

IBM Insight for SAP R/3

Results of Analysis for XYZ

Insight Data Collected From

June 28, 2001 – July 5, 2001

Document Prepared By IBM America's Techline On August 11, 2001

http://www.ibm.com/erp/sap/insight

IMPORTANT: Supplying correct hardware information during data collection process with IBM Insight for SAP R/3 (Server Model Numbers, # of CPUs, Speed in MHz) is the sole responsibility of the customer.



Control Section

CONTACTING IBM

You can contact IBM in one of the following ways:

- Send a note to IBMERP@US.IBM.COM and include the word "INSIGHT" in your subject heading.
- Call us at 1-800-IBM-0222
- For a more detailed analysis than provided here, please contact Rudy Waldner of IBM Global Services at 919-301-4162. Rudy is responsible for providing service offering for client/server capacity analysis and modeling.

MODULE ABBREVIATIONS

- AC Accounting General
- CO Controlling
- CS Customer Service
- EC Enterprise Controlling
- EHS Environment Management
- FI Financial Accounting
- IM Investment Management
- IS-RE Real Estate Management
- LE Logistics Execution
- LO Logistics General
- MM Materials Management
- PA Personnel Management
- PE Training and Event Management
- PM Plant Maintenance
- PP Production Planning and Control
- PS Project System
- PT Personnel Time Management
- PY Payroll Accounting
- SD Sales and Distribution
- TR Treasury
- BC Basis Components
- CA Cross-Application Components
- SY System Tasks
- BT Batch
- OT Other (Not Identified)



Client Site Description

CUSTOMER

XYZ

CUSTOMER CONTACT

John Doe

John.Doe@xyz.com

TOOL RUN DATE

June 28 2000 – July 5, 2001

INSTALLED SYSTEM INFORMATION

SAP ver: 4.0 B

SAP Kernel ver: 4.0 B

Operating System: AIX

Database: Oracle

SID: PRD

TOOL INFORMATION:

Insight: ver 2.7

Analysis Tool: ver C++ 2.7

Analysis For: Jun 28 – Jul 5, 2001



System Performance

Insight Observed **Peak Hour SAP Dialog Steps** between the monitoring period=46,289

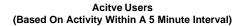
Insight Observed **Peak Hour Active Users** between the monitoring period = **140**

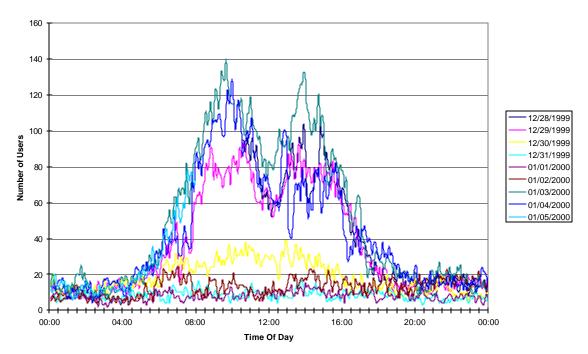
Average & Peak CPU Utilization for all servers between the monitoring period

Server Name	Model	Number of CPUs	CPU Speed (MHz)	Memory (GB)	Avg CPU Utilization	Peak Hour CPU Utilization
DB Server (magneto)	RS/6000 Silver Wide	4	332	3 GB	27%	95%
App Server 1 (wizard)	RS/6000 Silver Wide	4	332	2 GB	8%	63%
App Server 2 (iceman)	RS/6000 Silver Wide	4	332	2 GB	9%	62%



Report 1 of 9 - Active Users Observed





ANALYSIS

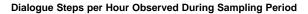
- Average number of active users between the monitoring period = 26
- Highest number of active users = 140 at 9:40am on Jan 3, 2000.
- Number of individual users logged on between the monitoring period = 2,776

