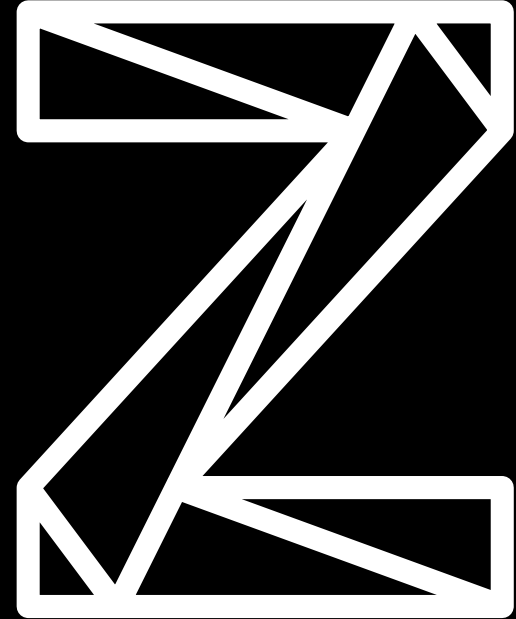


RMF – The Latest and Greatest V2.4 and z15 update

September 2019
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Contents

RMF V2R4 Enhancements

RMF Monitor III support for Crypto Activity Reporting

RMF PM HTTPS support

Secure Communication Enhancements in RMF DDS

RMF Support for Tailored Fit Pricing

Monitor new WLM Tenant Resource Groups and Tenant Report Classes

RMF z15 Enhancements

RMF Compression Support

System Recovery Boost

z15 RMF Crypto Support (CEX7)



RMF V2R4 Enhancements

RMF Monitor III support for Crypto Activity Reporting

RMF PM HTTPS support

Secure Communication Enhancements in RMF DDS

RMF Monitor III Crypto Activity Reporting

Customize Image Profiles: M35:TRX2 : TRX2 : Crypto

M35:TRX2

TRX2

General

Processor

Security

Storage

Options

Load

Crypto

Assigned Domains

--- Select Action ---

Select	Index	Control	Control and Usage
<input type="checkbox"/>	72		✓

Assigned Cryptos

--- Select Action ---

Select	Number	Candidate	Candidate and Online
<input type="checkbox"/>	9		✓
<input type="checkbox"/>	10		✓
<input type="checkbox"/>	11		✓

System TRX2:

Crypto cards 9,10 and 11 assigned to domain 72

Cryptographic number: 10

Cryptographic status: Configured

Cryptographic type: CEX6S CCA Coprocessor

Select the Usage Domain Indexes to zeroize

Select	Usage Domain Index	Partition Name	Crypto State	Compliance mode
<input type="checkbox"/>	0	M35LP08	Online	PCI HSM 2016
<input type="checkbox"/>	1	M35LP23	Online	
<input type="checkbox"/>	6	M35LP70	Standby	
<input type="checkbox"/>	11	M35LP70	Standby	
<input type="checkbox"/>	13	M35LP35	Online	
<input type="checkbox"/>	15	M35LP08	Online	
<input type="checkbox"/>	16	M35LP08	Online	
<input type="checkbox"/>	32	M35LP08	Online	
<input type="checkbox"/>	65	M35LP08	Online	
<input type="checkbox"/>	66	M35LP23	Online	
<input type="checkbox"/>	71	TRX1	Online	
<input type="checkbox"/>	72	TRX2	Online	

Crypto domains assigned to crypto card 10

Domain Management - M35

Cryptographic number: 11

Cryptographic status: Configured

Cryptographic type: CEX6S EP11 Coprocessor

Select the Usage Domain Indexes to zeroize

Select	Usage Domain Index	Partition Name	Crypto State	Compliance mode
<input type="checkbox"/>	1	M35LP23	Online	FIPS 2009
<input type="checkbox"/>	6	M35LP70	Standby	FIPS 2009
<input type="checkbox"/>	11	M35LP70	Standby	FIPS 2009
<input type="checkbox"/>	66	M35LP23	Online	FIPS 2009
<input type="checkbox"/>	71	TRX1	Online	FIPS 2009
<input type="checkbox"/>	72	TRX2	Online	FIPS 2009

Crypto domains assigned to crypto card 11

Domain Management - M35

Cryptographic number: 09

Cryptographic status: Configured

Cryptographic type: CEX6S Accelerator

Select the Usage Domain Indexes to zeroize

Select	Usage Domain Index	Partition Name	Crypto State	Compliance mode
<input type="checkbox"/>	1	M35LP23	Online	
<input type="checkbox"/>	6	M35LP70	Standby	
<input type="checkbox"/>	11	M35LP70	Standby	
<input type="checkbox"/>	66	M35LP23	Online	
<input type="checkbox"/>	71	TRX1	Online	
<input type="checkbox"/>	72	TRX2	Online	

Crypto domains assigned to crypto card 09

RMF Monitor III Crypto Activity Reporting

Existing RMF Postprocessor Support (OA54952V2R2/V2R3)

- RMF Spreadsheet Reporter ships new Crypto Hardware Activity Trend Report spreadsheet (Version 5.4.22)
- Overview Control Statements for SMF 70.2 with additional parameter LPAR.

Crypto activity for
Home Partition (LPAR)

CRYPTO HARDWARE ACTIVITY												
z/OS V2R3				SYSTEM ID S21				DATE 07/12/2018		INTERVAL 30.00.009		
				RPT VERSION V2R3 RMF				TIME 11.00.00		CYCLE 1.000 SECONDS		
----- CRYPTOGRAPHIC CCA COPROCESSOR -----												
----- LPAR -----												
TYPE	ID	RATE	EXEC TIME	UTIL%	----- CPC -----			---	---	---		
					RATE	EXEC TIME	UTIL%	KEY-GEN	RATE	KEY-GEN	RATE	
CEX5C	0	0.00	0.000	0.0	0.00	0.000	0.0	0.00	0.00	0.00		
	1	2185	0.201	43.9	4987	0.200	99.8	0.83	0.83	0.83		
CEX6C	5	4380	0.091	40.0	9121	0.109	99.5	3.89	3.89	3.89		
	6	4435	0.091	40.2	9236	0.108	99.5	3.89	3.89	3.89		
	7	4446	0.090	39.9	9262	0.107	99.5	3.82	3.82	3.82		
	8	4462	0.090	40.1	9290	0.107	99.5	3.76	3.76	3.76		
----- CRYPTOGRAPHIC PKCS11 COPROCESSOR -----												
----- LPAR -----												
TYPE	ID	RATE	EXEC TIME	UTIL%	----- CPC -----			FUNCTION		----- LPAR -----		
					RATE	EXEC TIME	UTIL%			RATE	EXEC TIME	UTIL%
CEX5P	3	461.5	1.005	46.4	1005	0.994	99.9	ASYM FAST		255.7	0.949	24.3
								ASYM GEN		0.00	0.000	0.0
								ASYM SLOW		188.2	1.080	20.3
								SYMM COMPLETE		17.57	1.019	1.8
								SYMM PARTIAL		0.00	0.000	0.0
										472.7	1.007	47.6
										0.40	2.113	0.1
										493.7	1.012	50.0
										38.61	0.603	2.3
										0.00	0.000	0.0
----- CRYPTOGRAPHIC ACCELERATOR -----												
----- LPAR -----												
TYPE	ID	RATE	EXEC TIME	UTIL%	----- CPC -----			FUNCTION		----- LPAR -----		
					RATE	EXEC TIME	UTIL%			RATE	EXEC TIME	UTIL%
CEX5A	2	1960	0.395	77.5	4930	0.202	99.8	RSA ME 1024		385.0	0.009	0.3
								RSA ME 2048		128.0	0.036	0.5
								RSA ME 4096		764.6	0.121	9.2
								RSA CRT 1024		0.00	0.000	0.0
								RSA CRT 2048		88.66	0.417	3.7
								RSA CRT 4096		593.3	1.075	63.8
										722.5	0.059	4.3
										1624	0.036	5.9
										1292	0.121	15.6
										562.6	0.080	4.5
										136.1	0.421	5.7
										593.3	1.075	63.8

Crypto activity
for entire CPC

RMF Monitor III Crypto Activity Reporting

z/OS V2.4

- z/OS V2.4 introduces new Monitor III reports for online monitoring of crypto hardware activity
- Crypto Measurements for crypto cards configured as:
 - Crypto Accelerator
 - CCA Coprocessor
 - PKCS11 Coprocessor
- Three new reports:
 - Crypto hardware overview report
 - Crypto accelerator activity report
 - Crypto PKCS11 coprocessor activity report
- Sysplex-wide view of crypto hardware activity
- Reported crypto measurements on CPC and LPAR (cryptographic usage domain) level.
- Data gathering controlled by Monitor III data gatherer option:
CRYPTO | NOCRYPTO
Default: CRYPTO

```
RMF Sysplex Report Selection Menu
Enter selection number or command for desired report.

Sysplex Reports
 1 SYSSUM      Sysplex performance summary          (SUM)
1A SYSRG       Resource Group activity              (SRG)
 2 SYSRTD      Response time distribution            (RTD)
 3 SYSWKM      Work Manager delays                   (WKM)
 4 SYSENQ      Sysplex-wide Enqueue delays           (ES)
 5 CFOVER      Coupling Facility overview             (CO)
 6 CFSYS       Coupling Facility systems              (CS)
 7 CFACT       Coupling Facility activity             (CA)
 8 CACHSUM     Cache summary                          (CAS)
 9 CACHDET     Cache detail                          (CAD)
10 RLSSC       VSAM RLS activity by storage class     (RLS)
11 RLSDS       VSAM RLS activity by data set          (RLD)
12 RLSLRU      VSAM LRU overview                     (RLI)
13 ZFSOVW      zFS Overview                          (ZFO)
14 ZFSFS       zFS File System                       (ZFF)
15 ZFSKN       zFS Kernel                            (ZFK)
16 CRYOVW      Crypto hardware overview              (CRO)
17 CRYACC      Crypto accelerator activity            (CRA)
18 CRYPKC      Crypto PKCS11 coprocessor activity     (CRP)

Data Index
 D DSINDEX    Data index                          (DI)
```

RMF Monitor III Crypto Activity Reporting

Crypto Hardware Overview Report

RMF V2R4 Crypto HW Overview - ENGTEST3

Samples: 100 Systems: 4 Date: 02/14/19 Time: 06.00.00

Syplex wide overview of crypto hardware activity

Type	ID	--CPC--	-System-	Rate	Exec Time	Util%	Key Rate	Gen ExTime	Util%
CEX5C	0	M88		6223	0.160	99.7	0.730	0.191	0.0
CEX5C	0	M88	S24	66.46	0.146	1.0	0.000	0.000	0.0
CEX5C	0	M88	S25	6157	0.160	98.7	0.730	0.191	0.0
CEX5C	1	M88		5259	0.190	99.7	0.820	0.828	0.1
CEX5C	1	M88	S24	48.04	1.167	5.6	0.000	0.000	0.0
CEX5C	1	M88	S25	5211	0.181	94.1	0.820	0.828	0.1
CEX5P	3	M88		949.4	1.053	100			
CEX5P	3	M88	S24	280.5	1.102	30.9			
CEX5P	3	M88	S25	668.9	1.032	69.0			
CEX6A	9	M88		5237	0.195	100			
CEX6A	9	M88	S24	2486	0.012	2.9			
CEX6A	9	M88	S25	2751	0.361	99.4			
CEX6C	11	M88		6177	0.161	99.7	0.010	0.087	0.0
CEX6C	11	M88	S24	172.7	0.282	4.9	0.000	0.000	0.0
CEX6C	11	M88	S25	6004	0.158	94.8	0.010	0.087	0.0
CEX6C	12	M88		6111	0.163	99.7	0.030	0.127	0.0
CEX6C	12	M88	S24	317.7	0.269	8.5	0.000	0.000	0.0
CEX6C	12	M88	S25	5793	0.157	91.1	0.030	0.127	0.0
CEX4C	1	P88		468.8	0.706	33.1	0.000	0.000	0.0
CEX3C	4	P88		465.0	0.685	31.8	0.000	0.000	0.0
CEX3A	5	P88		5472	0.129	70.8			
CEX4P	13	P88		28.19	12.22	34.5			
CEX4C	14	P88		460.6	0.688	31.7	0.000	0.000	0.0
CEX4P	15	P88		26.62	12.65	33.7			

Crypto activity on CPC level (M88).

Crypto activity on LPAR level

Crypto activity on CPC level (P88).

Details for Coprocessor Cards

RMF Monitor III Crypto Activity Reporting

Crypto Accelerator Activity Report

- Crypto measurements about public key operations (RSA cryptography operations) at CPC and LPAR level.

