

# PeopleSoft: A Properly Instrumented Application?

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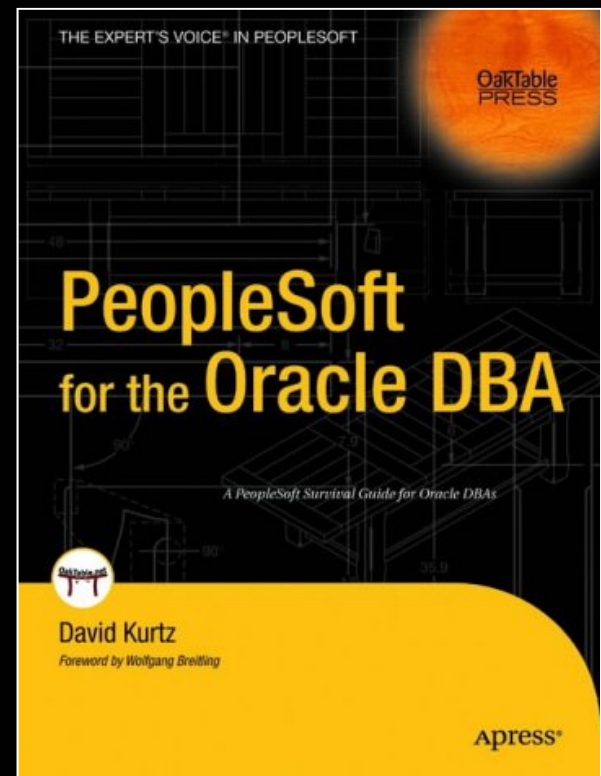


# Agenda

- Instrumentation
  - Oracle RDBMS
  - PeopleSoft PeopleTools
- Fusion
  - The shape of things to come

# Who Am I?

- Oracle Database Specialist
  - Independent consultant
- System Performance tuning
  - PeopleSoft ERP
  - Oracle RDBMS
- UK Oracle User Group
  - PeopleSoft Director
- Book
  - [www.psftdba.com](http://www.psftdba.com)



# *Resources*

- If you can't hear me say so now.
- Please feel free to ask questions as we go along.
- The presentation will be available from
  - Hotsos website
  - [www.go-faster.co.uk](http://www.go-faster.co.uk)
- Article in UKOUG Oracle Scene magazine

# *Taking the Con out of Fusion*

- Project Fusion is a new ERP application suite that Oracle will develop.
- Taking the best bits from:
  - Oracle's own E-Business suite
  - PeopleSoft
  - JD Edwards
  - Siebel
- All of which are now legacy applications!?

# *What databases will Fusion Support?*

- Not just Oracle RDBMS?
  - SQL Server?
  - DB2?

# Performance Tuning

- We do not use ratio based tuning any more.
  - Especially the buffer cache hit ratio
- We do use timed event based tuning.
- Further reading:
  - YAPP – Kolk, Yamaguchi, and Viscusi
  - Optimising Oracle Performance - Millsap & Holt
    - [www.hotsos.com](http://www.hotsos.com), [www.oreilley.com](http://www.oreilley.com)
  - The Goal – Eli Goldratt



# *Performance Instrumentation*

- Oracle does understand instrumentation.
  - Instrumentation is built in throughout the database kernel.
- PeopleTools 8.44 upwards includes Performance Monitor.
  - Instrumentation built into PeopleSoft technology.

# *Oracle RDBMS Instrumentation*



- Dynamic Performance Views
  - Statspack
  - AWR / ADDM (licensed extras)
- Trace/Dump to operating system files
  - Enhanced by setting events
  - Profilers

# *What does this instrumentation do for us?*

- If you have a performance problem, then you can determine exactly what the database is doing, and how long that is taking.
  - It can also prove that the problem is not located in the database!
- Hence, you can work out what to do about it.

# *Event 10046 Level 8*

- a.k.a. SQL\*Trace with timed event information
- Includes
  - Every SQL Statement
    - How long it took to parse/execute/fetch
  - Row source operation list
    - How long each operation took
      - STATISTICS\_LEVEL
  - Every event for which the database waits
- Can then profile with TKPROF, Trace File Analyzer, or Hotsos profiler

# *Nørgaard's Law*

- Every 18 months one of your vendors will add another tier or layer of software somewhere in your stack.
- Below the database
  - SAN, Cache, Raid Controller
- Above the database
  - Application Server, Web Server, Java, E-WAN (Ever Wider Area Network), Encryption, Browser, Javascript

# *You probably don't get a relevant need from event 10046!*

- SQL\*Net Message from Client
  - Idle Event?
  - Database is Idle, but is the user idle?
  - Or is something else active in the technology stack (so the user is still waiting)?
- This event cannot distinguish between these conditions.