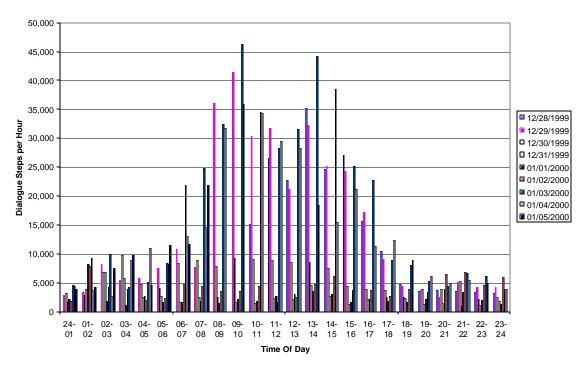
This data is the result of identifying the number of users that did any type of SAP R/3 activity during the various five minute intervals monitored (and annotated at the bottom of the above graphic). The intervals were created by the light weight CPU capture process used to gather load information during the data capture process of "Insight". The activity was generated by analyzing the SAP R/3 "stat" file in the evening for dialogue step records that occurred (or transcend) a CPU monitor period.

These results provide a good metric on your active user community profile. Use this with the size of your current "named" community to determine future user growth impacts.



Report 2 of 9 - Dialog Steps Observed Per Hour





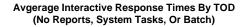
ANALYSIS

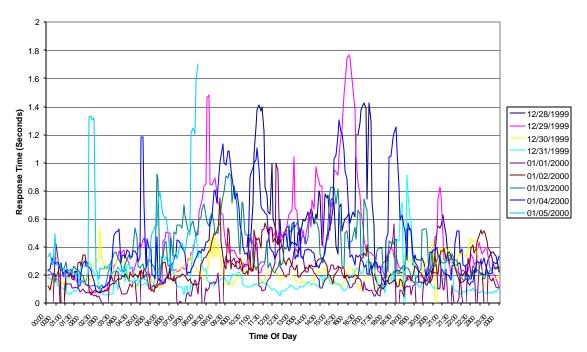
- Average number of Dialog Steps per Hour = 9,285
- Peak between 9:00am 10:00am = 46,289 on Jan 3, 2000.

This chart provides information on the number of dialogue steps monitored during the data collection process. Your company is probably already tracking this data. It is provided here to help verify the collection period was the peak period of interest.



Report 3a of 9 – Average Response Time





ANALYSIS

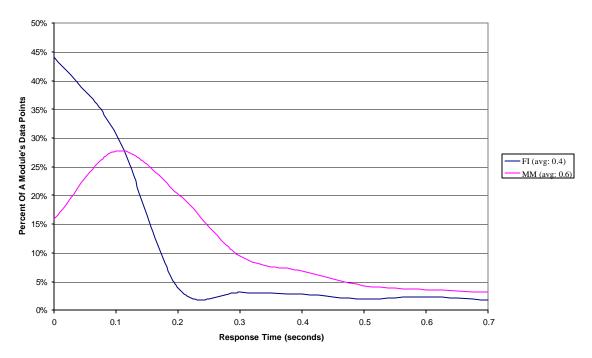
This chart shows the "average" response time of those dialogue steps that finished within each 5-minute interval during the observed and plotted period. Batch and reporting are excluded from these averages to make them more representative of interactive response time. System dialogue steps are also excluded, as they would tend to arbitrarily lower the average for this graph. However, it should be noted that one long running RFC to an interface may run for 1000 seconds while 99 dialogue steps finished in under a millisecond, the average would be 10 seconds while 99 percent finished very quickly.

The important aspect of this graph is for general patterns. Patterns like a spike everyday between noon and 1PM, or generally high average response times during a part of day. This indicates a problem with a specific application that should be investigated.