Syplex wide crypto activity details for crypto cards configured as crypto accelerator

Total crypto activity for Crypto card 9 on CPC M88

LPAR S25 share of Crypto activity for Crypto card 9 on CPC M88

RMF V2R4 Crypto Acc Activity - ENGTEST3 Line 1 of 15

Samples: 100 Systems: 4 Date: 02/14/19 Time: 06.00.00 Range: 100 Sec

Type	ID	--CPC---	-System-	-Key Len	----- Rate	ME RSA ExTime	----- Util%	----- Rate	CRT RSA ExTime	----- Util%
CEX6A	9	M88		1024	2705	0.023	6.1	64.25	0.078	0.5
CEX6A	9	M88		2048	223.7	0.040	0.9	274.6	0.334	9.2
CEX6A	9	M88		4096	661.6	0.122	8.0	1308	0.593	77.6
CEX6A	9	M88	S24	1024	2486	0.012	2.9	0.000	0.000	0.0
CEX6A	9	M88	S24	2048	0.000	0.000	0.0	0.000	0.000	0.0
CEX6A	9	M88	S24	4096	0.000	0.000	0.0	0.000	0.000	0.0
CEX6A	9	M88	S25	1024	218.5	0.147	3.2	64.25	0.078	0.5
CEX6A	9	M88	S25	2048	223.7	0.040	0.9	274.6	0.334	9.2
CEX6A	9	M88	S25	4096	661.6	0.122	8.0	1308	0.593	77.6
CEX3A	5	P88		1024	0.000	0.000	0.0	5472	0.129	70.8
CEX3A	5	P88		2048	0.000	0.000	0.0	0.000	0.000	0.0
CEX3A	5	P88		4096	0.000	0.000	0.0	0.000	0.000	0.0
CEX5A	9	S89		1024	0.000	0.000	0.0	0.000	0.000	0.0
CEX5A	9	S89		2048	0.000	0.000	0.0	147.8	0.522	7.7
CEX5A	9	S89		4096	0.000	0.000	0.0	673.0	1.371	92.2

RMF Monitor III Crypto Activity Reporting

Crypto PKCS11 Coprocessor Activity Report

Crypto measurements about secure public-key operations executed by cryptographic symmetric- and asymmetric-key functions (PKCS11 cryptography) at CPC and LPAR level.

Syplex wide crypto activity details for crypto cards configured as PKCS11 coprocessor

Total crypto activity for Crypto card 3 on CPC M88

LPAR S25 share of Crypto activity for Crypto card 3 on CPC M88

RMF V2R4 Crypto PKCS11 Act. - ENGTEST3 Line 1 of 7											
Samples: 100			Systems: 4		Date: 02/14/19		Time: 06.00.00		Range: 100		Sec
Type	ID	--CPC---	-System-	-Asym Rate	Slow Utl%	-Asym Rate	Fast Utl%	-Symm Rate	Part Utl%	-Symm Rate	Cmpl Utl%
CEX5P	3	M88		533.7	52.6	399.1	46.6	0.000	0.0	16.07	0.7
CEX5P	3	M88	S24	231.4	21.4	40.57	9.2	0.000	0.0	8.450	0.4
CEX5P	3	M88	S25	302.3	31.2	358.5	37.4	0.000	0.0	7.620	0.3
CEX4P	13	P88		13.97	3.3	0.000	0.0	0.000	0.0	14.14	31.1
CEX4P	15	P88		13.07	3.8	0.000	0.0	0.000	0.0	12.90	29.3
CEX5P	4	S89		341.6	34.3	484.8	42.0	0.000	0.0	0.000	0.0
CEX5P	5	S89		341.8	34.3	485.3	41.7	0.000	0.0	0.000	0.0

RMF Monitor III Crypto Activity Reporting

Report Options

- CRYOVW: Cursor sensitivity on ACC or PKC line displays CRYACC or CRYPKC (refer (1)).
- CRYACC, CRYPKC: Cursor sensitivity links back to CRYOVW, showing only ACC or PKC data lines (refer (2)).

RMF V2R4 Crypto HW Overview - ENGTEST3 Line 1 of 30

Samples: 100 Systems: 4 Date: 02/14/19 Time: 06.00.00 Range: 100 Sec

Type	ID	--CPC---	-System-	Rate	Exec Time	Util%	----- Key Gen -----	Rate	ExTime	Util%
CEX5C	0	M88		6223	0.160	99.7	0.730	0.121	0.0	
CEX5C	0	M88	S24	66.46	0.146	1.0	0.000	0.000	0.0	
CEX5C	0	M88	S25	6157	0.160	98.7	0.730	0.191	0.0	
CEX5C	1	M88		5259	0.190	99.7	0.820	0.828	0.1	
CEX5C	1	M88	S24	48.04	1.167	5.6	0.000	0.000	0.0	
CEX5C	1	M88	S25	5211	0.181	94.1	0.820	0.828	0.1	
CEX5P	3	M88		949.4	1.053	100				
CEX5P	3	M88	S24	280.5	1.102	30.9				
CEX5P	3	M88	S25	668.9	1.032	69.0				
CEX6A	9	M88		5237	0.195	100				
CEX6A	9	M88	S24	2486	0.012	2.9				

RMF V2R4 Crypto HW Overview - ENGTEST3 Line 1 of 8

Samples: 100 Systems: 4 Date: 02/14/19 Time: 06.00.00 Range: 100 Sec

Type	ID	--CPC---	-System-	Rate	Exec Time	Util%	----- Key Gen -----	Rate	ExTime	Util%
CEX5A	2	M88		0.000	0.000	0.0				
CEX5A	2	M88	S24	0.000	0.000	0.0				
CEX5A	2	M88	S25	0.000	0.000	0.0				
CEX6A	9	M88		5237	0.195	100				
CEX6A	9	M88	S24	2486	0.012	2.9				
CEX6A	9	M88	S25	2751	0.361	99.4				
CEX3A	5	P88		5472	0.129	70.8				
CEX5A	9	S89		820.8	1.218	100				

RMF V2R4 Crypto Acc Activity - ENGTEST3 Line 1 of 24

Samples: 100 Systems: 4 Date: 02/14/19 Time: 06.00.00 Range: 100 Sec

Type	ID	--CPC---	-System-	-Key Len	ME Rate	RSA ExTime	Util%	----- CRT RSA -----	Rate	ExTime	Util%
CEX5A	2	M88		1024	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88		2048	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88		4096	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88	S24	1024	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88	S24	2048	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88	S24	4096	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88	S25	1024	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88	S25	2048	0.000	0.000	0.0	0.000	0.000	0.0	
CEX5A	2	M88	S25	4096	0.000	0.000	0.0	0.000	0.000	0.0	
CEX6A	9	M88		1024	2705	0.023	6.1	64.25	0.078	0.5	
CEX6A	9	M88		2048	223.7	0.040	0.9	274.6	0.334	9.2	
CEX6A	9	M88		4096	661.6	0.122	8.0	1308	0.593	77.6	
CEX6A	9	M88	S24	1024	2486	0.012	2.9	0.000	0.000	0.0	
CEX6A	9	M88	S24	2048	0.000	0.000	0.0	0.000	0.000	0.0	
CEX6A	9	M88	S24	4096	0.000	0.000	0.0	0.000	0.000	0.0	
CEX6A	9	M88	S25	1024	218.5	0.147	3.2	64.25	0.078	0.5	

RMF Monitor III Crypto Activity Reporting

Cursor Sensitivity

- The contents of the Monitor III Crypto reports can be tailored by report options (use RO command on CRYOVW/CRYACC/CRYPKC panel).
- Example: Showing only lines for CPC „M88“, include inactive lines.

```
RMF Crypto Report Options                               Line 1 of 1
Change or verify parameters. To exit press END.
Changes will apply to the CRYOVW, CRYACC and CRYPKC reports.

Scope      ==> M88      ALL or one of the available CPC or system names below
Function   ==> ALL      Show ALL crypto functionalities,
                        only accelerator (ACC), CCA (CCA) or PKCS11 (PKC)
                        coprocessor data in CRYOVW report
Inactive   ==> YES      Show inactive cryptographic card entries (YES or NO)

Available CPCs and Systems
M88      P88      S0D      S0F      S24      S25      S89
```

RMF V2R4 Crypto HW Overview - ENGTEST3 Line 1 of 12

Samples: 100 Systems: 4 Date: 02/14/19 Time: 06.00.00 Range: 100 Sec

Type	ID	--CPC--	-System-	Rate	Exec Time	Util%	---- Key Gen Rate	ExTime	----- Util%
CEX5C	0	M88		6223	0.160	99.7	0.730	0.191	0.0
CEX5C	1	M88		5259	0.190	99.7	0.820	0.828	0.1
CEX5A	2	M88		0.000	0.000	0.0			
CEX5P	3	M88		949.4	1.053	100			
CEX6C	5	M88		0.000	0.000	0.0	0.000	0.000	0.0
CEX6P	6	M88		0.000	0.000	0.0			
CEX6P	7	M88		0.000	0.000	0.0			
CEX6P	8	M88		0.000	0.000	0.0			
CEX6A	9	M88		5237	0.195	100			
CEX6C	10	M88		0.000	0.000	0.0	0.000	0.000	0.0
CEX6C	11	M88		6177	0.161	99.7	0.010	0.087	0.0
CEX6C	12	M88		6111	0.163	99.7	0.030	0.127	0.0

RMF Monitor III Crypto Activity Reporting

RMF Data Portal for z/OS

- The browser based version of CRYOVW report (one report for all crypto cards metrics) can be requested from RMF Distributed Data Server (DDS) using the following URL:

<http://hostname:8803/gpm/rmf3.xml?report=CRYOVW&resource=,SYSDPLEX,SYSPLEX>

Also includes ACC and PKC data!

RMF Report [UTCPXCB,SYSPLEX] : CRYOVW (Crypto Hardware Overview)

Time Range: 12/19/2018 08:57:00 - 12/19/2018 08:58:00

Crypto Card Type	Crypto Card Index	CPC Name	System Name	Usage Domain ID	Scope	Cryptographic Mode	Total Rate	Total Avg Exec Time	Total Util %	RSA-Key-Gen Rate	RSA-Key-Gen Avg Exec Time	RSA-Key-Gen Util %	RSA Key Length	ME-Format RSA Rate	ME-Format RSA Avg Exec Time	ME-Format RSA Util %	CRT-Format RSA Rate	CRT-Format RSA Avg Exec Time	CRT-Format RSA Util %
CEX6C	0	M113			C	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6C	0	M114			C	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6A	0	M92			C	A	5.000	0.127	0.1				1024	1.667	0.018	0.0	1.500	0.133	0.0
CEX6A	0	M92			C	A							2048	1.233	0.031	0.0	0.600	0.610	0.0
CEX6A	0	M92			C	A							4096	0.000	0.000	0.0	0.000	0.000	0.0
CEX5C	0	S310			C	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6C	1	M113			C	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6C	1	M114			C	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6A	1	M92			C	A	5.000	0.221	0.1				1024	1.333	0.019	0.0	1.500	0.133	0.0
CEX6A	1	M92			C	A							2048	0.767	0.034	0.0	1.400	0.608	0.1
CEX6A	1	M92			C	A							4096	0.000	0.000	0.0	0.000	0.000	0.0
CEX5A	1	S310			C	A	9.667	0.181	0.2				1024	2.900	0.026	0.0	2.900	0.139	0.0
CEX5A	1	S310			C	A							2048	1.933	0.039	0.0	1.933	0.618	0.1
CEX5A	1	S310			C	A							4096	0.000	0.000	0.0	0.000	0.000	0.0
CEX6C	2	M92			C	C	0.033	0.714	0.0	0.000	0.000	0.0							
CEX5C	2	S310			C	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6C	2	M92	CB8A	17	S	C	0.033	0.714	0.0	0.000	0.000	0.0							
CEX6C	2	M92	CB8C	13	S	C	0.000	0.000	0.0	0.000	0.000	0.0							
CEX6C	3	M92			C	C	0.033	0.706	0.0	0.000	0.000	0.0							
CEX6C	3	M92	CB8A	17	S	C	0.033	0.706	0.0	0.000	0.000	0.0							
CEX6C	3	M92	CB8C	13	S	C	0.000	0.000	0.0	0.000	0.000	0.0							

Slow Asym-Key Rate	Slow Asym-Key Avg Exec Time	Slow Asym-Key Util %	Fast Asym-Key Rate	Fast Asym-Key Avg Exec Time	Fast Asym-Key Util %
↓↑	↓↑	↓↑	↓↑	↓↑	↓↑
Sym-Key Partial Rate	Sym-Key Partial Avg Exec Time	Sym-Key Partial Util %	Sym-Key Final Rate	Sym-Key Final Avg Exec Time	Sym-Key Final Util %
↓↑	↓↑	↓↑	↓↑	↓↑	↓↑
Asym-Key Generation Rate		Asym-Key Generation Avg Exec Time		Asym-Key Generation Util %	
↓↑		↓↑		↓↑	
				CB86	
				CB8B	
				CB8A	
				CB8A	
				CB8A	

RMF Monitor III Crypto Activity Reporting

RMF Data Portal for z/OS

Sysplex

MVS Image

I/O Subsystem

:
CRYPTO

CRYPTO_CARD

Processor

Storage

Enqueue

Operator

Subsystems

CPC

LPAR

Coupling Facility

CF Structure

New CRYPTO and CRYPTO_CARD resource types are added to the I/O_SUBSYSTEM resource

Children of: CB8B,*,I/O_SUBSYSTEM

Icon	Resource	Metrics	Attributes	Res-Type
	CB8B,*,ALL_CHANNELS	Metrics	N/A	ALL_CHANNELS
	CB8B,*,ALL_LCUS	Metrics	N/A	ALL_LCUS
	CB8B,*,ALL_SSIDS	Metrics	N/A	ALL_SSIDS
	CB8B,*,ALL_VOLUMES	Metrics	N/A	ALL_VOLUMES
	CB8B,*,CRYPTO	Metrics	N/A	CRYPTO
	CB8B,*,PCIE	Metrics	N/A	PCIE
	CB8B,*,SCM	Metrics	N/A	SCM
	CB8B,*,ZFS	Metrics	N/A	ZFS

Children of: CB8B,*,CRYPTO

Icon	Resource	Metrics	Attributes	Res-Type
	CB8B,0,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,1,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,10,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,11,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,2,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,3,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,4,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,6,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,7,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,8,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD
	CB8B,9,CRYPTO_CARD	Metrics	Show	CRYPTO_CARD

Details are available for the CRYPTO_CARD resource

Attributes of: CB8B,1,CRYPTO_CARD

Description	Value
Card type	CEX6C
Card ID	1
CPC name	M113
Usage domain	1

RMF Monitor III Crypto Activity Reporting

RMF Data Portal for z/OS

All performance metrics from the Crypto Sysplex reports are added to the crypto resources in the DDS and are promoted to the SYSPLEX and CPC resource as well.

