

IBM Education Assistance for z/OS V2R2

Item: GRS Usage Statistics in RMF Monitor III

Element/Component: RMF



Agenda

- Trademarks
- Presentation Objectives
- Overview
- Usage & Invocation
- Presentation Summary
- Appendix



Trademarks

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



Presentation Objectives

- Explain purpose/usage of RMF z/OS V2R2 GRS Statistics in Monitor III
- RMF GRS Statistics in Monitor III introduces a new Monitor III report with job oriented GRS (Global Resource Serialization) statistics
- The report allows to keep track how certain address spaces are calling the GRS API's GQSCAN and ISGQUERY= QSCAN
- In addition the new report provides general job oriented usage statistics with regard to CPU, Storage and I/O activity



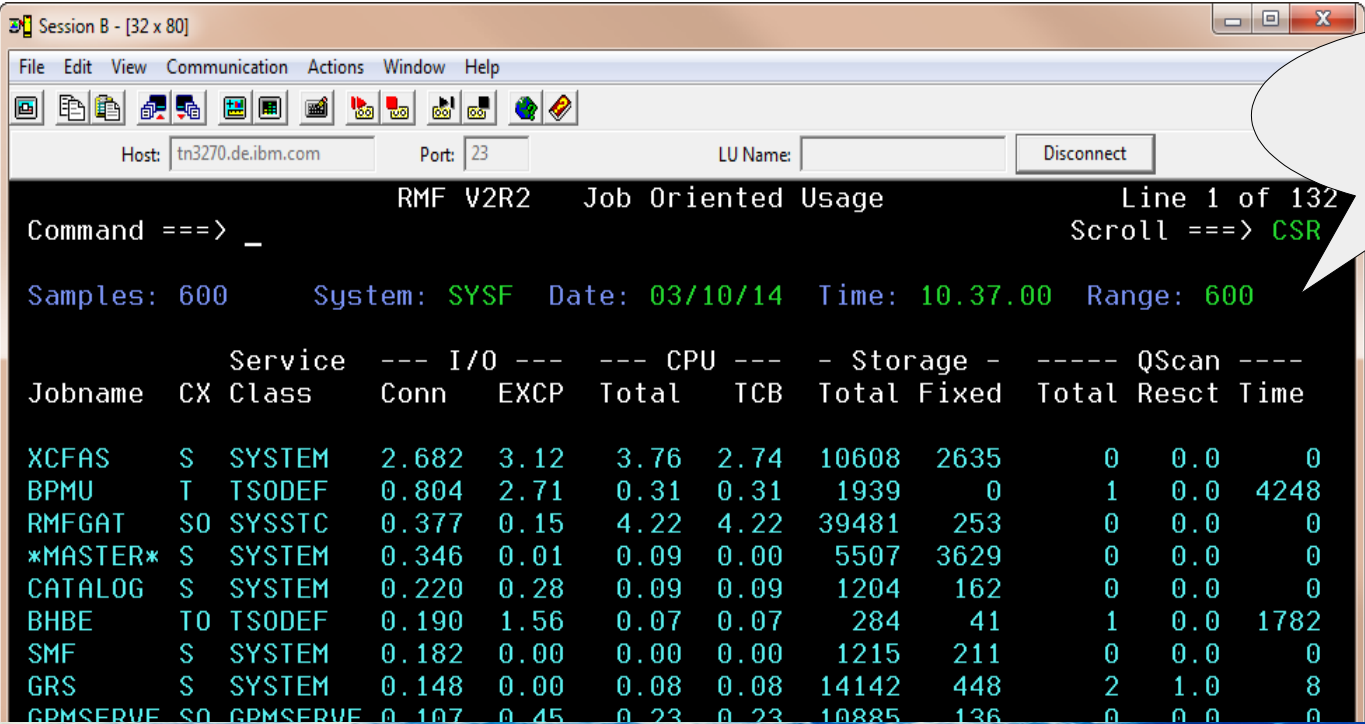
Overview


- Problem Statement / Need Addressed
 - Performance problems that can occur mainly on large systems and which are most problematic to identify can be caused by improper usage of the GRS services GQSCAN and ISGQUERY REQINFO=QSCAN. The services might be invoked too frequent, too generic, or both.
- Solution
 - The new RMF Monitor III Job oriented Usage Report provides detailed GQSCAN usage statistics on address space level
 - Additionally the report is enriched with other job usage statistics with regard to CPU, Storage and I/O resource consumption
- Benefit / Value
 - System programmers can easily identify address spaces utilizing the GQSCAN services and analyze the performance and/or improper usage
 - Furthermore, general job resource consumption is visible at a glance



Overview...

