PeopleSoft Architecture and Performance Benchmarking with "PeopleSoft Ping"

Session #23628
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Alliance 2007 Conference
Orlando, Florida
Your Presenter

Tony Neaton

• 20 years in IT in a range of technical and project management roles
• Working with PeopleSoft products since 1997
• Main PeopleSoft focus areas:
  – Infrastructure architecture and performance
  – Application architecture, design and integration
  – Portal integration
• Broader focus areas:
  – Information Systems Architecture
Overview

This presentation will outline a collaborative activity between various Australian and New Zealand universities to initiate a basic PeopleSoft Architecture Profile and Performance Benchmarking process using the "PeopleSoft Ping" function.
Agenda/Contents

Disclaimer
Why do this?
Points to Acknowledge
What is PeopleSoft Ping?
Trial Results and Observations
General Comments
Request for Participation
Griffith University, Australia

- Griffith University is located in the south-east corner of Queensland, Australia
  - Queensland is the most northern state on Australia’s east coast with a landscape ranging from outback deserts to lush tropical rainforests and coral reefs of the Great Barrier Reef.
Griffith University, Australia

- Griffith University has campuses across two cities:
  - Queensland's capital Brisbane which is home to more than 1.7 million residents who live in a sunny sub-tropical climate.
  - The Gold Coast which is Australia's main holiday destination offering great beaches and many other attractions. It is one of the fastest growing areas in Australia with a population of more than 450,000 residents.
Griffith University, Australia

Profile

- **32,000 students and 3000 staff**
- **Experienced large growth, more than doubled, in last 10 to 15 years**
  - Located in fastest growing region of country
  - Increased international student enrolments
  - Broader program offerings
    - Medical and Dental Schools and allied Heath areas etc.
- **Increased research focus**
- www.griffith.edu.au
Griffith University and Oracle

Student Administration/HR
- Live since 2001
- Currently ANZ 7.6 (Australian/New Zealand version)
  - Developed customised web self-service functions mostly in PeopleTools 8 technology
- Commenced 8.9 (possibly 9.0) upgrade
  - 8.1 series products not released for ANZ market

Finance
- Live since 2000
  - Smaller use of Asset module since 1997/8
- Currently 8.4
  - Upgraded 2004

Portal
- Live since 2004
  - Emphasis on web self-service functions
- Currently 8.9
  - Upgraded 2007

EPM
- Licensed option
  - Not in use because student components did not emerge
- Currently have a separate data warehouse project underway
  - SAS toolset

PeopleTools
- Current 8.47.06 (and 7.63)

Oracle Database
- Currently 9i for above applications
- Campus licence
Oracle in Australia and New Zealand

Broad and informal summary only...

About 45 Universities
- **Oracle (PeopleSoft) Student Administration product**
  - *Used by about a quarter*
    - Particularly larger institutions
  - *Others also using only Financials and/or HR*
  - *Many Oracle (eBusiness) users as well*
- **Others Solutions**
  - **Callista**
    - Australian development
      - Code base for the Oracle Student System
      - Various others packages and in-house solutions

Other “post-school” institutions using Oracle (PeopleSoft)
- **TAFE user, similar to a community college**
  - Managing more than 250,000 students
Analysis of the Results

Analysis of the Results
Thank you

To the Australian and New Zealand institutions who participated in this exercise.
Disclaimer

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Why is Griffith University doing this?

Upgrade Architecture Planning
- Assess various Technology and Architecture directions
- Gather information on other options
- Currently a “Sun shop”

Comparative Assessment
- What is “good performance” and can we do better?
- Areas for further improvement

Identifying Best Practice
- Architecture
- Tuning
Points to Acknowledge - 1

PeopleSoft Ping is only a single perspective of system performance
- Improving transaction response times is very important but it is not everything
- Basic transaction only
- Single execution stream
- Database I/O aspects not representative as objects are cached

Other aspects of Application Architecture also need to be considered
- Availability
  - Continuous Availability mechanisms (for example clustering, network load balancing and Tuxedo connection balancing across multiple physical servers and locations) will add minor overheads
- Scalability
  - The requirement to also handle peak concurrent user loads with acceptable response times is also very important
  - Batch performance is also a key factor
- Standards and support
  - Support expertise
  - Architectural standards
Points to Acknowledge - 2

Have only used a small sample run at a time when each system was relatively idle
  • Sample every 10 seconds for 60 iterations (10 minutes)

Only a small number of participants

Future Options
  • Add “busy time” samples for comparison
    – Difficult to define between sites
  • Longer samples
  • Larger number of participants
Regardless of this...

The PeopleSoft Ping function does provide a basis and a valid point of comparison between PeopleSoft sites.

