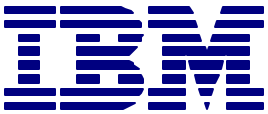


IBM *Insight for SAP R/3*

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

System Performance

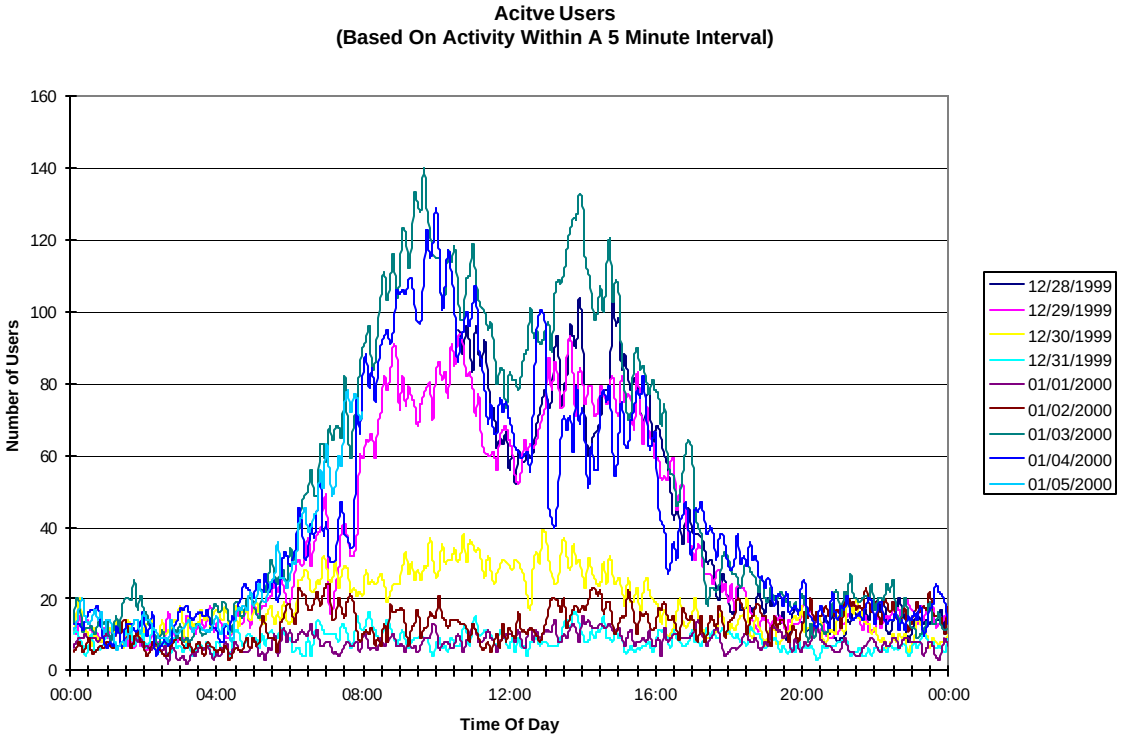
Insight Observed **Peak Hour SAP Dialog Steps** between the monitoring period=**46,289**

