



# chooses not to gamble with database performance



Betfair is the world's leading online betting exchange, a concept it has pioneered. Driven by cutting-edge technology, Betfair enables customers to choose their own odds and bet against each other, even after an event has started. Betfair processes 5 million transactions a day and more than 300 bets a second.

- >2 million registered accounts
- Total historical matched volume > £32bn
- > 4.65 billion dynamic page impressions per week
- 99.9% bets placed in < 1 second

[www.betfair.com](http://www.betfair.com)



**DB Tuna**

## Key Benefits for Betfair

- Low overhead - production safe monitoring technology
- Rapid Installation - agentless technology meant no installation or changes required on the monitored database platform
- Ease-of-use – intuitive web GUI meant it was easy to share information between teams
- Granularity – sub-minute time-slices, allowed fast resolution of problems that last for just a few seconds
- History – found problems ‘after the event’ before they could strike again
- Trending – spotted problems proactively before impacting users
- Scalability – provided support for some of the world’s heaviest hit databases
- Load-testing – showed performance profiles for different scenarios side-by-side
- Comparison reports - made it easy to compare performance for any two time periods, before and after a change
- Single common tool - supporting Oracle, SQL Server and MySQL

## The world’s leading betting exchange, Betfair, has selected DBTuna to help guarantee Oracle, SQL Server and MySQL database performance in production, performance testing and development environments

“When we thought about our selection criteria for a database performance monitoring tool there were four things that were key,” said Nigel Noble, Senior Performance DBA at Betfair.

**Firstly** it needed to be able to provide us with a very fine level of detail, so that we could capture very short duration performance issues.

**Secondly** it needed to be able to cope with monitoring our huge transaction volumes on various Oracle platforms, without adding significant overhead.

**Thirdly** it needed to be good at profiling performance during load-tests, allowing us to quickly and easily highlight bottlenecks, and compare differences between multiple tests.

**And fourthly** it needed to support not just Oracle but SQL Server and MySQL.

“In just a few months we’ve become totally hooked on DBTuna. Its ease of installation has meant that we have been able to deploy the product quickly and because it is so intuitive and easy to use we have had no trouble in getting our colleagues across the business to use it. DBTuna is used throughout all stages of application development as well as in production, helping everyone to communicate internally about database performance issues. I now frequently email my colleagues URL links to DBTuna that point them directly ‘in context’ to the issue or SQL statement that I’m working on. As you can imagine, this saves us a lot of time and helps to ensure that we can get to the root-cause of an issue more quickly, which is better for us and our customers. It is probably worth explaining more about each of the key criteria and explain how DBTuna meets them.”

## Granularity

“Improving visibility into very short duration performance problems was critical for Betfair. In the past we have seen performance problems in production that affect our customers for no longer than 15 seconds and then go away, only to return at a later date because we have not been able to see why they happened and do anything about it. Having a problem that only lasts 15 seconds may not sound that serious but if it’s the wrong 15 seconds it could seriously impact both our customers and the business. When you consider the huge number of customers that use our website to place bets just prior to the start of a major sporting event, then you can understand the impact that having a performance slowdown at that time would have, hence our need to be able to understand exactly what is going on inside the database and resolve it the first time it strikes.”

“Over the years we have reviewed a number of database monitoring tools but each time have been disappointed to find that the best granularity they could provide in our busy production environment was a 15 minute time slice. Although this information is interesting when looking at over the long term, when applied to our short duration performance problems, you realise that they completely miss the information we need, and effectively leave us blind. DBTuna, in contrast enables us to select the level of granularity we require for each of our databases; we routinely set the time slice to 10 seconds to give us the granularity and detail we require.”

Application Performance’s responsiveness to our questions and requests for enhancements has been nothing less than superb.

Oliver Cook, Engineering Services Manager at Betfair



[ApplicationPerformance.com](http://ApplicationPerformance.com)

## Scalability

“The last thing you want when trying to improve database performance is for your performance monitoring tool to impose a significant overhead, particularly when being implemented on production or highly stressed load testing servers. For this reason we tested DBTuna exhaustively, and having worked closely with the development team at Application Performance, confirmed that even when capturing information at the finest level of detail that total overhead would still be less than 1% of CPU resource. This overhead was well within acceptable limits and has enabled us to deploy DBTuna on even our most heavily loaded Oracle servers, which are amongst the busiest in the world.”