• Some quite definite and consistent patterns do emerge from this preliminary analysis.

• The results highlight to many participants where there is room for improvement at various Architectural Tiers.

• The process has provided Griffith University, and no doubt others, with information to consider.
  – 2 participants have already made architectural changes based on this information.
What is PeopleSoft Ping?

PeopleSoft Ping is a standard utility function within PeopleTools 8.19/8.42 and later versions.

- PeopleSoft Ping has nothing to do with the “ping command” in a network analysis context.
- PeopleSoft Ping repeatedly executes a "standard dummy" component, at specified intervals, and records the execution time at each tier of the Application Architecture (Browser/Network, Web Server, Application Server, Database Server) along with the overall Total Transaction Time.
- Related options allow a user to view the recorded results in tabular or graphical form.
- The primary purpose of PeopleSoft Ping is a basic diagnostic tool for identifying response time performance problems. Specifically it can be run continually or when response time performance problems arise to profile system performance over a period. Simple identification of variances against typical or average measures on a particular Application Architecture Tier provides a direction for further analysis.
How PeopleSoft Ping can be used in a Benchmarking Context?

The collation of PeopleSoft Ping results from different PeopleSoft sites has identified some interesting variations. Factors that may account for such variations include:

- CPU speed and hardware capability,
- Database technology and versions,
- Database connection options,
- Physical or logical tiers,
- Tuxedo domain size, load balancing and failover options (often a significant factor),
- Web server load balancing mechanism,
- Network speed,
- Browser type,
- PeopleTools version, operating system version etc.

From an individual organisation's perspective it enables comparison of their measures with the group's high/low and average results for each tier of the Application Architecture (Browser/Network, Web Server, Application Server, Database Server) along with the overall Total Transaction Time.

- This provides a basic reference point as to where further tuning effort may be directed and potential “best practice” approaches to Application Architecture.
Trial Results

Results presentation
- Maximum time
- Minimum time
- Average time
- 1 Standard Deviation about Average
  - Indicates main band of variation of results
  - Excludes the occasional larger variations
- Arranged in descending order of average Total Transaction Time
  - Organisation with highest average Total Transaction Time (on left hand side) to organisation with lowest average Total Transaction Time (on right hand side)
- Development / Test / Demo systems are noted
- Other results are for Production systems
Observations

x86 (Intel/AMD) systems generally outperforming Sun (Sparc and Niagara)
- Two main platforms in use by ANZ institutions
- Difference larger than expected

Not just newer technology accounting for variation
- Some x86 (Intel) purchased in 2004, outperforming
- Some Sun equipment purchased in 2006
Institutions with Lower (Better) Average Total Response Time are using proportionately more x86 (Intel/AMD) Platforms.
Platform Details

Summarised key aspects
Some of the more detailed information, such as Database, PeopleTools version and load balancing mechanism, not considered in analysis with a small sample.
Would include purchase year to try and “date” equipment in the future.
## Participants

<table>
<thead>
<tr>
<th>Organisation</th>
<th>PeopleTools Version</th>
<th>Web Server</th>
<th>Application Server</th>
<th>Database Server</th>
<th>Database Software</th>
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</thead>
<tbody>
<tr>
<td>UniSA (Dev)</td>
<td>8.47</td>
<td>Sun E250/ UltraSparc II/ 400Mhz</td>
<td>Sun E250/ UltraSparc II/ 400Mhz</td>
<td>Sun V880/ UltraSparc III/ 900Mhz</td>
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<td>CQU</td>
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<td>HP /Alpha EV7/ 1Ghz</td>
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<td>Griffith (Prd Sun)</td>
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<td>Sun F15K/ UltraSparc III/ 1.2Ghz</td>
<td>Sun F15K/ UltraSparc III/ 1.2Ghz</td>
<td>Oracle 9</td>
</tr>
<tr>
<td>Adelaide</td>
<td>8.47</td>
<td>HP/ Intel Xeon/ 3Ghz</td>
<td>Sun V880/ UltraSparc III/ 1.2Ghz</td>
<td>Sun V880/ UltraSparc III/ 1.2Ghz</td>
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<tr>
<td>UQ (Test)</td>
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<td>Sun F25K/ UltraSparc/ 1.2Ghz</td>
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<td>Oracle 10g</td>
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<td>Sun T2000/ Niagra/ 1Ghz (Zone)</td>
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<td>Intel Xeon/ 3.2Ghz (VMWare)</td>
<td>Intel Xeon/ 3.2Ghz (VMWare)</td>
<td>Oracle 10g</td>
</tr>
<tr>
<td>ANU</td>
<td>8.47</td>
<td>HP/ Xeon/ 3Ghz</td>
<td>HP/ Xeon/ 3Ghz</td>
<td>HP/ Xeon/ 3Ghz</td>
<td>SQL Server 2000</td>
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<td>Auckland</td>
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<td>Dell/ Intel Xeon/ 2.8Ghz</td>
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<tr>
<td>UWA</td>
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<td>Dell/ Intel Xeon/ 3.3Ghz</td>
<td>Oracle 9</td>
</tr>
</tbody>
</table>
Observations – Total Transaction Time

