



# Query Performance

The Missing Link In Your IT Dept



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- My Background

- Over 20 years tuning

- Oracle
- SQL Server
- DB2
- Various (Teradata, Informix, etc.)

- Query Performance for over 40 companies

- Direct tuning skills applied
- Establish & mentor teams focused on query performance

- Written many whitepapers on performance

- Some Testimonials

- <http://www.dbgtools.com/testimonials/dbperftestimonial.html>

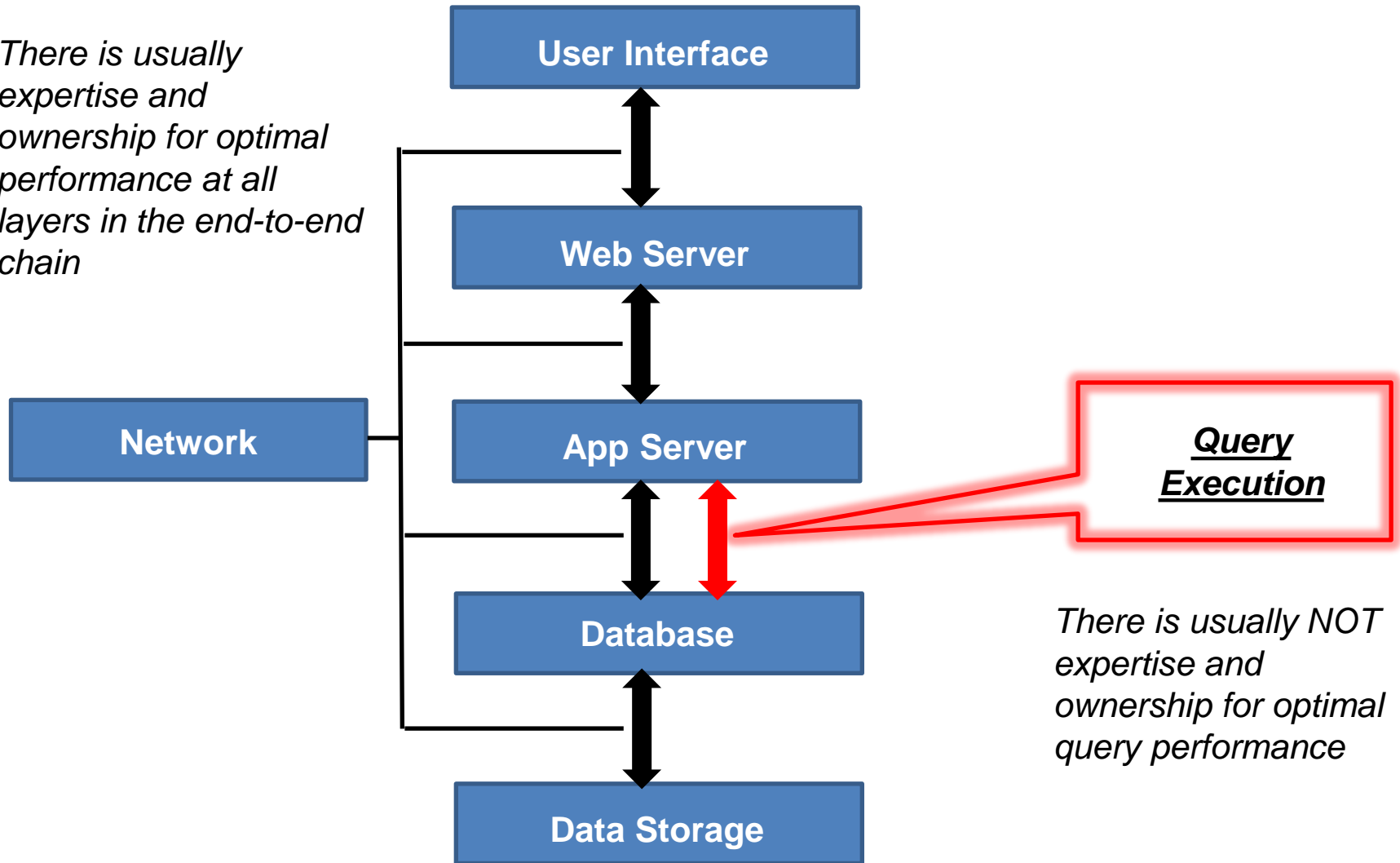


- Today's Agenda

1. Define End-To-End Performance
2. Query Performance – Current State
  - ✓ The Ripple Effect
3. The Missing Link
4. DPOP – What is it?
  - ✓ How To Implement It
  - ✓ Typical Impact & Results
  - ✓ Define Methodology
  - ✓ Success Factors

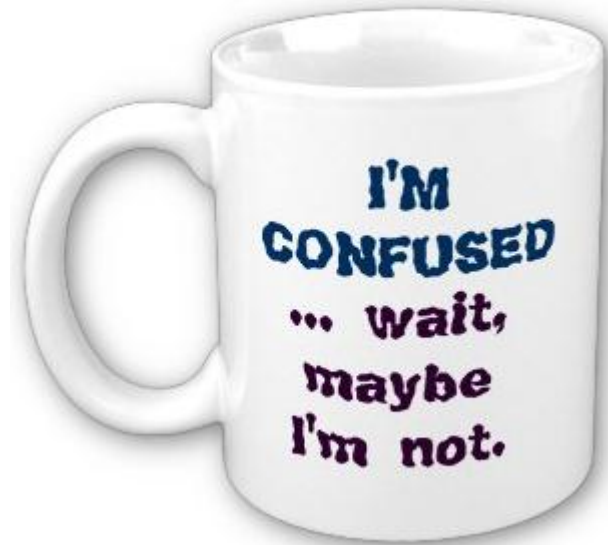


*There is usually expertise and ownership for optimal performance at all layers in the end-to-end chain*