- The Monitor III Job Oriented Usage Report report is designed as a complement to the existing Monitor III Job Delay Report. It displays GQSCAN usage statistics on job level together with some key metrics from the basic performance relevant areas CPU, I/O and Storage

■ 

■  ISPF Report

Jobname	Service CX Class	--- I/O --- Conn EXCP	--- CPU --- Total TCB	- Storage - Total Fixed	----- QScan ----- Total Resct Time
XCFAS	S SYSTEM	2.682 3.12	3.76 2.74	10608 2635	0 0.0 0
BPMU	T TSODEF	0.804 2.71	0.31 0.31	1939 0	1 0.0 4248
RMFGAT	SO SYSSTC	0.377 0.15	4.22 4.22	39481 253	0 0.0 0
MASTER	S SYSTEM	0.346 0.01	0.09 0.00	5507 3629	0 0.0 0
CATALOG	S SYSTEM	0.220 0.28	0.09 0.09	1204 162	0 0.0 0
BHBE	TO TSODEF	0.190 1.56	0.07 0.07	284 41	1 0.0 1782
SMF	S SYSTEM	0.182 0.00	0.00 0.00	1215 211	0 0.0 0
GRS	S SYSTEM	0.148 0.00	0.08 0.08	14142 448	2 1.0 8
GPMSEVE	SO GPMSEVE	0.107 0.45	0.23 0.23	10885 136	0 0.0 0

Overview...

Field Heading	Meaning
Jobname	<i>Name of the job.</i>
CX	<i>Abbreviation for the job class as follows:</i> S Started task T TSO B Batch A ASCH O OMVS <i>An O as second character indicates that the address space is using OMVS services.</i>
Service Class	<i>The name of the service class for this address space.</i>
I/O Conn	<i>Device connect time, in seconds, for this address space in the report interval.</i>
I/O EXCP	<i>Number of EXCP operations per second for this address space in the report interval.</i>
CPU Total	<i>Amount of total processor time, in seconds, for this address space in the report interval as sum of TCB time, global and local SRB time, and preemptable or client SRB time.</i>
CPU TCB	<i>Amount of TCB processor time, in seconds, for this address space in the report interval.</i>
Storage Total	<i>The number of active and idle frames for this address space, averaged over the report interval.</i>
Storage Fixed	<i>Number of fixed frames for this address space, averaged over the report interval.</i>
QScan Total	<i>Total number of QScan requests for this address space, including START and RESUME, but not QUIT requests.</i>
QScan Resct	<i>Average number of resources returned by QScan requests for this address space.</i>
QScan Time	<i>Average QScan request time, in microseconds, for this address space.</i>



Report Fields



Overview...

Field Heading	Meaning
ASID (dec)	<i>Address space id (decimal)</i>
Job Class	<i>Abbreviation for the job class as follows:</i> S Started task T TSO B Batch A ASCH O OMVS
Service Class Period	<i>The number of the service class period for this address space.</i>
Dispatching Priority	<i>Dispatching Priority for this address space.</i>
Transaction Active Time	<i>The time that has elapsed since the current transaction in this address space was started, in the form hhhh:mm</i>
Transaction Resident Time	<i>The time that has elapsed since the current transaction in this address space became resident, in the form hhhh:mm or hh:mm:ss</i>
Transaction Count	<i>Number of transactions for this address space since address space creation.</i>
Fixed Frames High	<i>Number of fixed frames above 2GB for this address space averaged over the report interval.</i>
Fixed Frames Above	<i>Number of fixed frames between 16MB and 2GB for this address space averaged over the report interval.</i>
Fixed Frames Below	<i>Number of fixed frames below 16MB for this address space averaged over the report interval.</i>



Utility Fields



Overview...

Utility Fields (cont.)