# *Timed Event Information*

- Oracle timed events tell us about the database.
- We need similar information for every element in the technology chain.
- PeopleSoft realised this and instrumented their entire technology stack.
  - And they got it right!

# *PeopleTools Performance Utilities*

- New instrumentation in PeopleTools 8.4
  - Query Statistics
    - 8.44, usable from 8.45
  - PeopleSoft Ping
    - 8.42, back-ported to 8.19
  - Performance Monitor
    - 8.44

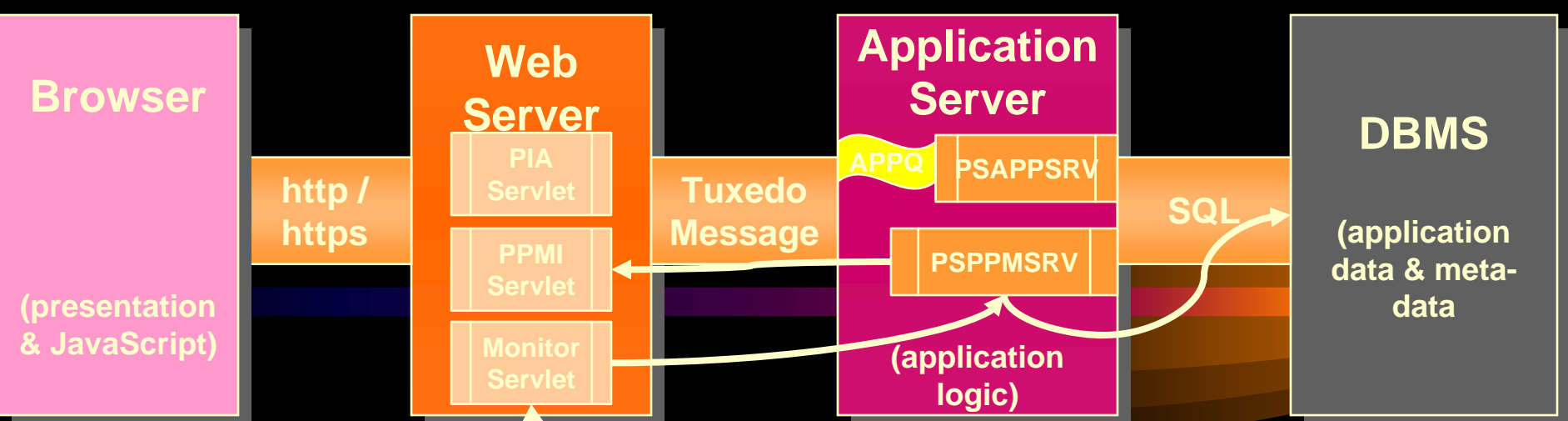


# *Performance Monitor*

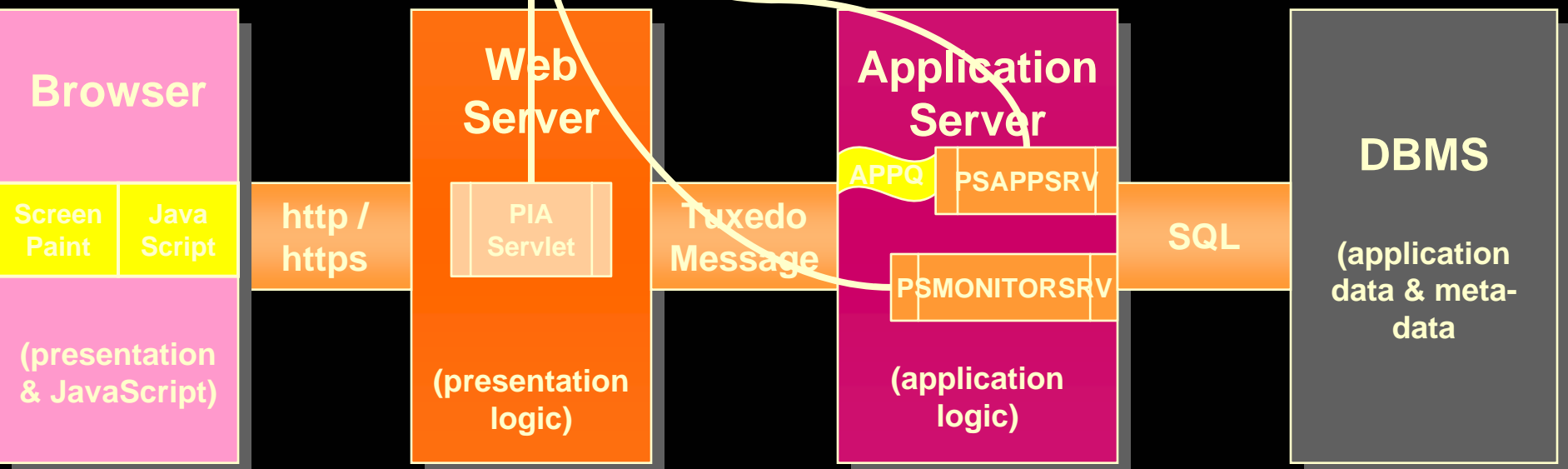
- PeopleTools 8.44
  - Fully instrumented
  - Including a timed-event interface
  - Event 10046 for the application
  - Useful PeopleBook
  - Additional analytics in PT8.45

