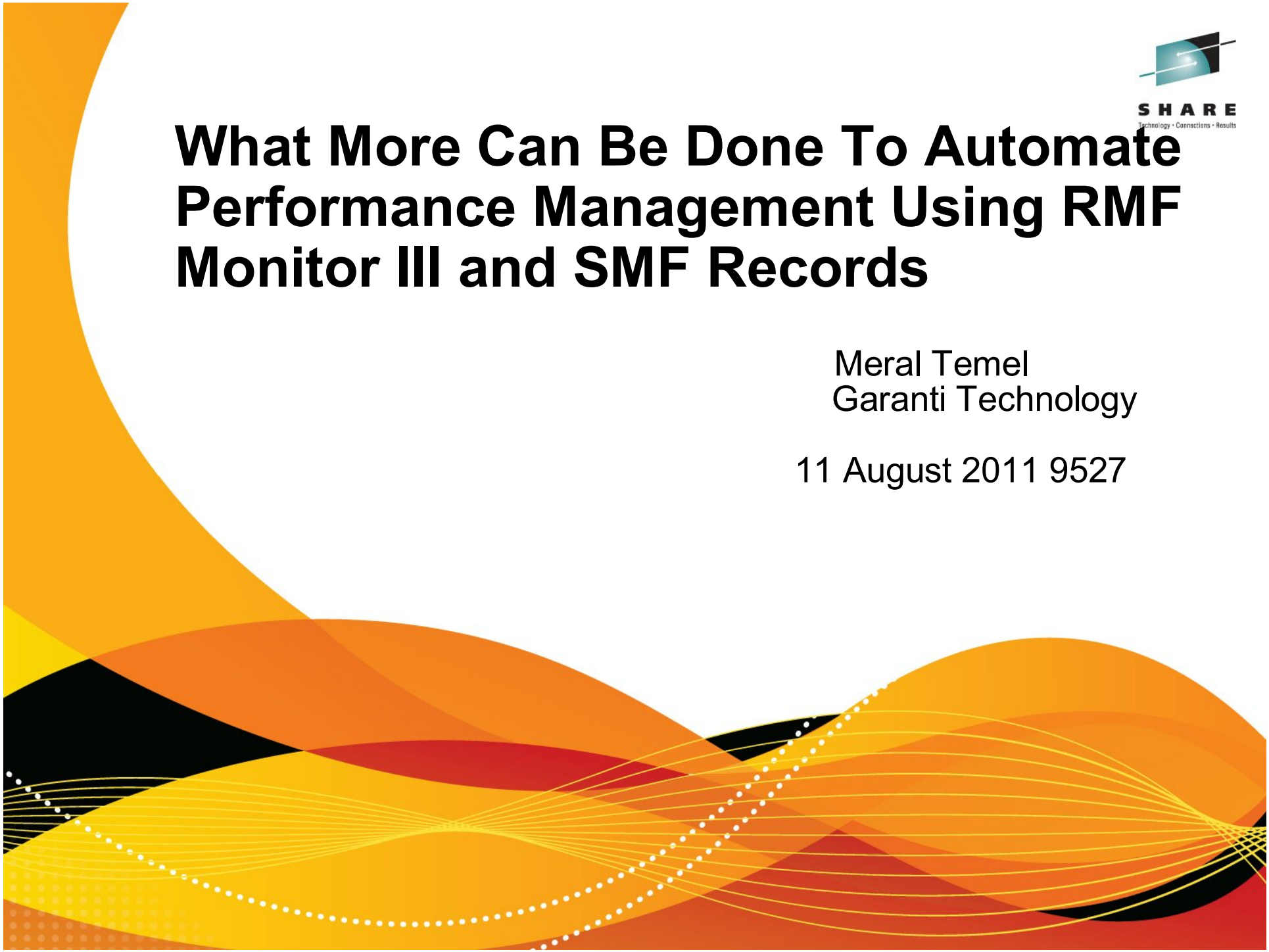


What More Can Be Done To Automate Performance Management Using RMF Monitor III and SMF Records

Meral Temel
Garanti Technology

11 August 2011 9527

Who is GT ?

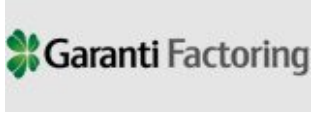
GARANTI TECHNOLOGY

- A wholly-owned subsidiary of Garanti Bank, the second largest private bank in Turkey owned by Doğuş Group and BBVA.
- One of the largest private internal IT service providers in Turkey
- Most up-to-date IT infrastructure
- Tightly integrated and fully in-house developed, custom-fit IT solutions
- Uninterrupted transaction capability and infrastructure security
- Well-reputed as a company of “firsts”
- Visionary and continuous investment in technology since 90’s

Garanti

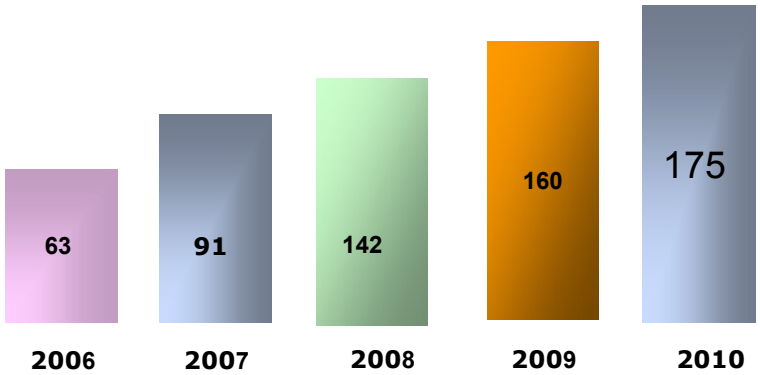
- Fast decision making and strong communication from top to down
- Centralized management reporting systems, enable management to take timely actions
- Advanced CRM applications
- Paperless banking

Our Customers



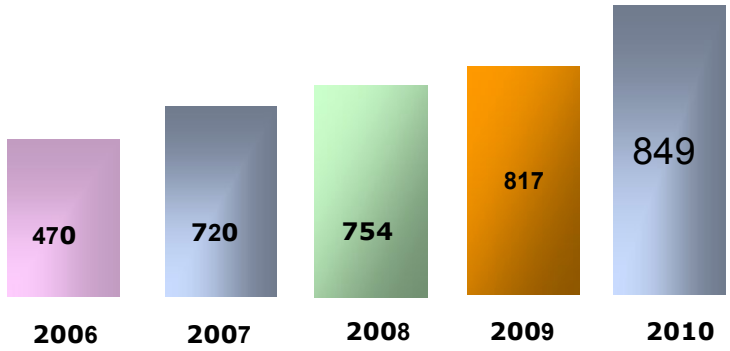
Who is GT ?

Number of Transactions / Day (mio.)



Average daily txs. : 205 million
Peak daily txs. : 281 million
Average response time: 0.045 sec.

Average Login / Day (`000)



Internet Average logins /day : 849,000
Internet Logins/day on peak days :1,209,000
Internet Average response time : 22 msec.

GT Is A Member Of …

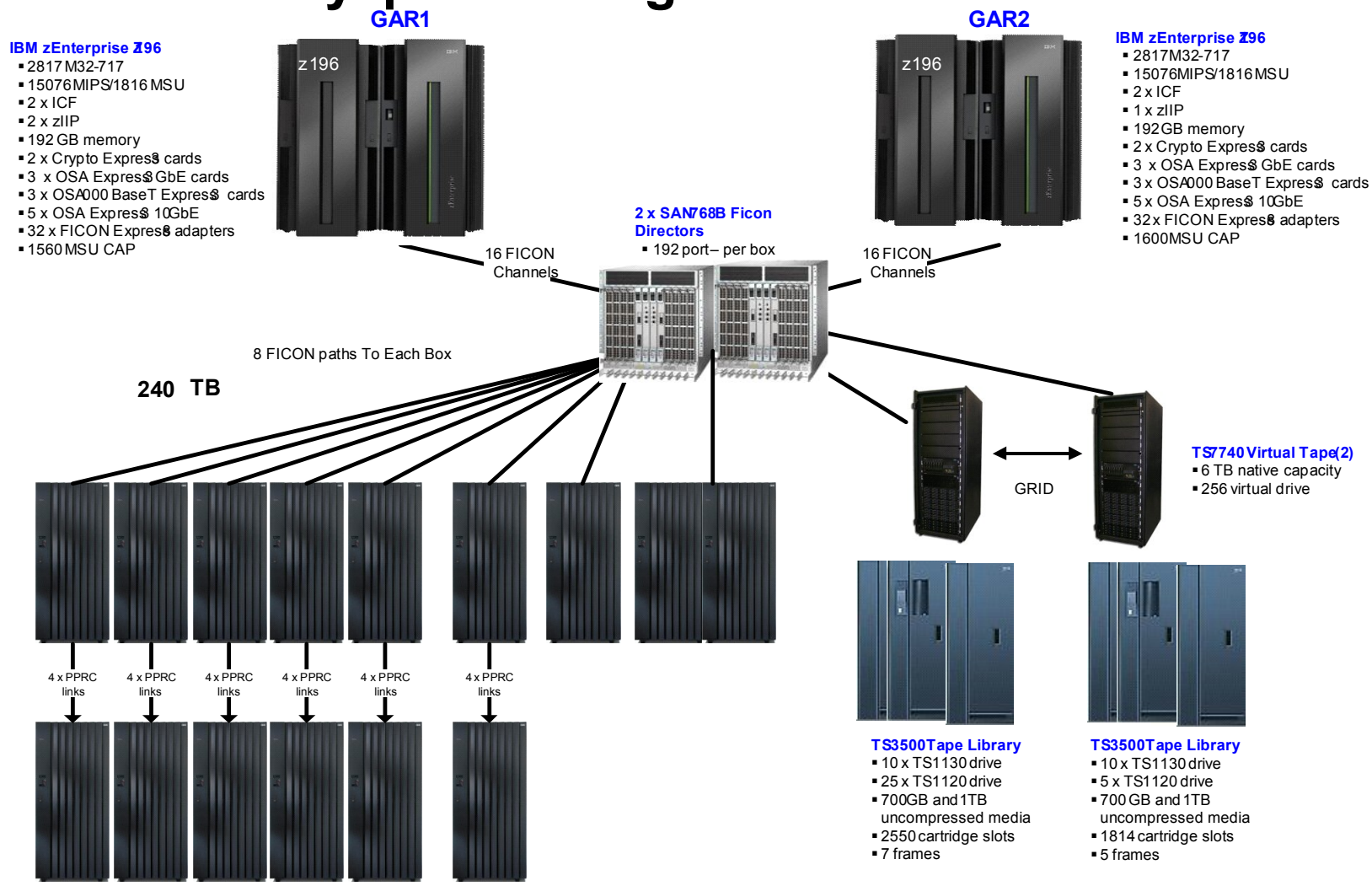
- SHARE

- CMG

- GDPS Design Council
- zBLC

GT Mainframe Configuration

GT Parallel Sysplex Configuration - Hardware

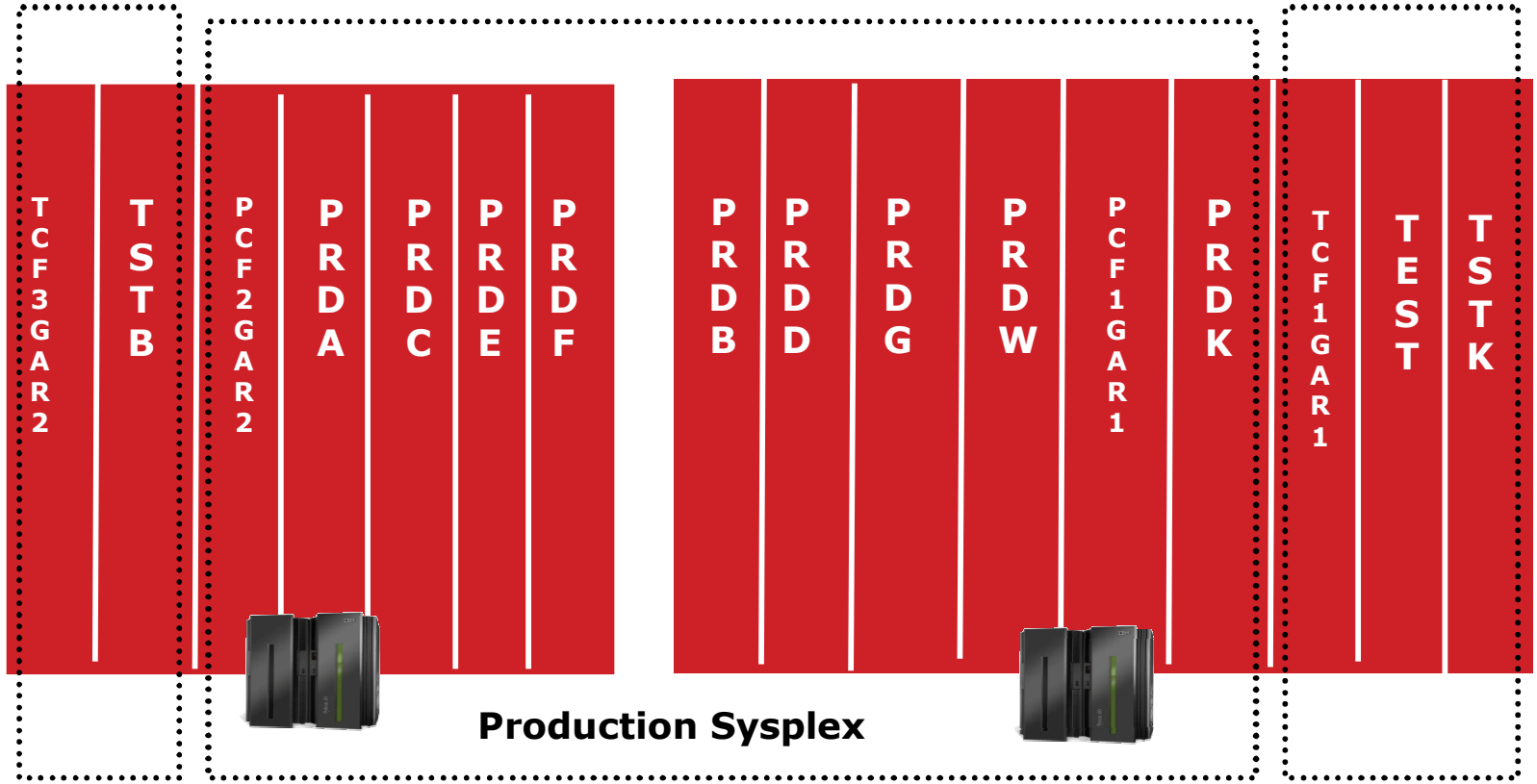


Production Disk Subsystems
- 4 x DS8700, 12,8 TB per box
- 4 x DS8300 Turbo, 12,8 TB per box
- 2 x DS8300 Turbo, 6,4 TB per box
- GDPS/PPRC, GDPS/XRC, HyperPAV, zHPF
- 128GB (4), 256GB (6) cache per box
- 24 (6) and 32 (4) FICON adapters per box

