created or Copied
 - Installed on the sysplex
- Indications
 - If service definition is installed and active
 - If service definitions are being viewed or edited
 - If messages exist for a service definition

The screenshot displays the IBM z/OS Management Facility interface in Mozilla Firefox. The main content area is titled "Workload Management" and shows a "Service Definitions" table. The table has columns for Name, Description, Status, and Date. A context menu is open over the "TESTFIX1" row, showing options like "Install and Activate...". A blue callout box says "Store all service definitions in one repository" and another says "Click to view, edit, print, install a service definition".

Name	Description	Status	Date
R12RGRP2	D10.WLM.ZOSMF.POLICY.R12RGRF	Error	Feb 23 2010 2:30:24 PM
RTDST3	Copy of RTDST3		Mar 21 2001 8:23:19 PM
RTDST3	SDS1 copy 5	Warning	Jan 31 2010 10:49:38 PM
SampleF	Sample WLM Service Definition 62		Sep 24 2007 8:48:22 AM
SampleF (Installed & Active)	Sample WLM Service Definition 57	Information	Feb 1 2010 8:62:56 PM
SPMinTst		Information	Jan 26 2010 3:50:46 PM
T13DEC07	add/remove SAP DB2s		Dec 13 2007 9:01:59 PM
TEST15		Information	Jan 12 2010 12:43:29 PM
TESTFIX1			Oct 3 2008 11:40:35 AM
TESTSD1		Error	Dec 30 2009 6:42:37 PM
WLM_BOF1	Large	Error	Feb 19 2010 5:12:08 PM
WLM_BOF2			
WLM_DESC	WL De		
WLM001	Service		
WLM600			
WLM700			
wlmpol01	policy		
WLMPOL03			
WLMPOL04			
WLMSTT	AVT R10+R11RAS		
WSCWLMDE	WSC Sample WLMServiceDefinition	Error	Jan 27 2010 4:05:01 AM

z/OSMF Workload Management

Editing Service Definitions

- Simplified creation, modification and review of service definitions
 - Policy elements are presented in tables
 - Tables can be filtered and sorted
 - Direct editing of policy elements within tables
 - Best-practice hints are displayed automatically while specifying policy elements
 - Several service definitions can be opened simultaneously
 - Cut, Copy, Paste of policy elements between service definitions

The screenshot shows the IBM z/OS Management Facility Workload Management interface. The main area displays a table of Service Classes with columns for Name, Period, Importance, Duration, Goal Type, Response Time, Percentile, Velocity, CPU Critical, and Resource Group. A context menu is open over the table, showing options like 'New Period', 'Expand', 'Collapse', 'Cut to Clipboard', 'Copy to Clipboard', 'Paste Periods', 'Move Periods', 'Delete...', and 'View Cross References'. Three callout boxes provide instructions: one points to a warning icon in the Velocity column, another points to the 'Copy to Clipboard' option in the context menu, and a third points to the 'Copy to Clipboard' option in the context menu.

Best-practice hints help to optimize service definitions

Click to copy element on clipboard for insertion into another service definition check where the element is used

Name Filter	Period Filter	Importance Filter	Duration Filter	Goal Type Filter	Response Time Filter	Percentile Filter	Velocity Filter	CPU Critical Filter	Resource Group Filter
*STTCL3							*91	*No	
STTCL3	1	*3		*Velocity					
*STTCL4								*No	
STTCL4	1	*2		*Average Response Time	*00:00:03.000				
*STTCL5								*No	
STTCL5	1	*2		*Average Response Time	*00:00:30.000				
*STTCL6								*No	
STTCL6	1	*2		*Average Response Time	*00:02:00.000				
*STTCL7									
STTCL7	1	*3	*3000	*Vel					
STTCL7	2	*3		*Vel					
*STTCL8									
STTCL8	1	*3	*3000	*Vel					
STTCL8	2	*3		*Vel					