# *Performance Monitor Architecture*

- Based upon existing PeopleSoft technology
- Monitored System
  - Send information to servlet in monitoring system
- Monitoring System
  - Monitor servlet writes results to database via PSPPM<sub>SRV</sub> process in application server
    - Ideally PeopleTools only system database
- This minimises measurement intrusion effect



**Monitoring System**



**Monitored System**

# *Performance Monitor Architecture*



- Instrumentation in
  - Application Server processes
    - PSMONITORSRV collects host resource statistics
      - Memory
      - CPU
  - Process Scheduler
  - PIA servlet

# *Performance Monitor Metrics*

- Transactions
  - User activities in PIA that cause communications with application server
  - Sampled
  - Enabled to form a trace
- Events
  - Periodic samples
  - Usually initiated by monitoring agents
  - eg. CPU, Tuxedo counters

# Performance Monitor Transactions

- User activity in PIA
- Performance Monitoring Unit
  - Hierarchy of transactions
- Similar to Oracle event 10046 trace
  - recursive actions

## PMU History Tree

Left | Right

### PMU Tree

1322.00 ms - PIA Request

1112.00 ms - JOLT Request

1020.00 ms - Tuxedo Service PCode and SQL

901.00 ms - ICPanel

1.00 ms - PeopleCode BuiltIn SQL Execute

0.00 ms - SQL Fetch Summary

13.00 ms - PeopleCode BuiltIn SQL Execute

0.00 ms - SQL Fetch Summary

2.00 ms - PeopleCode BuiltIn SQL Execute

0.00 ms - SQL Fetch Summary

3.00 ms - PeopleCode BuiltIn SQL Execute

0.00 ms - SQL Fetch Summary

1.00 ms - PeopleCode SQL Execute

1.00 ms - Implicit Commit

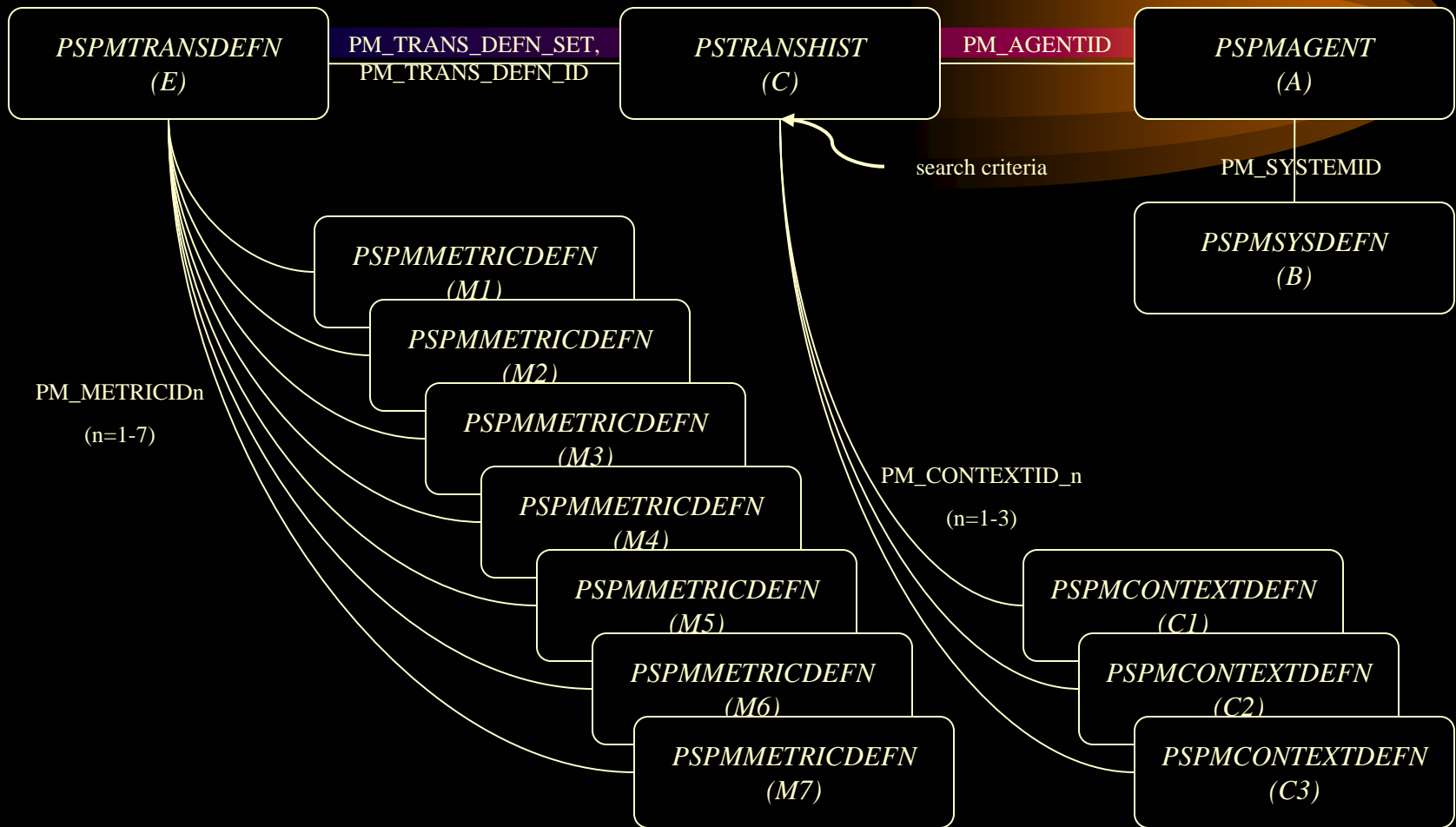
0.00 ms - Tuxedo Service Summary

0.00 ms - FieldChange PCode Summary

# *Transactions*

- Stored to PSPMTRANSCURR table
  - As PMUs are closed moved to PSPMTRANSHIST
  - Later deleted or archived to PSPMTRANSARCH
- ERD downloadable from Customer Connection

# ERD of Transaction





# Metrics

- Metric IDs specified on transaction definition  
PSPMTRANSDEFN
  - Metrics Types defined on PSPMMETRICDEFN
    - Type 1: Counters (including timers)