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



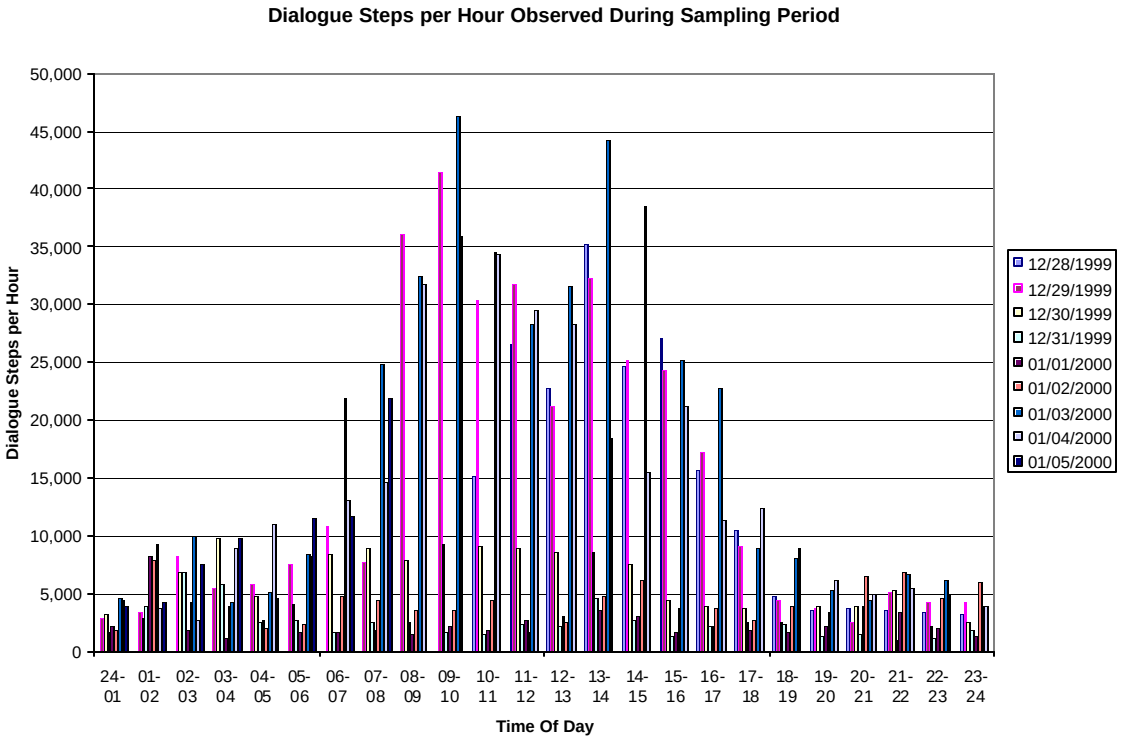
ANALYSIS

- 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

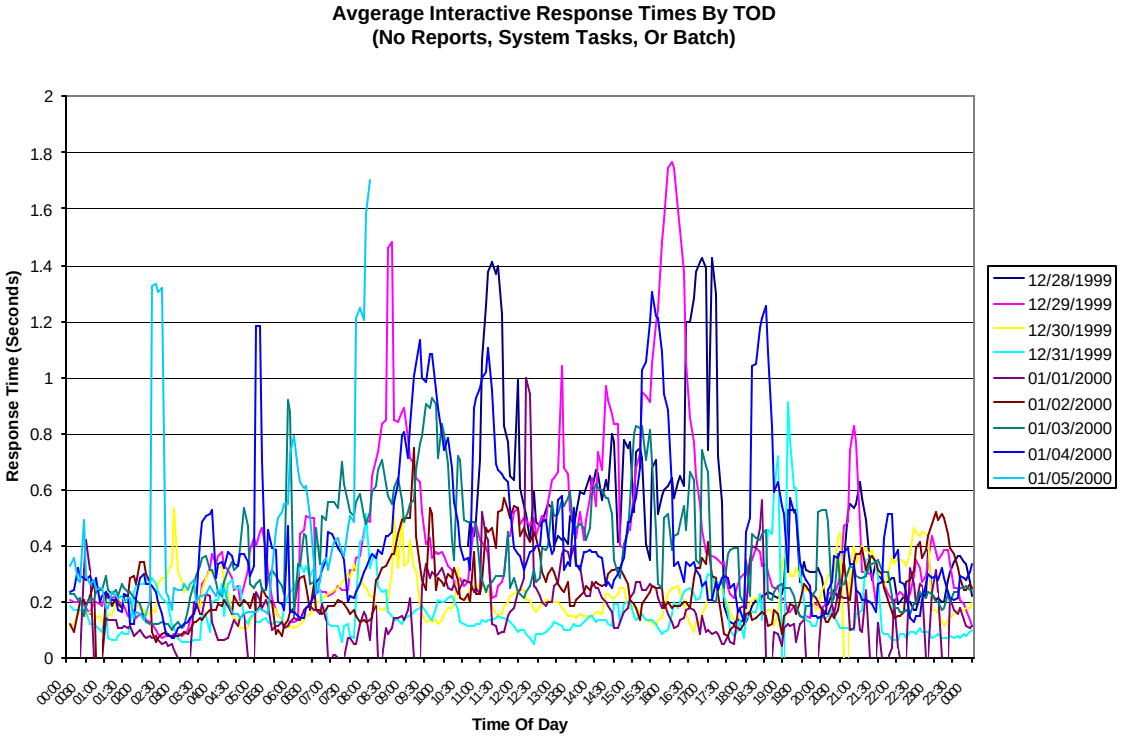


ANALYSIS

- 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

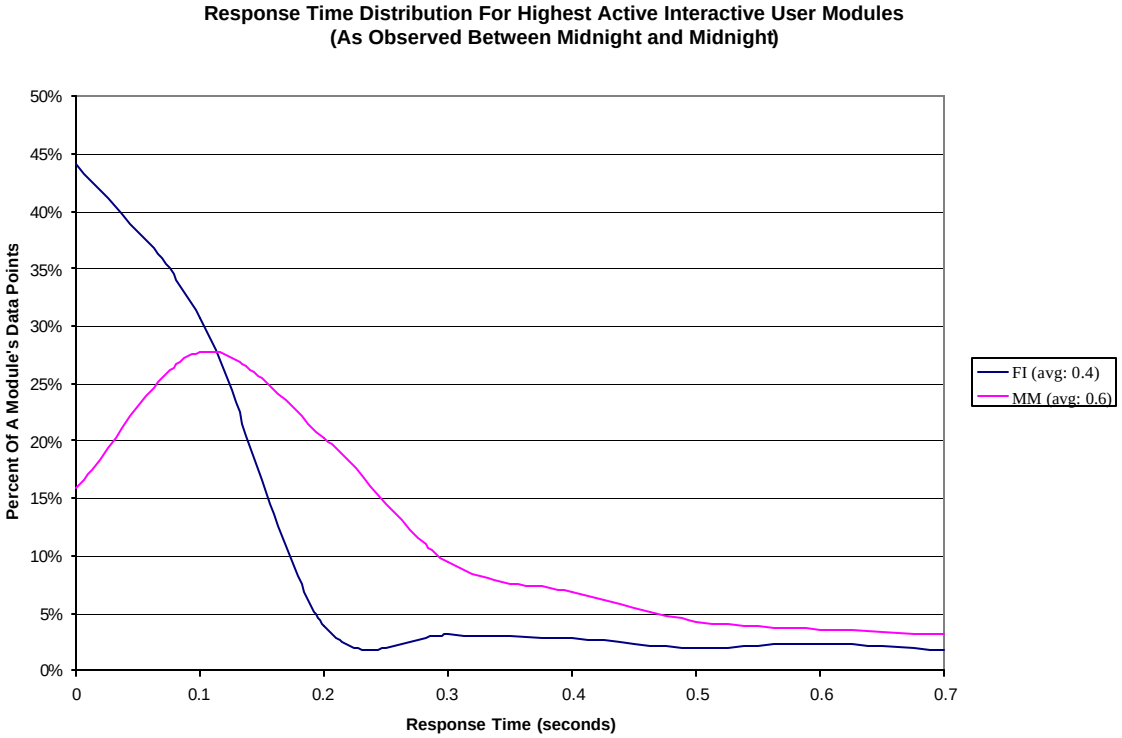


ANALYSIS

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)