Archive and TEST Disk Subsystems
- 3 x DS8300, 6,4 TB per box
- 1 x DS8700, 85 TB
- GDPS/PPRC, GDPS/XRC, PAV
- 256GB(1), 128GB(2), 64GB(1) cache per box
- 24 FICON adapters per box

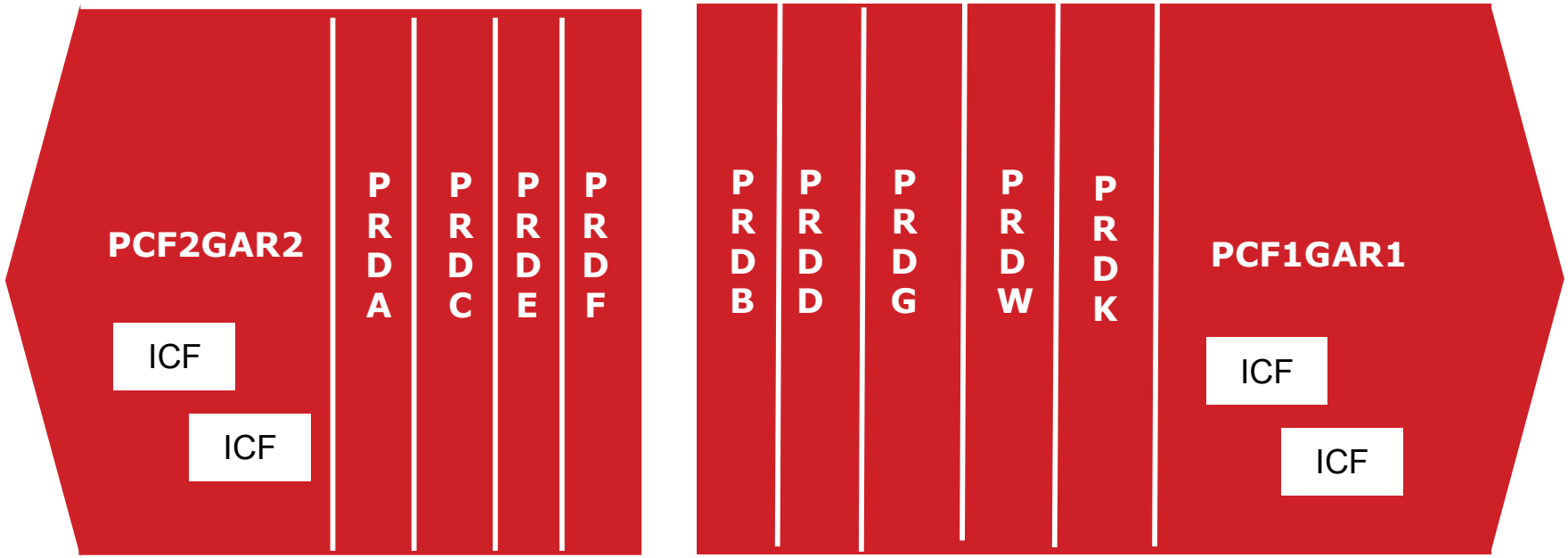
SHARE in Orlando 2011

GT Parallel Sysplex Configuration - LPARS



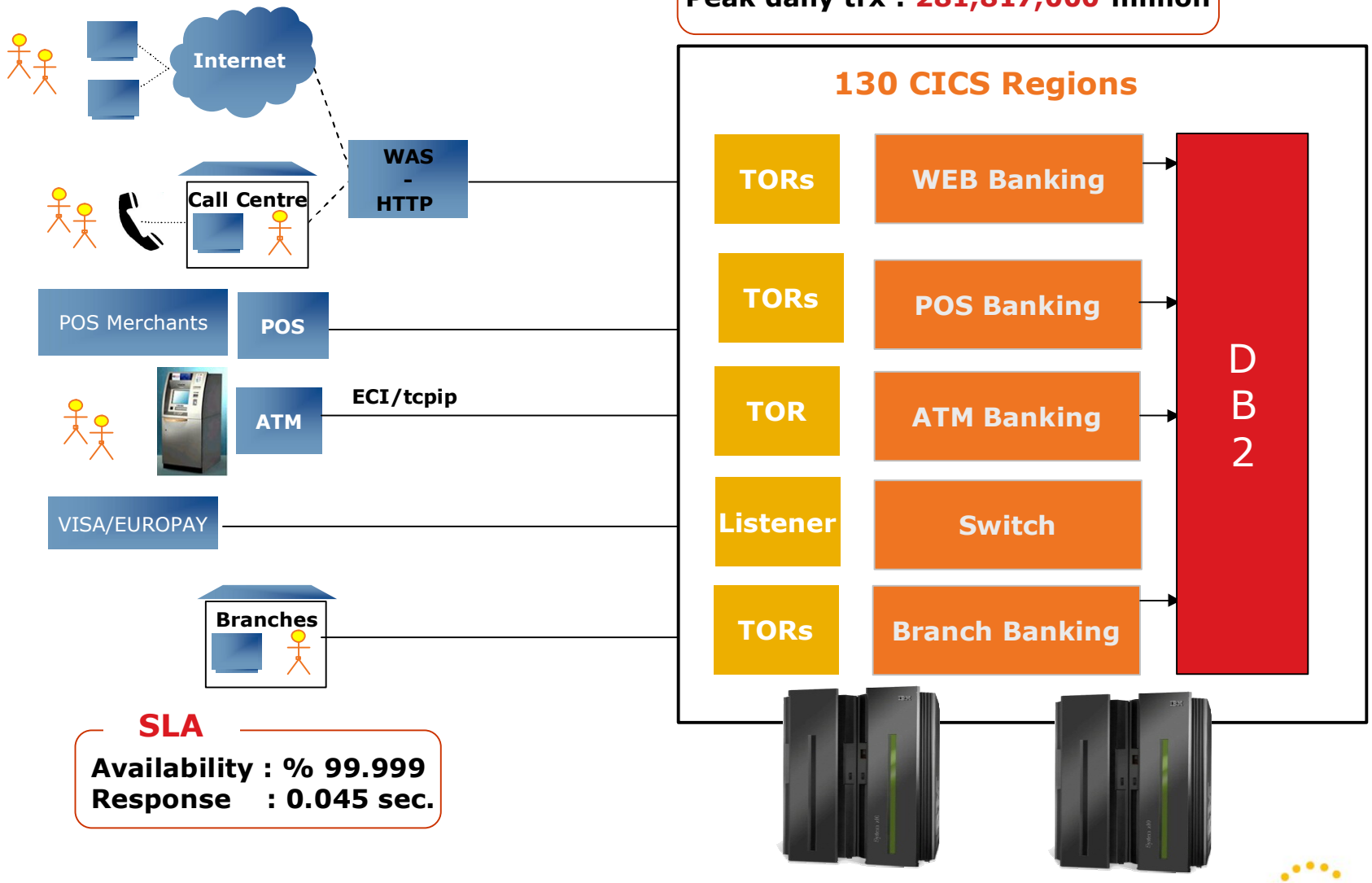
z/OS 1.12
DB2 V9
CICS TS 3.2

GT LPAR Configuration



GT- CICS Configuration –TORs & AORs

Average daily trx : 205 million
Peak daily trx : 281,817,000 million



SLA

Availability : % 99.999
Response : 0.045 sec.

10

PART I

Performance Management /Capacity Planning
&
Different View Of Enablers

Performance Management ....

- Create Processes To Prevent The Occurrence Of Performance Problem
- If Exists Solve As Soon As Possible
- Improve !
- Automate !
- Make Correct Capacity Planning
- Create Innovative Solutions
- Create Performance Management Methodology Suitable For Your Company

Performance Management & Capacity Planning ....

"Performance is about the amount of time that an individual transaction or piece of work takes to be completed "

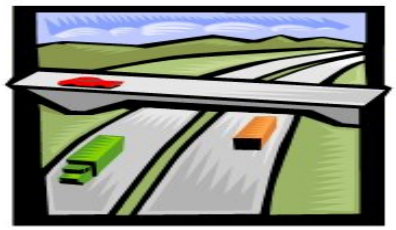
"Capacity is about the amount of work that can be completed over a period of time"

CMG- MeasureIT Article By Michael Ley – November 2008

Performance is the time it takes me to drive from London back to the family home in Wales ~ a distance of about 200 miles

Capacity is the number of cars per hour the M4 motorway* can handle

By extension, utilisation is the number of cars per hour travelling on the M4, divided by the maximum number of cars per hour that the M4 can handle.**



And high utilisation on the M4 certainly may lead to delays because of queuing, which in turn leads to elongated travelling time i.e. reduced performance

Components Used In Performance/Capacity Planning Management In GT

Performance Monitoring /TroubleShooting

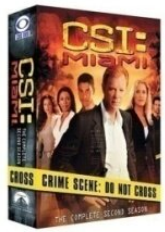
- RMF
- IBM Tivolli Omegamon For z/OS,CICS,DB2,MQ
- CPEXPERT, MXG
- Online Monitor Services (GT-PM Group)
- Reporting Services (GT-PM Group)
  [Based OnRMF-SMF & Other SMF Records]
  ALERTS & Automation Code
- Netmaster, CA Detector,STROBE, Subsystem analyzer
- CICS Performance analyzer
- z/OS HealthChecker, Tivolli SA Alerts

Capacity Planning

- zPCR
- Latent Demand Estimation (CMG)
- ResponseTime Estimation (CMG)
- Inhouse Developed Data Collection
- GT-PM Group Reporting Services
  Trend Reports
  Input : All Platforms Perf Data
  Mainframe SMF Records
  For Pricing Analizing LCS Tool

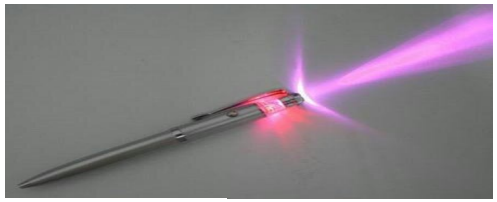
Performance Management / Capacity Planning Skills

Probably , you heard of CSI miami, CSI NY, NCSI…



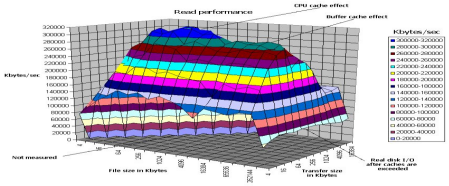
When we do performance troubleshooting, we work just like agents in CSI series

- desires much deeper knowledge
- knows where to look for the correct clue



- is aware of using latest methods is the way to success
- expected to know best way to use latest technologies

- expected to see the clues as soon as possible



- expected to know well how to combine collected data

WHAT IS NEED ?