      - Metric 4: Total Servlet Request time (ms)
    - Type 2: Gauges
      - Metric 102: %CPU Used
    - Type 3: Numeric Identifier
      - Metric 20: HTTP response code
    - Type 4: String Identifier
      - Metric 27: File Name

# Transaction 101

- Reported at entry and exit of PIA servlet
  - Context 1
    - Action=View Page
  - Context 2
    - IP Address=10.0.0.3
  - Context 3
    - Session ID=AN7tpzSwpZc4kt9k8 . . . .
  - Additional Description
    - [http://go-faster-3:7201/psc/ps/EMPLOYEE/HRMS/c/UTILITIES.PTPERF\\_TEST.GBL](http://go-faster-3:7201/psc/ps/EMPLOYEE/HRMS/c/UTILITIES.PTPERF_TEST.GBL)

# *Transaction 101*

- 4 metrics
  - Metric 19: Response Size (bytes)  
=17613
  - Metric 20: Response Code  
=200
  - Metric 22: Static Content Count  
=0
  - Metric 23: Is this a Pagelet?  
=0

# Transaction Query Results

```
PM_TOP_INST_ID PM_INSTANCE_ID PM_PARENT_INST_ID DBNAME
PM_HOST_PORT
PM_DOMAIN_NAME          PM_AGENT_TYPE
PM_INSTANCE             PM_AGENT_START_DTTM PM_MON_START_DTTM
OPRID                   PM_PERF_TRACE          PM_PROCESS_ID
PM_TRANS_DEFN_ID DESCR60
' CONTEXT1: ' || C.PM_CONTEXT_ID_1 || ' - ' || C1.PM_CONTEXT_LABEL || ' = ' || C.PM_CONTEXT_VALUE ...
PM_TRANS_DURATION
' METRIC1: ' || M1.METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE1 ...
PM_ADDTNL_DESCR
```

```
-----
      824633721163      824633721163              0 HR88
go-faster-3: 7201: 7202
ps                                WEBSERVER
-1                                16: 12: 07 14. 06. 2004 16: 12: 09 14. 06. 2004
PS                                PS: 2004-06-14 16: 01: 11                                0
      101 Reported at entry and exit of PIA servlet
Context1: 3-Session ID=AN7tpzSwpZc4kt9k8QNaCcYUWWWh9FaFt! 1963244185! 1087224685145
Context2: 2-IP Address=10. 0. 0. 3
Context3: 1-Action=View Page
      1322
Metric1: Response Size (bytes)=17613
Metric2: Response Code=200
Metric3: Static Content Count=0
Metric4: Is this a Pagelet?=0
Metric5: =0
Metric6: =0
Metric7: =
http: //go-faster-3: 7201/psc/ps/EMPLOYEE/HRMS/c/UTILITIES.PTPERF_TEST.GBL
```