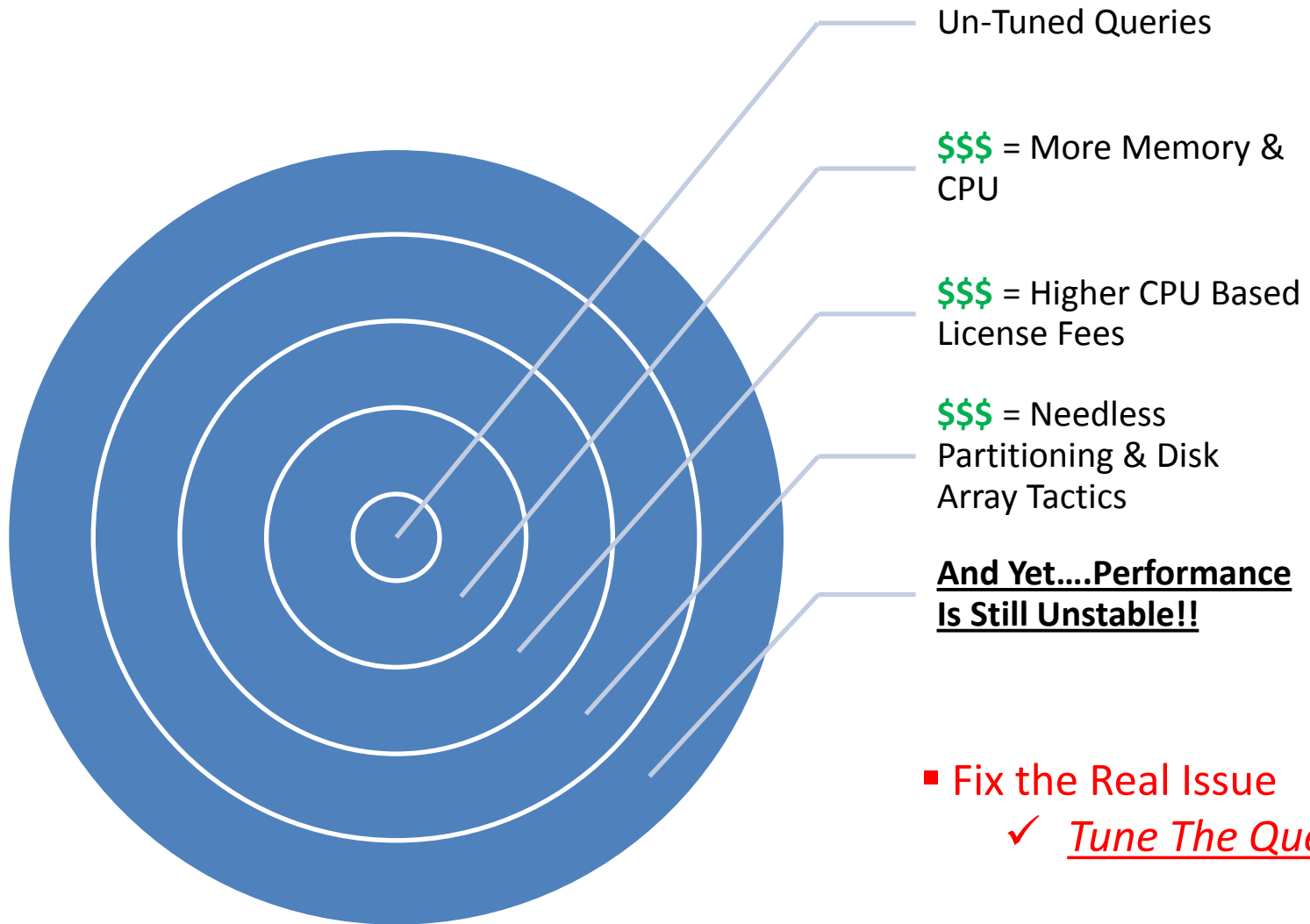


- Current State

- Developers write queries
  - They “own” the query code
  - Point finger at DBA’s for query performance issues
- DBA’s tune queries when needed
  - They “own” the database
  - Point finger at developers for query performance issues
- Query Performance
  - Does anyone “own” it? Not likely.
  - Does true accountability exist? Not likely.



# Bad Query Performance – The Ripple Effect





- Step 1
  - Recognize The Void
- Step 2
  - Do something about it
    - There is a solution!

- DPOP – What is it?

- Database Performance Optimization Practice

- A focus on query (SQL) performance
      - » Queries are 80% of all performance issues
    - Results are dramatic and immediate
      - » Transform end user experience
      - » Extend hardware life
    - A new and disciplined way of looking at end-to-end performance
      - » Appropriate tool selection
      - » Create a performance “mindset” company-wide



- DPOP Implementation

- Basically two options...

- Option 1

- » A dedicated team of resources would focus on query performance as their sole responsibility

- Frequent interaction and collaboration with DBA's and developers regarding query performance
        - Viewed as a staple for all system development life cycle phases (development, test, production)

- Option 2

- » DBA and developer responsibilities are significantly enhanced to be accountable for query performance

- Harder to implement due to time constraints of DBA's and developers



- DPOP results are dramatic
  - Slash hardware usage by 80-90%, which defers or eliminates hardware purchases
  - Slash runtimes of transactions by 80-90%, which completely changes end user experience
  - Skill set is gradually mentored so that all of development has a performance mindset



- **Increases in Revenue and Profit:** Customers are better satisfied, and more efficient applications reduce costs.
- **Extended Hardware Longevity:** Applications run more efficiently, extending the life of hardware
- **Reduced Costs:** Hardware purchases, hardware lease fees and CPU-based license fees are reduced for 3<sup>rd</sup> party software and databases.



- **Immediate Results:** Performance analysis provides an instantaneous and dramatic impact of SQL tuning.
- **Reduced Overhead Costs:** Processes are more efficient, freeing up resources for other projects.