- ❑ Collecting Correct Data
- ❑ Relating Data
- ❑ Daily Reports
- ❑ For Problematic So Short Period Of Times – Data In Seconds Period
- ❑ Mechanism To Decrease The Time To Process The Data
  So That We Will Have Time For Analize – Find Out What Is Wrong
- ❑ Alerts To Do The Checking That We Are Already Doing Manually
- ❑ Mechanism To Do Checking Report Automaticly

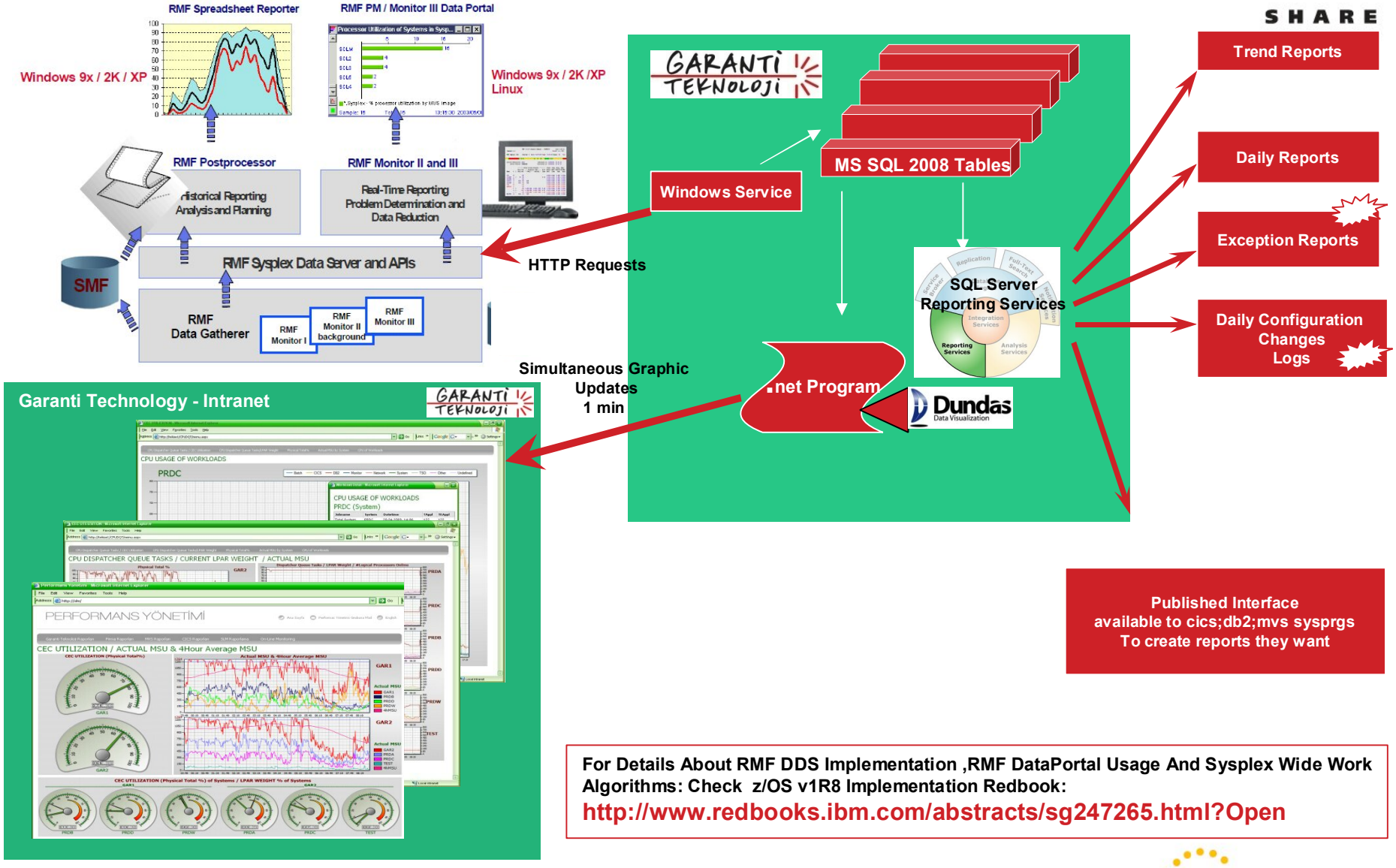
PART II

GT In-House Developed Online Performance Monitor Services Architecture

&

RMF Distributed Data Server API

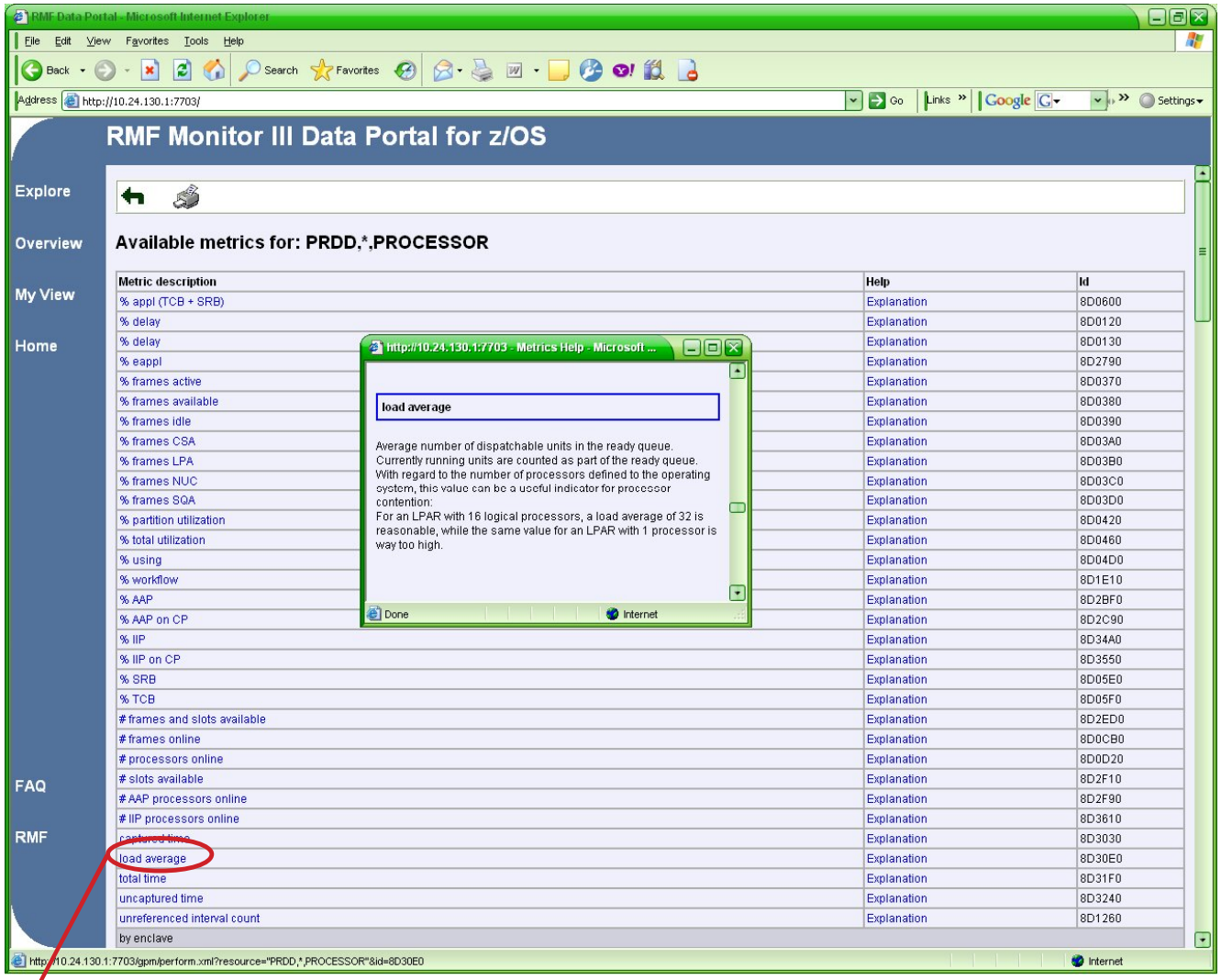
GT- In-House Developed Online Performance Monitor Services Architecture & RMF Monitor III DDS



Published Interface
available to cics;db2;mvs sysprgs
To create reports they want

For Details About RMF DDS Implementation ,RMF DataPortal Usage And Sysplex Wide Work Algorithms: Check z/OS v1R8 Implementation Redbook:
http://www.redbooks.ibm.com/abstracts/sg247265.html?Open

How Do We Know Which HTTP Request To Use In .net Program ?



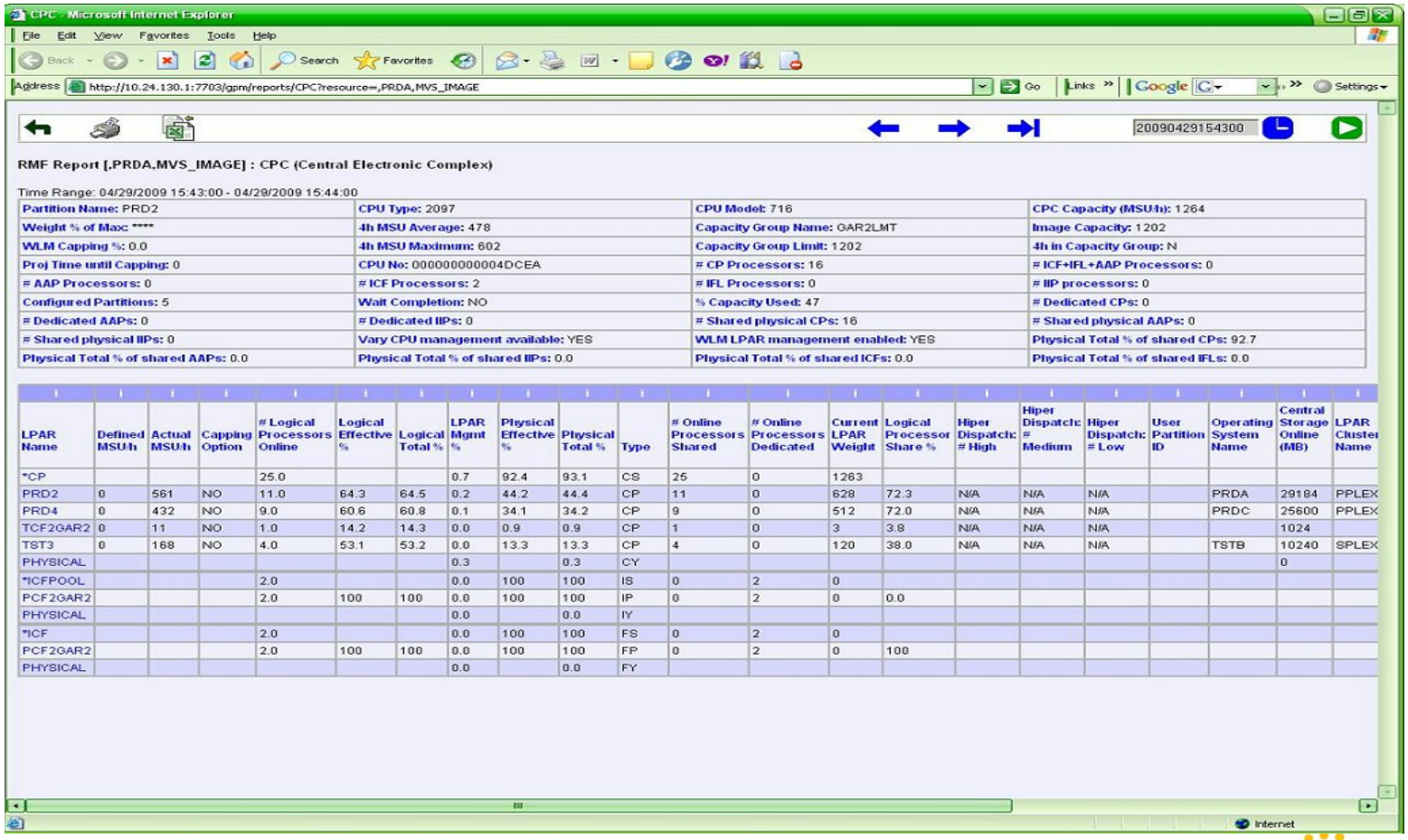
http://10.24.130.1:7703/gpm/perform.xml?resource="PRDD,*,PROCESSOR"&id=8D30E0

How Do We Know Which HTTP Request To Use In .net Program ?