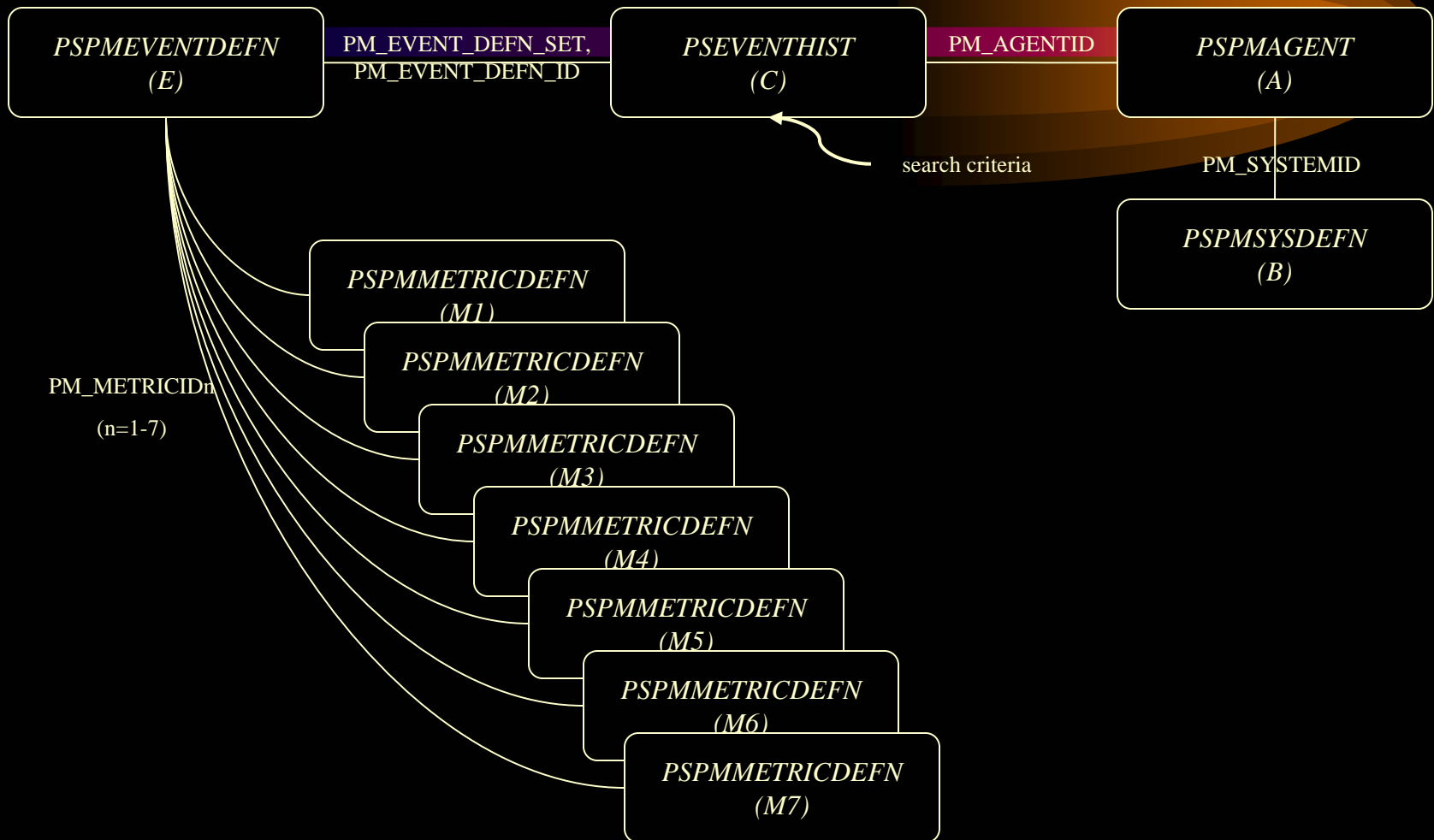
# Events

- Certain events are defined for which the monitor agents collect metrics
  - Regular cycle
    - Host resources
  - In response to user action
    - PeopleSoft Ping
  - On an exception
    - Jolt Exception or Query Timeout