z/OSMF Workload Management

The new WLM Control Center in z/OSMF V1.12

A complete overview is presented in session

Manage your Workloads and Performance with z/OSMF

Tuesday, 4:30 PM-5:30 PM

WLM support for zManager

Introduction

- The zEnterprise Unified Resource Manager (zManager) introduced with z196 provides zEnterprise platform management
- zManager enables you to install, monitor, manage, optimize, diagnose, and service resources and workloads from a single point of control while extending System z qualities of service across the entire infrastructure
- zManager is controlled by a platform workload management policy:
 - Specified at the HMC
 - Defines Workloads which are groups of partitions or virtual servers that support the same business application(s)
 - (not to be confused with Workloads defined in the WLM policy)
 - Defines Service Classes with platform wide performance goals of Workloads
- The *guest platform management provider* (GPMP) is the interface between the zManager and the z/OS Workload Manager

WLM support for zManager

GPMP – WLM Interaction

- GPMP
 - passes to WLM information about the platform wide performance goals of workloads in which the z/OS is participating
 - sends data provided by WLM to the HMC for platform performance monitoring
 - Server configuration and high level performance statistics collected on z/OS
 - Aggregated transaction response time and resource data for the ARM-instrumented applications
- WLM
 - supports GPMP configuration and management by new WLM service definition options, commands, and messages
 - manages the GPMP address space (start, stop, and restart)
 - displays GPMP status information
 - collects and aggregates performance measurements for GPMP

WLM support for zManager

Service Definition Enhancements for GPMP

- z/OS V1R12 introduces WLM functionality level LEVEL025 to support zManager and GPMP
- zManager Service Classes can be classified to WLM service and report classes by specifying classification rules for subsystem EWLM
 - Work qualifier ETC (EWLM transaction class name) is no longer supported
 - Work qualifier type ESC (EWLM service class name) is used to correlate zManager service classes with WLM service or report classes

Action	-----Qualifier-----			-----Class-----	
	Type	Name	Start	Service	Report
				DEFAULTS:	
1	ESC	Booking			
2	ESC	System	9		
3	ESC	GoldServ	15		
4	ESC	ice	23	SERVCLS3	

- Although z/OS V1R12 simply disregards ETC classification rules, you have to delete them the next time you modify the EWLM subsystem type classification rules
 - Message **IWMAM726 ETC is not a recognized qualifier type** is displayed when pressing F3=Exit
 - Rows with ETC rules have to be deleted before F3 becomes successful

WLM support for zManager

Service Definition Enhancements for GPMP

To configure GPMP

- 1) Select option 11 on the Definition Menu
- 2) Specify Guest Platform Management Provider settings

```

File Utilities Notes Optio
-----
Functionality LEVEL025 Def. WLM Appl LEVEL025
Command ==>

Definition data set . . . : none

Definition name . . . . . MYDEF01 (Required)
Description . . . . . Production 01

Select one of the
following options. . . . . 11
1. Policies
2. Workloads
3. Resource Groups
4. Service Classes
5. Classification Groups
6. Classification Rules
7. Report Classes
8. Service Coefficients/Options
9. Application Environments
10. Scheduling Environments
11. Guest Platform Management Provider
  
```

After GPMP settings defined, functionality level changes to 25

```

GPMP-Settings Notes Options Help
-----
Guest Platform Management Provider (GPMP) Settings
Command ==>

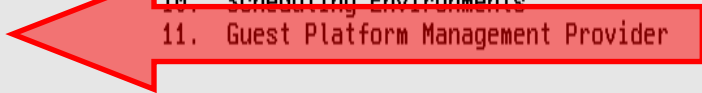
Guest Platform Management Provider activation: 2
1. NO
2. YES

Names of systems to be excluded:

SYS04   SYS09   _____
_____
_____
_____
_____
_____
_____
_____
_____
  
```

Specifies the systems in the sysplex on which the GPMP should not be started automatically

Specifies whether you want to start the GPMP address space automatically when a WLM policy is activated