Report 3b of 9 – Response Time Distribution (By Module)





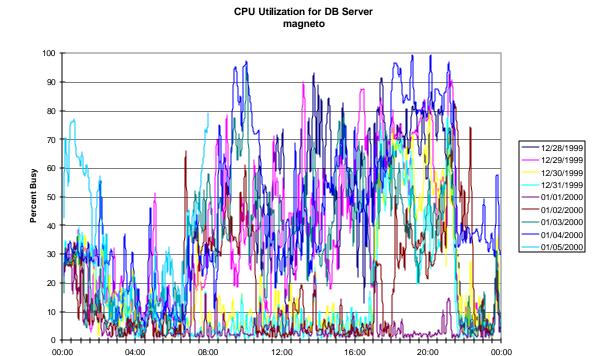
ANALYSIS

This chart depicts the response time distribution for various modules. It only displays those modules that had at least 10% of the dialogue steps. The time distribution on the x-axis is in tenths of a second and is scaled to include 90% of the total dialogue steps (one data point at 1000 seconds makes the graph rather useless). On the y-axis is the percent of dialogue steps for that module, which were captured for that module in each tenth of a second interval plotted. Note: in the legend is the average response time for that module. As commented before in this document, all it takes is one or two long running dialogue steps to skew an average.

The key in using and understanding this graphic is the curve of the various lines. Ideally, there will be a "hump" for each of these higher used modules at a reasonable response time. If one module is having performance problems, it will generally be obvious in comparison with other modules.



Report 4a of 9 - CPU Utilization - Database Server



<u>ANALYSIS</u>

This information may not track with what is similar information from CCMS. The reason for potential discrepancies is that this information was captured every minute through the use of standard SAP R/3 RFC and averaged to 5 minute intervals during the day by "Insight", while CPU utilization data provided by SAP R/3's CCMS is only a 10 second average captured on the hour.

Time Of Day

This graphic should tend to follow the curve described by "Active Users" unless there is a significant amount of batch or reporting which occurs during the prime interactive shifts.



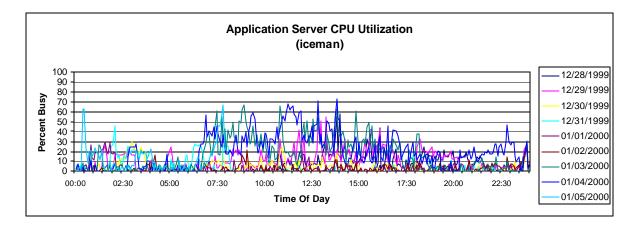
Report 4b of 9 - CPU Utilization - All App Servers

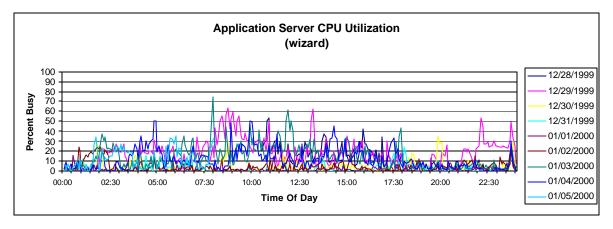
ANALYSIS

Similar to the consumption data on the previous database chart, this data is captured in the same 1 minute intervals and average across 5 minutes. Items of interest are how well balanced is the user workload across various application servers; how well do these curves track with the database load; and how well do these track with active user counts.

An application server that supports batch (or executes very much reporting) will tend to have more variation from the curves displayed by the "Active User (Report 1 of 9)".

It is common for application servers, that are setup with login groups, to not appear as evenly balanced as expected. This result occurs because once a user logs onto an application server, they stay on that server even if the load changes dramatically.



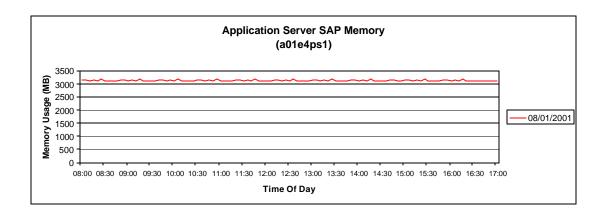


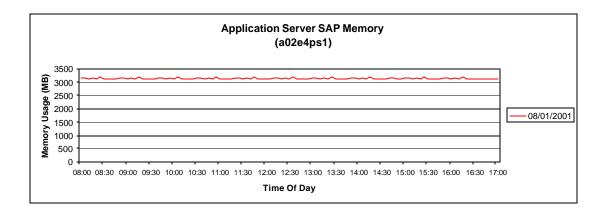


Report 4c of 9 – SAP Memory Utilization - All App Servers

ANALYSIS

This data is captured in the same 1 minute intervals and average across 5 minutes. Items of interest are how well balanced is the memory usage across various application servers; and how well do these track with active user counts.

