



**Accelerating
Web-Based SQL Server Applications
with
SafePeak
Plug and Play
Dynamic Database Caching**



A SafePeak Whitepaper

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Objective

This paper describes SafePeak's solution to deliver **plug-and-play acceleration and scalability for Cloud and Hosted SQL Server applications**. This paper will explain how SafePeak can instantly enable any type of organization to resolve information access bottlenecks on Cloud and Hosted servers, without any change to the existing applications or SQL Server databases.

Cloud application performance challenges

The Cloud brings efficiency and convenience with the ability to access applications from anywhere at any time, together with elasticity of "scale on demand". This is possible because of the ability to order and to connect as many virtual servers as customer needs require, within just a few minutes. However, with more applications moving from in-house IT infrastructure to the cloud, many business users, customers and employees suffer from poor application performance, slow response time and scalability challenges stemming from the database, a key part of any infrastructure. Slow application performance damages the user experience, leads to customer dissatisfaction, increases website abandonment and visitors seeking alternative websites – all of which negatively impacts revenues.

Application performance is critical for a positive user experience, whether the "user" is a customer or an employee. Research shows a direct impact of a web application's response time to its ability to turn visitors into customers and keep them on a website. A recent survey among managers and professionals produced by Unisphere Research¹, shows:

- *34% of respondents experience problems with on-line transactions at least several times a week and 64% several times a month*
- *26% of respondents who experience problems with a transaction switch to a competitor*
- *57% of respondents who experience problems with a transaction simply abandon a transaction entirely*
- *15% of respondents simply no longer do online business with the site's vendor*

The most common issue, reported by 8 out of 10 respondents, is slow response times.

¹Performance Under Pressure: OAUG ResearchLine Survey



How do organizations find out about these performance problems? Mainly by hearing from affected customers or end-users, as few organizations have mechanisms in place to discover performance problems when they occur.

What can be done to improve slow application performance?

The solution is not always obvious. While allocation of additional web or application servers/instances by the Cloud service provider is a straight forward process, the **resolution of performance and scalability bottlenecks of SQL Server databases remains a complicated challenge**. Resolution can demand significant restructuring of the application code and even a different application-database design. Lack of control of physical infrastructure and lack of ability to apply hardware improvements (like combining hardware acceleration solutions, SSD based storage systems, storage caching acceleration, network acceleration, etc.) creates complex challenges for SMBs and enterprises that host their critical applications on the Cloud and with Hosting providers.

SafePeak®- Immediate Acceleration of Cloud Applications

SafePeak Technologies provides SafePeak® - **the only immediate Plug-and-Play SQL Server acceleration and scalability software solution for Cloud and hosted applications**. SafePeak delivers results within hours, to resolve information access bottlenecks on Cloud and Hosted servers. Moreover, SafePeak's solution does not require any change to the existing applications or SQL Server databases. This means SafePeak accelerates both custom and 3rd-party applications (like SharePoint, and CRM Dynamics), that leverage SQL Server databases.

SafePeak's solution resolves:

- SQL Server performance
- query access speed
- retrieval bottlenecks
- CPU and IO load
- latency

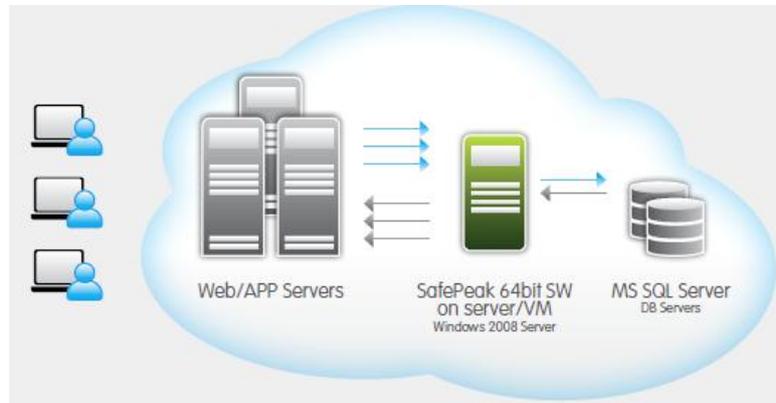
SafePeak dramatically accelerates data access and retrieval to microsecond speed, providing immediate benefits without changes to application code or database design. Moreover, SafePeak enables companies to maximize utilization of their existing Cloud and hosted infrastructure, with ability to scale 5-10x more users and workload.



SafePeak: Automated Dynamic Caching for SQL Server OLTP Apps

SafePeak delivers an innovative solution for dynamic database caching, using sophisticated auto learning and automatic adaptation algorithms.

SafePeak's solution is deployed on Windows 2008 64bit virtual servers, a dedicated server or two servers in a cluster, and acts as a seamless proxy between the applications and customer SQL Servers. Such a server instance can be easily and instantly ordered from the Cloud provider like Amazon EC2, GoGrid and others.