WLM support for zManager

GPMP Configuration and Management

- On **policy activation**
 - WLM checks whether the service definition has valid GPMP settings
 - If activate=yes and system name not specified on excluded-list, GPMP is started automatically
- Also, you can use the **MODIFY WLM** command
 - To start the GPMP on a system
 - To stop the GPMP on a system
 - Intended for recovery actions. Recommended is to manage GPMP through WLM
- Once you stopped the GPMP manually, the GPMP switches into “manual mode”. It is not automatically restarted even if a WLM policy with a valid GPMP configuration gets activated
 - Status maintained until next IPL

WLM support for zManager

GPMP related Commands

- Use the **MODIFY WLM,GPMP** command to start, stop, and modify the guest platform management provider:
 - **F WLM,GPMP,START**
 - Indicates that you want to start the GPMP

```
16.55.59 WLMG                f wlm, gpmp, start
16.55.59 WLMG STC00752      $HASP373 HVEMCA    STARTED
16.55.59 WLMG STC00752      IEF403I HVEMCA -  STARTED - TIME=16.55.59
```

- **F WLM,GPMP,STOP**
 - Indicates that WLM stops the currently active GPMP instance

```
17.03.39 WLMG                f wlm, gpmp, stop
17.03.39 WLMG STC00753      IEF404I HVEMCA -  ENDED - TIME=17.03.39
17.03.39 WLMG STC00753      $HASP395 HVEMCA    ENDED
```

- **F WLM,GPMP,TRACE=NONE|LOW|MEDIUM|HIGH,DEST=FILE|MEMORY**
 - Enables you to change the GPMP internal tracing level “on the fly” and to change the destination of the trace (file or memory)

WLM support for zManager

GPMP related Commands

- DISPLAY WLM command extensions:

```
IWM025I 11.42.45 WLM DISPLAY 231
ACTIVE WORKLOAD MANAGEMENT SERVICE POLICY NAME: BASEPOL
ACTIVATED: 2010/02/18 AT: 12:57:55 BY: BMAI FROM: TRX2
DESCRIPTION: Base policy for system test
RELATED SERVICE DEFINITION NAME: Ralfpol
INSTALLED: 2010/02/18 AT: 12:57:48 BY: BMAI FROM: TRX2
WLM VERSION LEVEL: LEVEL025
WLM FUNCTIONALITY LEVEL: LEVEL025
WLM CDS FORMAT LEVEL: FORMAT 3
STRUCTURE SYSZWLM_WORKUNIT STATUS: CONNECTED
STRUCTURE SYSZWLM_EBAE2097 STATUS: CONNECTED
```

To display system and GPMP status information, enter:

D WLM,SYSTEMS,GPMP

STATE OF GUEST PLATFORM MANAGEMENT PROVIDER (GPMP): ACTIVE

SYSNAME	*MODE*	*POLICY*	*WORKLOAD MANAGEMENT STATUS*
TRX1	GOAL	BASEPOL	ACTIVE
TRX2	GOAL	BASEPOL	ACTIVE

SYSNAME	*GPMP STATUS*
TRX1	INACTIVE
TRX2	ACTIVE

To display whether ARM is enabled or disabled, enter:

D WLM,AM

```
IWM075I 11.45.43 WLM DISPLAY 233
ARM SERVICES ARE ENABLED
GUEST PLATFORM MANAGEMENT PROVIDER JOBNAME=HUEMCA ASID=0032
GPMP POLICY IS ACTIVE
NUMBER OF REGISTERED PROCESSES=3, APPLICATIONS=1
```

WLM support for zManager

GPMP related Commands

- The existing **MODIFY WLM,AM=DISABLE|ENABLE** command is not changed, but the logic for DISABLE/ENABLE changed in the following way:
 - Disabling ARM (Application Response Measurement) will terminate a running GPMP
 - Manually starting the GPMP (using the **MODIFY WLM,GPMP,START** command) when ARM is disabled will result in message IWM078I
 - Activating a WLM policy that contains valid GPMP settings will not result in the start of a GPMP instance, if ARM is disabled
 - The state of the GPMP will be displayed as “DISABLED”, if ARM is disabled
 - If ARM is enabled again, the state of the GPMP will change to “STOPPED”. To start the GPMP again, it has to be started manually

