ScaleArc

Application Note

Achieving Zero Downtime and Accelerating Performance for WordPress

Executive Summary

WordPress is the world's most popular open source website content management system (CMS). As usage of your website increases, accelerating WordPress and its interaction with the underlying MySQL database becomes crucial to maintaining your site response time.

Traditionally, organizations have relied on directly modifying applications to improve database performance. For WordPress, that scenario is challenging for many reasons, including keeping up with frequent platform updates, as they are critical to ensuring the security of your website. As a result, acceleration approaches that rely on code-level application tuning take considerable time and resources, because every time a new security update comes out, you may need to re-modify the code or merge code with the new version before you can update WordPress.

Database load balancing software from ScaleArc provides a compelling alternative. ScaleArc deploys transparently between an application and a SQL database to improve application performance and availability, needing no modifications to the application accessing the SQL database.

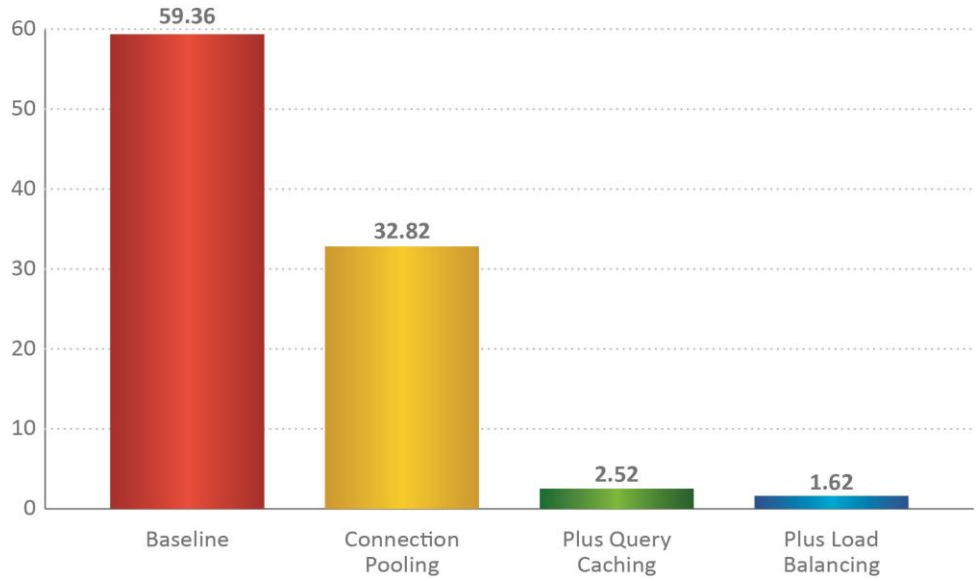
ScaleArc has developed database load balancing software for MySQL, SQL Server, and Oracle database servers. Deployed in conjunction with WordPress and MySQL, the ScaleArc software instantly improves WordPress performance, allowing the WordPress-based site to scale to potentially support millions of visitors without any changes to the platform.

Testing shows a reduction of average query response time from nearly 60 milliseconds (ms) to just above 1 millisecond (ms) as successively more ScaleArc features are enabled, as shown in Table 1.

Without ScaleArc, incorporating advanced features to gain these response-time improvements would require building support for connection pooling, load balancing, and query caching directly into the application. With ScaleArc, organizations can deploy the software in just a few hours, and their "out of the box" WordPress environments can gain an almost 60-fold improvement in application database performance.

This application note details how organizations can leverage the ScaleArc software to quickly and easily improve WordPress performance.

Table 1: Query response time



This table illustrates how query response time, measured in milliseconds, decreases as more ScaleArc features are enabled.

WordPress Overview

WordPress is the world's most popular open source website content management system (CMS). With more than 4.2 million live installations and 50% market share,[1] WordPress is the de facto standard for web site design, development, and delivery. WordPress is written in PHP to run on MySQL database servers. This combination provides a capable, expandable, and feature-rich platform for hosting dynamic web sites responsive to the needs of content consumers and creators as well as site administrators.

WordPress Challenges

Although WordPress presents a simple interface that shields users from its details, optimizing it for improved application performance is difficult. Among the challenges:

[1] Water & Stone, 2011 Open Source CMS Market Share Report, November, 2011.

- **Architectural complexity**: The web server, database, and WordPress engine all work together to deliver applications. Each has its own nuances and presents its own opportunities for optimization.
- **Lack of performance insights**: Architects and developers must be aware of dozens of factors affecting performance and often lack the tools needed to determine the performance bottlenecks for a given WordPress site.
- **Resources needed for database tuning**: At the database layer, optimizing MySQL requires specialized development. Improving performance via database replication requires patching WordPress to selectively issue read and write requests to different servers depending on the replication architecture,[2] diverting valuable engineering resources.