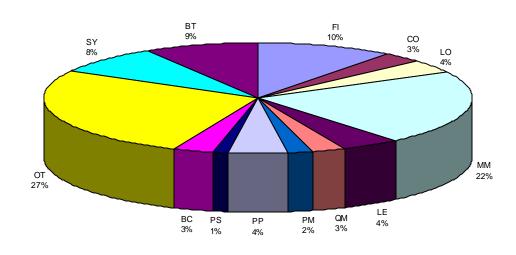






Report 5a of 9 - User Distribution (By Module)

User Distribution Between Midnight and Midnight (By Module)



☐ FI ☐ CO ☐ LO ☐ MM ☐ LE ☐ QM ☐ PM ☐ PP ☐ PS ☐ BC ☐ OT ☐ SY ☐ BT

ANALYSIS

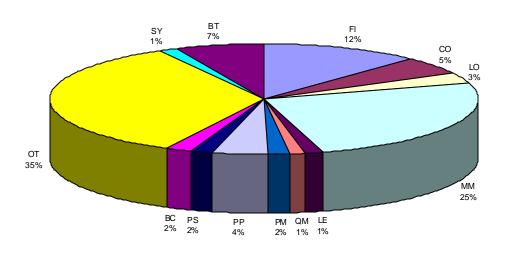
This chart is based on observed active users. The assignment of a user to a module is based on the SAP R/3 application hierarchy (as represented in 4.5, which is has inclusive definitions spanning back to 3.0C, but is better defined). The calculation is simple, a user that did 9 SD dialogue steps and 1 FI dialogue step during a 5 minute interval would have 90% (270 seconds) of the interval allocated to SD and 10% (30 seconds) to FI. The times for all periods are added and this chart is created.

Clarification for a couple modules: BC is Basis Component, SY is System work (buffer syncs, spool, etc.), and OT is other (could not be identified). Additionally, the CA (Cross Application) workload is distributed back to the calling module.



Report 5b of 9 - Database Server - CPU Utilization (By Module)

CPU Consumption On DB Server Between Midnight and Midnight (By Module)



□ FI □ CO □ LO □ MM □ LE □ QM □ PM □ PP □ PS □ BC □ OT □ SY □ BT

<u>ANALYSIS</u>

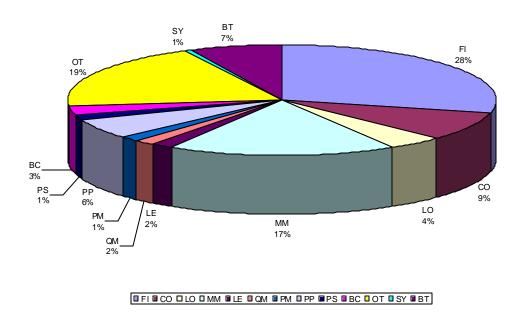
This chart looks at the total amount of CPU capacity consumed on the database server during the monitoring period (again based on the SAP R/3 application hierarchy). Frequently, the ratio's among modules will be different on this chart as compared to the previously displayed user breakouts. The reason for this apparent anomaly is that some modules are more capacity intensive then others.

SAP publishes typical relative consumption between modules. If desired, this information can be acquired through the IBM ERP Competency Center.