- DPOP Business Value

- New customers are attracted, existing customers stay loyal
- More revenue is generated and at a faster pace
- Risk Management enhanced
- Employee job satisfaction improved and turnover reduced
- Company growth is made more stable and reliable
- Company image is improved and secured



- DPOP Methodology

- Modes

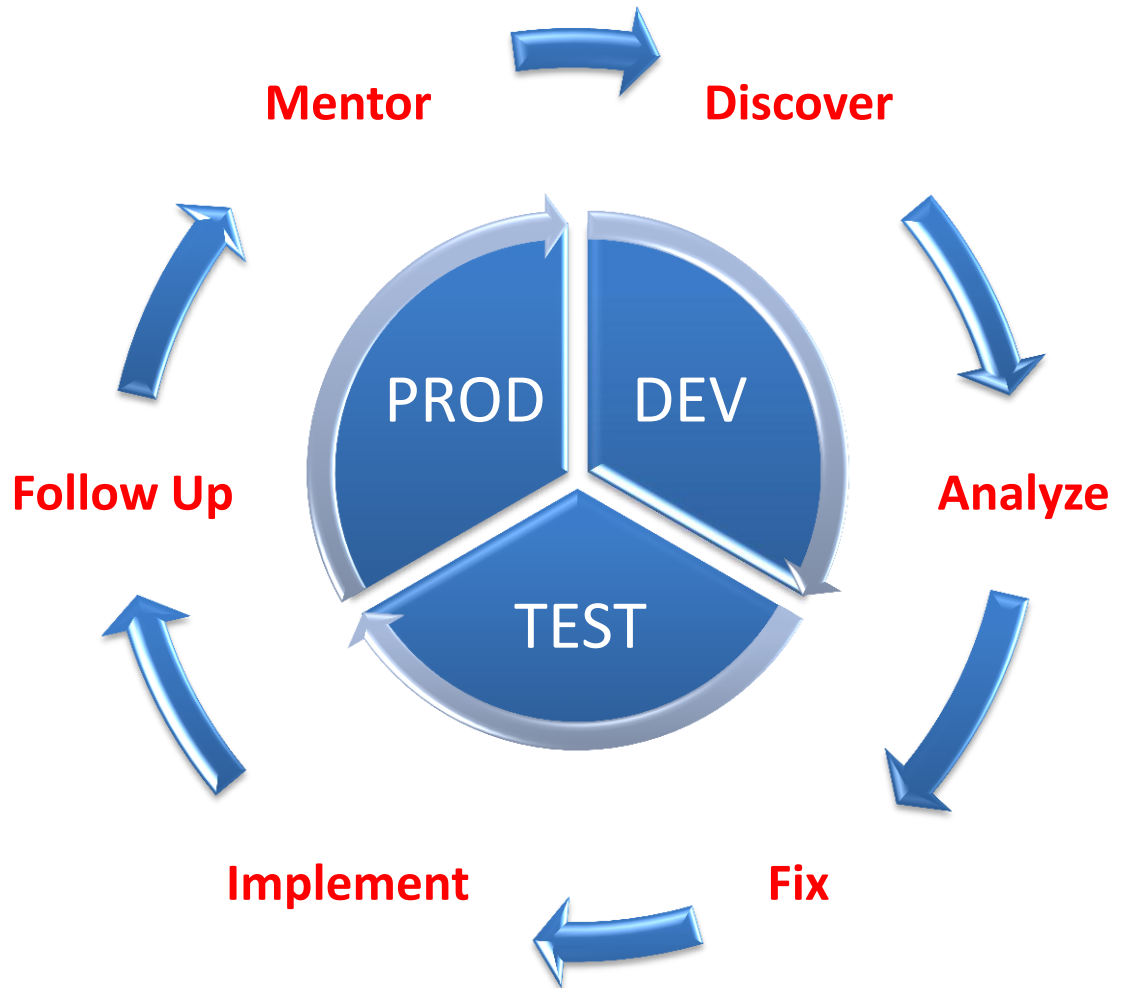
- Proactive
- Reactive

- Phases

- Dev
- Test
- Prod

- Frameworks

- Discover
- Analyze
- Recommend Fix
- Implement
- Follow Up
- Mentor



- Modes

- Proactive

- Take action before users or hardware feel the impact of poor performance.