Inside the program , HTTP Request

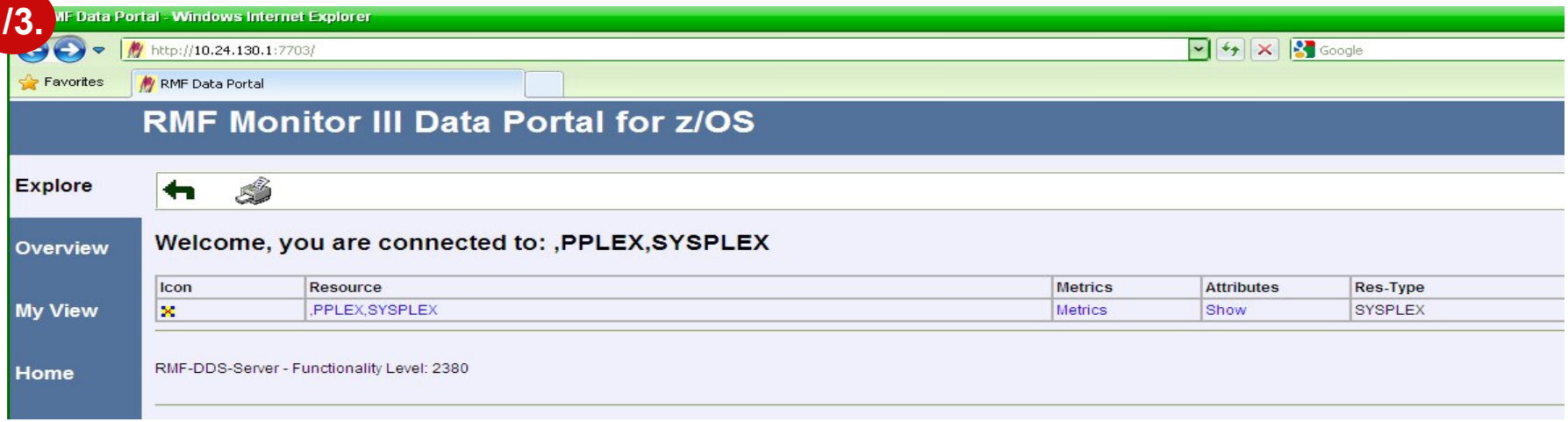
"http://10.24.130.1:7703/gpm/reports/CPC?resource=,PRDA,MVS_IMAGE"

is used to get the data below

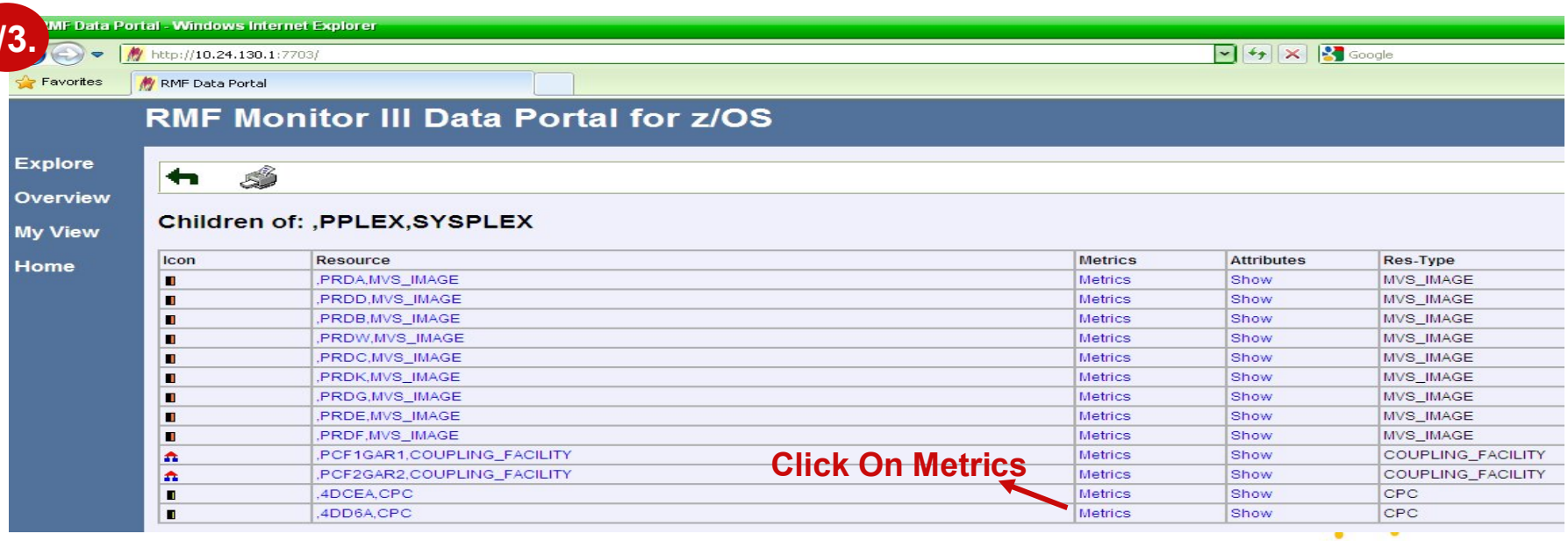


How Can We See Which Metrics Are Available In RMF Data Portal ?

1/3.

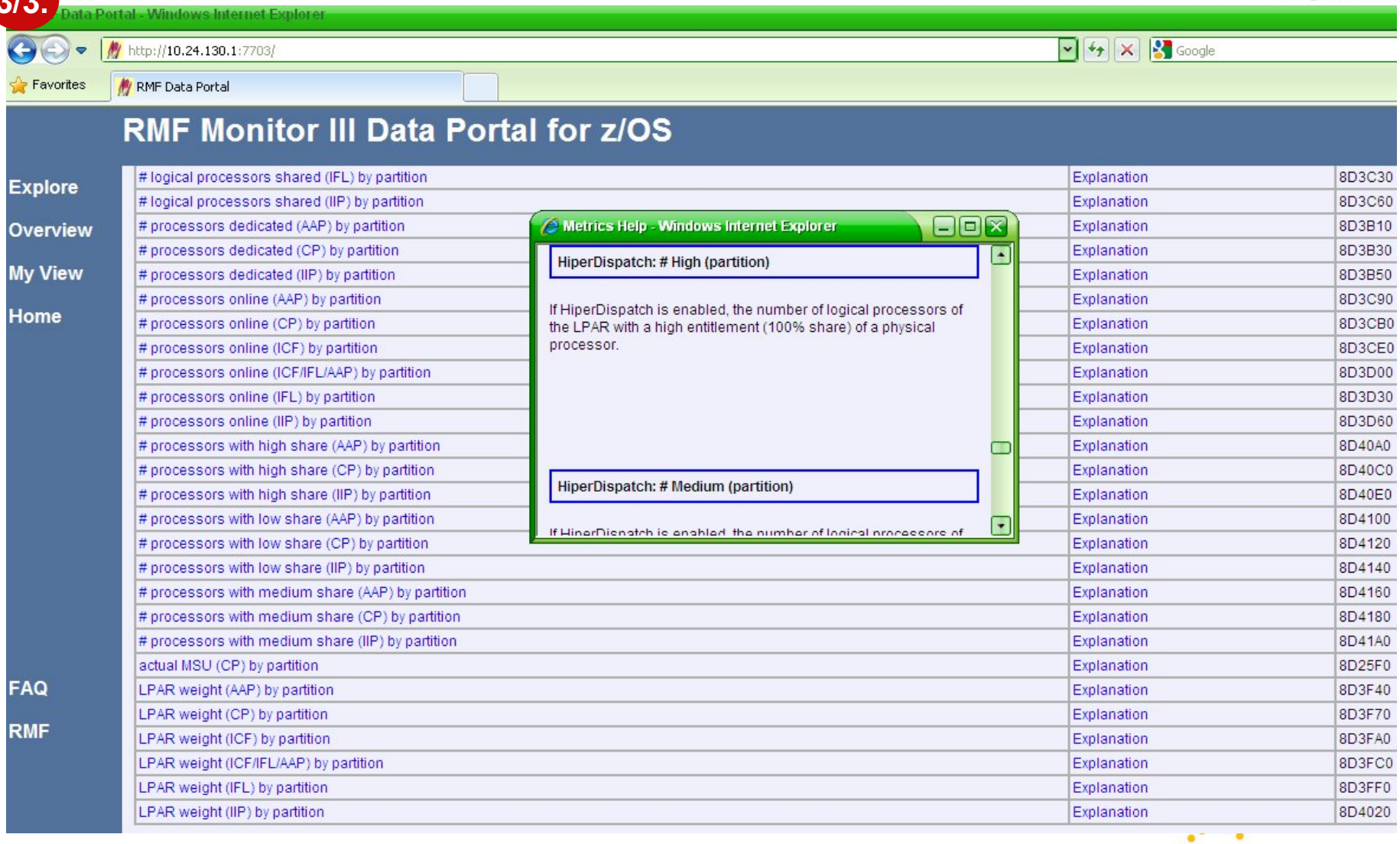


2/3.

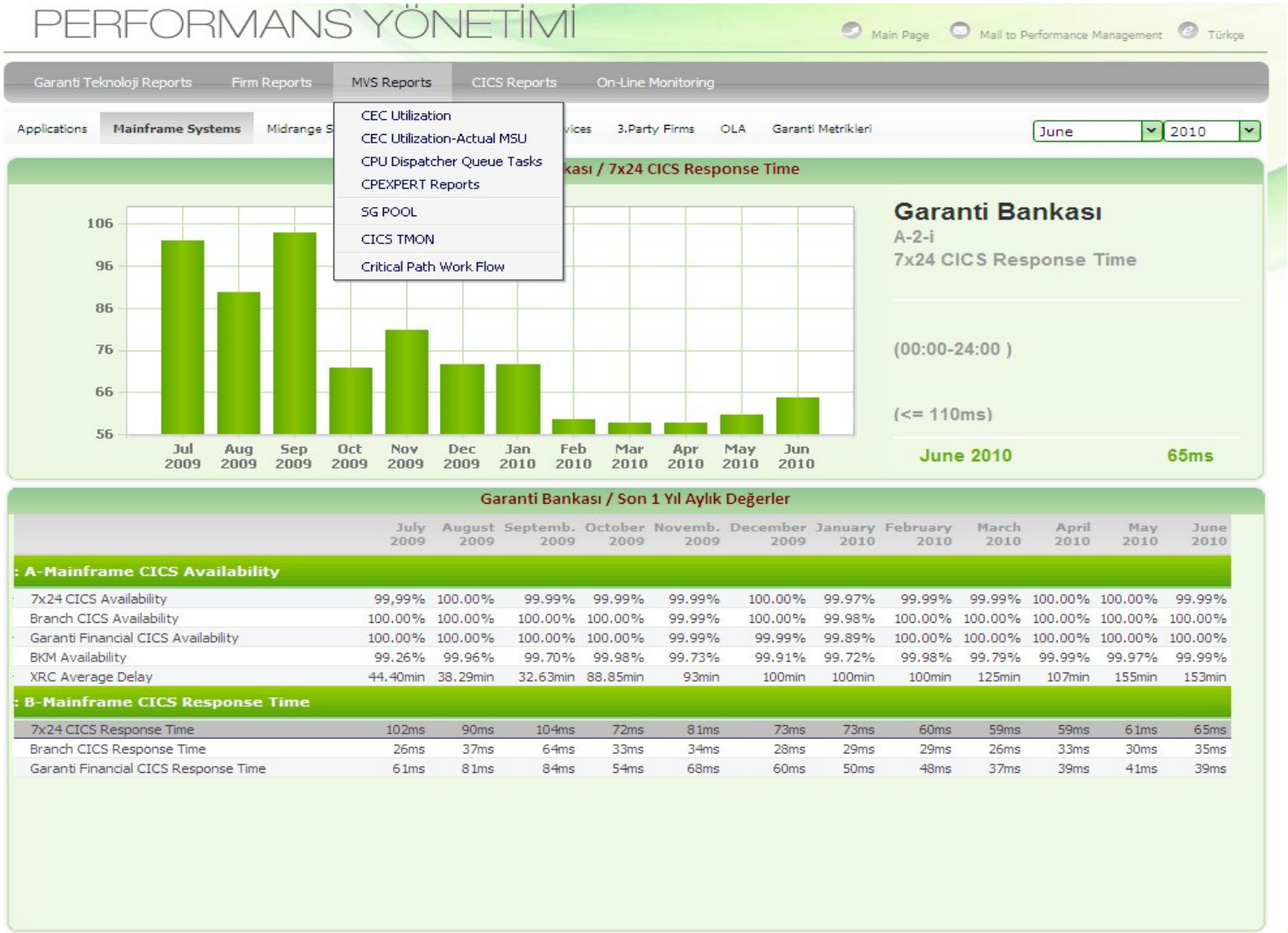


How Can We See Which Metrics Are Available In RMF Data Portal ?

3/3.