Production systems average response varies from 1.839 seconds to 0.545 seconds

- Wider range than expected
  - UniSA (Dev) Results excluded from analysis

Results in a tangible response time difference from an end user’s perspective

- Faster/slower on every page load or save etc.
ANZ HEUG PeopleSoft Ping Architecture Benchmark Trial - November 2006
Total PeopleSoft Ping Time

<table>
<thead>
<tr>
<th></th>
<th>Average Total</th>
<th>Max Total</th>
<th>Min Total</th>
<th>1 SD above Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>UniSA (Dev)</td>
<td>4.540</td>
<td>7.543</td>
<td>3.624</td>
<td>5.413</td>
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<td>CQU</td>
<td>1.839</td>
<td>4.625</td>
<td>1.313</td>
<td>2.568</td>
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<td>Griffith (Prd Sun)</td>
<td>1.436</td>
<td>2.437</td>
<td>1.140</td>
<td>1.708</td>
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<td>Adelaide</td>
<td>1.232</td>
<td>2.363</td>
<td>1.131</td>
<td>1.422</td>
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<tr>
<td>UQ (Test)</td>
<td>1.174</td>
<td>1.563</td>
<td>1.109</td>
<td>1.244</td>
</tr>
<tr>
<td>USQ</td>
<td>1.097</td>
<td>1.872</td>
<td>1.011</td>
<td>1.257</td>
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<tr>
<td>RMIT (Dev)</td>
<td>1.093</td>
<td>2.562</td>
<td>0.969</td>
<td>1.257</td>
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<tr>
<td>ANU</td>
<td>1.046</td>
<td>3.407</td>
<td>0.766</td>
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<td>Auckland</td>
<td>0.777</td>
<td>1.257</td>
<td>0.659</td>
<td>1.557</td>
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<td>0.642</td>
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<tr>
<td>USyd</td>
<td>0.590</td>
<td>0.641</td>
<td>0.461</td>
<td>0.679</td>
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<tr>
<td>UWA</td>
<td>0.545</td>
<td>2.453</td>
<td>0.453</td>
<td>0.830</td>
</tr>
</tbody>
</table>
Observations – Browser/Network Time

Quite different distribution from overall measure

• Mostly independent from other tiers
• Depends mainly on campus network speed at workstation location

Important to remember this aspect in any tuning
Observations – Web Server Time

Smallest duration component

Largest proportional variation

• Average measures for some sites are many times lower than other sites
ANZ HEUG PeopleSoft Ping Architecture Benchmark Trial - November 2006
Web Server PeopleSoft Ping Time

<table>
<thead>
<tr>
<th></th>
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<th>Adelaide</th>
<th>UQ (Test)</th>
<th>USQ</th>
<th>RMIT (Dev)</th>
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<th>Auckland</th>
<th>Griffith (Dev 8.47)</th>
<th>Griffith (Prd x86)</th>
<th>USyd</th>
<th>UWA</th>
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</thead>
<tbody>
<tr>
<td>Average WebSvr</td>
<td>0.176</td>
<td>0.179</td>
<td>0.027</td>
<td>0.052</td>
<td>0.037</td>
<td>0.065</td>
<td>0.037</td>
<td>0.210</td>
<td>0.053</td>
<td>0.029</td>
<td>0.018</td>
<td>0.027</td>
<td>0.019</td>
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<tr>
<td>Max WebSvr</td>
<td>2.045</td>
<td>3.134</td>
<td>0.076</td>
<td>0.451</td>
<td>0.043</td>
<td>0.453</td>
<td>0.093</td>
<td>2.703</td>
<td>0.172</td>
<td>0.048</td>
<td>0.032</td>
<td>0.038</td>
<td>0.032</td>
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<td>Min WebSvr</td>
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<td>0.013</td>
<td>0.025</td>
<td>0.036</td>
<td>0.033</td>
<td>0.031</td>
<td>0.110</td>
<td>0.002</td>
<td>0.015</td>
<td>0.000</td>
<td>0.021</td>
<td>0.000</td>
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<tr>
<td>1 SD above Avg.</td>
<td>0.564</td>
<td>0.748</td>
<td>0.036</td>
<td>0.126</td>
<td>0.039</td>
<td>0.170</td>
<td>0.051</td>
<td>0.539</td>
<td>0.087</td>
<td>0.040</td>
<td>0.028</td>
<td>0.031</td>
<td>0.028</td>
</tr>
</tbody>
</table>
Observations – Application Server Time