## Support for load-testing

“Betfair has seen year on year customer usage almost doubling for four years and now needs to deal with regularly in excess of 25,000 dynamic page impressions per second. To meet the demands of high performance it is essential that we load test all of our applications thoroughly prior to release, because if we get it wrong, even a seemingly innocuous change can have a significant impact on the customer experience”, said Oliver Cook, Engineering Services Manager at Betfair. “DBTuna has helped us to significantly reduce the time it takes to isolate and resolve performance problems during development and pre-production load testing. The result is that we can release new functionality faster without having to compromise on quality.”

## Support for production

“The best thing about DBTuna in production is the amount of time it saves us when investigating performance problems”, said Unai Basterretxea, DBA Engineering Manager at Betfair. “Using DBTuna, we can now fix problems faster and keep our customers happy. It has dramatically improved the way we handle performance problems, ensuring that we get to the root-cause of a problem via an automated process rather than having to review database information manually.”

“It is also important to realise that DBTuna displays performance information based on the time spent waiting for resources rather than simple metrics, ensuring that when we run into a problem we can quickly isolate where time and resources are being wasted and work to remove the bottleneck. DBTuna has made a real difference and we would not be without it.”

## Comparisons made easy

“Comparing any two database loads in a changing environment can be complex. This is especially true in a load testing environment where many different scenarios are evaluated for performance and scalability. Being able to quickly see what has changed between the different scenarios is vital. This is where the DBTuna load test comparison report excels. It immediately highlights where things have changed either positively or negatively saving Betfair valuable analysis time.”

**“The best thing about DBTuna in production is the amount of time it saves us when investigating performance problems. This means we fix problems faster and keep our customers happy. It automated our approach to performance tuning and removed the need for manually reviewing data from different tools”**

Unai Basterretxea, DBA Engineering Manager

“The report gives a side-by-side comparison of two load tests, clearly showing the key performance indicators of each test along with the differences. It is easy to spot any change in CPU utilisation, wait time, or number of executions for each individual SQL statement as well as for the database instance overall. The DBTuna load test comparison reports are not limited only to load testing and can simplify the task of comparing any two scenarios. For example you could compare a QA load with production, or compare two nodes of a cluster. Or you might want to compare a period of time before and after a change such as the addition of a new index.

Whatever your reason for using it, the DBTuna load test comparison report is a real time saver.”



## Load Test Comparison Report

- Immediately visualise change by comparing the key performance indicators of two tests side by side

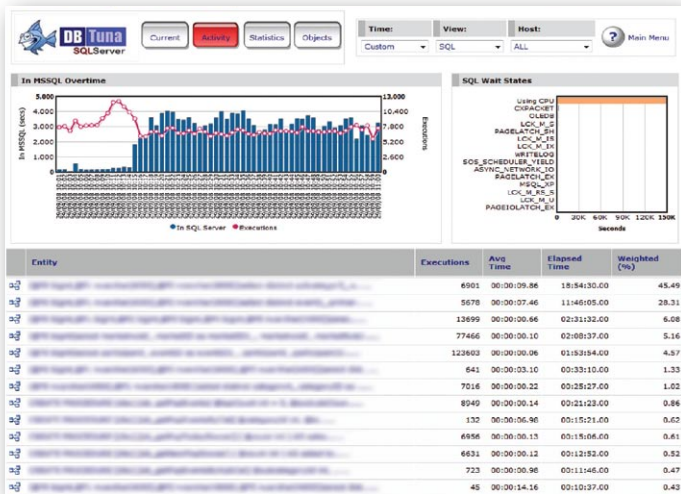
## Support for Oracle, SQL Server and MySQL

“It was common sense for us to look for a standard tool for use across our database estate, and DBTuna's unique ability to support MySQL as well as Oracle and SQL Server from exactly the same user interface was an important benefit. Like all organisations the different members of our team have different skill levels across each of the database platforms we support. So being able to learn how to use DBTuna on, say, Oracle and then use this knowledge when looking at SQL Server is great. Over time I'm sure that being able to transfer skills in this way will help us provide the business with a higher level of service, and our customers with consistently high performance”.