Report 5c of 9 - CPU Utilization - All App Servers (By Module)

CPU Consumption Across App Servers Between Midnight and Midnight (By Module)



<u>ANALYSIS</u>

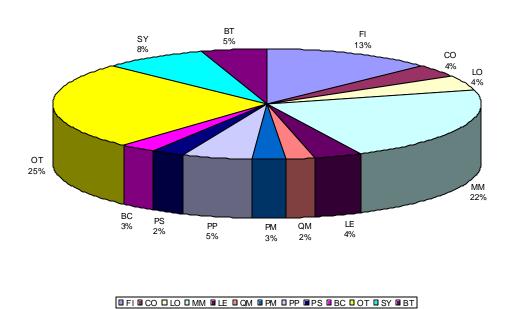
This chart looks at the total amount of CPU capacity consumed across all the application servers during the monitoring period. This chart should be compared with the database consumption breakouts (Report 5b of 9). The various wedges should be fairly similar in the size. Where major variance occurs, it is frequently from customer written code or heavy reporting being performed in a module.

Use some care when comparing these two CPU consumption charts (Report 5b & 5c). A big increase in one or two modules will cause all others to reduce (and conversely). This phenomenon is a result of the fact that both charts are done as a percentage of the whole.



Report 6 of 9 - Dialog Steps Observed (By Module)

Dialogue Steps ObservedMidnight and Midnight (By Module)



<u>ANALYSIS</u>

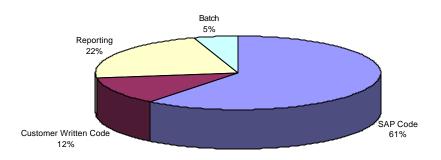
This chart should appear relatively similar to the "User Distribution" chart (Report 5a of 9). It represents all the dialogue steps executed during the collection period.

Variance between the "User Breakout" chart and this one can be the result of several things. Some examples: large BDCs being executed; automated collection devices (such as scanners); or the inherent difference in system usage between modules (a CFO closing the books does not generate the same number of GL dialogue steps as does a person on a shipping/receiving dock using the SD module).



Report 7 of 9 - Dialog Steps Observed (By Type)

Dialogue Steps Between Midnight and Midnight (By Type)



☐ SAP Code ☐ Customer Written Code ☐ Reporting ☐ Batch

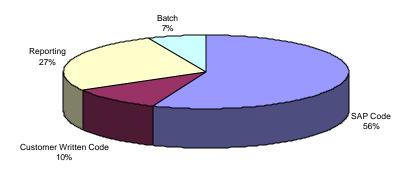
<u>ANALYSIS</u>

This chart is generated to provide insight into the impact of custom code, reporting, and batch. It portrays the number of dialogue steps executed for each of the four types (not the amount of code that exists). Custom code is that code which was written by the customer (note: custom code executed in batch is represented in the batch wedge). Reporting represents those transactions not run in batch that were generated out of SAP's Report Writer, or from SART (SAP Application Reporting Tree), or that generated over 5,000 bytes of output back over the WAN.



Report 8a of 9 - CPU Consumption - Database Server (By Type)

CPU Consumption On DB Server Between Midnight and Midnight (By Type)



☐ SAP Code ☐ Customer Written Code ☐ Reporting ☐ Batch

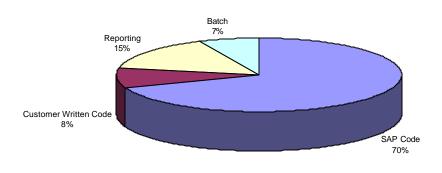
<u>ANALYSIS</u>

This chart will hopefully be similar to the previous chart (Report 7 of 9). It represents the CPU consumed by the four types of dialogue steps already discussed. Reporting and batch wedges will typically be somewhat larger as these dialogue steps tend to be longer running and more capacity intensive then typical interactive ones. The more interesting comparison is the change in ratio of custom code to SAP code execution. If the ratio changes dramatically, it may be the result of code that could benefit from a performance review.