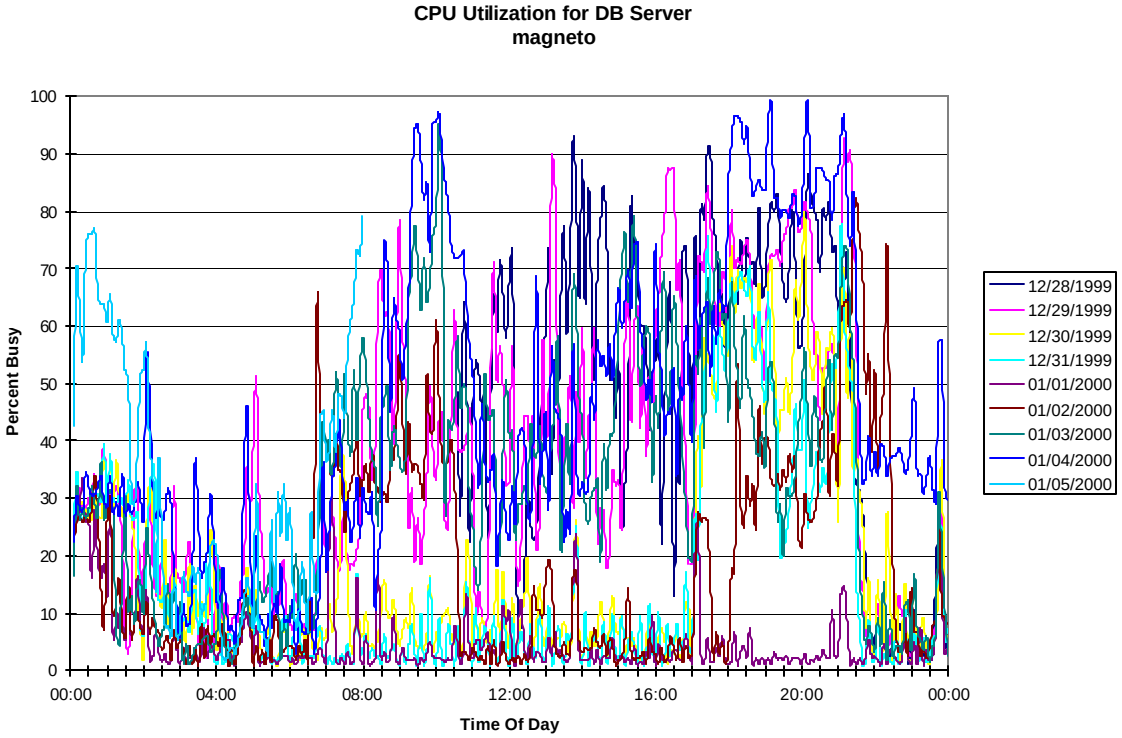


ANALYSIS

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



ANALYSIS

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.

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.

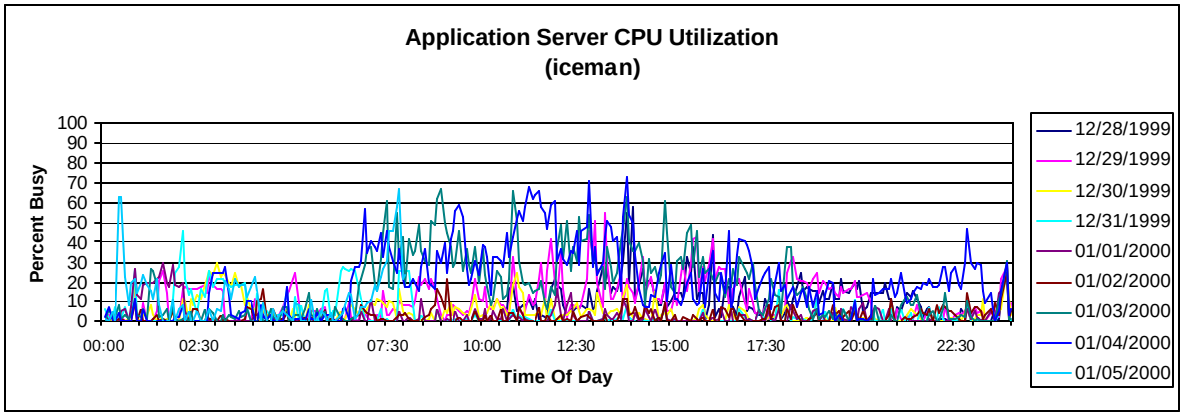
Report 4b of 9 - CPU Utilization - All App Servers