Available metrics for: TRX1,1,CRYPTO_CARD

Metric description	Help	Id
% utilization asym-key generation operations (domain)	Explanation	8D6460
% utilization asym-key generation operations (CPC)	Explanation	8D6480
% utilization complete sym-key operations (domain)	Explanation	8D64A0
% utilization complete sym-key operations (CPC)	Explanation	8D64C0
% utilization crypto operations (domain)	Explanation	8D64E0
% utilization crypto operations (CPC)	Explanation	8D6500
% utilization fast asym-key operations (domain)	Explanation	8D6520

Available metrics for: ,TRX1PLEX,SYSPLEX

by crypto card		
% utilization asym-key generation operations (domain) by crypto card	Explanation	8D6470
% utilization asym-key generation operations (CPC) by crypto card	Explanation	8D6490
% utilization complete sym-key operations (domain) by crypto card	Explanation	8D64B0
% utilization complete sym-key operations (CPC) by crypto card	Explanation	8D64D0
% utilization crypto operations (domain) by crypto card	Explanation	8D64F0
% utilization crypto operations (CPC) by crypto card	Explanation	8D6510
% utilization fast asym-key operations (domain) by crypto card	Explanation	8D6530

Available metrics for: TRX1,*,CRYPTO

Metric description	Help	Id
by crypto card		
% utilization asym-key generation operations (domain) by crypto card	Explanation	8D6470
% utilization asym-key generation operations (CPC) by crypto card	Explanation	8D6490
% utilization complete sym-key operations (domain) by crypto card	Explanation	8D64B0
% utilization complete sym-key operations (CPC) by crypto card	Explanation	8D64D0
% utilization crypto operations (domain) by crypto card	Explanation	8D64F0
% utilization crypto operations (CPC) by crypto card	Explanation	8D6510
% utilization fast asym-key operations (domain) by crypto card	Explanation	8D6530

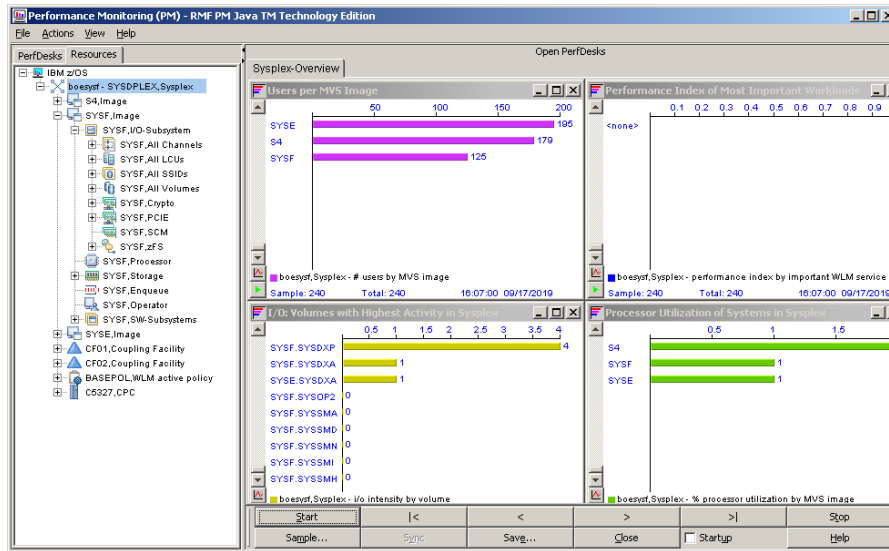
Available metrics for: ,829E7,CPC

by crypto card		
% utilization asym-key generation operations (CPC) by crypto card	Explanation	8D6490
% utilization complete sym-key operations (CPC) by crypto card	Explanation	8D64D0
% utilization crypto operations (CPC) by crypto card	Explanation	8D6510
% utilization fast asym-key operations (CPC) by crypto card	Explanation	8D6530

Crypto Card Resource and performance metrics also supported with RMF PM Version 2.5.0

RMF PM HTTPS Support

- RMF PM Version 2.4.92 supports secure communication via HTTPS with the RMF DDS (APAR OA56116 V2R2/V2R3)!
- RMF PM Version 2.5.0 gets rid of Classical RMF PM Port (Port Number 8801) (V2R4)
- You may decide to disable DDS Classical RMF PM Port using DDS Parmlib option: MAXSESSIONS_INET(0) or SESSION_PORT(0)
- Available from the RMF FTP site or SYS1.SERBPWSV(GPMWINV2)



RMF PM Java TM Technology Edition - New Sysplex

New Sysplex: ProductionPlex

Host Name: production.ibm.com

HTTP Port Number: 8803

☒ Use HTTPS

User Id: BMAI

Communication timeout [sec]: 10

Date/Time at Sysplex: 2019/09/17 13:03

GMT-Offset of Time-zone: Europe/Berlin

Ok Cancel

In the Sysplex definition dialog specify "Use HTTPS"! But ensure that your DDS is enabled to talk HTTPS using AT-TLS...

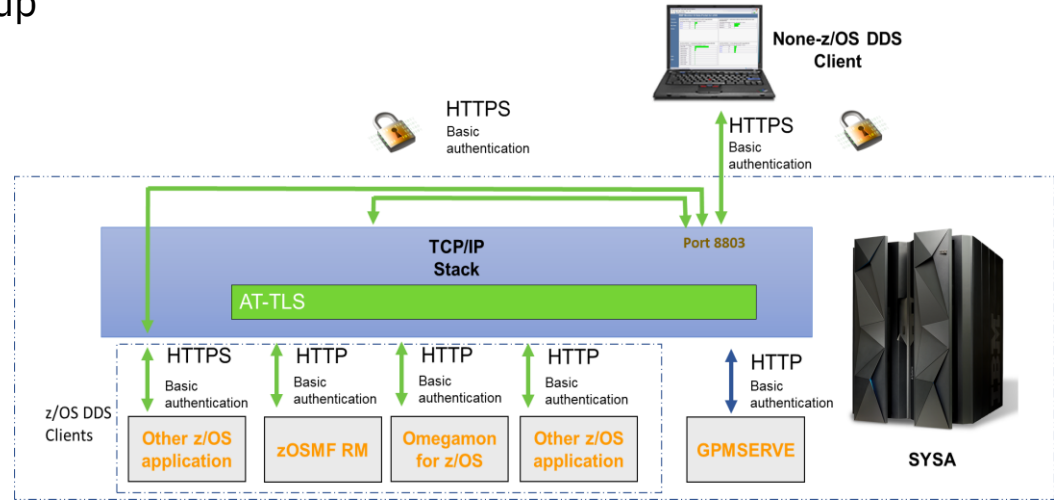
Secure Communication Enhancements



- Per default DDS will only accept HTTPS communication requests.
- DDS HTTPS support requires AT-TLS setup
- New DDS Parmlib option HTTPS
 - Specifies if a secure DDS connection via AT-TLS is required
 - If **ATTLS** is specified, DDS verifies that the incoming HTTP connection is secured by an AT-TLS setup. If the incoming connection is not secured by an AT-TLS setup, the connection is refused.
 - If **NO** is specified, no further checks are done by DDS. In this case, communication with the DDS can either be via HTTP or via HTTPS secured by AT-TLS.

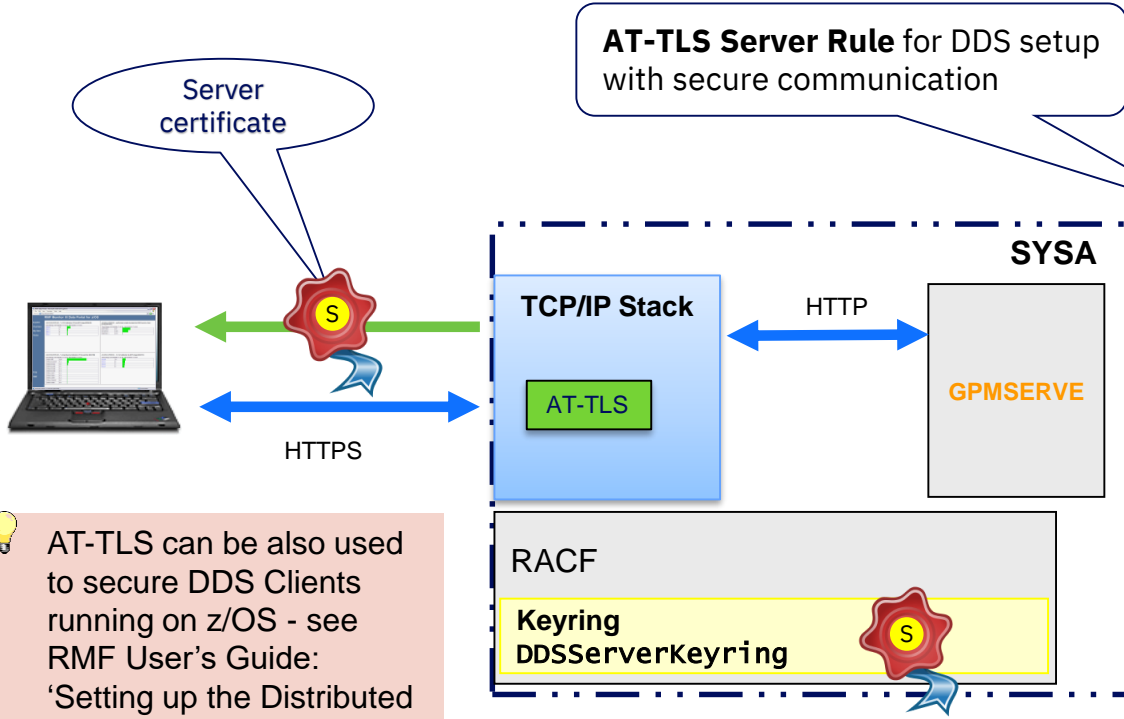
Default: HTTPS(ATTLS)

Example: HTTPS(ATTLS)



For information on how to set up secure DDS communication refer to RMF User's Guide: 'Setting up the Distributed Data Server for z/OS'

Secure Communication Enhancements



AT-TLS can be also used to secure DDS Clients running on z/OS - see RMF User's Guide: 'Setting up the Distributed Data Server for z/OS'

```
# RMF Distributed Data Server Rule
TTLRule
  DDSServerRule
  {
    LocalPortRange      8803
    Jobname              GPMSEVE
    Direction            Inbound
    Priority              1
    TTLGroupActionRef    DDSServerGRP
    TTLEnvironmentActionRef DDSServerENV
  }
  TTLGroupAction
    DDSServerGRP
    {
      TTLEnabled          On
      Trace                1
    }
  TTLEnvironmentAction
    DDSServerENV
    {
      HandshakeRole       Server
      TTLSKeyringParms
      {
        Keyring
        DDSServerKeyring
      }
      TTLEnvironmentAdvancedParms
      {
        ServerCertificateLabel1  RMFDDS
      }
    }
  }
}
```

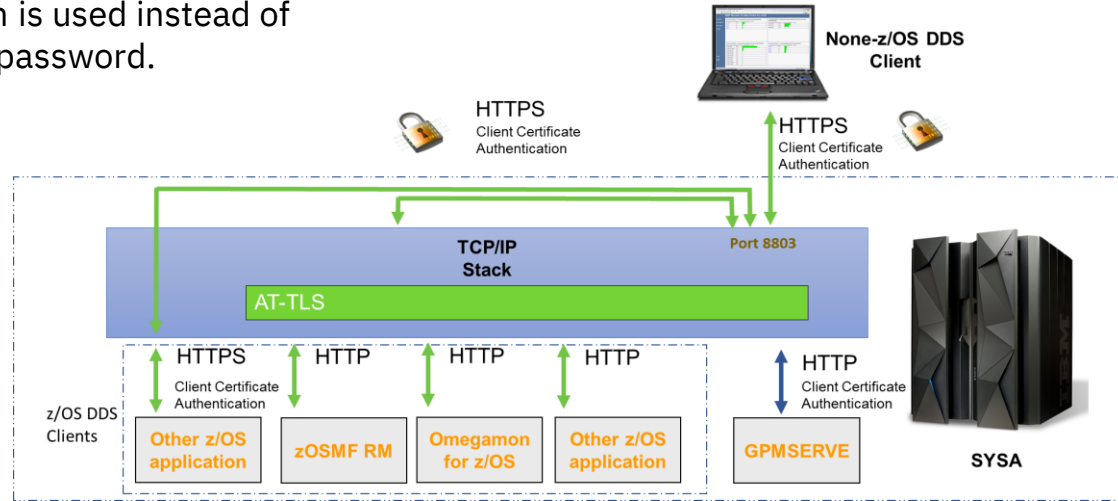
Secure Communication Enhancements

V2R4

DDS enhanced to support secure communication with client certificate authentication using AT-TLS.