WLM support for zManager

GPMP Installation

- GPMP must be authorized to run as a trusted started task
- Sample job HVEENV provided in SYS1.SAMPLIB to
 - define the GPMP security setup (see STEP01)
 - configure the execution environment for the GPMP (see STEP02)
- Modify following variables according to your specific environment:

Variable	Description
DATA_ROOT	Directory on UNIX where the GPMP stores the configuration and diagnostics data
JREBIN_ROOT	Directory on UNIX where the Java executable is located
LOGFILE_ROOT	Directory where the GPMP startup related diagnostics messages will be stored
MCA_USER	The user created in STEP01 of the JCL. It is recommended to keep HVEMCA1 as the user name.
MCA_GROUP	The group created in STEP01 of the JCL. It is recommended to keep HVEMCA as the group name.
MCA_JAVADUMPS	Optional USS directory where GPMP Java, Heap, SNAP, CEE dumps will be created
ENV_PROFILE	The UNIX profile to be used by the GPMP. This should contain environmental information, for example, TimeZone, Locale.

- Run the JCL from an authorized user with UID=0
- STEP01 must be modified when running GPMP in a SECLABEL environment
 - Example provided in Chapter 15 of the WLM Planning Guide

WLM support for zManager

Prerequisites

- Hardware
 - z196 with zEnterprise Unified Resource Manager
 - Guest platform management provider on z/OS cannot be started on pre-z196 servers
 - If started on pre-z196 servers, message **IWM078E GUEST PLATFORM MANAGEMENT PROVIDER CANNOT BE STARTED, FUNCTION NOT AVAILABLE** is issued on the console
- Software
 - z/OS V1R12 and OA30928
 - For z/OS V1R10 and V1R11: OA30928

धन्यवाद

Hindi

多謝

Traditional Chinese

ขอบคุณ

Thai

Спасибо

Russian

Gracias

Spanish

Thank You

English

Obrigado

Brazilian Portuguese

شكراً

Arabic

多谢

Simplified Chinese

Danke

German

Bedankt

Dutch

Grazie

Italian

Merci

French

நன்றி

Tamil

ありがとうございました

Japanese

감사합니다

Korean

WLM Tools: A Summary

Tool	Name	Description	Content	Support
SVDEF	Service Definition Formatter	Uses output from WLM Administrative Administration to display content of service definition in a workstation spreadsheet	Excel/workstation	Not updated anymore but still available on WLM Tools page
WSE	Service Definition Editor	Allows to create, modify, retrieve and install WLM service definitions	Java program on workstation	YES!! Available
WLMQUE	Application Environment Viewer	Allows to monitor WLM Application Environments	ISPF Tool	YES!! Available
WLMOPT	OPT Display	Display WLM/SRM OPT Parameters	IPF Tool	No!! Obsoleted by RMF in z/OS V1.11

<http://www-03.ibm.com/servers/eserver/zseries/zos/wlm/tools/>

WLM Tools

Service Definition Editor

WLM Service Definition Editor - D:\SAMPLESD.xml

File Edit Options Help

local

Classification Groups		Classifications		Service Parameter		Application Environments		Scheduling Environments		Report Classes	
Service Definition			Resource Groups		Workloads		Service Policies		Report Classes		
Name	ServiceClasses	Period	Goal	Im...	Duration	ResponseTime	Perce...	Level	ResourceGr...	CPU...	Description
WKL DASC											ALL APPC Transaction
WKL DASC	A3V30STD								GBATCH20	No	ASCH default Service Class
WKL DASC	A3V30STD	1	Velocity	2	500			10			
WKL DASC	A3V30STD	2	Velocity	2	-			8			
WKL TJK											All Batch Jobs
WKL TJK	B4V10STD								-	No	Batch Standard VEL 10 IMP 4
WKL TJK	B4V10STD		velocity	4	-			10			
WKL TJK	B4V20STD		velocity	4	1000			20			
WKL TJK	B4V20STD	2	Velocity		-			10			
WKL DTSO											ALL TSO USERIDS
WKL DTSO	T2335DEV								-	No	Developer (Standard) TSO
WKL DTSO	T23		PrecentileResponseTime	2	2500	00:00:02.000	98				
WKL DTSO	T23		AverageResponseTime	3	300000	00:00:20.000	95				
WKL DTSO	T23		PercentileResponseTime	5	-			10			
WKL DTSO	T23								-	No	Production TSO Helpers
WKL DTSO	T23		PrecentileResponseTime	2	2000	00:00:01.000	99				
WKL DTSO	T23		PrecentileResponseTime	2	10000	00:00:00.000	90				