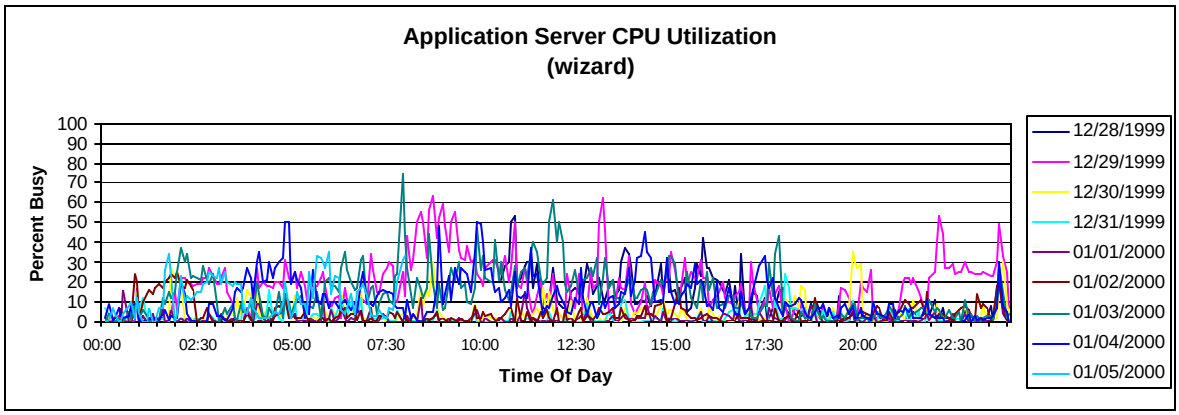
ANALYSIS

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.