# SQL Server Case Study

Betfair.it runs Betfair's Sportbook betting site for Italy. It is a very busy site backed by a large SQL Server 2005 database. When CPU consumption peaked to 100% at random times of day and for quite lengthy periods DBTuna was able to provide deep dive visibility into exactly what was occurring and helped locate the root cause of the issue.

DBTuna was able to provide a performance profile of each and every SQL statement and stored procedure executing within the SQL Server instance, and assess the percentage of CPU consumed by each. It quickly pinpointed two stored procedures consuming the majority of the CPU resource, but this was only part of the story. What DBTuna clearly showed was that the number of executions was high, yet fairly static, for the two offending stored procedures. However, the number of logical I/O operations had increased four-fold during the problematic time periods due to a shift in query execution plans; it was this that had caused the CPU to spike. Further investigation revealed that a batch operation preceding the problem had deleted many rows and had triggered the shift in execution plan; correlation of these two events was key in understanding what had occurred and vital for resolving the issue.



## Spike in CPU and Elapsed Time begins mid-morning

- Activity is dominated by "Using CPU"
- Two SQL Statements are the main consumers with 45% and 28% of the CPU consumption

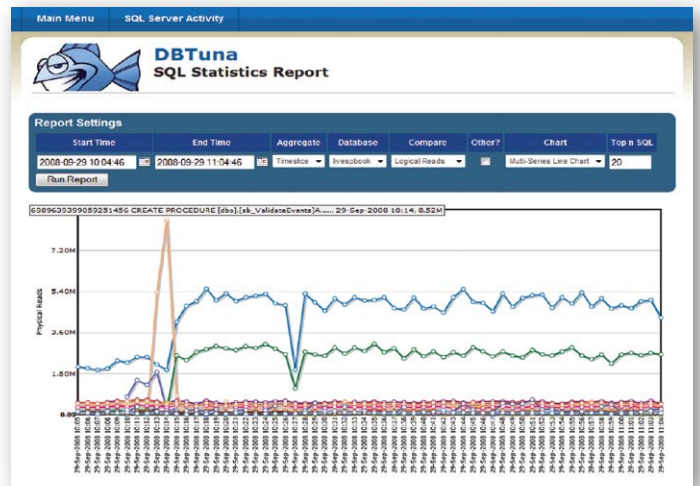
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Oliver Cook, Engineering Services Manager at Betfair



## Drilldown into top statement

- Execution count is consistent at around 100 per minute
- CPU time increases at 10:15 and then plateaus hogging multiple CPUs
- Elapsed time increases significantly (CPU Wait time)
- I/O graph shows big increase in logical Reads corresponding to CPU spike



## Top SQL Report by Logical Reads

- Logical Reads increase for top 2 statements (green and blue on the graph)
- Summed Logical reads for top 2 statements dominate total Logical Reads
- A stored procedure displayed as a yellow line on the chart has high logical reads immediately preceding the problem period



## Drilldown into Stored Procedure

- The stored procedure is not a problem in itself i.e. CPU and elapsed time is not excessively high but DBTuna reveals that it deletes from two tables, both of which are queried by the top 2 statements
- Further investigation by the DBA team reveal that it is these delete statements which trigger a chain of events resulting in the problem

# Oracle Case Study

Betfair's Oracle databases are amongst the busiest in the world and managing their performance levels is critical. DBTuna has proven its ability to monitor these heavily utilised Oracle databases in great detail around the clock whilst incurring only a tiny overhead and enabling the various operational, testing and development teams to share information about performance trends and bottlenecks much more effectively.

DBTuna provides graphical views of resource usage over time that show exactly where Oracle and server resources are being consumed by the various applications. This enables Betfair to focus on the bottlenecks caused by time spent waiting on resources, making it easy to get to the root-cause of a problem. This is a way of working which allows the Betfair team to quickly view the performance profile of each component part of their applications, making it very easy to find out how a particular function is performing e.g. the User Login process, before drilling down to view the performance of each SQL and PL/SQL statement involved in the process.