Field Heading	Meaning
Total Device Connect Time	<i>Accumulated device connect time, in seconds, for this address space since address space creation.</i>
Total CPU Time	<i>Accumulated amount of processor time, in seconds, for this address space since address space creation as sum of TCB time, global and local SRB time, and preemptable or client SRB time.</i>
Total TCB Time	<i>Accumulated amount of TCB processor time, in seconds, for this address space since address space creation.</i>
Specific QSCAN requests	<i>Number of specific QScan requests for this address space, that are either GQSCAN requests specified by QNAME and RNAME or ISGQUERY requests specifying a search by ENQTOKEN.</i>
QSCAN Resource Count Standard Deviation	<i>Standard deviation for the number of resources returned by QSCAN requests for this address space.</i>
QScan Request Time Standard Deviation	<i>Standard deviation for the QSCAN request time for this address space.</i>



Overview...

DDS Report

Firefox

RMF Monitor III Report

boesysf.boeblingen.de.ibm.com:8803/gpm/rmfm3.xml?report=USAGE&resource=",SYSF,MVS_IMAGE"

20140310141400

RMF Report [,SYSF,MVS_IMAGE] : USAGE (Job Oriented Usage)

Time Range: 03/10/2014 14:14:00 - 03/10/2014 14:14:36

Jobname	ASID (dec)	Job Class	Job Class Ext	Service Class	Period	Dispatching Priority	Transaction Active Time	Transaction Resident Time	Transaction Count	Total Frames	Fixed Frames	Fixed Frames High	Fixed Frames Above	Fixed Frames Below
XCFAS	0006	S	S	SYSTEM	1	FF	114:31:35	114:31:35	1	10624	2642	1160	1482	0
MASTER	0001	S	S	SYSTEM	1	FF	114:33:10	114:33:10	1	5507	3629	3479	150	0
JES2	0054	S	S	SYSSTC	1	FE	114:30:22	114:30:22	1	9929	891	560	321	10
CATALOG	0042	S	S	SYSTEM	1	FF	4:13:31	4:13:31	1	1432	177	78	99	0
GPMSERVE	0108	S	SO	GPMSERVE	1	F8	114:29:27	114:29:24	1	10933	139	116	23	0
IZUSVR1	0126	S	SO	STCDEF	1	EE	114:28:27	114:28:27	1	72452	564	535	30	0
RMFGAT	0098	S	SO	SYSSTC	1	FE	11:00:36	11:00:36	3	39587	255	232	23	0
GRS	0007	S	S	SYSTEM	1	FF	114:33:10	114:33:10	1	14237	448	414	34	0
OMVS	0016	S	S	SYSTEM	1	FF	114:31:35	114:31:35	1	27115	386	282	104	0
SMF	0030	S	S	SYSTEM	1	FF	114:31:35	114:31:35	1	1215	211	185	26	0
DFSZFS	0045	S	S	SYSSTC	1	FE	114:31:15	114:31:15	1	27618	514	484	30	0
SMS	0024	S	S	SYSSTC	1	FE	114:31:21	114:31:21	1	545	89	67	22	0
AXR03	0129	S	S	SYSSTC	1	FF	113:34:17	0:03:20	1	652	80	57	23	0
CFZCIM	0123	S	SO	STCDEF	1	EE	114:29:02	28:26:00	1	16323	163	132	31	0
GPM4CIMZ	0120	S	SO	STCDEF	1	EE	114:28:49	114:28:49	1	17985	166	140	26	0
GPM4CIMX	0125	S	SO	STCDEF	1	EE	114:28:50	114:28:50	1	44269	279	252	27	0



Overview...

DDS Report (cont.)