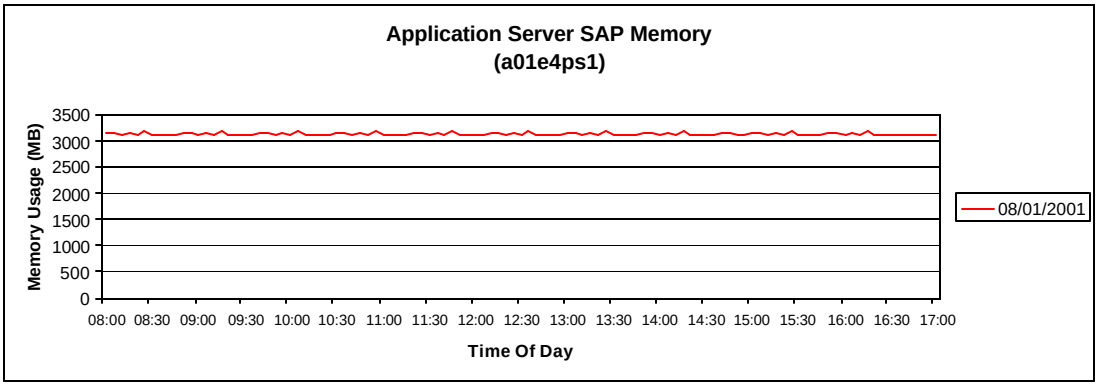


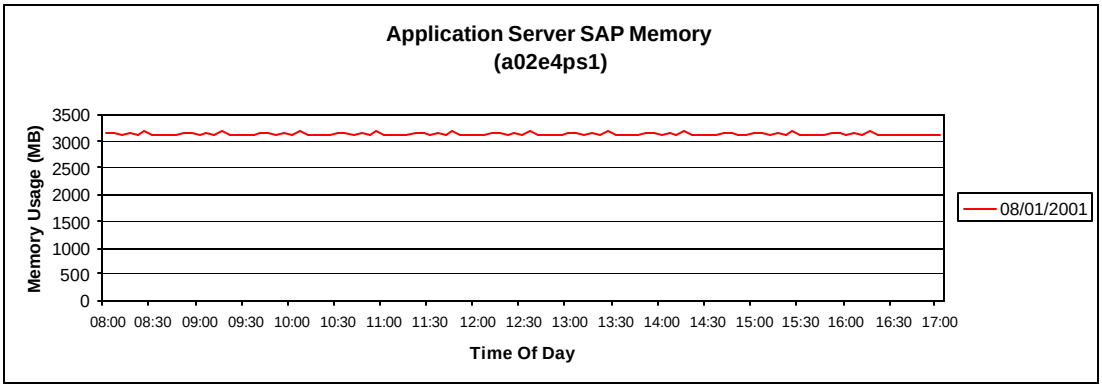


Report 4c of 9 – SAP Memory Utilization - All App Servers

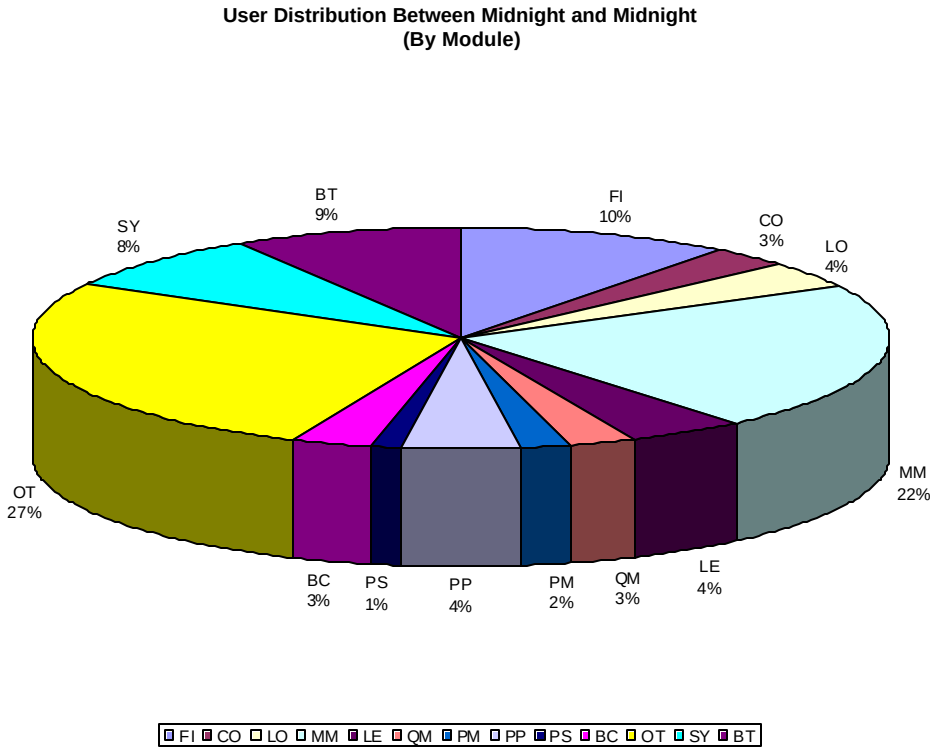
ANALYSIS

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)

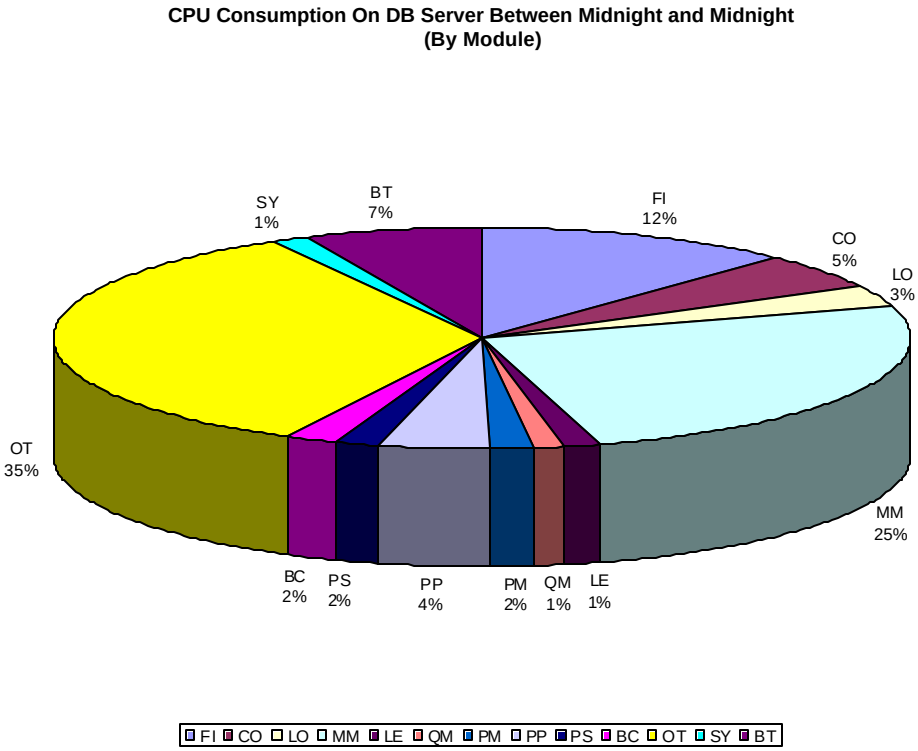


ANALYSIS

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)

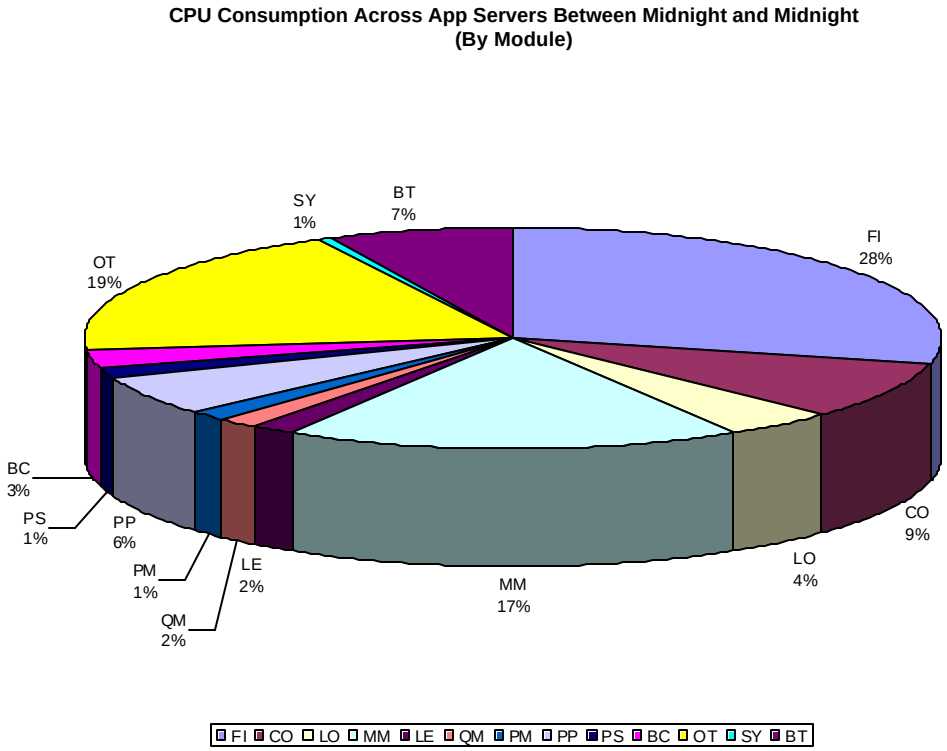


ANALYSIS

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)