Report 8b of 9 - CPU Consumption - All App Servers (By Type)

CPU Consumption For App Server CPU Seconds (By Type)



☐ SAP Code ☐ Customer Written Code ☐ Reporting ☐ Batch

ANALYSIS

This chart is similar to the past two but represents the amount of capacity consumed on all the application servers (Report 8a of 9). As on the database chart, the ratios are key. When the ratio of custom code to SAP code indicates a lower percentage here as compared to the database, it suggests a coding style which is database intensive might exist. This situation may warrant a performance code review and or rewrite (as database capacity consumption is frequently more expensive in terms of many elements – system performance, interactive response time, cost, system management, etc.).



Report 9 of 9 – Transaction Data

Top CPU intensive R/3 transactions per used R/3 module.

R/3 madule: Tx Code	Report	# Called	DB CPU tine %	Ti Code	Report	# Called	App CPU time 9
	BAPWSSY1	155753	88.22	10 0000	SAPMSSY1	155753	89.6
	RSWI3000	31808			RSM13000	37805	4.7
WEDS:	RESIDOCO	76	0.63		SAPMSYST	19833	2.0
	SAPMISTET	-16E33	0.43		RSPOWPOO	1900	1.6
	RSPOWP00	1900	0.39		SAPMSSYE	526	0.6
	RBEQUIDO	33	0.22	_	RSBTCRTE	966	0.3
9.00	SAPLETCH:	38 95	0.18	Name .	RSECOCO	3778	0.
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6433	SAPWING:K	1125	15.23	DD01	SAPMEDED	797	18.6
081	RSW13000	179		2D02	SAPMFROD	585	11.3
002	SAPMF030	585	10.88	V-E9	SAPMFIDD	440	8
001	SAPMFOZD	797	7.41	SART	RFH0P000	179	6.1
D32	BAPWF02C	146	4.77	3D01	RSM13000		27
V-09 4002	SAPMP02B RSM13000	449	389	FD02	SAPM*020 RSML3000	145	2
-D33	SAPMF020	31	343	FB03	SAPMFIEL	99	11
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VLD4	5APW/503	1843	17.6	V101	SAPMYSDA	7100	30.6
ALD1	SAPWYSDA	7109	14.97	V184	SAPMV503	1843	137
LIII	R59/13000	3082	502	VIBT	RSM13000	370	103
1.00	FV450L21	3	4.83	V102	BAPMV50A	4096	3.3
VLD2	RSW13000	2014	3.22	V102	RSM13000	2014	1.1
VL02 VL15	SAPWINSDA SAPWINSDL	4085	269	0.000	BAPMV90A	1296	0.5
VL15	SAPWIVEDA	109	0.45	V103	SAPMVSOL	108	0.6
T24	RLLT2400	1,885	0.26	VL04	SAPMSSY4	1.6	0.0
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WMEE	RMWWEEST	435	92:17	MVEE	RMMVBEST	435	37.2
VEVED4	SAPWWOOA	22	1.66	MWDf	RSM13000	- 32	16.8
11.5	RMOATINO	2	1.35	MV03	SAFMW301	-513	153
CSD	RSW13000	3	121	MVID2	SAPMWG01.	285	0.2
AMD3	SAPMMG01	513	0.9	-	RMDATND	2	6.4
VIEWD1	RSW13000	32	.065	MVE1	SAPMWO01	137	33
MMD5	RSW13000	52 17	0.6	MVCC	RSM13000 RSM13000	52	2.4
CSE7	SAPMINGET	293	0.49	0 B07	SAPMVESG	147	1.9
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ME22	SAPMIMORE	ABB2	27.34	ME22	SAPMMORE	4880	13
VE22	R3W13000	364		ME27	SAPMMORE	4215	12
WES9	R3Wt3000	43	14.83	MESS	RM06BB20	50	10
VICTO	RM050020	55	14.41	MC2W	RM06EW00	1	9.1
WE2W	RM09EW00	1	1393	ME22	RSM13000	364	8.5
VE27	SAPMINDEE	4215	8.25	MEED)	RSM13000	43	82