Firefox

RMF Monitor III Report

boesysf.boeblingen.de.ibm.com:8803/gpm/rmfm3.xml?report=USAGE&res

Fixed Frames Below	Total Device Connect Time	Device Connect Time	EXCP Rate	Total CPU Time	CPU Time	Total TCB Time	TCB Time	QSCAN Requests	Specific QSCAN Requests	QSCAN Resource Count	QSCAN Resource Count Std.Dev.	QSCAN Request Time	QSCAN Request Time Std.Dev.
0	1393.46	0.172	3.44	3072.73	0.19	2350.17	0.15	0	0	0.0	0.0	0	0
0	220.14	0.022	0.25	97.20	0.00	24.65	0.00	0	0	0.0	0.0	0	0
10	74.77	0.015	1.89	183.43	0.01	100.41	0.01	0	0	0.0	0.0	0	0
0	2.76	0.015	0.42	1.26	0.00	1.17	0.00	0	0	0.0	0.0	0	0
0	5.93	0.009	0.72	117.68	0.02	117.25	0.02	0	0	0.0	0.0	0	0
0	46.29	0.008	12.22	126.24	0.03	124.40	0.03	0	0	0.0	0.0	0	0
0	251.52	0.008	0.22	3231.48	0.28	3221.53	0.28	0	0	0.0	0.0	0	0
0	63.21	0.008	0.00	73.69	0.00	55.77	0.00	1	0	0.0	0.0	602	0
0	35.47	0.007	0.00	19.86	0.00	18.72	0.00	0	0	0.0	0.0	0	0
0	78.68	0.005	0.00	2.90	0.00	0.13	0.00	0	0	0.0	0.0	0	0
0	47.42	0.004	0.64	59.34	0.00	46.94	0.00	0	0	0.0	0.0	0	0
0	31.64	0.001	0.78	38.47	0.00	37.63	0.00	0	0	0.0	0.0	0	0
0	0.14	0.001	0.19	0.02	0.00	0.01	0.00	0	0	0.0	0.0	0	0
0	0.17	0.000	4.11	35.02	0.00	34.78	0.00	0	0	0.0	0.0	0	0
0	0.42	0.000	2.56	384.59	0.05	384.53	0.05	0	0	0.0	0.0	0	0
0	0.16	0.000	3.08	1992.47	0.44	1992.41	0.44	0	0	0.0	0.0	0	0



Overview...

Resource	Metric	Workscope
MVS_IMAGE	transaction active time	job
	transaction resident time	job
	# transactions	job
	# QSCAN generic requests	job
	# QSCAN specific requests	job
	# QSCAN resources	job
	# QSCAN resources standard deviation	job
	QSCAN request time	job
	QSCAN request time standard deviation	job
MVS_IMAGE	transaction active time by job	global
	transaction resident time by job	global
	# transactions by job	global
	# QSCAN generic requests by job	global
	# QSCAN specific requests by job	global
	# QSCAN resources by job	global
	# QSCAN resources standard deviation by job	global
	QSCAN request time by job	global
	QSCAN request time standard deviation by job	global

Derived from the metrics contained in the Job USAGE Report, the following resources and metrics will be supported by the Data Portal:



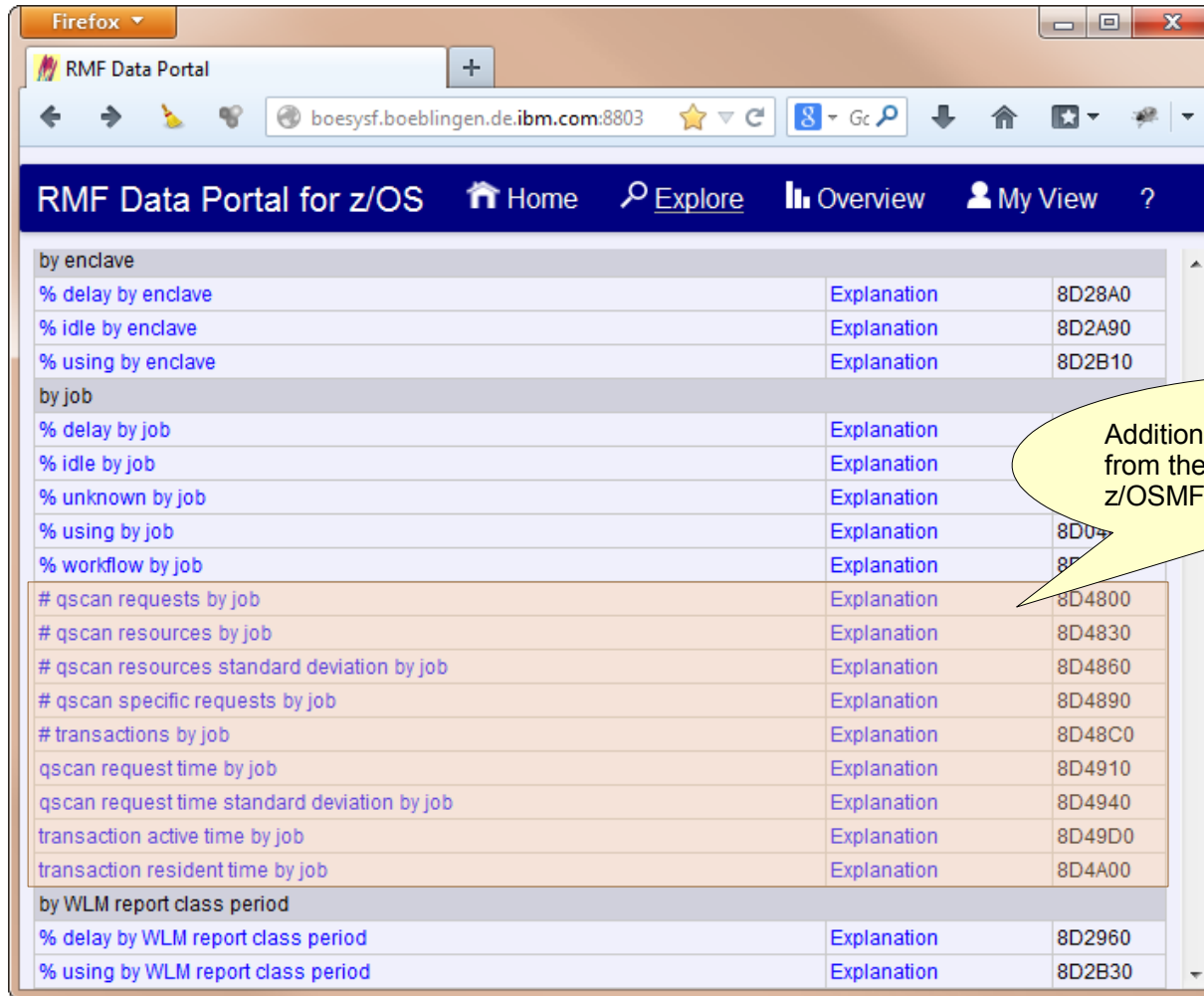
Overview...

Resource	Metric	Workscope
STORAGE	# frames fixed below 16 MB	job
	# frames fixed above 16 MB	job
	# frames fixed above 2 GB	job
	# frames fixed below 16 MB by job	global
	# frames fixed above 16 MB by job	global
	# frames fixed above 2 GB by job	global
I/O_SUBSYSTEM	total device connect time	job
	connect time	job
	EXCP rate	job
	total device connect time by job	global
	connect time by job	global
	EXCP rate by job	global
PROCESSOR	total CPU time	job
	CPU time	job
	total TCB time	job
	TCB time	job
	total CPU time by job	global
	CPU time by job	global
	total TCB time by job	global
	TCB time by job	global

Derived from the metrics contained in the Job USAGE Report, the following resources and metrics will be supported by the Data Portal:



Overview...