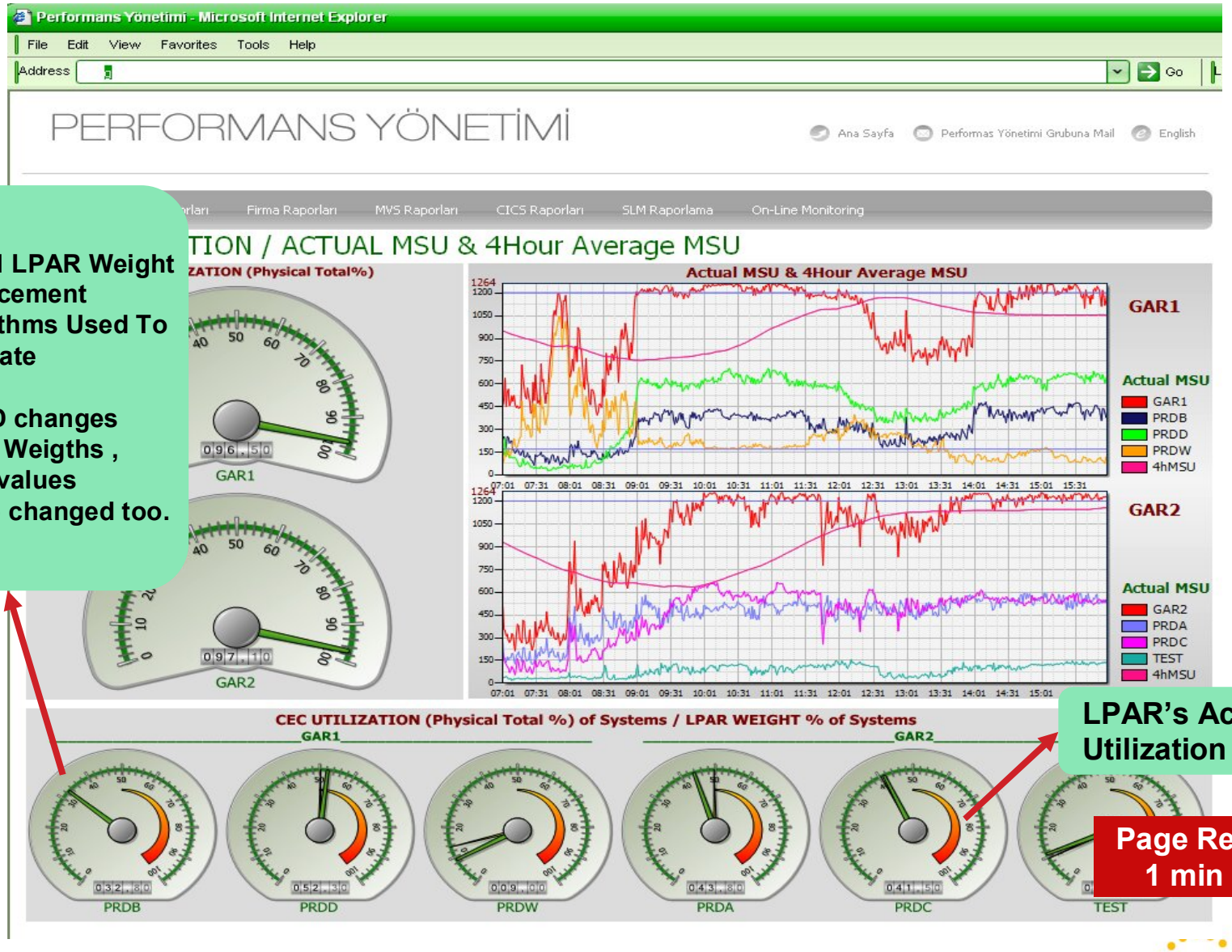


GT- Online Performance Monitor Services – Main Panel



	July 2009	August 2009	Septemb. 2009	October 2009	Novemb. 2009	December 2009	January 2010	February 2010	March 2010	April 2010	May 2010	June 2010
: A-Mainframe CICS Availability												
7x24 CICS Availability	99,99%	100.00%	99.99%	99.99%	99.99%	100.00%	99.97%	99.99%	99.99%	100.00%	100.00%	99.99%
Branch CICS Availability	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	99.98%	100.00%	100.00%	100.00%	100.00%	100.00%
Garanti Financial CICS Availability	100.00%	100.00%	100.00%	100.00%	99.99%	99.99%	99.89%	100.00%	100.00%	100.00%	100.00%	100.00%
BKM Availability	99.26%	99.96%	99.70%	99.98%	99.73%	99.91%	99.72%	99.98%	99.79%	99.99%	99.97%	99.99%
XRC Average Delay	44.40min	38.29min	32.63min	88.85min	93min	100min	100min	100min	125min	107min	155min	153min
: B-Mainframe CICS Response Time												
7x24 CICS Response Time	102ms	90ms	104ms	72ms	81ms	73ms	73ms	60ms	59ms	59ms	61ms	65ms
Branch CICS Response Time	26ms	37ms	64ms	33ms	34ms	28ms	29ms	29ms	26ms	33ms	30ms	35ms
Garanti Financial CICS Response Time	61ms	81ms	84ms	54ms	68ms	60ms	50ms	48ms	37ms	39ms	41ms	39ms

GT- Online Performance Monitor Panels -1



PR/SM LPAR Weight Enforcement Algorithms Used To Calculate

As IRD changes actual Weigths , these values will be changed too.

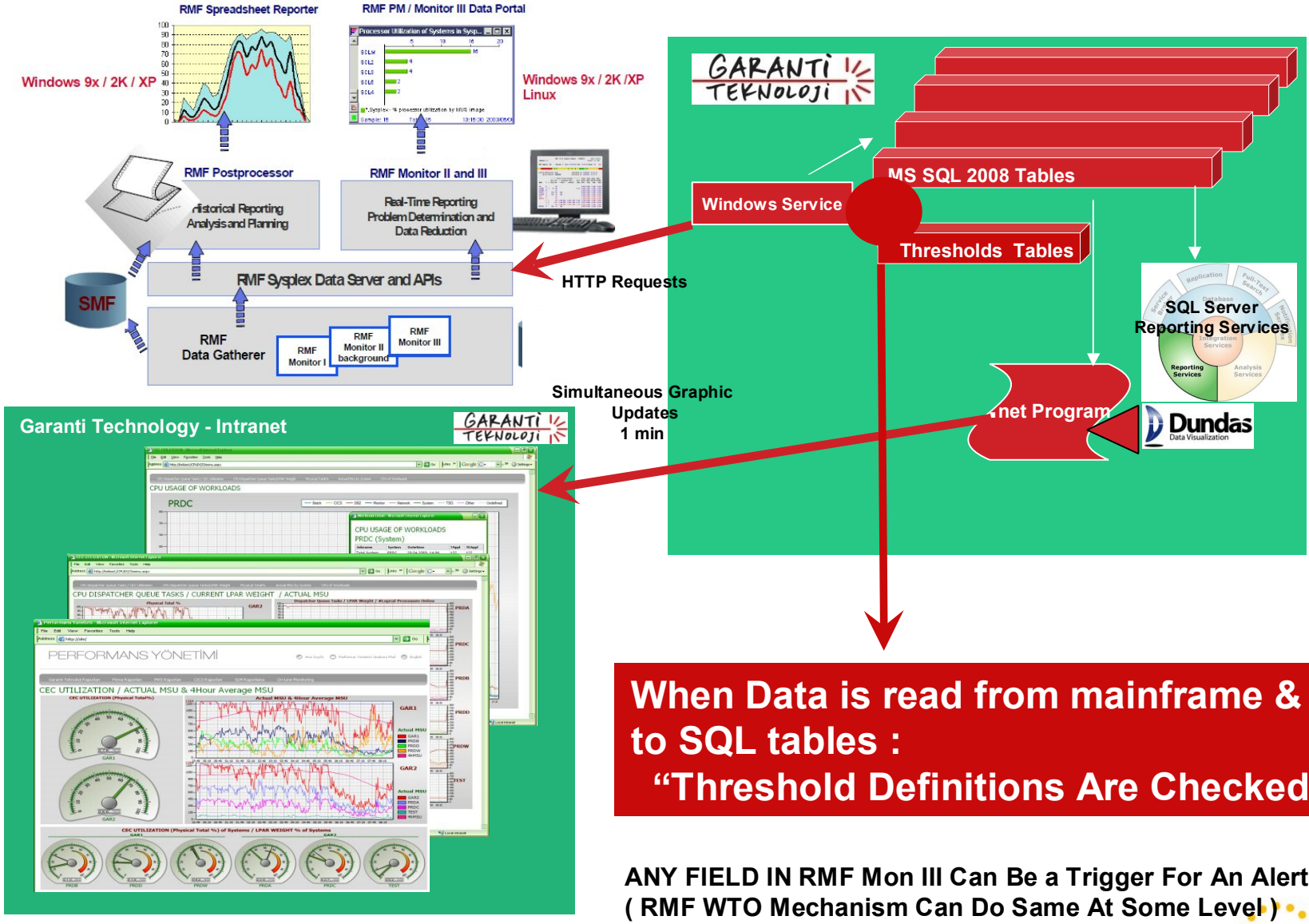
LPAR's Actual CEC Utilization %

Page Refresh in 1 min period

PART III

GT In-House Developed Online Performance Monitor Services
MORE PERFORMANCE ALERTS

Where/When And How Alerts Are Created ?



When Data is read from mainframe & written to SQL tables :
"Threshold Definitions Are Checked HERE!"

ANY FIELD IN RMF Mon III Can Be a Trigger For An Alert
(RMF WTO Mechanism Can Do Same At Some Level)

Checking CPU Usage Of System AS

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji)
Cc: Meral Temel (Garanti Teknoloji)
Subject: Address Space CPU kullanımı artışı!! *MASTER* (PRDB),(Max Değer:19), Gerçekleşen: 40.9

Address Space CPU kullanımı son 1 ay max değerini aştı.
MASTER (PRDB),(Max Değer:19), Gerçekleşen: 40.9

06.08.2011 07:32:11

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Checking CPU Delay Of System AS & Subsystems

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji); Adem Arslan (Garanti Teknoloji)
Cc: Emre Aliakar (Garanti Teknoloji)
Subject: CPU Delay değeri belirlenen değeri geçti. (PRDB-RGARCPRT),(Max Değer: %90), Gerçekleşen: 100%

CPU Delay değeri belirlenen değeri geçti.
(PRDB-RGARCPRT),(Max Değer: %90), Gerçekleşen: 100%

01.08.2011 10:16:48

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız...

Checking CPU Delay Of System AS & Subsystems

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji); Adem Arslan (Garanti Teknoloji)
Cc: Emre Aliakar (Garanti Teknoloji)
Subject: CPU Delay değeri belirlenen değeri geçti. (PRDB-RGARCPRT),(Max Değer: %90), Gerçekleşen: 100%

CPU Delay değeri belirlenen değeri geçti.
(PRDB-RGARCPRT),(Max Değer: %90), Gerçekleşen: 100%

01.08.2011 10:16:48

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız...

Checking CPU Usage Of DB2 AS

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji)
Cc: Meral Temel (Garanti Teknoloji)
Subject: Address Space CPU kullanımı artışı!! PDA2IRLM (PRDA),(Max Değer:3.5), Gerçekleşen: 7

Address Space CPU kullanımı son 1 ay max değerini aştı.
PDA2IRLM (PRDA),(Max Değer:3.5), Gerçekleşen: 7

31.07.2011 04:29:07

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız...

Checking CF Utilization %

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji)
Cc: Emre Aliakar (Garanti Teknoloji)
Subject: CF Utilizasyonu Belirlenen Degeri (PCF1GAR1),(Max Değer: %25), Gerçekleşen: % 46.6

CF Utilizasyonu Belirlenen degerini gecti
(PCF1GAR1),(Max Değer: %25), Gerçekleşen: % 46.6

19.07.2011 22:02:40

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız...

Checking CPU Delay% Of Service Classes

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji); Adem Arslan (Garanti Teknoloji)
Cc: Emre Aliakar (Garanti Teknoloji)
Subject: CPU Delay değeri belirlenen değeri geçti. (PRDB-SCICMED),(Max Değer: %90), Gerçekleşen: 100%

CPU Delay değeri belirlenen değeri geçti.
(PRDB-SCICMED),(Max Değer: %90), Gerçekleşen: 100%

01.08.2011 11:37:58

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız...

Checking DFW ByPass Value

From: Performans Yönetimi - Online Monitoring Uygulaması [PerfMonAlerts@garanti.com.tr]
To: Meral Temel (Garanti Teknoloji)
Cc: Meral Temel (Garanti Teknoloji)
Subject: Disklerde NVS cache i bypass etmek zorunda kalan I/O lar olustu. (P2LX62-4C0E) 80 adet I/O request NVSi bypass etmek zorunda kaldı.

Disklerde NVS cache i bypass etmek zorunda kalan I/O lar olustu.
(P2LX62-4C0E) 80 adet I/O request NVSi bypass etmek zorunda kaldı.

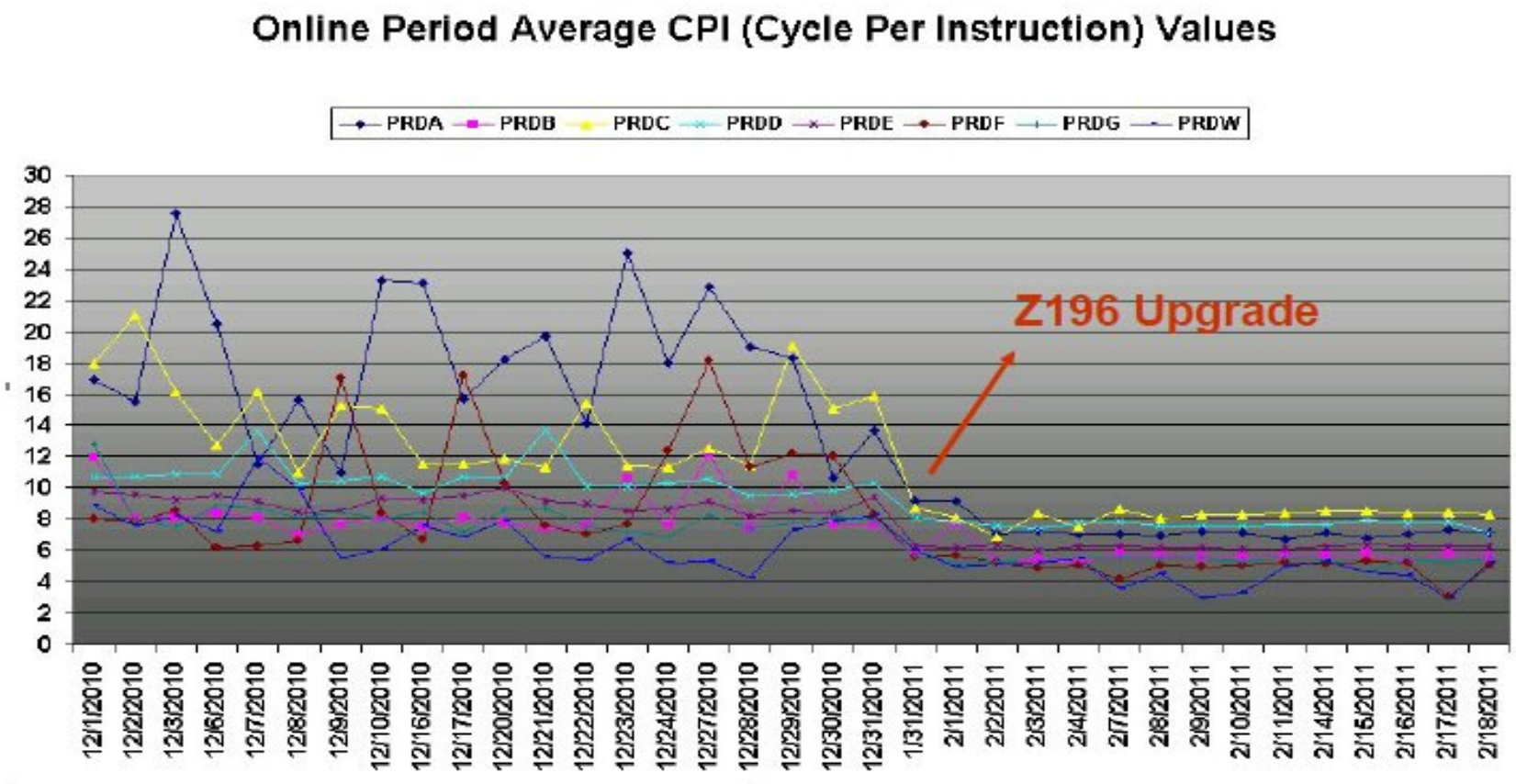
14.07.2011 07:02:40

http://SLM adresinde 'On-Line Monitoring' menüsünden takip edebilirsiniz

Bu mail adresi bilgilendirme amaçlıdır, lütfen reply yapmayınız...