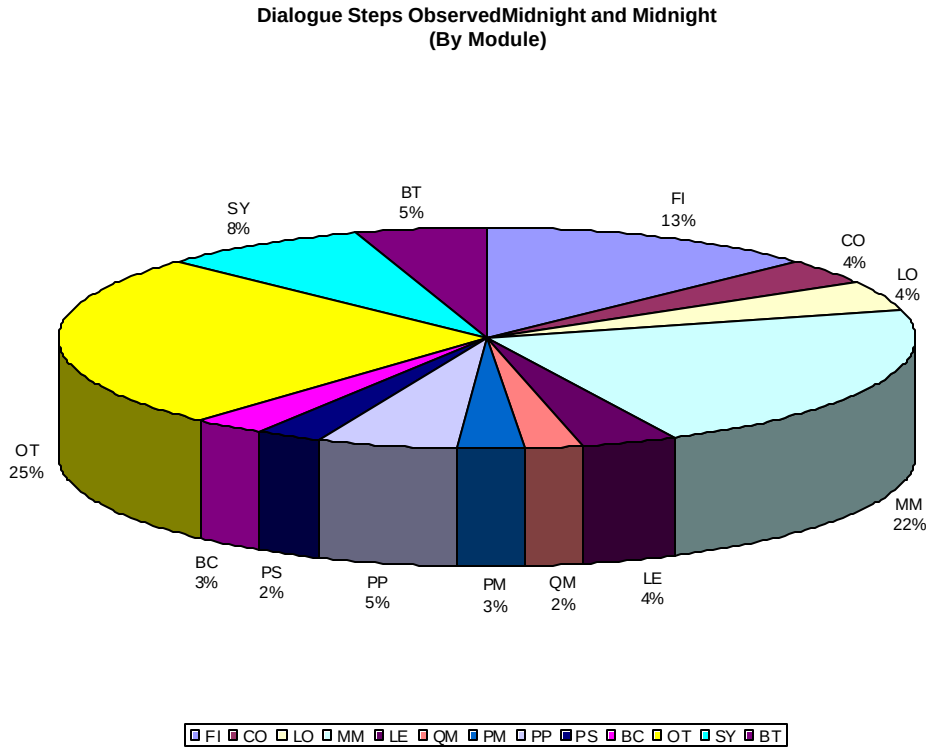


ANALYSIS

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)

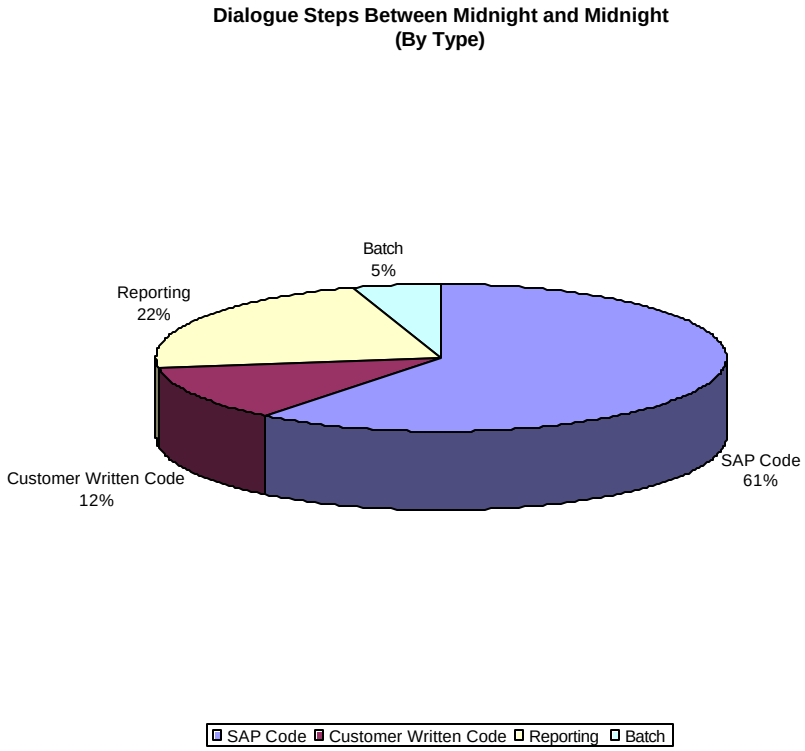


ANALYSIS

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).