# Events

- Do not have an explicit context
  - Collecting agent provide context
- Stored in PSPMEVENTHIST
  - Later deleted or archived to PSPMEVETARCH

# ERD of Events



# Event Query Results

```
DBNAME      PM_HOST_PORT
PM_AGENT_TYPE          PM_DOMAIN_NAME
PM_INSTANCE          PM_AGENT_DTTM          PM_INSTANCE_ID
PM_EVENT_DEFN_ID DESCR60
'METRIC1: ' || M1.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE1
'METRIC2: ' || M2.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE2
'METRIC3: ' || M3.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE3
'METRIC4: ' || M4.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE4
'METRIC5: ' || M5.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE5
'METRIC6: ' || M6.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE6
'METRIC7: ' || M7.PM_METRIC_LABEL || ' = ' || C.PM_METRIC_VALUE7
PM_ADDTNL_DESCR
```

```
-----
HR88      go-faster-3: 7201: 7202
WEBSERVER          ps
-1              16: 12: 08 14. 06. 2004      824633721166
```

600 PSPI NG metrics forwarded from browser

Metric1: Network Latency (ms)=435

Metric2: WebServer Latency (ms)=100

Metric3: AppServer Latency (ms)=561

Metric4: DB Latency (milli secs)=451

Metric5: =0

Metric6: =0

Metric7: IP Address=10. 0. 0. 3

PS; AN7tpzSwpZc4kt9k80NaCcYUWWH9FaFt! 1963244185! 1087224685145

PeopleSoft

Instrumentation

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# Agent Filter Levels

## Agent Filters

System ID: 1

Database Name: HR88

Reset All Filters:

Apply

### Agent Filters

<u>Agent Type</u>	<u>by</u>	<u>Last Update Date/Time</u>	<u>*Filter Level</u>
PERFMON	PS	2004/06/14 6:35:28PM	04-Standard
PSAPPSRV	PS	2004/06/14 6:35:28PM	04-Standard
PSMONITORSRV	PS	2004/06/14 6:35:28PM	04-Standard
PSMSTPRC	PS	2004/06/14 6:35:28PM	04-Standard
PSQRYSRV	PS	2004/06/14 6:35:28PM	04-Standard
PSSAMSRV	PS	2004/06/14 6:35:28PM	04-Standard
WEBRESOURCE	PS	2004/06/14 6:35:28PM	04-Standard
WEBSERVER	PS	2004/06/14 6:35:28PM	04-Standard

Save and Notify Agents

# *Agent Filter Levels*

- Controls amount of detail recorded in PMUs
  - 4- standard
  - 5 – verbose
    - Includes SQL fetch operations
    - Performance penalty
  - 6 - debug

# Analytics: System Performance

## System Performance

System ID: 1

Database Name: psf8live

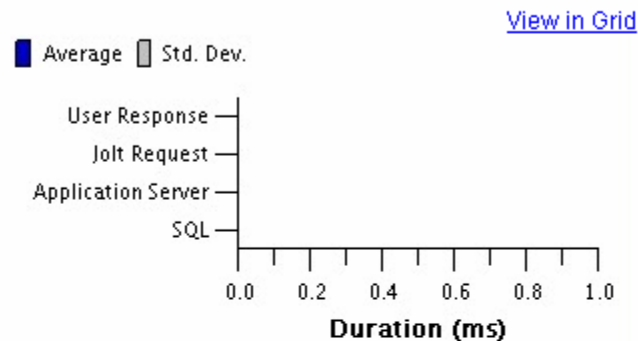
Last Page Refresh:

[Refresh](#)

### Performance Indices

User Sessions:	0	<a href="#">Current User Sessions</a>
Tuxedo Requests Queued:	0	
PMUs in Past Hour:	0	<a href="#">Open PMUs</a> <a href="#">Completed PMUs</a>
Alarms in Past Hour:	0	<a href="#">Alarm History</a>
Batch Jobs in Process:	1	<a href="#">Master Scheduler</a>
Batch Jobs in Queue:	0	

### Today's Averages



### Web Servers

Name	Agent Date/Time	Host/Port	Filter Level	Sessions in Web-App	%JVM Memory Used	Execute Threads
<a href="#">peoplesoft</a>	06/07/2005 11:43:11	peoplesoft01:80:443		139	14.4803	132