- New DDS Parmlib option **CLIENT_CERT**
 - Specifies if client certificate authentication is used instead of HTTP Basic Authentication via userid and password.
 - If **ACCEPT** is specified, DDS accepts incoming HTTP connections, takes the user ID from an AT-TLS provided client certificate and will bypass user ID/password authentication. If the incoming HTTP connection does not supply a client certificate that is associated with a user ID, user ID/password authentication is performed.
 - If **NONE** is specified, no further checks are done.

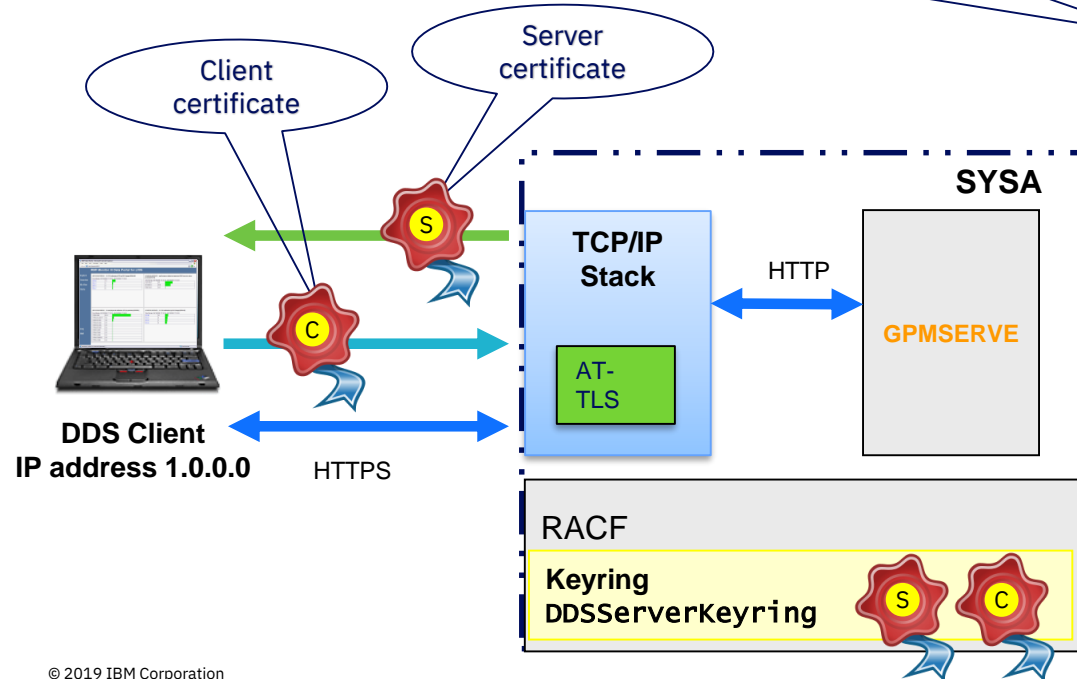
Default: CLIENT_CERT(NONE)
Example: CLIENT_CERT(ACCEPT)



CLIENT_CERT(ACCEPT) can be used to support DDS data exploiter running on z/OS with a protected userid (for example, OMEGAMON z/OS agent)

Secure Communication Enhancements

AT-TLS Server Rule for DDS setup with secure communication and Client Certificate Authentication



```
# RMF Distributed Data Server Rule
TTLSRule
DDSServerClientCertRule
{
    LocalPortRange      8803
    Jobname              GPMSEVER
    RemoteAddr          1.0.0.0
    Direction            Inbound
    TTLSGroupActionRef   DDSServerClientCertGRP
    TTLSEnvironmentActionRef DDSServerClientCertENV
    Priority              2
}

TTLSGroupAction
DDSServerClientCertGRP
{
    TTLS-enabled         On
    Trace                1
}

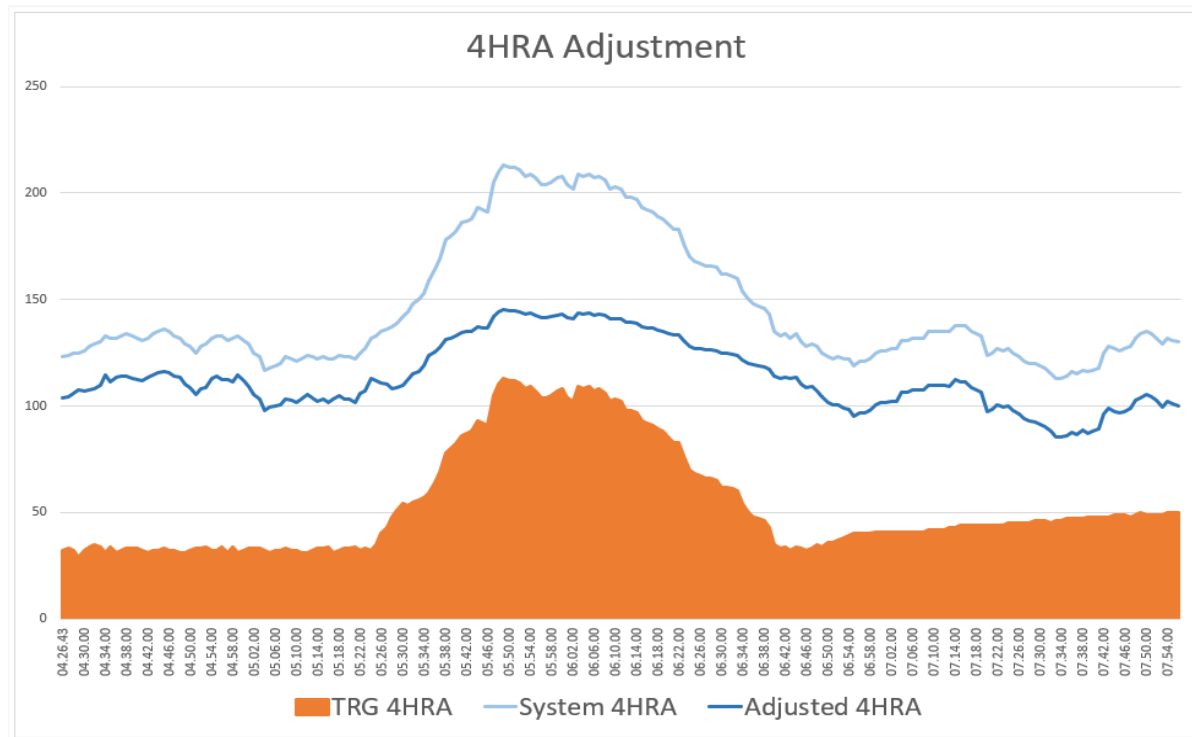
TTLSEnvironmentAction
{
    HandshakeRole        ServerWithClientAuth
    TTLSKeyringParms
    {
        Keyring          DDSServerKeyring
    }
    TTLSEnvironmentAdvancedParms
    {
        ClientAuthType    SAFCheck
        ServerCertificateLabel RMFDDS
    }
}
```

RMF Support for Tailored Fit Pricing

Monitor new WLM Tenant Resource Groups and Tenant Report Classes

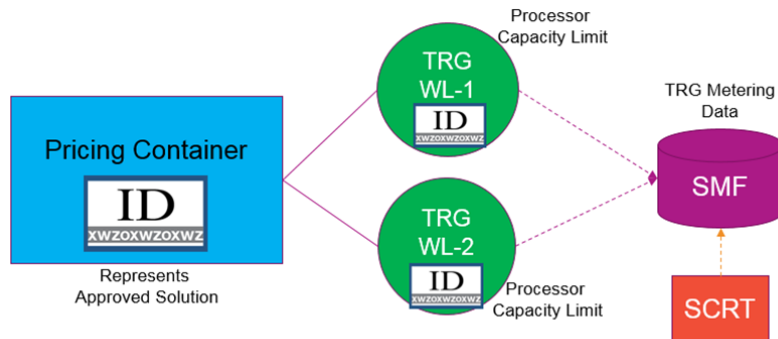
RMF Support for Tailored Fit Pricing

- Identify a subset of the work running in a system in the WLM service definition
- WLM automatically gathers consumption data (4HRA, service units) for that subset
- SCRT then uses this 4HRA to adjust the system 4HRA (which determines your software charges), and prices the work separately and/or differently (discount, free of charge, MSU consumption, other metric like number of transactions, etc.)



RMF Support for Tailored Fit Pricing

- For an eligible solution, IBM provides customers with a “Solution ID” (key)
- In their WLM service definition customers
 - Define one or more TRGs and paste the Solution ID into the definition
 - Dummy solution IDs for test/education will be documented
 - Define one or more TRCs associated with TRG
 - Change or add classification rules to classify eligible work (only!), and assign service class and TRCs
 - Install and activate WLM service definition
- Monitors query WLM and write new SMF70 data sections for TRGs
 - In addition, the TRC and TRG data will be reported via the existing report class and resource group mechanism in the WLMGL report
- SCRT consumes SMF70 and SMF89 data for billing
 - Verifies solution ID, applies pricing rules



New WLM service definition objects

- A Tenant Report Class (TRC) is similar to a WLM Report Class. TRCs are assigned through WLM classification and are always associated with a Tenant Resource Group.
- A Tenant Resource Group (TRG) is similar to a WLM Resource Group and can be associated with tenants or solutions. TRGs aggregate consumption data and can optionally be used to apply consumption limits.

RMF Support for Tailored Fit Pricing



- RMF Monitor I collects and stores TRG performance data into new fields of SMF 70-1. The new SMF data can be used by exploiter like SCRT
- New Postprocessor overview conditions based on the new fields in SMF 70-1 to report the CPU consumption of a TRG
- RMF collects TRG and TRC information in SMF 79 for use by SDSF
- Detailed TRC and TRG information is collected in SMF 72-3 and can be reported in the Postprocessor Workload Activity (WLMGL) report
- Basic TRC and TRG information is reported in various RMF Monitor III reports
 - Sysplex Summary (SYSSUM)
 - System Information (SYSINFO)
 - Storage Delay Summary Report (STORS)
 - Group Response Time (GROUP)
 - Response Time Distribution (SYSRTD)
 - Work Manager Delays (SYSWKM)

RMF Support for Tailored Fit Pricing

Overview Condition	Name	Qualifier	Source	Algorithm
Long-term average of CPU service consumed by a tenant resource group	TRGLACS	trg	SMF70_TRG_LAC	Value or comparison
Service units on general purpose processors consumed by a tenant resource group per second	TRGCP	trg	SMF70_TRG_SUCP SMF70INT	$\text{TRG_SUCP} * 1000 / \text{INT}$
Service units on zAAPs consumed by a tenant resource group per second	TRGAAP	trg	SMF70_TRG_SUIFA SMF70INT	$\text{TRG_SUIFA} * 1000 / \text{INT}$
Service units on zIIPs consumed by a tenant resource group per second	TRGIIP	trg	SMF70_TRG_SUSUP SMF70INT	$\text{TRG_SUSUP} * 1000 / \text{INT}$
General purpose processor consumption by a tenant resource group in terms of 1/100 of a CP	TRGCPN	trg	SMF70_TRG_SUCP SMF70ADJ SMF70INT	$(\text{TRG_SUCP} * \text{ADJ}) / (\text{INT} * 160000)$
zAAP processor consumption by a tenant resource group in terms of 1/100 of a CP	TRGAAPN	trg	SMF70_TRG_SUIFA SMF70ADJ SMF70INT	$(\text{TRG_SUIFA} * \text{ADJ}) / (\text{INT} * 160000)$
zIIP processor consumption by a tenant resource group in terms of 1/100 of a CP	TRGIIPN	trg	SMF70_TRG_SUSUP SMF70ADJ SMF70INT	$(\text{TRG_SUSUP} * \text{ADJ}) / (\text{INT} * 160000)$
Memory consumption of a TRG	TRGMEM	trg	SMF70_TRG_MEM SMF70INT	$\text{TRG_MEM} / (\text{TRG_M_CNT} * 256)$

OA54916
V2R2/V2R3

RMF Support for Tailored Fit Pricing

Report Class and Tenant Report Class reports

POLICY=STANDARD									
REPORT CLASS=RMFGAT									
DESCRIPTION =RMF Monitor III									
-TRANSACTIONS--									
TRANS-TIME HHH.MM.SS.FFFFFF									
TRANS-APPL%-----CP-IIPCP/AAPCP-IIP/AAP									
---ENCLAVES---									
AVG	1.00	ACTUAL	0	TOTAL	0.31	0.00	0.25	AVG ENC	0.00
MPL	1.00	EXECUTION	0	MOBILE	0.00	0.00	0.00	REM ENC	0.00
ENDED	0	QUEUED	0	CATEGORYA	0.00				
END/S	0.00	R/S AFFIN	0	CATEGORYB	0.00				
#SWAPS	0	INELIGIBLE	0						
EXCTD	0	CONVERSION	0						
		STD DEV	0						