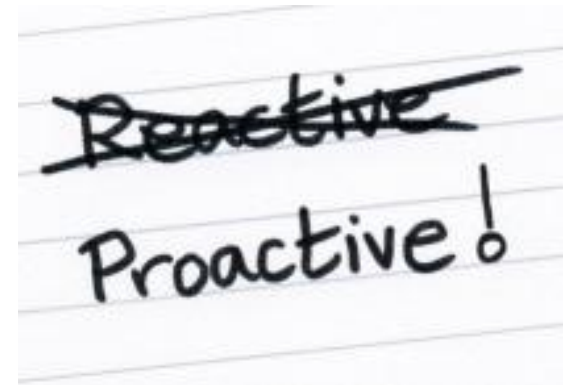
- Profound return on investment!

- Reactive

- A user is complaining or hardware is being compromised as a result of poor performance

- A rush to mitigate the problem ASAP!

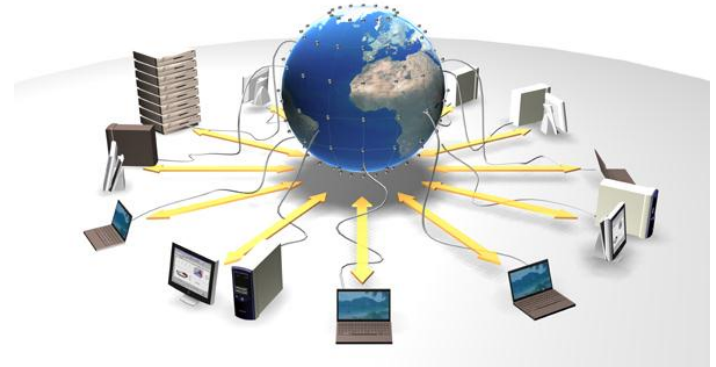
- Disastrous effects on end user perception, hardware resource usage and accurate capacity forecasting.



- Phases
  - Development
    - Query code reviews are not feasible anymore
      - DBA's & developers too busy
      - Hundreds of queries
  - Two databases needed
    - Query development
      - » Developers code and design queries
    - Query Analysis
      - » Developers execute queries in “final form”



- Phases
  - System Test
    - Stress the database
      - Mimic actual user transaction mix!
      - Don't script to artificially slam the database
    - Identify "Top 10%" functionality
      - No holds barred on tuning mission critical transactions
      - Must be tested with every test, regardless of changes



- Phases
  - Production
    - Stay proactive!
      - Mine for query performance opportunities
        - » Daily, Weekly, Monthly reports
    - Trending is key!
      - Query performance metrics
      - Plan changes
    - Define SLA's for query performance
      - Establish alerts for SLA breaches (email, page, etc.)
      - Follow up on query performance recommendations



- Frameworks
  - Query Discovery
    - Capture inefficient queries via proper tool
    - Prioritize queries in “Overall Analysis Reports”
      - Elapsed Time, CPU usage, etc.
  - Query Analysis
    - Execution plan is the focus
    - Create “Analysis” documents
    - Create “Performance Recommendation” reports
      - Summarize performance issue
      - Before/After Metrics
      - Rationale provided for solutions
    - Knowledge transfer and mentoring where appropriate



- Frameworks
  - Query Analysis
    - Format the query
    - In prod and test
      - Gather statistics on query objects (tables/indexes)
      - Gather indexing structures
      - Get values test for bind variables to test query
      - Capture original execution plan (resolve differences)
      - Capture original metrics
    - Tune the query!
      - Save “Analysis” document
      - Create “Performance Recommendation” report



- Success Factors
  - Proper tool selection critical
    - All phases and modes
    - Send me an email to see my favorites
  - Focus on best query plan, not times
  - Track recommendations and follow up after implementation
  - Keep analysis document and recommendation report
  - Create/maintain database dedicated to tuning
  - Keep skill set visible in company with monthly reports to upper management



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