### Application Servers

Name	Agent Date/Time	Host/Port	Filter Level	%CPU Used	%Memory Used	Hard Page Faults/Second
<a href="#">psexcel</a>	06/07/2005 11:44:13	PEOPLESOFT01:9020		16.36	52.54	25.3
<a href="#">psf8live2</a>	06/07/2005 11:43:57	PEOPLESOFT01:9010		16.57	52.56	25.3
<a href="#">psf8live1</a>	06/07/2005 11:43:40	PEOPLESOFT01:9000		15.78	52.55	25.5
<a href="#">ibroker</a>	06/07/2005 11:43:33	PEOPLESOFT01:9030		15.43	52.62	25.1

# Analytics: Top Components

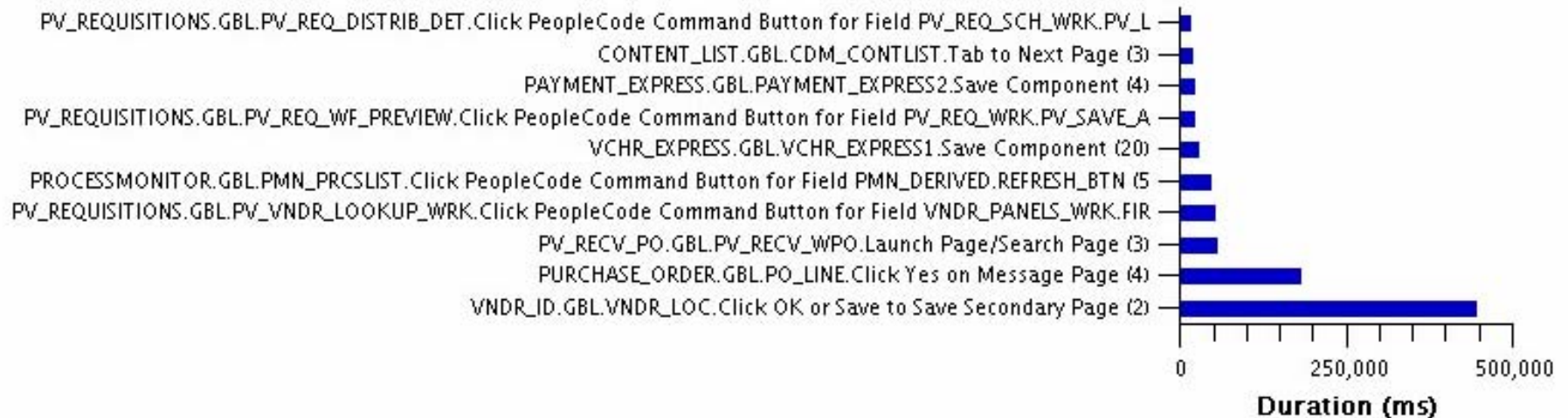
## Top Cumulative Durations

[View in Grid](#)



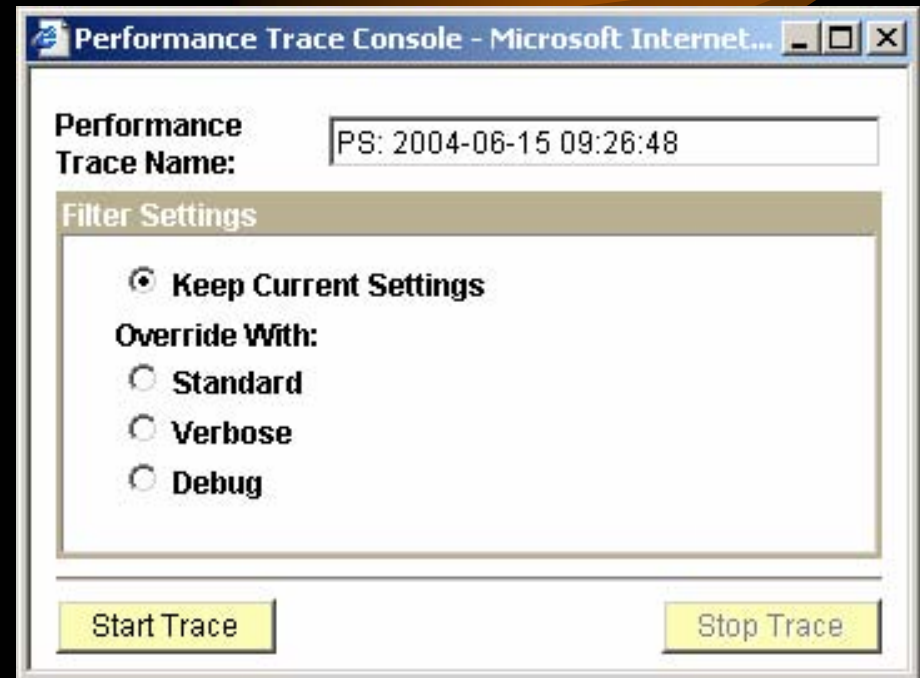
1 to 10 of 10

■ Sum (Sample Size)