Tenant identifier
associated with TRG

POLICY=STANDARD									
REPORT CLASS= RMFTRCN1									
DESCRIPTION =RMF Tenant Report Class									
-TRANSACTIONS--									
TRANS-TIME HHH.MM.SS.FFFFFF									
TRANS-APPL%-----CP-IIPCP/AAPCP-IIP/AAP									
---ENCLAVES---									
AVG	0.00	ACTUAL	0	TOTAL	0.00	0.00	0.00	AVG ENC	
MPL	0.00	EXECUTION	0	MOBILE	0.00	0.00	0.00	REM ENC	
ENDED	0	QUEUED	0	CATEGORYA	0.00	0.00	0.00	MS ENC	
END/S	0.00	R/S AFFIN	0	CATEGORYB	0.00	0.00	0.00		
#SWAPS	0	INELIGIBLE	0						
EXCTD	0	CONVERSION	0						
		STD DEV	0						

Report Class Period and Tenant Report Class Period reports

POLICY=STANDARD									
REPORT CLASS=OMVS									
PERIOD=1									
HOMOGENEOUS: GOAL DERIVED FROM SERVICE CLASS OMVSKERN									
-TRANSACTIONS--									
TRANS-TIME HHH.MM.SS.FFFFFF									
TRANS-APPL%-----CP-IIPCP/AAPCP-IIP/AAP									
---ENCLAVES---									
AVG	0.00	ACTUAL	0	TOTAL	0.00	0.00	0.00	AVG ENC	0.00
MPL	0.00	EXECUTION	0	MOBILE	0.00	0.00	0.00	REM ENC	0.00
ENDED	0	QUEUED	0	CATEGORYA	0.00				
END/S	0.00	R/S AFFIN	0	CATEGORYB	0.00				
#SWAPS	1	INELIGIBLE	0						
EXCTD	0	CONVERSION	0						
		STD DEV	0						

Name of TRG

POLICY=STANDARD									
REPORT CLASS=RMFTRCN1									
HOMOGENEOUS: GOAL DERIVED FROM SERVICE CLASS DISCRETN									
-TRANSACTIONS--									
TRANS-TIME HHH.MM.SS.FFFFFF									
TRANS-APPL%-----CP-IIPCP/AAPCP-IIP/AAP									
---ENCLAVES---									
AVG	3.00	ACTUAL	0	TOTAL	17.18	0.00	17.86	AVG ENC	0.00
MPL	3.00	EXECUTION	0	MOBILE	0.00	0.00	0.00	REM ENC	0.00
ENDED	0	QUEUED	0	CATEGORYA	0.00	0.00	0.00	MS ENC	0.00
END/S	0.00	R/S AFFIN	0	CATEGORYB	0.00	0.00	0.00		
#SWAPS	0	INELIGIBLE	0						
EXCTD	0	CONVERSION	0						
		STD DEV	0						

RMF Support for Tailored Fit Pricing

Service Policy Page

WORKLOAD ACTIVITY

z/OS V2R3

SYSPLEX SYSDPLEX
RPT VERSION V2R3 RMF

DATE 09/28/2017
TIME 10.45.00

INTERVAL 14.59.999 MODE = GOAL

POLICY ACTIVATION DATE/TIME 09/14/2017 10.54.07

- SERVICE POLICY PAGE -

SERVICE DEFINITION: SYSTES2

INSTALL DATE: 09/10/2017 15.02.56 INSTALLED BY: BLUCIUS

POLICY: STANDARD Standard policy

DISCRETIONARY GOAL MANAGEMENT: YES

DYNAMIC ALIAS MANAGEMENT: YES

I/O PRIORITY MANAGEMENT: YES

-SERVICE DEFINITION COEFFICIENTS-

IOC CPU SRB MSO AAP IIP

5.0 10.0 10.0 0.0001 1.0000 1.0000

Discretionary Goal
Management status:
YES = Enabled

RESOURCE GROUPS

--NAME--	-----DESCRIPTION-----	-SYSTEM-	---CPU CONSUMPTION---	-----CPU CAPACITY-----	----MEMORY----
			#CPS MSU SU/SEC	MIN MAX DEFINED AS	USAGE LIMIT

RGROUP1	Traditional Resource Group 1		0.01 1K	20 50000K	120G
		SYSD	0.01 567		138M
		SYSE	0.00 0 234		240M
		SYSF	0.00 1 376		
-----SERVICE CLASSES	GPMSEVE		0.00 31		
	RMFGAT		0.01 1K		
...					

List of traditional resource groups
associated with service classes

TRGRMFN1	RMF Tenant Resource Group 1		0.34 38 27K	4711 MSU	
		SYSD	0.00 0		138M
		SYSE	0.17 19 14K		240M
		SYSF	0.16 19 13K		251M
-----REPORT CLASSES	RMFTRC1		0.17 18 13K		
	RMFTRC2		0.19 20 14K		

List of Tenant resource groups
associated with
tenant report classes

RMF Support for Tailored Fit Pricing

Resource Group Limits
and Sysplex wide CPU
consumption

System wide CPU and
MEMORY usage

Processor consumption as:

- Number of general purpose processors
- „Accounted workload MSU”
- Raw (unweighted) SU/SEC

- System wide memory usage statistics
- Memory limits for TRGs supported by WLM APAR OA54452

WORKLOAD ACTIVITY

RESOURCE GROUPS

--NAME--	-----DESCRIPTION-----	-SYSTEM-	---CPU CONSUMPTION---			-----CPU CAPACITY-----			---MEMORY---	
			#CPS	MSU	SU/SEC	MIN	MAX	DEFINED AS	USAGE	LIMIT
RGROUP1	Traditional Resource Group 1		0.01	1	1K *	20	50000K	SU/SEC		120G
		SYSD	0.01		567				138M	
		SYSE	0.00	0	234				240M	
		SYSF	0.00	1	376				281M	
	-----SERVICE CLASSES	GPMSEVE	0.00		31					
		RMFGAT	0.01		1K					
...										
TRGRMFEN1	RMF Tenant Resource Group 1		0.34	38	27K	4711		MSU		
		SYSD	0.00		0				0	
		SYSE	0.17	19	14K				1340K	
		SYSF	0.16	19	13K				1200K	
	-----REPORT CLASSES	RMFTRC1	0.17	18	13K					
		RMFTRC2	0.19	20	14K					

Processor limits as:

- SU/SEC across sysplex
- %LPAR SHARE for each system
- Number of CPS for each system
- „Accounted workload MSU” across sysplex

Sysplex wide CPU usage
on SC/TRC level

RMF Support for Tailored Fit Pricing

- z/OS V2.4 introduces new Monitor III Resource Group Activity (SYSRG) report online monitoring of WLM Resource Groups and Tenant Resource Groups
- Sysplex-wide view of (Tenant) Resource Group activity

Similar to Resource Group section in RMF PP WLMGL report

Processor consumption of (tenant) resource group at

- Sysplex level and
- System level

RMF V2R4 Resource Groups - SYSDPLEX Line 1 of 20

WLM Samples: 240 Systems: 3 Date: 05/22/19 Time: 10:00:00 Range: 60 Sec

Name	Type	System	---CPU consumption---			---CPU capacity---			---Mem	ry---
			#CPs	MSU	SU/sec	Min	Max	Unit	Usage	Limit
TRGRMFN1	TRG	*ALL	3.40	410	293K					
		SYSE	0.91	110	78602				7596K	1111G
		SYSF	1.43	173	123K				7768K	
		S4	1.06	128	91143				7636K	
TRGRMFN2	TRG	*ALL	1.16	139	99468					
		SYSE	0.01	1	728				5904K	1024M
		SYSF	0.52	63	44769				7472K	
		S4	0.63	76	53971				5948K	
TRGRMFN3	TRG	*ALL	1.06	128	91177					
		SYSE	0.31	37	26471				1960K	3333G
		SYSF	0.30	36	25503				2676K	
		S4	0.46	55	39203				1992K	
TRGRMFN4	TRG	*ALL	0.77	93	66187					
		SYSE	0.21	25	18005				1964K	444G
		SYSF	0.25	30	21475				2576K	
		S4	0.31	37	26707				1980K	
TRGRMFN5	TRG	*ALL	0.87	105	74857					
		SYSE	0.30	37	26084				1960K	53P
		SYSF	0.27	33	23583				2608K	
		S4	0.29	35	25191				1970K	

Processor and memory limits of all (tenant) resource groups as defined in the WLM policy.

Memory consumption of (tenant) resource group at system level.

RMF Support for Tailored Fit Pricing

- Cursor Sensitivity

RMF V2R4 Resource Groups - SYSDPLEX Line 1 of 52

WLM Samples: 480 Systems: 3 Date: 02/19/19 Time: 14.39.00 Range: 120 Sec

Name	Type	System	---CPU HCPs	consumption--- MSU SU/sec	---CPU capacity--- Min Max Unit	---Memory--- Usage Limit
RGPIX1	RG	*ALL	0.10	8611	1.00 9999 HCPs	95P
		SYSD	0.00	0		
		SYSE	0.06	4779		26M
		SYSF	0.04	3832		1868K
RGPIX2	RG	*ALL	0.16	13607	20 00 %LPAR	52P
		SYSD	0.04	3030		2016K
		SYSE	0.04	3396		3126K
		SYSF	0.08	3300		5683K
RGPIX3	RG	*ALL	0.15	12822	40.0M 50.0M SU/sec	120G
		SYSD	0.03	2646		1127K
		SYSE	0.03	2353		1971K
		SYSF	0.09	7822		3732K
RGPIX4	RG	*ALL	0.08	7294		120G
		SYSD	0.00	0		0
		SYSE	0.00	0		0
		SYSF	0.08	7294		3728K
RGPIX5	RG	*ALL	0.13	11319		
		SYSD	0.00	0		0
		SYSE	0.00	0		0
		SYSF	0.13	11319		5587K
RGROUP2	RG	*ALL	0.00	0	100 SU/sec	
		SYSD	0.00	0		0
		SYSE	0.00	0		0
		SYSF	0.00	0		0
RGROUP3	RG	*ALL	0.00	3	10000 SU/sec	
		SYSD	0.00	0		0
		SYSE	0.00	3		0
		SYSF	0.00	0		0
TRGRMFN1	TRG	*ALL	1.52	130K	50000 MSU	1111G
		SYSD	0.00	0		0
		SYSE	0.00	0		0
		SYSF	1.52	130K		7660K

Command ==> F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=TOGGLE F7=UP F8=DOWN F9=SWAP F10=BREF F11=FREF F12=RETRIEVE

Resource Group Activity Details

Resource Group Name: RGPIX5
Description: RG for RGPIX5

Specialty Processor Consumption Included: No
Definition of CPU capacity limits:
Minimum CPU capacity:
Maximum CPU capacity:

Service	Class	HCPs	MSU	SU/sec
*ALL		0.13		11319
BMAISVC5		0.09		7448
BMAISVC6		0.05		3872

Press Enter to return to the report panel.
F1=Help F2=SplitScr F3=End F4=RMFHelp F7=Backward F8=Forward F9=SwapScr F12=Return

Content of the pop-up panel depends on the resource group type

Tenant Resource Group Activity Details

Tenant Resource Group Name: TRGRMFN1
Description: RMF Tenant Resource Group nmbr 1

Specialty Processor Consumption Included: No
Definition of CPU capacity limit: MSU
Maximum CPU capacity: 50000

Tenant Report	Class	HCPs	MSU	SU/sec
*ALL		1.52		130K
RMFTRCN1		1.32		114K
RMFTRCN6		0.19		16574

Press Enter to return to the report panel.
F1=Help F2=SplitScr F3=End F4=RMFHelp F7=Backward F8=Forward F9=SwapScr F12=Return

Detailed breakdown of Processor Consumption Data on Service class level or Tenant report class level.