SMF113 Related Alerts - CPI

Online Period Intervals That is > That LPAR"s Characteristic CPI Value



SMF113 Related Alerts- CPI Thresholds

BATCH				ONLINE			
SYSTEM	z10CPI	z196CPI	%Decrease	SYSTEM	z10CPI	z196CPI	%Decrease
PRDA	11.2	5.3	52.3	PRDA	18.1	7.4	59.4
PRDB	6.5	4.7	28.6	PRDB	8.5	5.7	32.6
PRDC	9.7	5.7	41.3	PRDC	14.3	8.2	42.3
PRDD	7.2	5.1	29.8	PRDD	10.7	7.7	28.0
PRDE	10.4	5.0	51.4	PRDE	9.1	6.2	31.3
PRDF	6.1	4.6	25.0	PRDF	10.0	5.0	50.0
PRDG	6.4	5.0	21.9	PRDG	8.2	5.4	34.8
PRDW	6.2	4.4	28.7	PRDW	7.2	4.6	35.8
Average	8.0	5.0	37.5	Average	10.8	6.3	41.6

Other Alerts

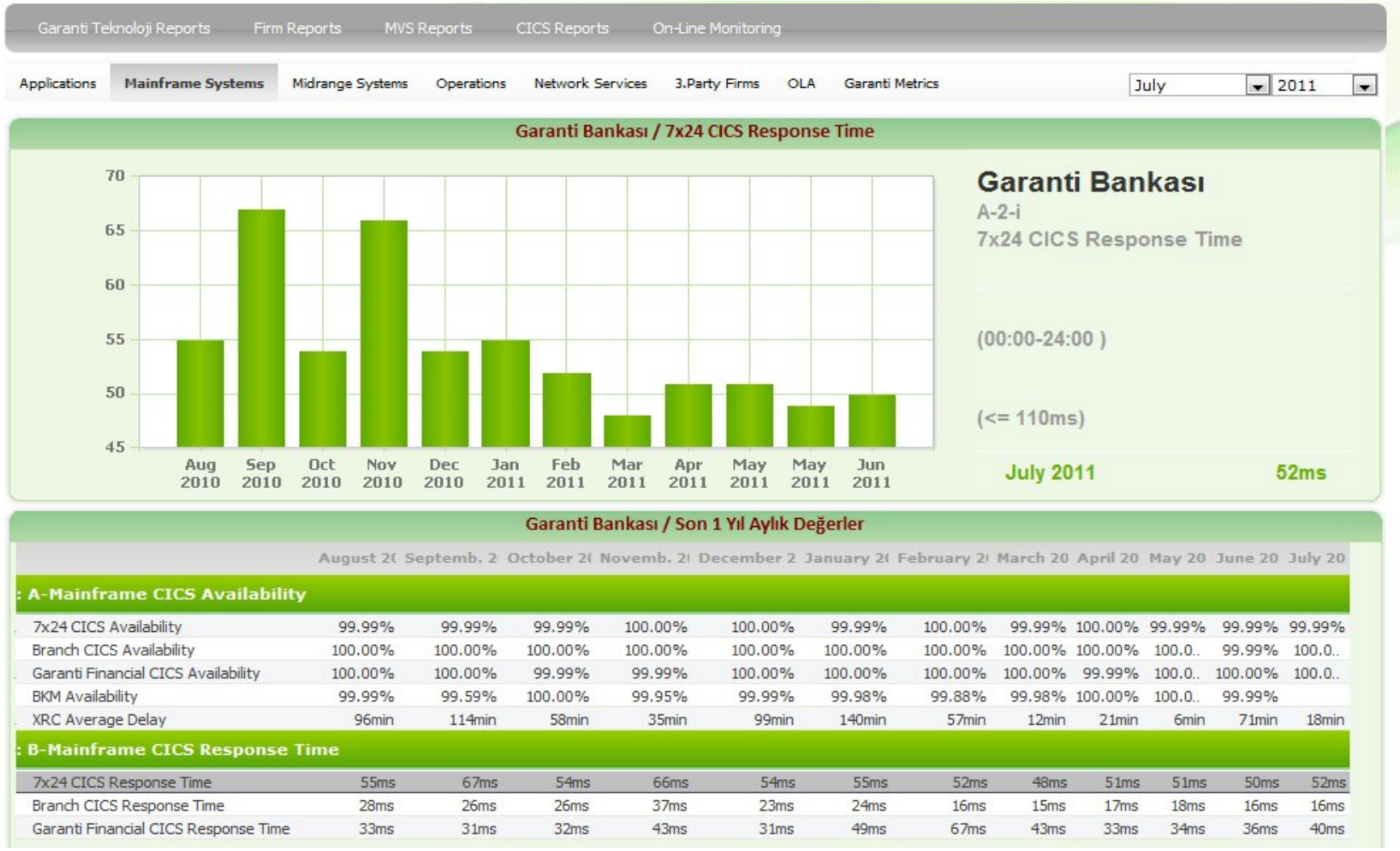
CF Requests > Normal Workload Values – Online /Batch Alert

Channel Utilization > 30% & Above Normal Workload Values Alert

Average Structure Async Request % > Normal Workload Values Alert

Average Structure Delay Request % > 10% Alert

Performance Management Main Menu

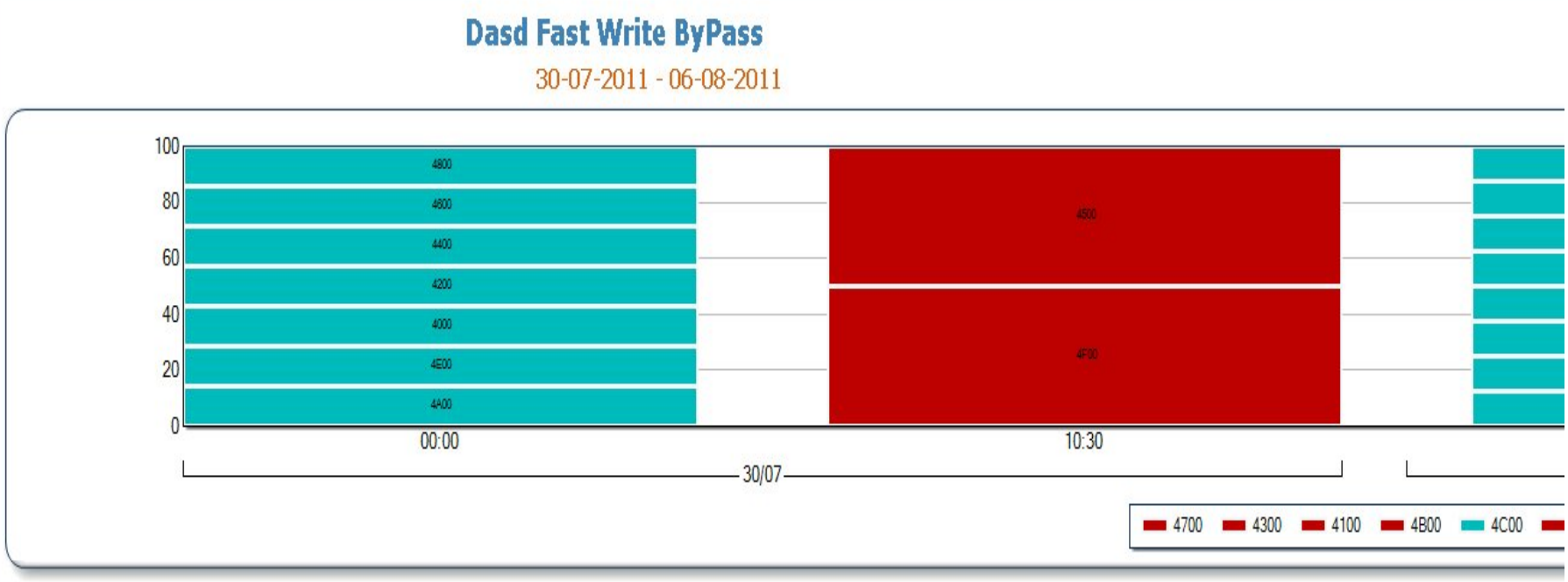


Garanti Bankası / Son 1 Yıl Aylık Değerler

	August 2(	Septemb. 2	October 2(	Novemb. 2(	December 2	January 2(	February 2(	March 20	April 20	May 20	June 20	July 20
: A-Mainframe CICS Availability												
7x24 CICS Availability	99.99%	99.99%	99.99%	100.00%	100.00%	99.99%	100.00%	99.99%	100.00%	99.99%	99.99%	99.99%
Branch CICS Availability	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0..	99.99%	100.0..
Garanti Financial CICS Availability	100.00%	100.00%	99.99%	99.99%	100.00%	100.00%	100.00%	100.00%	99.99%	100.0..	100.00%	100.0..
BKM Availability	99.99%	99.59%	100.00%	99.95%	99.99%	99.98%	99.88%	99.98%	100.00%	100.0..	99.99%	
XRC Average Delay	96min	114min	58min	35min	99min	140min	57min	12min	21min	6min	71min	18min
: B-Mainframe CICS Response Time												
7x24 CICS Response Time	55ms	67ms	54ms	66ms	54ms	55ms	52ms	48ms	51ms	51ms	50ms	52ms
Branch CICS Response Time	28ms	26ms	26ms	37ms	23ms	24ms	16ms	15ms	17ms	18ms	16ms	16ms
Garanti Financial CICS Response Time	33ms	31ms	32ms	43ms	31ms	49ms	67ms	43ms	33ms	34ms	36ms	40ms

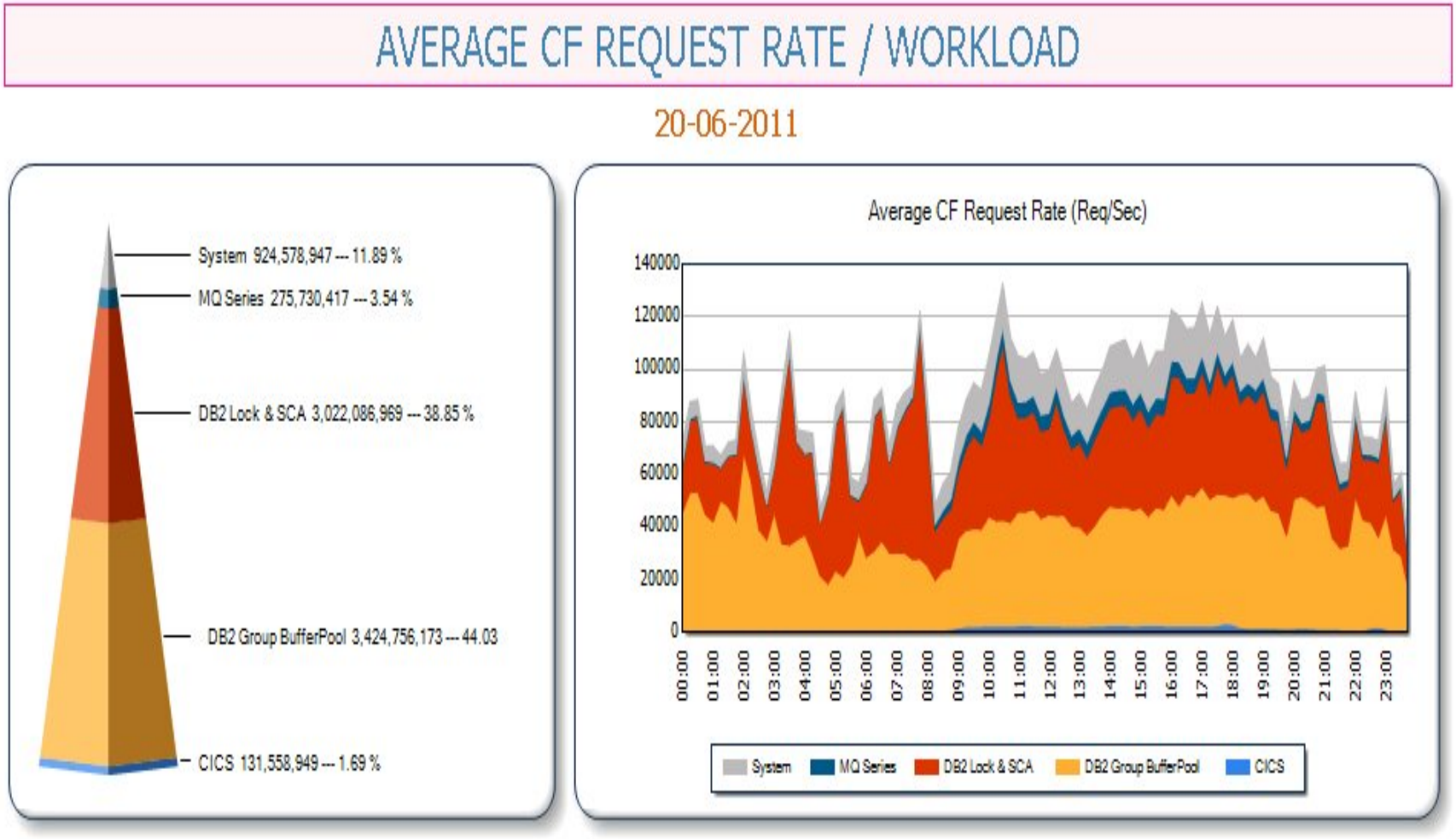
Checking Last 1 Week DFW ByPass Value

From: GTPerformansYonetim@garanti.com.tr
To: Meral Temel (Garanti Teknoloji)
Cc:
Subject: DFWBypass group by nvs
Sent: Sat 8/6/2011 8:01 AM