# Performance Trace

- Generates a group of PMUs for activity in a user session
  - Choose an ID to identify records later



# Performance Trace

## Round Trip Details

<b>Action:</b>	Click OK or Save to Save Secondary Page	<b>Component Buffer Size (KB):</b>	387.0332
<b>Component:</b>	VNDR_ID.GBL	<b>PeopleCode Global Size (KB):</b>	0.8789
<b>Page:</b>	VNDR_LOC	<b>SQL Fetches:</b>	159
<b>Round Trip Cache Status:</b>	Cached	<b>SQL Executes:</b>	68
<a href="#">PMU Details</a>		<b>PeopleCode Program Executions:</b>	0

## Duration Summary

Measurement	Duration (sec)	% of Trip
Total Trip	446.094	100.00
SQL	446.014	99.98
Pack/Unpack Time	0.000	0.00
PeopleCode	0.028	0.01
PeopleTools Run Time	0.052	0.01

SQL	Customize	Find	View All	First	1-10 of 68	Last
SQL Executes	SQL Fetches					
Seq	SQL Operation and Tables	SQL Statement	SQL Type	Duration (sec)		
1	SELECT PS_PYMNT_VCHR_XREF A, PS_VOUCHER B	SELECT Y' from ps_pymnt_vchr_xref a, ps_voucher b where a.business_unit = :1 and a.business_unit = b.business_unit and a.voucher_id = b.voucher_id and a.remit_setid = :2 and a.remit_vendor = :3 and a.vndr_loc = :4 and a.bank_acct_seq_nbr = :5 and a.pymnt_method in ( 'BEF', 'GE', 'ACH', 'EFT' ) and a.pymnt_selct_status not in ( 'P', 'X', 'S' ) and b.entry_status <> 'X' and b.close_status = 'O' and a.pymnt_action <> 'X' Bind1='PROVP'; Bind2='MEDIC'; Bind3='0000147734'; Bind4='REMIT'; Bind5='1'; SELECT Y' from ps_pymnt_vchr_xref a, ps_voucher b where	Inline PeopleCode	55.300		

# Performance Monitoring Unit

- Look at PMU Tree
- Demonstration

## PMU History Tree

Left | Right

```
PMU Tree
├── 446125.00 ms - PIA Request
│   └── 446125.00 ms - JOLT Request
│       ├── 446094.00 ms - Tuxedo Service PCode and SQL
│       │   ├── 2.00 ms - PeopleTools SQL Execute
│       │   │   └── 0.00 ms - SQL Fetch Summary
│       │   ├── 0.00 ms - Implicit Commit
│       │   └── 2.00 ms - PeopleTools SQL Execute
│       │       └── 0.00 ms - SQL Fetch Summary
│       ├── 0.00 ms - Implicit Commit
│       ├── 1.00 ms - Implicit Commit
│       └── 446049.00 ms - ICPanel
│           └── 446046.00 ms - Modal Level 1
│               ├── 43.00 ms - PeopleCode BuiltIn SQL Execute
│               │   └── 0.00 ms - SQL Fetch Summary
│               ├── 455.00 ms - PeopleCode SQL Execute
│               │   └── 0.00 ms - SQL Fetch Summary
│               ├── 7203.00 ms - PeopleCode SQL Execute
│               │   └── 0.00 ms - SQL Fetch Summary
│               ├── 41898.00 ms - PeopleCode SQL Execute
│               │   └── 0.00 ms - SQL Fetch Summary
│               ├── 12983.00 ms - PeopleCode SQL Execute
│               │   └── 0.00 ms - SQL Fetch Summary
│               └── 0.00 ms - PeopleCode SQL Execute
```

### Context Information

#### Generic:

VNDR\_ID.GBL

#### PeopleCode Program:

RECORD.BANK\_ACCT\_SBR.FIELD.BNK\_ID\_NBR.METHOD.SaveEdit

#### SQL Origin:

SQLExec

# Summary

- Very impressive feature rich piece of code
  - It could also put me out of business!
- In house support tool
  - An end use could be enabled to collect a performance trace



# *My Questions*

- Will Fusion have a Performance Monitor?
  - *I think it should*
  
- Will it be separately licensed product?
  - *PeopleSoft's performance monitor isn't*

*Your Questions?*



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