used by:
Classification: JES

- Insert
- Insert Before
- Insert After
- Replace by
- Copy
- Cut
- Delete

No	Description	Element
1	Importance value can not be null	Workload "WKL TJK"/ServiceClass "B4V20STD"/Velocity (#1)
2	WLM may not distinguish between periods with equal importance and only slightly different velocity levels	Workload "WKL DASC"/ServiceClass "A3V30STD"

Help Error

Ok

WLM Tools

Display WLM/SRM OPT Parameter (WLM Tool, supported up to R10)

```

. Command ==>                               Scroll ==> PAGE
.
.                               WLM OPT Settings                               >SAVE<
. System: AQFT      Version: z/OS 011100  OPT: FT  Time: not issued
. OPT-Parameter:   Value:                Description:
.
. ABNORMALTERM      Yes  Abnormal term. used in routing rec.
. BLWLTRPCT         5   CPU cap. to promote blocked work
. BLWLINTHD         20  Time blocked work waits for help
. CCCAWMT           3200,3200  AWM time value (defined, used)
. ZAAPAWMT          3200,3200  AWM time value for zAAPs (def, used)
. ZIIPAWMT          3200,3200  AWM time value for zIIPs (def, used)
. CNTCLIST          No   Clist commands count individually
. CPENABLE         10,30  LOW,HI thresh for % TPI int. x 100
. DVIO              Yes  Specifies w/ directed VIO is active
. ERV              1000,E6  Enq res. CPU Service and DP
. HIPERDISPATCH   Yes,Yes  Hiperdispatch value(inOPT, Running)
. IFAHONORPRIORITY Yes  Specifies if CPs may help zAAPs
. IIPHONORPRIORITY Yes  Specifies if CPs may help zIIPs
. INITIMP          0,FE  INITIMP value and DP for initiators
. MCCAFCST         400,800  LOW,HIGH central threshold
. MCCFXEPR         92   % of storage fixed within first 16MB
. MCCFXTPR         80   % of online storage fixed
. PROJECTCPU       No   CPU projection for zAAPs and zIIPs
. RCCFXTT          66,72  Low,High Logical MPL threshold
. RCCFXET          82,88  Low,High Physical MPL threshold
. RMPTTOM          1000  SRM invocation interval
. STORAGEENSDP     Yes  Set Non-swappable AS non dispatchable
. STORAGEWTOR      Yes  Issue IRA221D and IRA421D
. IRA405I          46,32,32  IRA405I warning level: 16M,2G,Tot
. VARYCPU          No   VARYCPU is enabled
. VARYCPUMIN       1   VARYCPUMIN value
. WASROUTINGLEVEL  0   WebSphere Routing Level
.
.