WE27	RSW13000	556	2.%	MEZ7	RSM13000	656	13
MRHR MB61	BAPWWER RMD7WMAT	449	0.43	MERC	SAPMVI3A	807 807	1.0
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	mod the total		0.43			363	
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BG readule: Fix Code ZDDD ZBKT ZUOR ZHR1 WE90 Z 15 ZPHL	Report 250 RP020 2MMT022 250 RP080 250 RP080 250 RP08 250 RP08 250 RP08 2M06	# Called 1816 421 3 5 1 188 1199 202	DB CPU sine % 25.24 16.08 15.44 2.75 6.60 5.34 4.67 3.84 2.03	To Code ZDDD MC30 ZEKT ZPL3 ZPKL ZHR1	Report ZSDITIDE CACIM MES ZSDEPD20 ZMOCENDR ZMITICO2 ZSDEPD27 SAPMZPHI ZSDEPD30 ZSDEPD30 ZSDEPD30 ZSDEPD30 ZSDEPD30 ZSDEPD30	# Callad 15 2216 1616 202 421 90 146 1199	App CPU time 1 202 202 112 103 64 53 61 22
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RZ mailule; Fe Code SDOD SDOT SUOR SHE! NESO C.16 SPHJ. RZ mailule; Fe Code WOOL	Reput 250 RPD00 250 RPD000 250 RPD000 250 RPD000 250 RPD0000 250 RPD00000 250 RPD0000000 250 RPD00000000000000000000000000000000000	# Called	DB CPU sms % 25.25 15.09 15.44 275 662 5.24 4.57 384 2.03 187 DB CPU sms % 45.99 45.91	To Code ZDDD MCSQ ZERT ZPRL ZHRI ZERT To Code MCQA MCQA MCQA MCQA MCQA MCQA	Report ZSERTIDE CACION MES ZSERFOZO ZMOCENDR ZMITICOZ ZSERFUZY ZSE	# Called 15: 2216	App CPU time 1 30 2 30 2 31 2 31 2 31 2 31 2 31 2 31
AZ module; is coss scop sect suga sect sect suga sect sect sect sect sect sect sect sect	Reput 250 RPH20	# Called 1818 421 5 11 188 1199 202 51146 # Called 5179 11737	DB CPU sew % 20.25 15.08 15.44 20.75 6.62 5.24 4.67 3.84 2.00 1.87 DB CPU sew % 45.95 45.91	To Code 2000 MS30 ZECT SPUJ ZPKI ZERT ZECT To Code MC03 MC03 MC04 MC05 MC05 MC05 MC05 MC05 MC05 MC05 MC05	Report ZSERTIDE CACION MES ZSERTIDE CACION MES ZSERTIDE ZMMT022 ZSERTIDE SAPMZPI-L SAPMZPI-L ZSERTIDE ZMDATINO Report SAPMMSTIR SAPMMSTIR SAPMMSTIR SAPMMSTIR SAPMMSTIR SAPLE	# Called 15: 2216 2216 2216 2316 25: 421 145 1150 25: 421 145 1150 25: 421 145 1170 25: 421 145 1170 25: 421 145 1170 25: 421 145 145 145 145 145 145 145 145 145 14	App CPU time 28 1 20 2 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2
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R2 mailule; Tr Cods 2000 2444 2444 2444 2444 2444 2444 244	Report 250 HPUDD 24M41002 250 HPUDD	© Called 1818 421 11 1818 1199 2022 601 146 6 Called 224440 6 called 224440 6 called 13516 13516 13516 13517	DB CPU sew % 25.25 50.00 15.44 27.75 66.01 15.44 27.75 66.01 15.44 27.75 26.44 27.75 26.44 27.75 26.44 27.75 26.44 27.75 26.45 27.75 2	ME23 To Code 2000 ME39 ZEGT ZPKL ZHRI ZERT To Code MC04 MC05 MC05 MC05 MC05 MC01 To Code VA01 VA01 VA01 VA07 VA07 VA07 VA07 VA07	RESORT SECTION CASCINICATION C	# Called 2219 2229 22	App CPU time 38 30 11 11 10 10 10 10 10 11 11 11 11 11 11



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