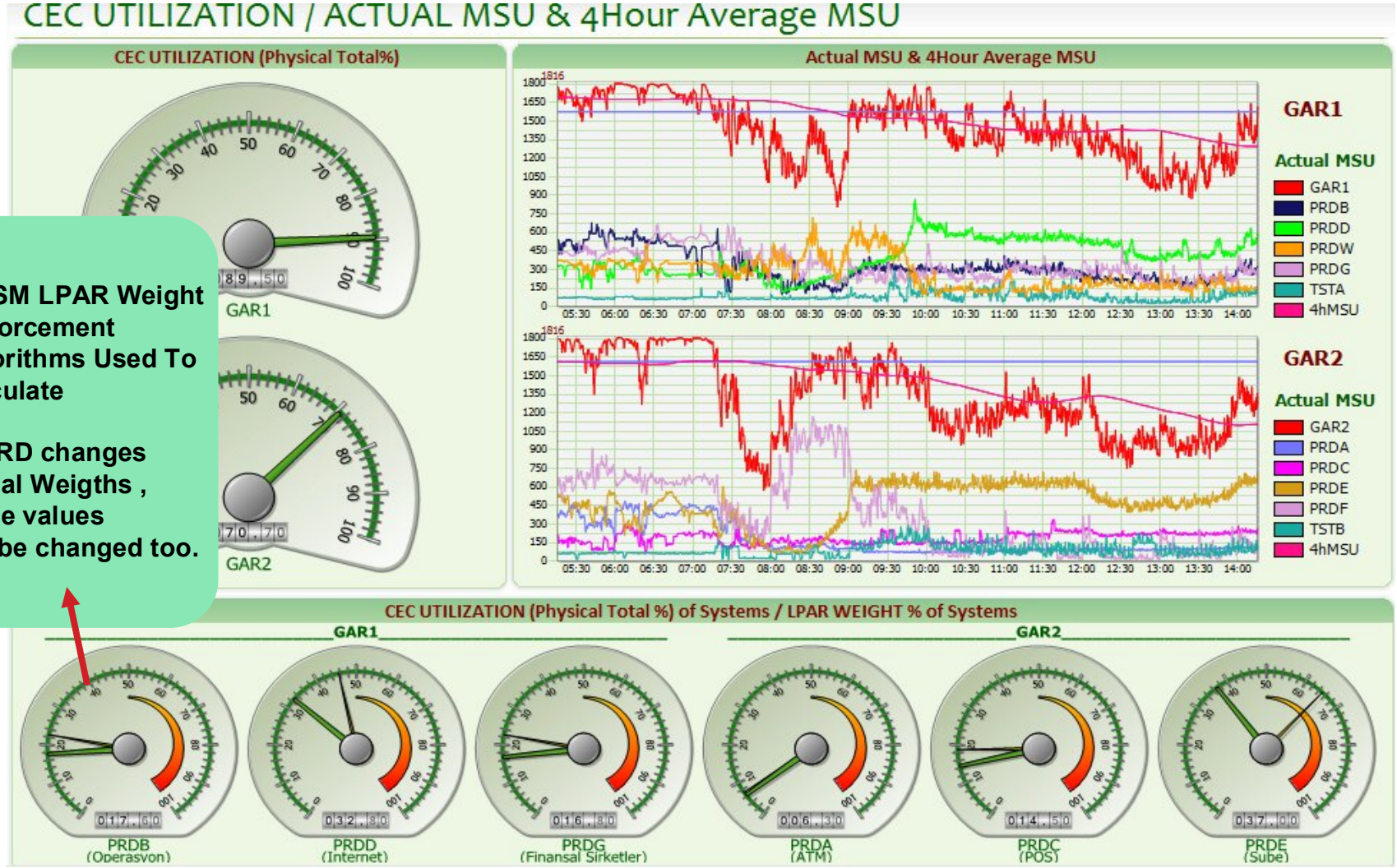
stmtname	time	evenodd	Value
4000			
	30-07-2011 00:00	Even	1194
	01-08-2011 23:15	Even	1329
	05-08-2011 19:00	Even	3710

Sample SMF Records – CF Report



Performance Management Main Menu

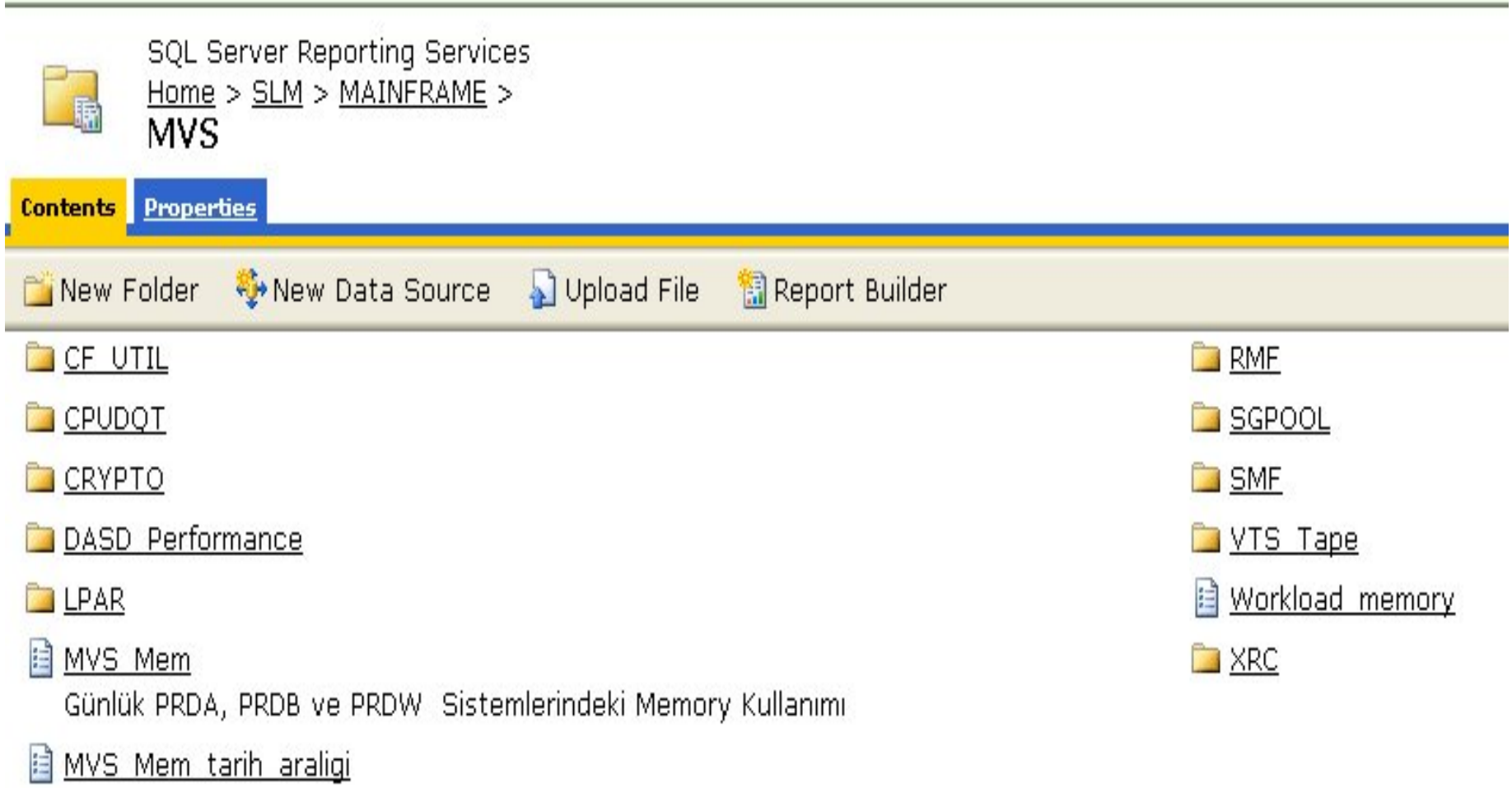
CEC UTILIZATION – EXECUTIVE PANEL



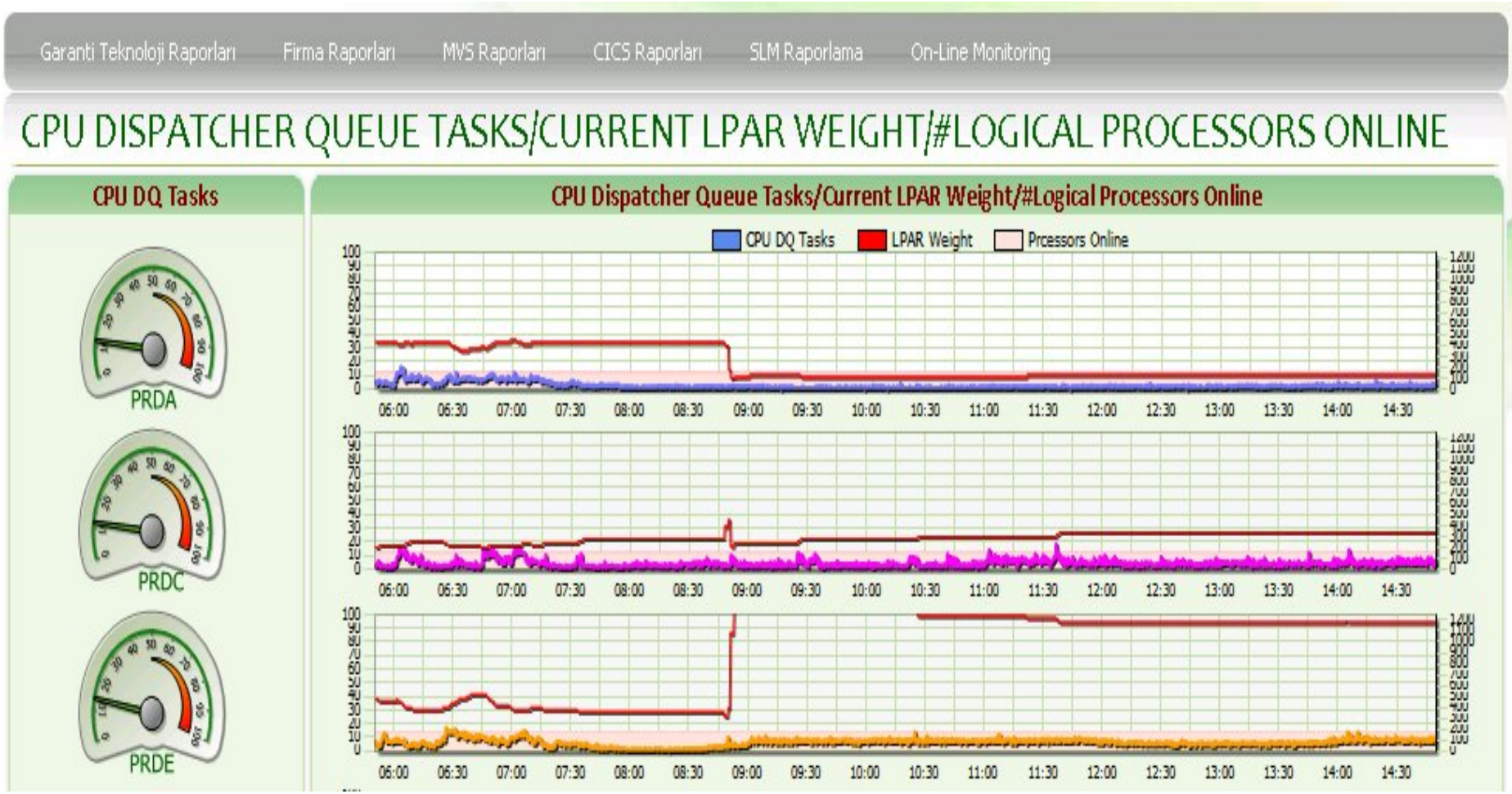
PR/SM LPAR Weight Enforcement Algorithms Used To Calculate

As IRD changes actual Weigths , these values will be changed too.