Largest duration component
- Generally 50% of Total Transaction Time

CPU speed is the key factor
- Many other smaller factors such as overheads with load balancing/failover and configuration etc.
Focus: Griffith Application Server Results

Griffith (Prd Sun)
- Application Server is Sun F15K/ UltraSparc III/ 1.2Ghz domain (Purchased 2003)
- 0.843 second average

Griffith (Prd x86)
- Application Server is Dell/ Intel Xeon/ 2.8Ghz (Purchased 2004)
- 0.304 second average

Web and Database Tiers are identical in both cases

Different Application Server Platform
- Ratio almost 3 to 1
- 0.5 second difference
ANZ HEUG PeopleSoft Ping Architecture Benchmark Trial - November 2006
Application Server PeopleSoft Ping Time

<table>
<thead>
<tr>
<th></th>
<th>UniSA (Dev)</th>
<th>CQU</th>
<th>Griffith (Prd Sun)</th>
<th>Griffith (Test)</th>
<th>UQ (Test)</th>
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<th>Griffith (Prd x86)</th>
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<th>UWA</th>
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<td>Average AppSvr</td>
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<td>0.843</td>
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<td>0.346</td>
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<td>0.304</td>
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<td>1 SD above Avg.</td>
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<td>0.272</td>
<td>0.280</td>
<td>0.334</td>
<td>0.266</td>
<td>0.500</td>
</tr>
</tbody>
</table>
Observations – Database Server

Large duration component
  • Generally 30-40% of total transaction time

Less proportional variation between sites
  • CPU speed is a factor
  • Also suggest that other factors such as Database version are also relevant
    – Sample too small for any detailed analysis
Focus: Griffith Database Server Results

Same Database Server Platform in both cases
  • Griffith (Prd Sun) Application Server
    – 0.468 second average for Database Tier
  • Griffith (Prd x86) Application Server
    – 0.260 second average for Database Tier

Different Application Server Platform
  • Same Database “worked faster” with faster Application Server Tier
  • Slower Application Server performance seems to cause delays/waits on Database Server Tier
  • Repeated this same outcome in further test runs
Database Server PeopleSoft Ping Time

<table>
<thead>
<tr>
<th>UniSA (Dev)</th>
<th>CQU</th>
<th>Griffith (Prd Sun)</th>
<th>Adelaide</th>
<th>UQ (Test)</th>
<th>USQ</th>
<th>RMIT (Dev)</th>
<th>ANU</th>
<th>Auckland</th>
<th>Griffith (Dev 8.47)</th>
<th>Griffith (Prd x86)</th>
<th>USyd</th>
<th>UWA</th>
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<tbody>
<tr>
<td>Average DBSvr</td>
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<td>0.522</td>
<td>0.468</td>
<td>0.315</td>
<td>0.406</td>
<td>0.254</td>
<td>0.333</td>
<td>0.352</td>
<td>0.299</td>
<td>0.251</td>
<td>0.260</td>
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<td>Max DBSvr</td>
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<td>0.371</td>
<td>0.257</td>
<td>0.276</td>
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</tr>
</tbody>
</table>
General Comments

Primarily CPU speed
  • Particularly on Application Server Tier

Both CPU Speed and Number of Processing Cores
  • Effective Throughput is combination of
    – More transactions completed per period, and
    – More parallel processing engines/cores to run on.

x86 (Intel/AMD) systems generally outperforming Sun
(Sparc and Niagra)
  • Material differences noted

All vendors moving to faster CPU speeds, multi-core
processors and more performance/watt etc.
Discussion for Future

Option to extend to more sites
- More version variations
- Wider HEUG and potentially other sectors

Perhaps extend data collection
- “idle” and a “busy” profile
  - Issues with “busy” if other applications also in mix

Will include purchase year to try and “date” equipment in the future
Request for Participation

Download the Ping Benchmark Trial spreadsheet from the HEUG website (file with this presentation)
Request for Participation

Run a Ping Test as per the instructions
Complete the architecture details
Return to T.Neaton@griffith.edu.au
  • By 27 April 2007

Will collate and present information
  • Will keep sites anonymous but advise each participant of their reference number
Questions?
Contacts

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Phone: +61 7 373 53950
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Presentations from previous meetings are also available.