RMF Support for Tailored Fit Pricing

- Report Options:
The contents of the Monitor III SYSRG reports can be tailored by report options (use RO command on SYSRG panel).
- Example: Display all (tenant) resource groups with system level breakdown

```
RMF Resource Group Activity Report Options: SYSRG      Line 1 of 3
Change or verify parameters. To exit press END.
Changes will apply to the SYSRG report.

Name    ==> ALL      ALL or one of the available resource groups below
Type    ==> ALL      Resource group type (RG, TRG or ALL)
Detail  ==> YES      Show single system data (YES or NO)
Inactive ==> YES      Show inactive resource groups (YES or NO)

Available Resource Groups
RGPIX1  RGPIX2  RGPIX3  RGPIX4  RGPIX5  RGROUP2
RGROUP3 TRGRMFN1 TRGRMFPM TRGRMFN2 TRGRMFN3 TRGRMFN4
TRGRMFN5
```

RMF V2R4 Resource Groups - SYSDPLEX Line 1 of 52

WLM Samples: 480 Systems: 3 Date: 02/19/19 Time: 14.39.00 Range: 120 Sec

Name	Type	System	---CPU consumption---	MSU	SU/sec	---CPU capacity---	Min	Max	Unit	---Memory---	Usage	Limit
RGPIX1	RG	*ALL	0.10		8611	1.00	9999	#CPs				95P
		SYSD	0.00		0						0	
		SYSE	0.06		4779						26M	
		SYSF	0.04		3832						1868K	
RGPIX2	RG	*ALL	0.16		13607	20	60	%LPAR				52P
		SYSD	0.04		3030						2016K	
		SYSE	0.04		3396						3126K	
		SYSF	0.08		7180						5683K	
RGPIX3	RG	*ALL	0.15		12822	40.0M	50.0M	SU/sec				120G
		SYSD	0.03		2646						1127K	
		SYSE	0.03		2353						1971K	
		SYSF	0.09		7822						3732K	
RGPIX4	RG	*ALL	0.08		7294							120G
		SYSD	0.00		0						0	
		SYSE	0.00		0						0	
		SYSF	0.08		7294						3728K	
RGPIX5	RG	*ALL	0.13		11319							
		SYSD	0.00		0						0	
		SYSE	0.00		0						0	
		SYSF	0.13		11319						5587K	
RGROUP2	RG	*ALL	0.00		0	100			SU/sec			
		SYSD	0.00		0						0	
		SYSE	0.00		0						0	
		SYSF	0.00		0						0	
RGROUP3	RG	*ALL	0.00		3	10000			SU/sec			
		SYSD	0.00		0						0	
		SYSE	0.00		3						0	
		SYSF	0.00		0						0	
TRGRMFN1	TRG	*ALL	1.52		130K				MSU			1111G
		SYSD	0.00		0						0	
		SYSE	0.00		0						0	
		SYSF	1.52		130K						7660K	

RMF Support for Tailored Fit Pricing

- RMF Data Portal:
The browser based version of SYSRG can be requested from RMF Distributed Data Server (DDS) using the following URL:
<http://hostname:8803/gpm/rmfm3.xml?report=SYSRG&resource=,SYSDPLEX,SYSPLEX>

RMF Report [,SYSDPLEX,SYSPLEX] : SYSRG (WLM Resource Group Activity)

Samples: 60 Systems: 2 Time Range: 05/22/2019 13:00:00 - 05/22/2019 13:01:00

Resource Group Name	Type	Description	System Name	Associated WLM Class	Capacity Def	Capacity Min	Capacity Max	Capacity Actual (# CPs)	Capacity Actual (MSU)	Capacity Actual (SU/sec)	Include Specialty Processors	Memory Limit	Memory Actual	CBP Eligible	SMF ID
TRGRMFN1	TRG	RMF Tenant Resource Group nmbr 1	*ALL	*ALL	MSU		50000	1.97	238	170000	No	1192927166464		No	*ALL
			SYSE	*ALL				0.91	110	78602			7778304		SYSE
			S4	*ALL				1.06	128	91143			7819264		S4
			*ALL	RMFTRCN1				1.66	200	143000					
			*ALL	RMFTRCN6				0.31	37	26716					
TRGRMFN3	TRG	RMF Tenant Resource Group nmbr 3	*ALL	*ALL	#CPs		3.33	0.76	92	65675	Yes	3578781499392		No	*ALL
			SYSE	*ALL				0.31	37	26471			2007040		SYSE
			S4	*ALL				0.46	55	39203			2039808		S4
			*ALL	RMFTRCN3				0.76	92	65675					
TRGRMFN2	TRG	RMF Tenant Resource Group nmbr 2	*ALL	*ALL	SU/sec		99999	0.64	77	54699	Yes	1073741824		No	*ALL
			SYSE	*ALL				0.01	1	728			6045696		SYSE
			S4	*ALL				0.63	76	53971			6090752		S4
			*ALL	RMFTRCN2				0.64	77	54699					

RMF Support for Tailored Fit Pricing

- RMF Data Portal

Sysplex

...
Coupling Facility
CF Structure

...
WLM_ACTIVE_POLICY
ALL_WLM_WORKLOADS
WLM_WORKLOADS
WLM_SERVICE_CLASS
WLM_SC_PERIOD
ALL_WLM_REPORT_CLASSES
WLM_REPORT_CLASS
WLM_RC_PERIOD
ALL_WLM_RESOURCE_GROUPS
WLM_RESOURCE GROUP

New WLM resources are added to the DDS resource model as children of the top-level resource **SYSPLEX**

RMF Data Portal for z/OS Home Explore Overview My View ? RMF

Children of: ,SYSDPLEX,SYSPLEX

Icon	Resource	Metrics	Attributes	Res-Type
	,S4,MVS_IMAGE	Metrics	Show	MVS_IMAGE
	,SYSF,MVS_IMAGE	Metrics	Show	MVS_IMAGE
	,SYSE,MVS_IMAGE	Metrics	Show	MVS_IMAGE
	,CF01,COUPLING_FACILITY	Metrics	Show	COUPLING_FACILITY
	,CF02,COUPLING_FACILITY	Metrics	Show	COUPLING_FACILITY
	,BASEPOL,WLM_ACTIVE_POLICY	Metrics	Show	WLM_ACTIVE_POLICY
	,CS327,CPC	Metrics	Show	CPC

RMF Data Portal for z/OS Home Explore Overview My View ?

Attributes of: ,BASEPOL,WLM_ACTIVE_POLICY

Description	Value
Service Definition name	VICOM6MF
Service Definition installation time	03/22/19, 08.40.11
Activated at	03/22/19, 08.40.18

Details are available for the **WLM_ACTIVE_POLICY**

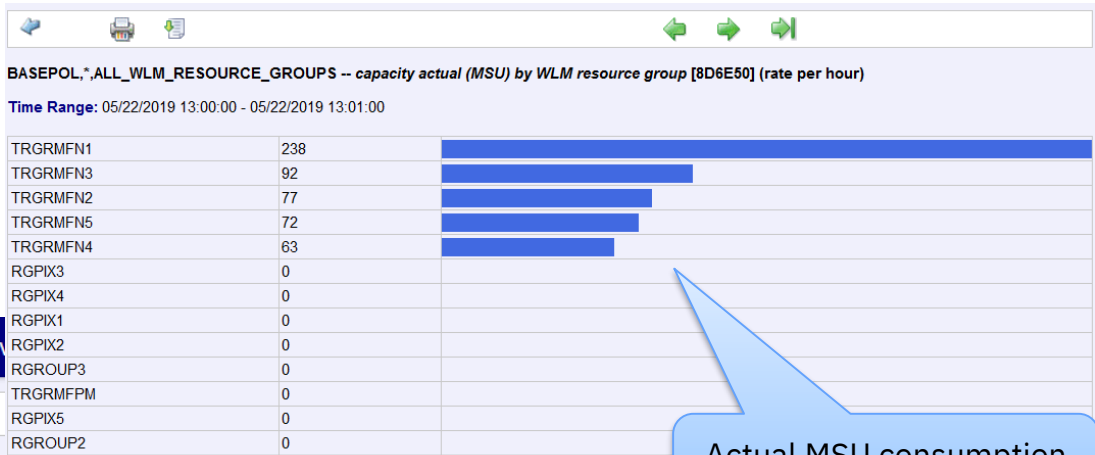
RMF Support for Tailored Fit Pricing

Large set of metrics available for each new WLM resource to report on:

- WLM workloads
- WLM service classes
- WLM report classes
- WLM resource groups

Available metrics for: BASEPOL,*,ALL_WLM_RESOURCE_GROUPS

Metric description	Help	Id
by WLM resource group		
capacity actual (# CPs) by WLM resource group	Explanation	8D6E30
capacity actual (MSU) by WLM resource group	Explanation	8D6E33
capacity actual (SU/sec) by WLM resource group	Explanation	8D6E70



New WLM Resources and performance metrics also supported with RMF PM Version 2.5.0

RMF z15 Enhancements

RMF Compression Support
System Recovery Boost
z15 RMF Crypto Support (CEX7)



RMF Compression Support



With z15 GA1, zEDC Express PCIE adapters cannot be used for data compression anymore. Hence PCIE reports will no longer contain any information about compression. This functionality is moved into the CPU and is either executed synchronously (zlib interface) on the current processor or asynchronously (BSAM, QSAM, HSM, etc) on an IOP.

- By default all asynchronous compression and decompression requests will be directed to **the Extended Asynchronous Data Mover (EADM)** for execution on an IOP (z/OS running under z/VM will use synchronous execution by default)

Renaming of SCM (Storage Class Memory) into EADM (Existing keywords will still work)

- Postprocessor SCM Activity Report -> EADM Activity
- Monitor III SCM Activity Report -> EADM Activity
- Monitor III gatherer option 'SCM/NOSCM' -> 'EADM/NOEADM'

RMF is enhanced to report performance metrics for asynchronous compression within RMF Postprocessor, RMF Monitor III and RMF DDS

RMF Compression Support

RMF I/O Queuing Activity Report:

- Field '% CMPR BUSY' displays IOP Utilization for EADM compression work. Includes compression and decompression.
New Overview Condition: 'IOPECB'



I/O QUEUING ACTIVITY

PAGE 1

z/OS V2R4 SYSTEM ID JJ0 DATE 08/09/2019 INTERVAL 29.59.996
RPT VERSION V2R4 RMF TIME 17.29.35 CYCLE 1.000 SECONDS
-TOTAL SAMPLES = 1800 IODF = D7 CR-DATE: 08/08/2019 CR-TIME: 15.12.53 ACT: POR

INPUT/OUTPUT PROCESSORS

- INITIATIVE QUEUE -			-- IOP UTILIZATION --				-- % I/O REQUESTS RETRIED --					----- RETRIES / SSCH -----				
IOP	ACTIVITY	AVG Q	% IOP	% CMPR	I/O START	INTERRUPT	CP	DP	CU	DV		CP	DP	CU	B	
	RATE	LNTH	BUSY	BUSY	RATE	RATE	ALL	BUSY	BUSY	BUSY	BUSY	ALL	BUSY	BUSY	BUSY	
00	3449.440	0.00	2.60	23.09	3392.196	4887.445	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
01	3449.720	0.00	20.41	23.09	3392.476	4235.469	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
02	3449.454	0.00	7.27	23.09	3392.208	479.684	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
03	3449.480	0.00	12.29	23.09	3392.231	9714.039	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
04	3449.484	0.01	3.67	23.09	3392.232	574.939	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
05	3449.481	0.00	2.88	23.09	3392.230	6049.867	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
06	3449.452	0.01	3.64	23.09	3392.197	578.022	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
07	3449.463	0.00	2.24	23.09	3392.208	3888.013	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
08	3449.433	0.01	3.75	23.09	3392.177	558.933	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
09	3449.441	0.00	6.89	23.09	3392.186	4691.848	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
0A	3449.468	0.00	7.68	23.09	3392.214	515.930	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
0B	3449.468	0.00	6.14	23.09	3392.214	11493.10	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
0C	3449.447	0.00	8.24	23.09	3392.191	720.626	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
0D	3449.480	0.00	2.27	23.09	3392.224	4552.500	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
0E	3449.463	0.00	4.08	23.09	3392.210	346.013	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
0F	3449.482	0.00	3.53	23.09	3392.230	8485.188	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0
SYS	148333.5	0.00	5.69	23.09	145871.9	153644.5	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0

RMF Compression Support



RMF Postprocessor EADM Activity Report in XML Format (formerly known as SCM report) contains new section for compression metrics

- Requested with RMF Postprocessor option: REPORTS(EADM)

RMF Postprocessor Interval Report [System CB8C] : Extended Asynchronous Data Mover

RMF Version : z/OS V2R4 SMF Data : z/OS V2R4

Start : 08/14/2019-00.00.00 End : 08/14/2019-00.15.00 Interval : 15:00:000 minutes

▼ Device/Subchannel Summary

Total Number of SSCH : 1477588 SSCH Rate : 1641.76 Avg Function Pending Time : 0.013 Avg IOP Queue Time : 0.000 Avg Initial Cmd Response Time : 0.000

▼ Compression Activity

Compression Request Rate : 0.21 Compression Throughput : 11651 Compression Ratio : 5.00 Decompression Request Rate : 18.42 Decompression Throughput : 126994 Decompression Ratio : 0.14

▼ Storage Class Memory Activity

Card ID ↓↑	Util% (LPAR) ↓↑	Util% (Total) ↓↑	Read B/Sec (LPAR) ↓↑	Read B/Sec (Total) ↓↑	Write B/Sec (LPAR) ↓↑	Write B/Sec (Total) ↓↑	Request Rate (LPAR) ↓↑	Request Rate (Total) ↓↑	Avg Response Time (LPAR) ↓↑	Avg Response Time (Total) ↓↑
VFM	100.00	99.66	43.9M	43.9M	44.6M	45.3M	3428.21	3612.49	0.007	0.007

RMF Compression Support



RMF Monitor III EADM Activity Report in XML Format (formerly known as SCM Activity report) contains new section for compression metrics

```
RMF V2R4  EADM Activity                                     Line 1 of 1
Command ===>                                                Scroll ===> CSR

Samples: 60      System: CB8C  Date: 08/14/19  Time: 00.00.00  Range: 60  Sec

----- EADM Summary -----
SSCH Total      SSCH Rate      PEND Time      IOPQ Time      ICMR Time
      89570           1492.83           0.011           0.000           0.000
Compress: Rate  Throughput      Ratio  Decompress: Rate  Throughput      Ratio
           8.80       384478      22.00           276.35      1904913      0.14

Card ID      Util(%)      Read(B/s)      Write(B/s)      Req Rate      Resp Time      IOPQ
           Part Total  Part Total  Part Total  Part Total  Part Total  Part Total  Time

VFM          100.0 100.0  40.7M 40.7M  45.7M 46.5M   1878  2055  0.013 0.012  0.000
```

RMF Compression Support

Similar changes to DDS:

- Support of RMF Postprocessor EADM Activity Report (formerly known as SCM Activity report)
- Support of RMF Monitor III EADM Activity Report (formerly known as SCM Activity report)
- And additional new performance metrics for compression support (also available via RMF PM)

The screenshot displays the RMF Monitor III Report web interface. The browser address bar shows the URL: `cb8b:8803/gpm/rmf3.xml?report=EADM&resource=",CB8A,MVS_IMAGE"`. The page title is "RMF Report [,CB8A,MVS_IMAGE] : EADM (Extended Asynchronous Data Mover)". Below the title, it indicates "Samples: 60 Time Range: 09/17/2019 09:05:00 - 09/17/2019 09:06:00".