How SafePeak does it

SafePeak's patent-pending auto-learning algorithms analyze connected SQL Server instances while a unique self-adaptive algorithm studies the application traffic, creates patterns of queries, understands their nature and dependencies and provides caching rules for the SafePeak Core engine.

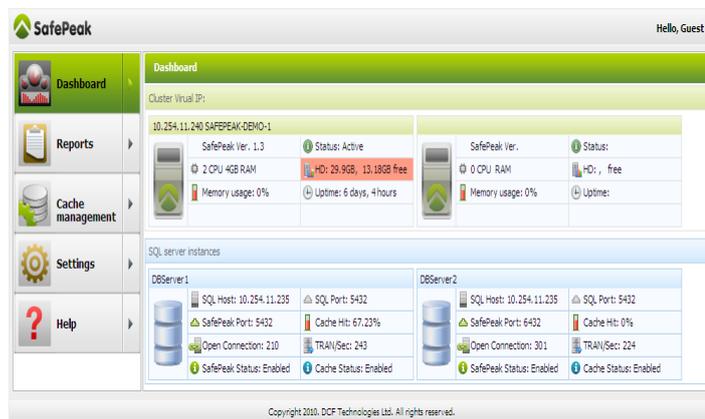
SafePeak offloads repetitive "Read" queries and stored procedures (queries and procedures that "select" data), while storing the result-sets in SafePeak cache memory. Requests for same queries are not sent to the database servers and the result is retrieved from the cache memory with instant speed (microseconds). SafePeak's sophisticated algorithms manage changes to data automatically, evicting in real-time the relevant items from cache with arrival of "write" commands (DML, DCL, DDL) ensuring 100% data integrity. As a result, database CPU and IO load is reduced dramatically, freeing important resources, and leading to additional overall performance acceleration for both reads and writes.

The results of SafePeak's solution are immediate. SafePeak deployment on a virtual cloud server takes up to 15 minutes and within 60 minutes the application will experience a performance acceleration boost. SafePeak is transparent to the application or Web server and the database. The installation process requires minimal effort. No code changes in the application and database are required.

SafePeak Dashboard – Deep Real-Time Performance Analysis

SafePeak provides a web-based GUI management dashboard for configuration, management, operation, reporting and statistical analysis. In addition, SafePeak acts as a real-time auditing profiler and provides tools for analyzing performance bottlenecks.

The auditing and analysis mechanisms and tools are built into SafePeak and add no additional performance overhead on the application and the SQL Server.



SafePeak Management Dashboard

SafePeak’s management dashboard provides DBAs, IT managers, architects and developers with critical performance information. This information includes a drill down on database instances regarding usage, accessed tables and length of execution of queries. SafePeak’s management dashboard also helps to uncover queries that are incorrect or those which can be fine-tuned for better processing efficiency.

Case Study: EEDAR (CA, USA)

Video gaming industry

Accelerating a Cloud-based SQL Server application using SafePeak®.



EEDAR (Carlsbad, California, USA) is the largest specialty video game research firm in the world. The company provides analytics and business intelligence in the video game industry. EEDAR’s key product is a service called GamePulse™, a research tool for understanding game titles, retail and digital sales, industry trends, press and critical response, advertising effectiveness and product launch dashboards. The service provides an incredibly powerful way to look at data from dozens of partners simultaneously and to provide an accurate high-level perspective on the gaming market.

EEDAR’s service uses a mixed cloud-physical hosting environment with extensive use of web services located in a cloud environment (Cloud provider: **GoGrid**).



EEDAR faced three major challenges:

- Integrating data from a large number of partners regularly – updating and analyzing gigabytes of data across all of its customer servers on a daily basis.
- Complex analytics processing – customers receive results of complex analytics performed on large amounts of data requiring the use of dashboards as well as complex “deep-dive” analysis.
- Customer response time – providing a great customer experience from their main dashboard system with fast response times for user dashboards and deep-dive analytic requests.

SafePeak Implementation Results

EEDAR installed SafePeak software on a virtual cloud server, which acted as an automated dynamic caching proxy between the application servers and the SQL Server. No software modifications were required to either the application or to the SQL Server database.

EEDAR configuration tuning lasted less than a day. Performance was significantly improved, as measured by different aspects and applications:

- *90% database load reduction on average and 95% load reduction at peak times*
- *Data access speed of queries was reduced from 5-30 seconds to 0.0005-0.010 second*
- *Web performance improvement reached 200% (from 45 seconds per page to 15 seconds or less)*
- *SLA during peak hours remained the same as during off-peak hours (previously the SLA performance was worse during peaks, due to load)*

And perhaps most importantly, EEDAR achieved significantly better customer satisfaction as reported by customers.