```

WLM Tools

Display WLM/SRM OPT Parameter (RMF Monitor II OPT Report)

```

boewlm1 - wc3270
RMF - OPT Settings
Line 1 of 29
Command ==>>
Scroll ==>> PAGE

CPU= 4      UIC= 65K PR= 0      System= WLM1 Total

OPT: 00      Time: N/A
-- Parameter -- - Default - -- Value -- Unit ----- Description -----
ABNORMALTERM      Yes      Yes Y/N  Abnormal terminations in routing
BLWLINTHD         20      20 sec  Time blocked work waits for help
BLWLTRPCT         5       5 0/00  CPU cap. to promote blocked work
CCCAWMT           12000   12000 usec  Alternate wait management time
ZAAPAWMT          12000   12000 usec  AWM time value for zAAPs
ZIIPAWMT          12000   12000 usec  AWM time value for zIIPs
CNTCLIST          No       No Y/N    Clist commands count individually
CPENABLE          10,30|0,0  10,30 %   Threshold for TPI (low,high)
DVI0              Yes      Yes Y/N    Directed VIO is active
ERV               500     500/CB SU  Enqueue residency CPU Service/DP
HIPERDISPATCH    No       No/No Y/N  Hiperdispatch is desired/active
IFAHONORPRIORITY Yes      Yes Y/N    Allows CPs to help zAAPs
IIPHONORPRIORITY Yes      Yes Y/N    Allows CPs to help zIIPs
INITIMP           0       0/FE #    INITIMP value/DP for initiators
IRA405I           70,50,50  70,50,50 %  Fixed storage of <16M,16M-2G,tot
WAXPROMOTETIME   6       6 *10s    Holder allowed to run promoted
WCCAFCTH         400,800  400,800 #   Threshold for storage (low,ok)
WCCFXEPR         92      92 %      Fixed storage threshold < 16 MB
WCCFXTPR         80      80 %      Fixed online storage threshold
PROJECTCPU        No       No Y/N    CPU projection for zAAPs, zIIPs
RCCFXET          82,88   82,88 %   Physical MPL threshold (low,high)
RCCFXTT          66,72   66,72 %   Logical MPL threshold (low,high)
RMPPTOM          1000|3000  3000 msec  SRM invocation interval
RTPIFACTOR       100     100 %     PI affects server routing weights
STORAGENSWDP     Yes      Yes Y/N    Sets non-swap. ASID non-dispatch.
STORAGEWTOR     Yes      Yes Y/N    WTOR to cancel AS in shortage
VARYCPU          Yes      Yes Y/N    VARYCPU is enabled
VARYCPUMIN       1       1 #       VARYCPUMIN value
WASROUTINGLEVEL  0       0 #       WebSphere routing level

F1=HELP      F2=SPLIT      F3=END      F4=RETURN      F5=RFIND      F6=SORT
F7=UP        F8=DOWN       F9=SWAP lis F10=LEFT      F11=RIGHT     F12=RETRIEVE
4B          X          T          IPY$1C09      002/015

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WLM Tools

WLMOPT – WLM Application Environment Viewer

```

Command ==>                                     Scroll ==> PAGE
Application Environment Monitor
Selection: >HELP< >SAVE< >OVW< >ALL< \AE=SYSBATCH
System: AQFT Sysplex: MCLXCF01 Version: z/OS 011100 Time: 06:22:27

ApplEnv_ Type SubName_ WMAS Del Dyn NQ QLen Str Hav Unb Trm Min_ Max_ ICnt
SYSBATCH JES JES2 0031 No No 3 0 0 12 0 0 0 0 0

WorkQue_ Del Wnt Hav ICnt QueIn_ QueOut QueLen QueTot_ Act_ Idl_
WLMLONG No 7 7 0 0 0 0 0 0 4 3
WLMSHORT No 3 3 0 0 0 0 0 0 2 0
COMBUILD No 2 2 0 0 0 0 0 0 1 1

SvAS Binding_ Ter Opr Btc Dem Have Jobname
0043 WLMLONG No No Yes No 1 BCNDEVD
0175 WLMLONG No No Yes No 1 ALLAEBS.2.SEAS.2.JBNI
0166 WLMLONG No No Yes No 1 SERV9956
0165 WLMLONG No No Yes No 1 SERV9955
015A COMBUILD No No Yes No 1 C90SPACE
0150 WLMLONG No No Yes No 1 INIT
0202 WLMLONG No No Yes No 1 INIT
0152 COMBUILD No No Yes No 1 INIT
0229 WLMSHORT No No Yes No 1 BMGX1$
0119 WLMLONG No No Yes No 1 INIT
0050 WLMSHORT No No Yes No 1 ALLAEBS.2.SEAS.11.JBNI
01A5 WLMSHORT No No Yes No 1 INIT

```