DBTuna also helps with performance comparison analysis across different time periods and/or different database instances. For example, it is possible to compare two busy Saturday afternoons, or report on how the pre-production load test compares with the live database. This type of analysis is even more valuable when tracking the performance of new code releases into production. The comparison report can be filtered by a specific functional area, and it is then possible to get a report on the exact CPU and wait-time difference before and after the code goes live. This means that it is easy to assess the impact of new code releases, and provides the team with all the information they need to confirm that a change is good hence reducing risk by immediately spotting any adverse effects.

**👍👍 In just a few months we've become totally hooked on DBTuna!**  
**Its ease of installation has meant that we have been able to deploy the product quickly and because it is so intuitive and easy to use we have had no trouble in getting our colleagues across the business to use it. 👍👍**

Nigel Noble, Senior Performance DBA at Betfair

## Working with Application Performance?

"We've been working with AP for just over a year and during that time they have shown to us that they really do understand the challenges we face, and bring us the right technologies to meet our needs".

"We are working closely with Application Performance R&D in order to ensure that future DBTuna releases will become even easier to use. It is vital that we can delegate more performance and capacity testing to each of our development teams rather than relying solely on our specialised central team. By making the development teams more self-sufficient we will be able to increase product delivery throughput and hence support business growth and maintain our market leading position".

Oliver Cook, Engineering Services Manager at Betfair

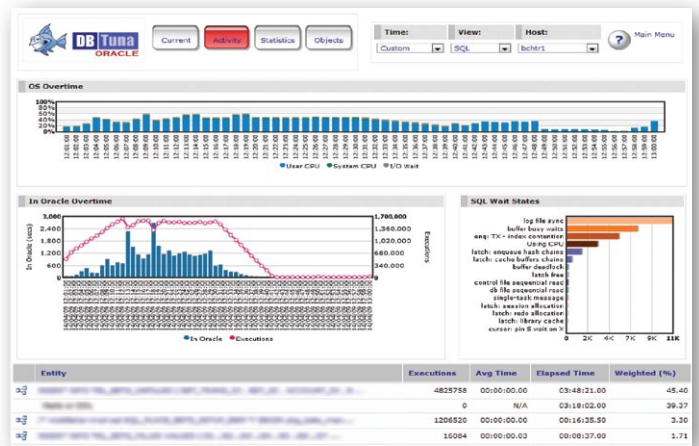
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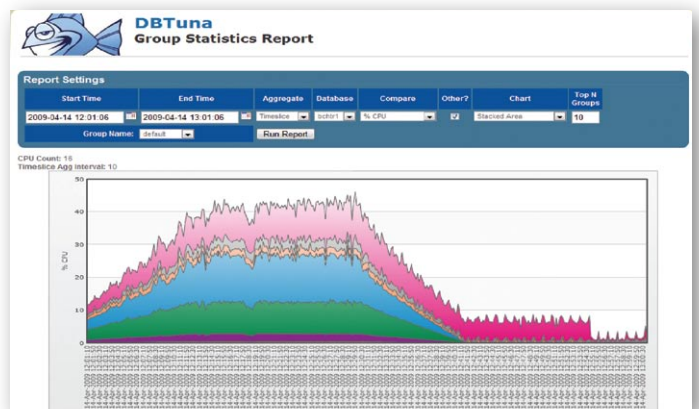
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DBTuna builds on the capabilities of Oracle's own management tools, making it easier to manage application performance more proactively than ever before.



## DBTuna for Oracle Activity workspace displays the key indicators of application and database performance

- Percent CPU consumption of the server
- Time spent executing queries in Oracle versus Query Throughput
- Top Database Wait States
- Detailed view of top Queries ranked by CPU and Elapsed time



## DBTuna Report displaying the percentage CPU consumption of each SQL Group

- Each colour on the graph represents a group of SQL and/or PL/SQL comprising a distinct piece of functionality

## About Application Performance Ltd

Application Performance is focused on helping customers improve the performance of business critical applications through all stages of their development, testing and production usage. We have been helping major corporations for over 10 years and have developed DBTuna for Oracle, SQL Server and MySQL database monitoring and tuning in response to customer requests for functionality not available in any other tool.

As well as supporting some of the world's largest production databases, DBTuna has achieved immediate success during load-testing where its ease of deployment and highly visual interface allow non-DBAs to troubleshoot database performance problems.



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