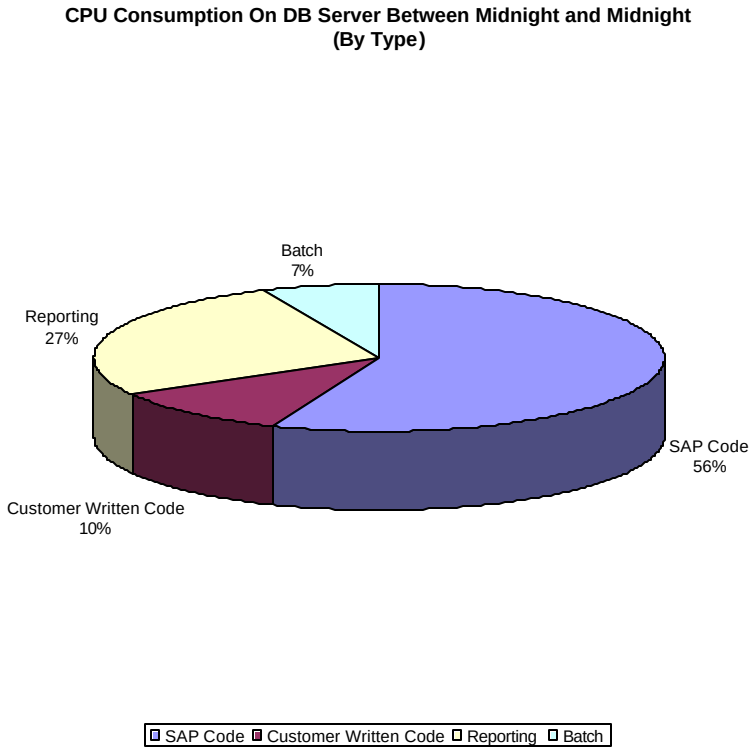
Report 7 of 9 - Dialog Steps Observed (By Type)



ANALYSIS

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.

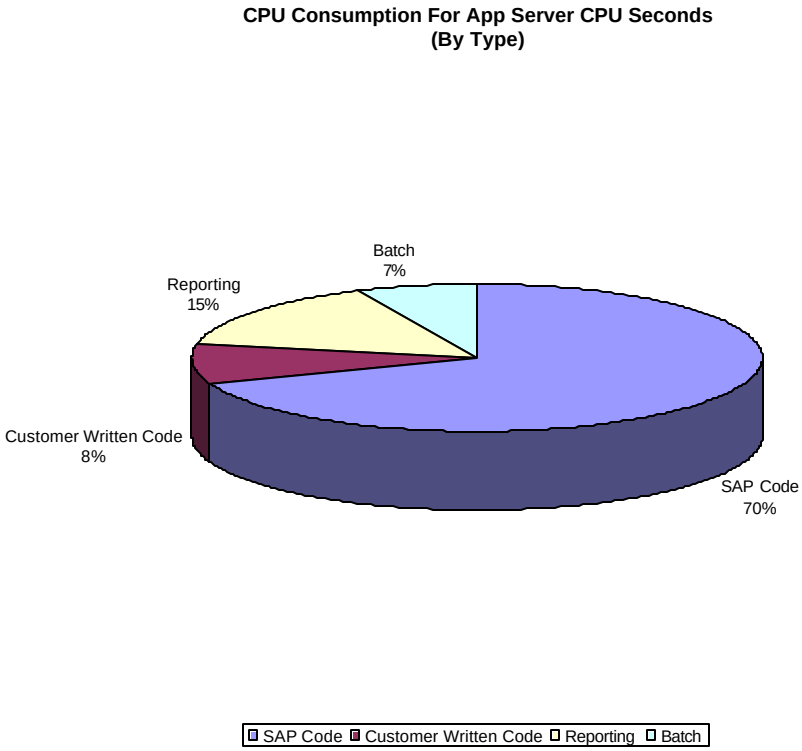
Report 8a of 9 - CPU Consumption - Database Server (By Type)



ANALYSIS

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)