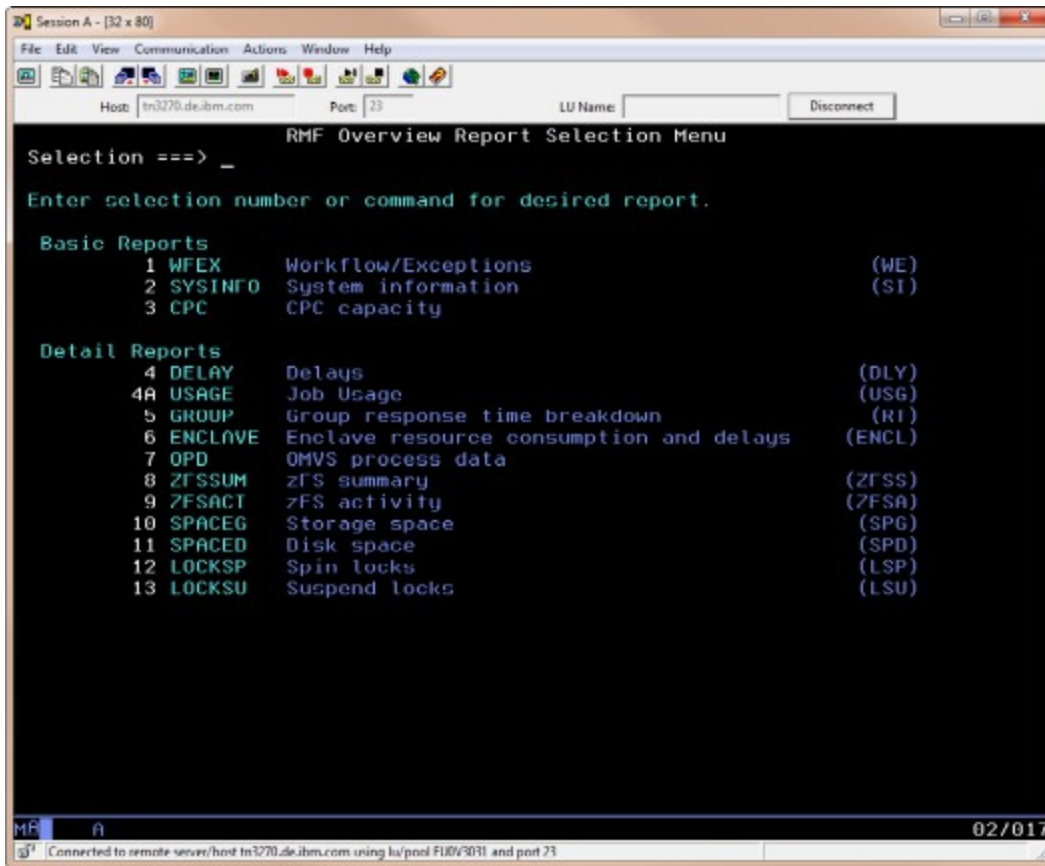
RMF Data Portal for z/OS			
Home Explore Overview My View			
by enclave			
% delay by enclave	Explanation	8D28A0	
% idle by enclave	Explanation	8D2A90	
% using by enclave	Explanation	8D2B10	
by job			
% delay by job	Explanation		
% idle by job	Explanation		
% unknown by job	Explanation		
% using by job	Explanation	8D04	
% workflow by job	Explanation	8D	
# qscan requests by job	Explanation	8D4800	
# qscan resources by job	Explanation	8D4830	
# qscan resources standard deviation by job	Explanation	8D4860	
# qscan specific requests by job	Explanation	8D4890	
# transactions by job	Explanation	8D48C0	
qscan request time by job	Explanation	8D4910	
qscan request time standard deviation by job	Explanation	8D4940	
transaction active time by job	Explanation	8D49D0	
transaction resident time by job	Explanation	8D4A00	
by WLM report class period			
% delay by WLM report class period	Explanation	8D2960	
% using by WLM report class period	Explanation	8D2B30	

Additional Metrics can be selected from the RMF Data Portal and from z/OSMF Resource Monitoring



Usage & Invocation

- The ISPF version of the Monitor III Job Usage Report can be invoked from the Monitor III Overview Report Selection Menu (via selection 4A)



Usage & Invocation

- Alternatively, the browser based version of the report can be requested from the RMF Distributed Data Server (DDS) by using the following URL:

http://hostname:8803/gpm/rmfm3.xml?report=USAGE&resource=,sysname,MVS_IMAGE



Presentation Summary

- The new Monitor III Job oriented Usage Report presents GRS usage statistics together with general resource consumption statistics on address space level
- The report is available as new standard ISPF report in a Monitor III Reporter session
- Alternatively, the browser based version of the report can be requested from the RMF Distributed Data Server (DDS)
- All metrics contained in the report can be selected as individual metrics for continuous monitoring from the following applications:
 - RMF Data Portal for z/OS
 - z/OSMF Resource Monitoring



Appendix

RMF website: www.ibm.com/systems/z/os/zos/features/rmf

- Product information, newsletters, presentations, etc.
- Downloads
 - Spreadsheet Reporter
 - RMF PM Java Edition

RMF email address: rmf@de.ibm.com

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- Documentation and news:

- *RMF Report Analysis*, SC34-2665
- *RMF User's Guide*, SC34-2664
- PDF files can be downloaded from: www.ibm.com/systems/z/os/zos/bkserv