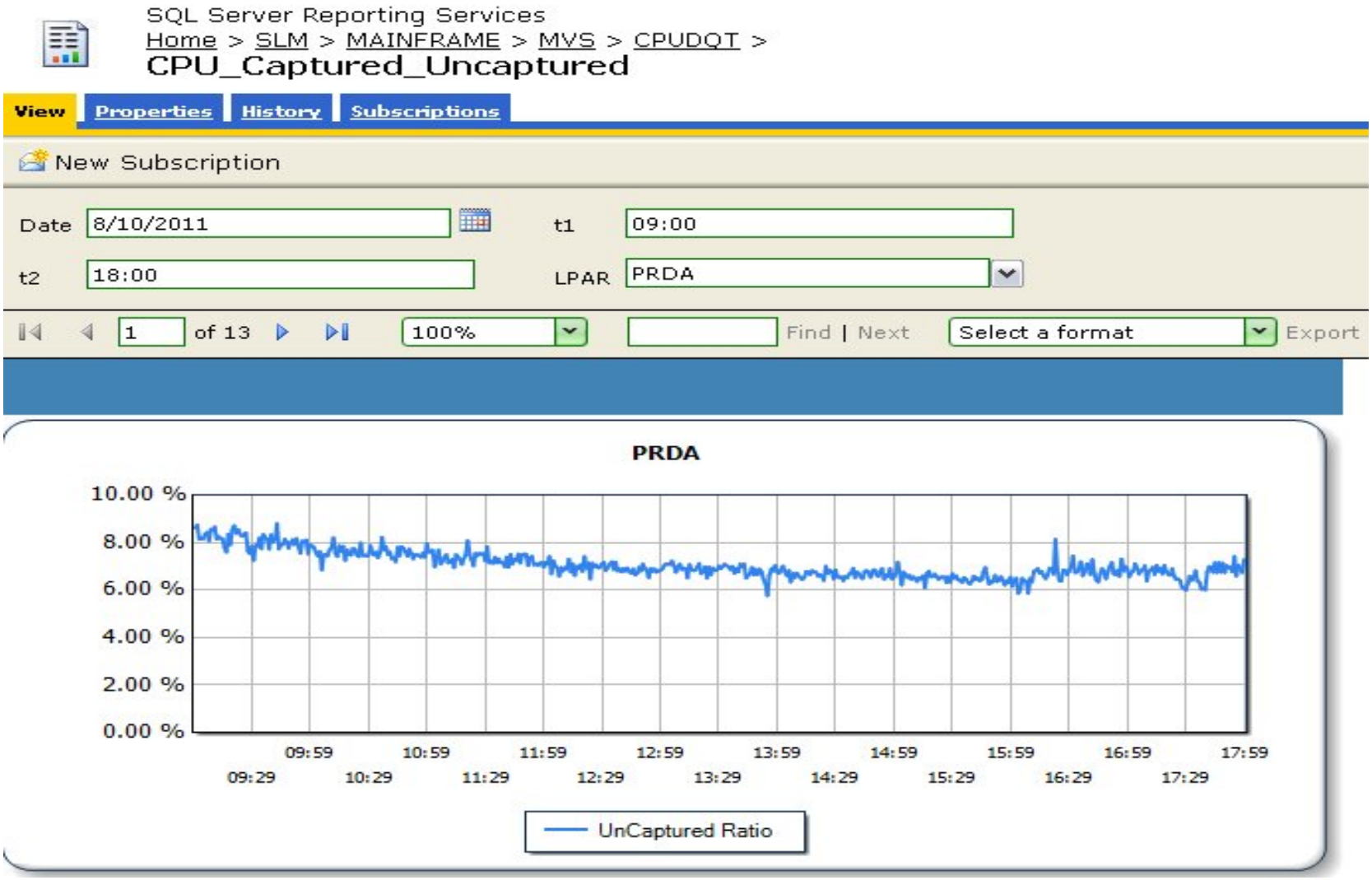
SQL Server Reporting Services



Performance Management Main Menu



CPU Captured/Uncaptured- RMF Mon III Data



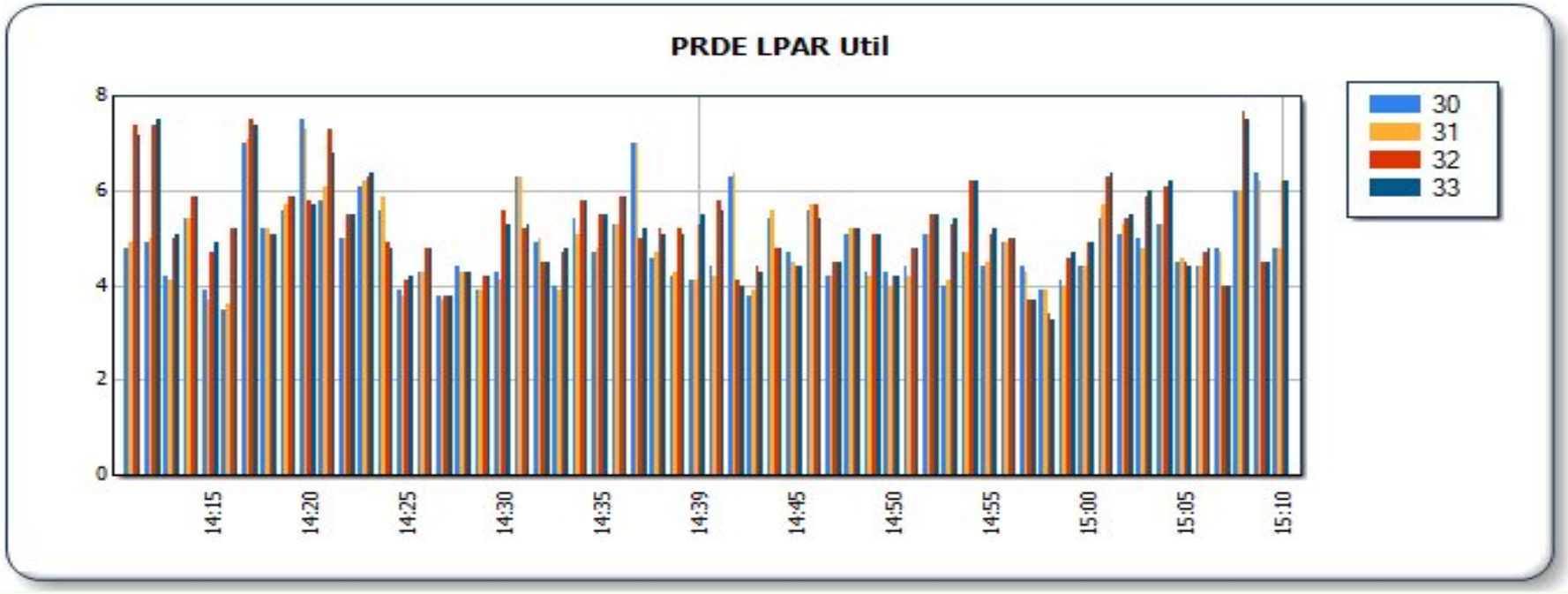
Channel Utilization – One LPAR Peak Day

t1 8/1/2011 2:10:30 PM t2 8/1/2011 3:10:30 PM

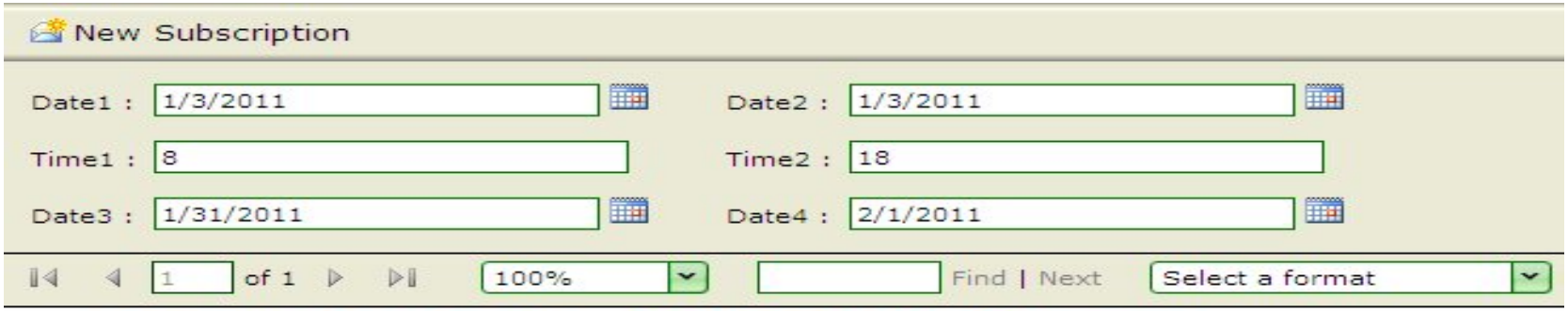
LPAR PRDE CHPID 30, 31, 32, 33

1 of 1 100% Find | Next Select a format Export

01/08/2011 14:10 - 01/08/2011 15:10



Calculating Actual Throughput

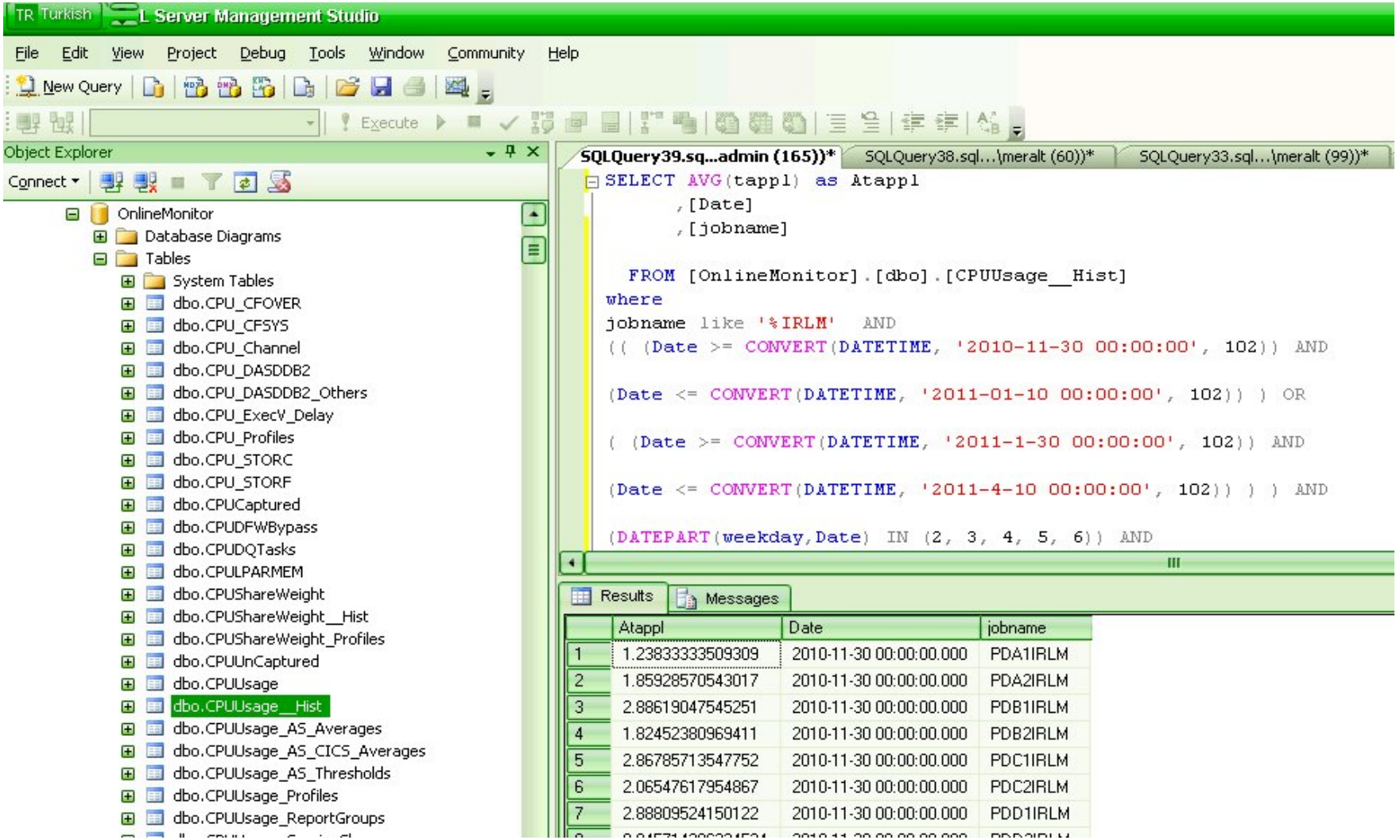


Actual Throughput - Relative ITR Difference

System	Before Avg Oran (03.01.2011-03.01.2011)	After Avg Oran (31.01.2011-01.02.2011)	After/Before Relative ITR Difference
PRDA	261	267	1.02
PRDB	204	250	1.23
PRDC	225	303	1.35
PRDD	233	291	1.25
PRDE	273	292	1.07
PRDF	271	439	1.62
PRDG	253	356	1.40
PRDW	370	549	1.48

Machine ID	Before Avg Oran (03.01.2011-03.01.2011)	After Avg Oran (31.01.2011-01.02.2011)	After/Before Relative ITR Difference
GAR1	265	362	1.36
GAR2	257	325	1.26

SQL Server & Queries



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Thank You!

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