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 module:	BC							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
	SAPMSSY1	155753	88.22			SAPMSSY1	155753	89.68
	RSM13000	31809	5.82			RSM13000	31809	4.79
WE05	RSEIDOCD	76	0.63			SAPMSYST	18833	2.09
	SAPMSYST	18833	0.43			RSPO0PT00	1000	1.61
	RSPO1WP00	1500	0.39			SAPMSSY5	535	0.65
	RSEOUT00	33	0.22			RSBTCRTE	966	0.37
	RBDAPP01	38	0.18			SAPMSSY2	2778	0.21
SM37	SAPLSTCH	95	0.18		WE05	RSEIDOCD	76	0.15
	SAPMSSY2	2778	0.17			RSEOUT00	33	0.13
	RSDRANMN	3	0.14			RBDAPP01	38	0.09
R/3 module:	FI							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
SART	RFKOPC000	2	22.16		FK03	SAPMF02K	1125	35.53
FK01	SAPMF02K	1125	10.73		FD01	SAPMF02D	297	10.65
XD01	RSM13000	179	12.67		FD02	SAPMF02D	595	11.22
XD03	SAPMF02D	585	10.89		V-09	SAPMF02D	680	8.1
XD01	SAPMF02D	797	7.41		SART	RFKOPC00	2	6.94
FD32	SAPMF02C	146	4.77		FD01	RSM13000	175	5.63
V-09	SAPMF02D	449	3.69		FD02	SAPMF02C	140	2.36
XD02	RSM13000	107	3.66		FD03	RSM13000	107	2.11
FD33	SAPMF02C	31	3.63		FB03	SAPMF06L	39	1.91
XD04	MFDIADEB	2	2.79		FD03	SAPMF02D	32	1.65
R/3 module:	LE							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
	SAPMV50S	3502	47.01			SAPMV50S	3502	36.89
VL04	SAPMV50S	1043	17.6		VL01	SAPMV50A	7100	30.03
VL01	SAPMV50A	7106	14.97		VL04	SAPMV50S	1043	13.78
VL01	RSM13000	3082	8.02		VL01	RSM13000	3082	10.97
	RVV50L21	3	4.83		VL02	SAPMV50A	4095	3.38
VL02	RSM13000	2014	3.22		VL02	RSM13000	2014	1.83
VL07	SAPMV50A	4095	2.69			RVV50L21	3	0.94
VL15	SAPMV50L	106	0.45		VL03	SAPMV50A	1299	0.67
VL03	SAPMV50A	1286	0.6		VL15	SAPMV50L	106	0.1
LT24	RLLT2400	47	0.26		VL04	SAPMSSY4	5	0.09
R/3 module:	LO							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
MMBE	RMMMBEST	435	20.27		MMBE	RMMMBEST	435	37.22
MM04	SAPMM03A	22	1.68		MM01	RSM13000	35	16.62
	RMDATIND	2	1.35		MM03	SAPMM0301	513	15.35
CS07	RSM13000	3	1.21		MM02	SAPMM0301	282	11.73
MM03	SAPMM0301	513	0.9			RMDATIND	2	6.41
MM01	RSM13000	32	0.65		MM01	SAPMM0201	159	3.37
MM02	RSM13000	52	0.6		MM02	RSM13000	52	2.47
CS07	SAPLCSAL	17	0.49		CS07	RSM13000	3	2.37
MM02	SAPMM0301	283	0.44		MM06	SAPMM05G	147	1.92
MM01	SAPMM0301	137	0.23		MM04	SAPMM03A	22	1.37
R/3 module:	MM							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
ME22	SAPMM06E	8882	27.36		ME22	SAPMM06E	8882	83.1
ME22	RSM13000	364	17.68		ME27	SAPMM06E	4215	12.2
ME59	RSM13000	43	14.83		ME59	RM06BB20	56	10.9
ME19	RM06IP00	56	14.41		ME2W	RM06EW00	1	9.19
ME2W	RM06EW00	1	13.93		ME22	RSM13000	364	8.58
ME27	SAPMM06E	4215	6.35		ME59	RSM13000	43	8.23
ME27	RSM13000	556	2.16		ME27	RSM13000	556	1.71
MRHR	SAPMM06R	448	0.63		MRHR	SAPMM06R	448	1.28
MB51	RM07MMAT	43	0.41		MRK2	SAPMV13A	607	1.03
MEK2	SAPMV13A	607	0.41		ME23	SAPMM06E	353	0.77
R/3 module:	OT							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
ZDDD	ZSDRP020	1616	25.25			ZSDIT006	15	39.87
ZEXT	ZMMIT022	421	16.08			<ADM MES	2216	30.74
	ZSDRP060	3	15.44		ZDDD	ZSDRP020	1616	11.23
ZUOR	ZSDIT012	5	9.75		MC90	ZMDDENDR	209	10.45
	ZSDUT013	1	6.62		ZEXT	ZMMIT022	421	6.41
	ZSDIT006	15	5.24		ZPL3	ZSDRP027	90	5.97
ZHR1	SAPMZHR1	1199	4.67		ZPKL	SAPMZPKL	146	5.03
ME50	ZMDDENDR	202	3.84		ZHR1	SAPMZHR1	1199	2.88
Z_15	ZVAUFRUF	69	2.03			ZSDRP000	3	2.69
ZPKL	SAPMZPKL	146	1.87		ZEXT	ZMDATIND	61	1.35
R/3 module:	PP							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
MD04	SAPMM61R	5179	49.35		MD04	SAPMM61R	5179	60.53
MD06	SAPMM61R	1737	46.81		MD06	SAPMM61R	1737	39.31
CO09	SAPLCOKO	882	5.61		CO09	SAPLCOKO	882	9.34
MD06	RSM13000	270	0.49		MD06	RSM13000	270	0.72
MD03	SAPMM61X	7	0.1		MD03	SAPMM61X	7	0.05
MD01	SAPMM61X	1	0.02		MD01	SAPMM61X	1	0.01
R/3 module:	SD							
Tx Code	Report	# Called	DB CPU time %		Tx Code	Report	# Called	App CPU time %
VA01	SAPMV45A	23444	51		VA01	SAPMV45A	23444	55.39
VA02	SAPMV45A	6858	11.33		VA02	SAPMV45A	6858	30.19
VA01	RSM13000	13515	8.6			RV50SBT1	390	5.85
	RV50SBT1	390	7.43		VA01	RSM13000	13515	4.81
VA05	SAPMV75A	19450	5.78		VA02	RSM13000	7144	2.34
VKM1	RVKRED01	1144	5.09		VA05	SAPMV75A	19450	2.24
VA02	RSM13000	7144	2.08		VKM1	RVKRED01	1144	1.12
V_14	RVSPERAU	1	1.73		VA21	SAPMV45A	3319	1.03
VA03	SAPMV75F	2719	1.29		VA01	SAPMV61A	2774	0.91
VF01	RSM13000	1620	1.1		VA22	SAPMV97A	760	0.89

END OF INSIGHT REPORT