The main content area contains a summary table with the following data:

SSCH Rate: 0.28	Total Number of SSCH: 17	Avg Function Pending Time: 0.000	Avg IOP Queue Time: 0.000
Avg Initial Cmd Response Time: 0.000	Compression Request Rate: 0.28	Compression Throughput: 17476	Compression Ratio: >1.00
Decompression Request Rate: 0.00	Decompression Throughput: 0	Decompression Ratio:	

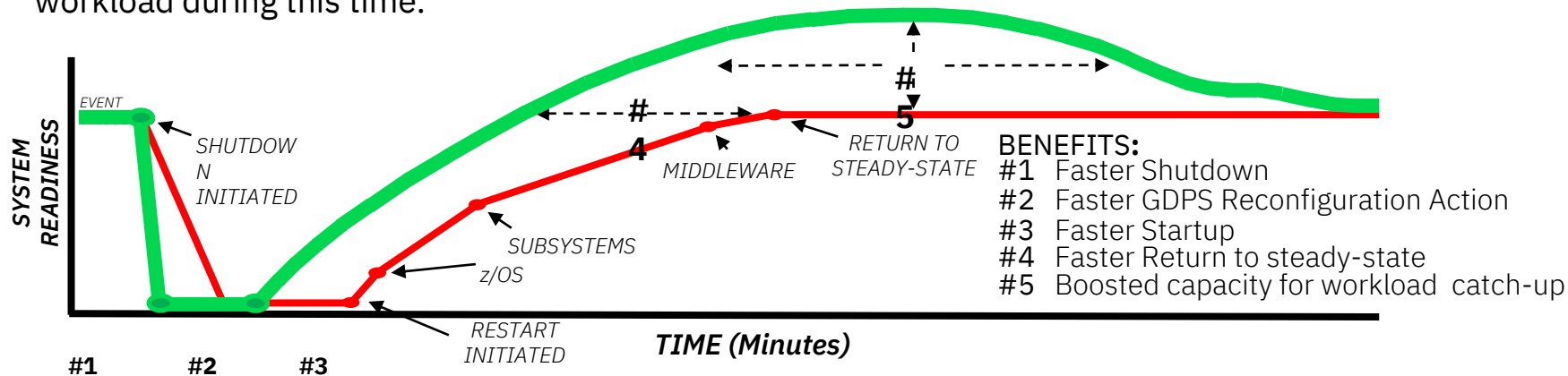
Below the summary table is a detailed performance table with 14 columns:

Card ID	Util% (LPAR)	Util% (Total)	Read B/Sec (LPAR)	Read B/Sec (Total)	Write B/Sec (LPAR)	Write B/Sec (Total)	Request Rate (LPAR)	Request Rate (Total)	Avg Response Time (LPAR)	Avg Response Time (Total)	Avg IOP Queue Time (Total)	Requests (LPAR)	Requests (Total)
VFM	100.0	100.0	0.00	133000000	0.00	116000000	0.00	12834	0.000	0.005	0.003	0	770000

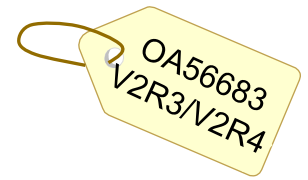
RMF System Recovery Boost

System Recovery Boost expedites IPL, Shutdown, middleware/workload restart and recovery, and the workload execution that follows, by :

- using client's entitled zIIP capacity, plus (optionally) additional zIIPs provided by an OOCOD-like capacity record during the boost period (zIIP processor capacity boost)
- on sub-capacity machine models, running sub-capacity general purpose processors at full-capacity speed (speed boost, frequency boost, or sub-capacity to full-capacity boost)
- expediting and parallelizing GDPS reconfiguration actions that may be part of the overall restart and recovery process (e.g. reset LPAR, apply CBU, activate LPAR, load/IPL LPAR, etc.)
- and, doing this without increasing the 4HRA software billing cost associated with the customer's workload during this time.



RMF System Recovery Boost



RMF is enhanced to gather and report System Recovery Boost information

- The Monitor III CPC and Postprocessor Partition Data reports provide boost information for all LPARs in the CEC.
- The Postprocessor CPU Activity and Workload Activity reports provide boost information for the home partition on which RMF is collecting data.
- Boost indicators are set in the PR/SM Logical Partition data section of SMF 70.1 and in the Product section of all SMF records.
- Boost indicators are reported by RMF as DDS and CIM Provider attributes.

RMF System Recovery Boost

RMF Postprocessor CPU Activity Report

CPU ACTIVITY									
z/OS V2R4				SYSTEM ID R75		DATE 08/07/2019		INTERVAL 12.43	
CPU 8561 CPC CAPACITY 3068				RPT VERSION V2R4 RMF		TIME 02.02.16		CYCLE 1.000 SEC	
MODEL 634				SEQUENCE CODE 000000000002B0E8					
H/W MODEL T01				HIPODISPATCH=YES					
CHANGE REASON=NONE				BOOST TYPE=ALL		BOOST CLASS=IPL			
---CPU---									
NUM	TYPE	ONLINE	LPAR BUSY	MVS BUSY	PARKED	PROD	MT %	LOG PROC	--I/O INTERRUPTS--
0	CP	100.00	14.89	14.82	0.00	100.00			
1	CP	100.00	6.83	6.80	0.00	100.00			
2	CP	100.00	8.90	8.84	0.00	100.00			
3	CP	100.00	5.62	5.60	0.00	100.00			
4	CP	100.00	4.54	4.54	0.00	100.00			
5	CP	100.00	2.47	2.47	0.00	100.00			
TOTAL/AVERAGE			7.21	7.18		100.00			
6	IIP	100.00	7.49	7.48	0.00	100.00			
7	IIP	100.00	3.30	3.30	0.00	100.00			
8	IIP	100.00	0.00	-----	100.00	100.00			
9	IIP	100.00	0.00	-----	100.00	100.00			
A	IIP	100.00	0.00	-----	100.00	100.00			
B	IIP	100.00	0.00	-----	100.00	100.00			
C	IIP	100.00	0.00	-----	100.00	100.00	0.00	0.0	LOW
D	IIP	100.00	0.00	-----	100.00	100.00	0.00	0.0	LOW
E	IIP	100.00	0.00	-----	100.00	100.00	0.00	0.0	LOW
F	IIP	100.00	0.00	-----	100.00	100.00	0.00	0.0	LOW
TOTAL/AVERAGE			1.08	5.39		100.00	1.08	166.7	
MULTI-THREADING ANALYSIS									
CPU TYPE	MODE	MAX CF	CF	AVG TD					
CP	1	1.000	1.000	1.000					
IIP	1	1.000	1.000	1.000					

BOOST TYPE: The boost type that was active at the end of the interval:

- NONE Boost is inactive
- ZIIP zIIP capacity boost
- SPEED Speed boost
- ALL zIIP capacity and speed boost are both active

BOOST CLASS: Indicates whether boost was active during IPL or Shutdown. NONE is displayed if boost was inactive.

BOOST TYPE: The boost type that was active at the end of the interval:

NONE Boost is inactive
ZIIP zIIP capacity boost
SPEED Speed boost
ALL zIIP capacity and speed boost are both active

BOOST CLASS: Indicates whether boost was active during IPL or Shutdown. NONE is displayed if boost was inactive.

RMF System Recovery Boost

RMF Postprocessor Partition Data Report

P A R T I T I O N D A T A R E P O R T																		
z/OS V2R4			SYSTEM ID R75			DATE 08/07/2019			INTERVAL 12.43.749			PAGE 38						
			RPT VERSION V2R4 RMF			TIME 02.02.16			CYCLE 1.000 SECONDS									
MVS PARTITION NAME			R75			PHYS PROC NUM 54			GROUP NAME N/A			INITIAL CAP NO						
IMAGE CAPACITY			541			CP 34			LIMIT N/A			LPAR HW CAP NO						
NUMBER OF CONFIGURED PARTITIONS			44			ICF 10			AVAILABLE N/A			HW GROUP CAP YES						
WAIT COMPLETION			NO			IIP 10						ABS MSU CAP YES						
DISPATCH INTERVAL			DYNAMIC															
----- PARTITION DATA -----																		
----- LOGICAL PARTITION PROCESSOR DATA -----																		
----- AVERAGE PROCESSOR UTILIZATION PERCENTAGES -----																		
----- PHYSICAL PROCESSORS -----																		
NAME	S	BT	U	GT	DEF	ACT	DEF	WLM%	NUM	TYPE	EFFECTIVE	TOTAL	EFFECTIVE	TOTAL	LPAR	MGMT	EFFECTIVE	TOTAL
R75	A	S	500		0	38	N	N	Y	6.0	CP	00.05.23.107	00.05.30.280	7.05	7.21	0.03	1.24	1.27
S50	A	N	500		0	152	N	N	N	20.0	CP	00.21.23.721	00.21.36.551	8.40	8.49	0.05	4.94	4.99
S51	A	N	500		0	144	N	N	N	20.0	CP	00.20.22.311	00.20.38.368	8.00	8.11	0.06	4.71	4.77
R76	A	S	459*		0	32	N	N	Y	5.5	CP	00.04.34.774	00.04.52.328	6.52	6.94	0.07	1.06	1.13
S58	A	N	500		0	150	N	N	N	50.0	CP	00.21.11.686	00.21.26.534	3.33	3.37	0.06	4.90	4.95
S59	A	N	500		0	151	N	N	N	30.0	CP							4.99
PHYSICAL															0.25			
TOTAL															2959			
XACFT87	A		DED						1	ICF								10.00
X5CFT87	A		DED						6	ICF								60.00
X7CFT87	A		DED						3	ICF								30.00
PHYSICAL															0.00			
TOTAL															0			
R75	A	I	500				N	N	Y	10	IIP							1.08
S50	A	N	500				N	N	N	5	IIP							0.37
S51	A	N	500				N	N	N	5	IIP							0.37
R76	A	I	459*				N	N	Y	10*	IIP	00.00.03.529	00.00.03.583	0.08	0.08	0.00	0.05	0.05
S58	A	N	500				N	N	N	4	IIP	00.00.27.968	00.00.28.239	0.92	0.92	0.00	0.37	0.37
S59	A	N	500				N	N	N	4	IIP	00.00.27.989	00.00.28.396	0.92	0.93	0.01	0.37	0.37
PHYSICAL															0.03			
															0.03			

BT: The boost type that was active at some point within the interval:

- S Speed boost. Only shown for partitions that are grouped together for processor type CP.
- I zIIP capacity boost. Only shown for partitions that are grouped together for processor type IIP.
- N Speed boost or zIIP capacity boost was inactive
 - zIIP capacity boost was inactive if shown for processor type IIP
 - Speed boost was inactive if shown for processor type CP

RMF System Recovery Boost

RMF Postprocessor Workload Activity Report

W O R K L O A D A C T I V I T Y									
z/OS V2R4		SYSPLEX SVPLEX7			DATE 08/07/2019		INTERVAL 14.59.980		
		RPT VERSION V2R4 RMF			TIME 03.30.00				
POLICY ACTIVATION DATE/TIME 05/14/2019 10.14.45									
- SERVICE POLICY PAGE -									
SERVICE DEFINITION: SYSTEST BASEPOL from ...DEF.IOSPLEX						-SERVICE DEFINITION COEFFICIENTS-			
INSTALL DATE: 05/14/2019 10.14.44 INSTALLED BY: SETUP						IOC	CPU	SRB	MSO
POLICY: BASEPOL BASEPOL from ...DEF.IOSPLEX									
DISCRETIONARY GOAL MANAGEMENT: YES						0.1	99.9	0.1	0.0001
DYNAMIC ALIAS MANAGEMENT: YES									
I/O PRIORITY MANAGEMENT: YES									
SYSTEMS									
---	ID---	OPT	SU/SEC	CAP%	--TIME--	INTERVAL	--BOOST--		
R75		AA	53156.1	171	03.30.00	00.14.59	A Shutdown		

BOOST: Indicates whether boost was inactive or active during IPL or Shutdown.

If active, the boost type is shown:

BOOST: Indicates whether boost was inactive or active during IPL or Shutdown.