Customer Spotlight

SpinMedia

SpinMedia is the world's largest collective of pop culture and music digital brands, garnering 34 million unique visitors consuming more than 400 million page views each month. The company's 45 digital brands include the WordPress-based sites Buzznet, Celebuzz, Idolator, SPIN, The Frisky, The Superficial, and Vibe.

As the popularity of its websites increased, SpinMedia needed to scale throughput, but database scale out requires app modification, which isn't possible with packaged applications like WordPress.

SpinMedia turned to ScaleArc for transparent scalability. Deployment brought an immediate boost, speeding page load times and improving availability. SpinMedia has now designed ScaleArc into its next-generation web hosting architecture.

Database Load Balancing Software – The Simple Alternative

Just as web load balancers abstract applications from web servers and provide a platform for performance optimization, database load balancing software improves application availability and performance for SQL databases without needing any changes to the application accessing the database.

Database load balancing software inserts transparently between applications and SQL databases, providing a range of features that increase application response time, simplify high availability (HA) architectures, and provide real-time analytics into SQL queries.

[2] Using Replication for Scale-Out, Section 16.3.3, MySQL 5.6 Reference Manual.

ScaleArc offers database load balancing software for MySQL, SQL Server, and Oracle databases. Leveraging this software in WordPress and MySQL environments offers an ideal solution for improving WordPress performance.

Among its capabilities, the ScaleArc software can provide functionality such as:

- **Read/write split**: ScaleArc automatically directs read requests to replication Slaves and writes requests to replication Masters. No change within WordPress itself is required. This approach allows you to use your hot spare slave to serve read traffic, using what would otherwise be idle, redundant capacity and improving performance.

- **Load balancing**: ScaleArc automatically balances requests among a pool of database servers using a dynamic load-balancing algorithm that sends more load to the server that is likely to respond the fastest. WordPress does not need to track how busy (or free) various servers are within the pool.

- **Automatic failover**: ScaleArc can automatically detect server failures and redirect load to a second master, if one is available, or even safely promote an existing slave to become the new master. It does so in a transactionally consistent manner, maintaining ACID compliance and keeping your data safe.

- **Connection pooling**: ScaleArc automatically pools requests from multiple WordPress sites and ensures that database connections are used in the most efficient manner possible. This capability allows you to add many more web servers, without having to worry about running out of database connections.

- **Query result caching**: ScaleArc automatically caches SQL queries on a per-user, per-query basis. Repeated requests for the same item, such as a site's home page, are subsequently retrieved from memory cache rather than disk. Caching both the most common queries, such as requests to the content and comment tables, and WordPress configuration tables – even for periods as short as one minute – drives a massive boost in performance.

- **Full SQL logs**: ScaleArc automatically logs all successful and exceptional activity between WordPress and a collection of MySQL servers to offer a single point for data collection.

- **Real-time analytics**: The ScaleArc software includes visual graphing tools to help administrators and developers analyze site operations dynamically in real-time.

Benefits of ScaleArc Software

The ScaleArc software offers site administrators and developers the following benefits:

- **Immediate performance gains.** The combination of read/write split, load balancing, pooling, and caching traffic between WordPress and MySQL offers an immediate performance improvement, well beyond that available with any single optimization approach.
- **Application transparency.** Implementing the ScaleArc software requires only administrative changes – no WordPress or other code change is required. Once MySQL server replication is configured, optimizing another WordPress site requires only a connection reference change.
- **Development and operations de-coupling.** Administrators may determine which database servers are masters without involving WordPress. Administrators may allocate servers based on seasonal performance load. Developers can use the simpler single-threaded design pattern, even if administrators find a more complex architecture is needed.
- **High availability.** ScaleArc offers a fault-tolerant, high-availability mode that can provide "five nines" (99.999%) uptime. This architecture is critically important for 24x7 website operation, especially in commerce, content delivery, and media industries.
- **Reduced cost.** Since ScaleArc optimizes performance at the SQL query level, it is effective across the entire database infrastructure with all storage engines simultaneously. Site administrators also save money because they don't need to invest in versions of MySQL that perform thread pooling.
- **Analytics and logging.** Detailed reporting provides up-to-the-minute problem and status metrics, going well beyond simple "go/no go" testing. This real-time data provides insights for avoiding congestion problems before they happen.

See the Gains in your Environment

To get a better feel for how the ScaleArc software works, you can watch a **brief animation** on our website. But the best way to see what ScaleArc can do for your WordPress environment is to try it out. Request a **free trial** on our website.

Also check out our detailed **WordPress Deployment Guide**. It provides each step needed to deploy ScaleArc to improve availability and performance on WordPress.

ScaleArc

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ScaleArc is the leading provider of database load balancing software. The ScaleArc software inserts transparently between applications and databases, creating an agile data tier that provides continuous availability and increased performance for all apps. With ScaleArc, enterprises also gain instant database scalability and a new level of real-time visibility for their application environments, both on prem and in the cloud. Learn more about ScaleArc, our customers, and our partners at **www.ScaleArc.com**.

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