If active, the boost type is shown:

I zIIP capacity boost

S Speed boost

A zIIP capacity and speed boost were both active

RMF System Recovery Boost

RMF Monitor III CPC Report Postprocessor Workload Activity Report

Command ==> _

RMF V2R4 CPC Capacity

Line 1 of 23

Scroll ==> CSR

Samples: 60

System: R75

Date: 08/07/19

Time: 02.04.00

Range: 60

Sec

Partition: R75

8561 Model 634

Boost: All

CPC Capacity: 3068

Weight % of Max: 55.6

4h Avg: 1

Image Capacity: 541

WLM Capping %: 0.0

4h Max: 40

Group: N/A

MT Mode IIP: 1

Prod % IIP: 100

AbsMSUCap: Y

Limit: N/A

Partition	MSU Def	MSU Act	Cap Def	Proc Num	Logical Effect	Util % Total	Physical LPAR	Util %
*CP				132			0.5	
R75	0	31	N N Y	6.0	5.7	6.0	0.0	
R76	0	0	N N Y	6.0	0.0	0.0	0.0	
S50	0	150	N N N	20.0	8.3	8.4	0.0	
S51	0	149	N N N	20.0	8.3	8.4	0.1	
S58	0	151	N N N	50.0	3.3	3.4	0.1	
S59	0	149	N N N	30.0	5.5	5.5	0.1	
PHYSICAL							0.3	0.3
*ICF				10.0			0.0	100 100
XACFT87			N N N	1.0	100	100	0.0	10.0 10.0
X5CFT87			N N N	6.0	100	100	0.0	60.0 60.0
X3CFT87			N N N	8.0	100	100	0.0	80.0 80.0

BOOST: The boost type that was active at the end of MINTIME:

N Boost was inactive

zIIP zIIP capacity boost

Speed Speed boost

All zIIP capacity and speed boost were both active

+ hidden fields

RMF System Recovery Boost

RMF Data Portal CPC Report (header)

RMF Report [R75,MVS_IMAGE] : CPC (Central Processor Complex)

Samples: 60 Time Range: 08/07/2019 03:23:00 - 08/07/2019 03:24:00

Partition Name: R75	CPU Type: 8561	CPU Model: 634	Boost Type: All
CPC Capacity (MSU/h): 3068	Weight % of Max: 55.6	4h MSU Average: 12	Capacity Group Name: N/A
Image Capacity: 541	WLM Capping %: 0.0	4h MSU Maximum: 47	Capacity Group Limit: N/A
Less than 4h in Capacity Group:	MT Mode IIP: 1	MT IIP Core Productivity: 100	Absolute MSU Capping: Y
Proj Time until Capping: 14400	Proj Time until Group Capping: N/A	4h Unused Group Capacity Average: N/A	CPC sequence number: 000000000002B0E8
CPC name: T87	# CP Processors: 34	# AAP Processors: 0	# CBP Processors: N/A
# ICF Processors: 10	# IFL Processors: 0	# IIP Processors/Cores: 10	Configured Partitions: 44
Wait Completion: NO	% Capacity Used: 5	# Dedicated CPs: 0	# Dedicated AAPs: 0
# Dedicated CBPs: N/A	# Dedicated IIPs: 0	# Shared physical CPs: 34	# Shared physical AAPs: 0
# Shared physical CBPs: N/A	# Shared physical IIPs: 10	Vary CPU management available: NO	WLM LPAR management enabled: YES
Capacity Adjustment Indicator: 100	Capacity Change Reason: 0	MT CP Core Productivity: 100	MT Max Capacity Factor IIP: 1.00
MT Max Capacity Factor CP: 1.00	MT Capacity Factor IIP: 1.00	MT Capacity Factor CP: 1.00	Average Thread Density IIP: 1.00
Average Thread Density CP: 1.00	MT Mode CP: 1	CPU zCBP Model: 400	Boost Class: Shutdown
Physical Total % of shared CPs: 21.3	Physical Total % of shared AAPs: 0.0	Physical Total % of shared CBPs: N/A	Physical Total % of shared IIPs: 2.2
Physical Total % of shared ICFs: 0.0	Physical Total % of shared IFLs: 0.0		

BOOST TYPE: The boost type that was active at the end of the interval:

NONE Boost is inactive

ZIIP zIIP capacity boost

SPEED Speed boost

ALL zIIP capacity and speed boost are both active

BOOST CLASS: Indicates whether boost was active during IPL or Shutdown. NONE is displayed if boost was inactive.

Also available via
attributes for LPAR and
MVS_IMAGE resource
(+supported by RMF PM)

RMF System Recovery Boost

RMF Data Portal CPC Report (tabular report)

LPAR Name	Defined MSU/h	Actual MSU/h	Capping Option	# Logical Processors/Cores Online	Logical Effective %	Logical Total %	LPAR Mgmt %	Physical Effective %	Physical Total %	Line Type	# Onln Proce Share
*CP				132			0.4	21.0	21.5	CS	132
R75	0	21	NNY	6.0	3.8	3.8	0.0	0.7	0.7	CP	6
R76	0	24	NNY	6.0	4.4	4.5	0.0	0.8	0.8	CP	6
S50	0	153	NNN	20.0	8.5	8.6	0.0	5.0	5.0	CP	20
S51	0	142	NNN	20.0	7.9	8.0	0.1	4.6	4.7	CP	20
S58	0	154	NNN	50.0	3.4	3.4	0.0	5.0	5.1	CP	50
S59	0	152	NNN	30.0	5.6	5.7	0.0	5.0	5.0	CP	30
PHYSICAL							0.2		0.2	CY	
*ICF				10.0			0.0	100	100	FS	0
XACFT87			NNN	1.0	100	100	0.0	10.0	10.0	FP	0
X5CFT87			NNN	6.0	100	100	0.0	60.0	60.0	FP	0
X7CFT87			NNN	3.0	100	100	0.0	30.0	30.0	FP	0
PHYSICAL							0.0		0.0	FY	
*IIP				33.0			0.0	2.2	2.2	US	33
R75			NNY	10.0	0.8	0.8	0.0	0.8	0.8	UP	10
R76			NYN	5.0	0.0	0.0	0.0	0.0	0.0	UP	5
S50			NNN	5.0	0.8	0.8	0.0	0.4	0.4	UP	5
S51			NNN	5.0	0.6	0.6	0.0	0.3	0.3	UP	5
S58			NNN	4.0	0.9	0.9	0.0	0.4	0.4	UP	4
S59			NNN	4.0	0.9	0.9	0.0	0.4	0.4	UP	4
PHYSICAL							0.0		0.0	UY	

zIIP Boost: zIIP capacity boost active at end of MINTIME

Speed Boost: Speed boost active at some point at end of MINTIME

...

n	Initial Capping Option	Absolute Capping Limit (CPUs)	Hardware Group Name	Hardware Group Capping Limit (CPUs)	zIIP Boost	Speed Boost
↑↓	↑↓	↑↓	↑↓	↑↓	↑↓	↑↓
	NO		GROUPB	250.1		Y
	NO		GROUPB	250.1		Y
	NO					N
	NO					N
	NO					N
	NO					N
	NO		GROUPB	250.5	Y	
	NO	111.1	GROUPB	250.5	N	
	NO				N	
	NO				N	
	NO				N	
	NO				N	

RMF System Recovery Boost

RMF CIM Provider - IBMz_ComputerSystem resource

- New attributes are defined for resource IBMz_ComputerSystem.

Property	Description
uint16 zIIPBoost	zIIP capacity boost information 0 zIIP capacity boost was inactive 1 zIIP capacity boost was active
uint16 SpeedBoost	Speed boost information 0 Speed boost was inactive 1 Speed boost was active

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V2R2/V2R3/
V2R4)

OA56682
V2R2/V2R3/
V2R4)

C R Y P T O H A R D W A R E A C T I V I T Y

z/OS V2R4

SYSTEM ID CB89

DATE 08/11/2019

INTERVAL 15.00.001

RPT VERSION V2R4 RMF

TIME 22.45.00

CYCLE 1.000 SECONDS

----- CRYPTOGRAPHIC CCA COPROCESSOR

TYPE	ID	LPAR			CPC			LPAR		CPC	
		RATE	EXEC TIME	UTIL%	RATE	EXEC TIME	UTIL%	KEY-GEN	RATE	KEY-GEN	RATE
CEX7C	0	0.00	0.000	0.0	0.00	0.000	0.0	0.00		0.00	
	1	1997	0.209	41.7	4873	0.205	99.8	0.86		0.86	

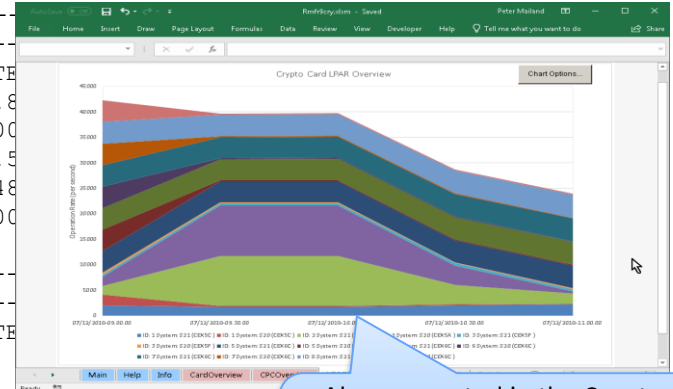
----- CRYPTOGRAPHIC PKCS11 COPROCESSOR

TYPE	ID	LPAR			CPC			FUNCTION	RATE
		RATE	EXEC TIME	UTIL%	RATE	EXEC TIME	UTIL%		
CEX7P	3	461.8	1.004	46.4	1005	0.995	99.9	ASYM FAST	253.8
								ASYM GEN	0.00
								ASYM SLOW	186.5
								SYMM COMPLETE	21.48
								SYMM PARTIAL	0.00

----- CRYPTOGRAPHIC ACCELERATOR

TYPE	ID	LPAR			CPC				
		RATE	EXEC TIME	UTIL%	RATE	EXEC TIME	UTIL%	FUNCTION	RATE
CEX7A	2				15043	0.066	99.7	RSA ME	1024
								RSA ME	2048
								RSA ME	4096
								RSA CRT	1024
								RSA CRT	2048
								RSA CRT	4096

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Also supported in the Crypto Hardware Activity Trend Report Spreadsheet of the Spreadsheet Reporter



RMF z15 Crypto Support (CEX7)

Support of CEX7 crypto card in RMF Monitor III Crypto Reports (V2R4 only)

Crypto Hardware Overview Report , Crypto Accelerator Activity Report, Crypto PKCS11 Activity Report and DDS CRYOVW report (one report for all crypto cards metrics), e.g. :

RMF V2R4 Crypto HW Overview - UTCPLXCB Line 11 of 46

Samples: 120 Systems: 8 Date: 08/15/19 Time: 07.24.00 Range: 120 Sec

Type	ID	--CPC---	-System-	Rate	Exec Time	Util%	---- Key Gen ----	Rate	ExTime	Util%
CEX6C	0	T92		<0.01	0.898	0.0	0.000	0.000	0.0	
CEX7A	1	T92		0.000	0.000	0.0				
CEX7C	2	T92		0.000	0.000	0.0	0.000	0.000	0.0	
CEX6C	3	T92		0.000	0.000	0.0	0.000	0.000	0.0	
CEX7C	4	T92		0.000	0.000	0.0	0.000	0.000	0.0	
CEX7C	5	T92		0.000	0.000	0.0	0.000	0.000	0.0	
CEX6A	6	T92		0.000	0.000	0.0				
CEX7C	7	T92		0.000	0.000	0.0	0.000	0.000	0.0	
CEX7C	7	T92	CB8A	0.000	0.000	0.0	0.000	0.000	0.0	
CEX7C	7	T92	CB8C	0.000	0.000	0.0	0.000	0.000	0.0	
CEX7C	7	T92	CB89	0.000	0.000	0.0	0.000	0.000	0.0	
CEX7A	8	T92		0.000	0.000	0.0				
CEX7C	9	T92		0.000	0.000	0.0	0.000	0.000	0.0	
CEX7P	10	T92		0.000	0.000	0.0				

RMF z15 Support Overview

- RMF z15 Compression support (EADM) (V2R1-V2R4)
- RMF System Recovery Boost support (V2R3-V2R4)
- RMF support for Crypto Express7S (CEX7) card (V2R2-V2R4)

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Information and Tools

Website <https://github.com/IBM/IBM-Z-zOS/tree/master/zOS-RMF>

with product information, newsletters, presentations, ...

Downloads from <ftp://public.dhe.ibm.com/eserver/zseries/zos/rmf/>

- Spreadsheet Reporter, RMF PM, RMF Postprocessor XML Toolkit

Documentation:

z/OS RMF Data Gatherer Programmer's Guide, GC27-4935

z/OS RMF Data Gatherer User's Guide, SC27-4934

z/OS RMF Report Analysis, SC34-2665

z/OS RMF Reporter Programmer's Guide, GC27-4937

z/OS RMF Reporter User's Guide, SC27-4936

– Latest version of PDF files can be downloaded from:

<https://www.ibm.com/servers/resourceink/svc00100.nsf/pages/zOSV2R4Library?OpenDocument>

