

Scaling Drupal with Confidence



Company Summary

- Organization: Lifetime Digital
- Industry: Media
- Type of Drupal Sites: Entertainment, community forums
- # of Drupal Sites: 6
- Page Views per Month: 50 million
- Visitors per Month: 6.5 million

Drupal Success Stories

The Lifetime Digital case study is the first in a series of papers highlighting Drupal success stories. Lifetime is not an Acquia customer and Acquia was not involved in the project to build their website.

The purpose of these Drupal case studies is to share details on how enterprises have built beautiful, high performance, enterprise-scale websites using Drupal.

Lifetime Digital Case Study

Lifetime Networks, the most powerful media brand targeted to women, is a diverse, multi-media company, committed to offering the highest quality entertainment and informational content that celebrates, entertains and supports women. Through its award-winning public affairs initiatives, the Company also advocates on a wide range of issues affecting women and their families.

In addition to myLifetime.com, Lifetime Digital offers a family of related sites, including Roiworld.com, DressUpChallenge.com, LMN.tv, LifetimeMoms.com and MothersClick.com. Lifetime Networks depends on the myLifetime® family of sites to better connect with television audiences, and grow a community of dedicated fans of television series such as Project Runway®, Army Wives™, and Drop Dead Diva™. Several of these sites reside on a shared server environment, while others, such as their “Dress-up Challenge” reside on separate servers.

Established Volume

Among the top 500 most visited sites on the Internet, myLifetime.com receives 6.5 million visitors (3.6 million unique) and 50 million page views per month. Because of online campaigns, and the popularity of associated television shows, the Lifetime family of sites must be prepared to accommodate significant volume spikes. Nathan Potter, VP of Digital Media Technology at myLifetime.com, cites show-related volume spikes of 150,000 page views per hour as within the normal range of traffic. The site has been load tested to levels of over 500,000 page views per hour directly to the Drupal servers.

The site development team has been tasked with building and tuning a Drupal-based architecture that is scalable enough to withstand high volume, while flexible enough to quickly build new site areas around programming and campaigns.

Scalability Challenges

- Tied to programming – difficult to anticipate
- Promotional subsites drive specific traffic
- Sporadic volume spikes
- Separating anonymous and named user traffic
- Traffic increases require ongoing database query tuning

Building in Scalability

Nathan recalled the state of the site as he stepped in to take over management after the transition from custom PHP to a Drupal architecture. “Our development team had to quickly change gears, as we made some adjustments to improve reliability and scalability. Drupal does not simply deliver enterprise scalability out of the box. That said, one of Drupal’s greatest assets is a flexible architecture that is responsive to scaling efforts. We have been able to build out our implementation without substantial resources, and build a reliable infrastructure that meets our traffic demands.”

Drupal’s scalability can be understood in terms of the evolution of independent, developer-generated modules and functionality. A given Drupal module may work fine in a lower volume environment (50,000 visitors), but may not hold up to higher volumes. Typically, independent developers design, build and test new modules in an independent environment. Specifically, in a community such as Drupal.org, a developer will release a beta candidate, and many testers will look for bugs independently. This is a highly effective model for feedback and bug-testing, but does not necessarily prepare modules for volume intensive environments.

To address scalability, Lifetime Digital adopted a set of best practices to build in additional performance. Running MySQL logs and j-meter help the team to determine which modules are behaving as the weakest link. Based on those findings, the team added extra database indexes, and rewrote database queries.

While putting scalability testing and performance tuning in the hands of the internal team might seem counter-intuitive for enterprise customers of large proprietary content management systems, Nathan cites some flexibility in doing so, “Because we are testing and tuning in our own environment, we don’t have to submit a support ticket, and wait for the vendor to work on a fix. We also don’t have to have our performance improvements chalked up to ‘future enhancements’ for a subsequent release.” myLifetime.com is also a site that enjoys rapid, sustained growth. Scalability testing has to be a process, rather than an event. Because the software investment is based in testing and development, Nathan’s team is free to continuously test for scalability. As a result, the site is growing along with its audience.

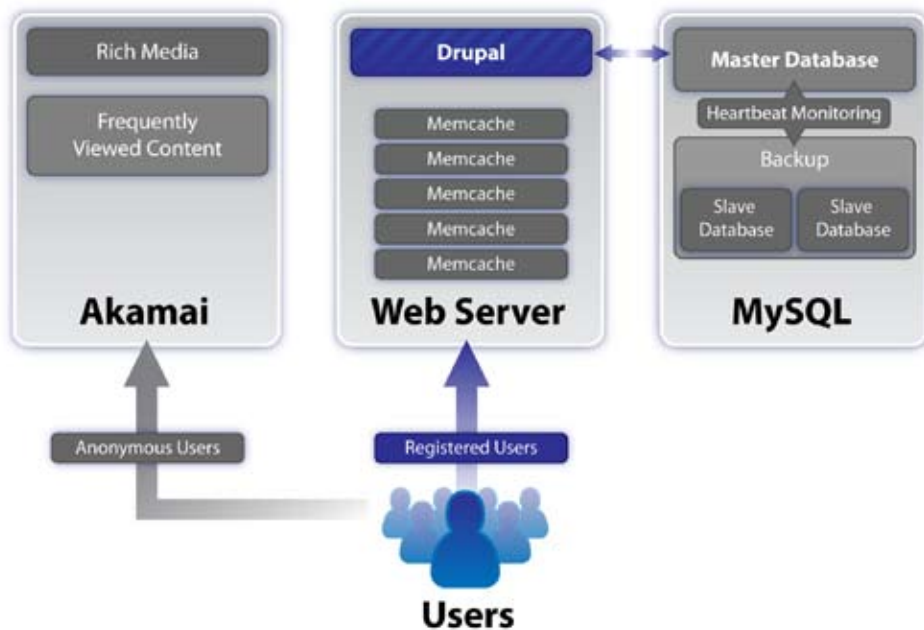
Drupal is built on a platform with many developers working on similar issues. Drupal’s wealth of shared information can accelerate troubleshooting and enhancements, as opposed to custom built solutions where the only experts available are the solution architects themselves.

In addition, as larger organizations begin to consider Drupal for applications with high volume demands, a new breed of developers and organizations are emerging to directly address these concerns. Commercial software and support providers such as Acquia review and test modules in a rigorous environment. These organizations are bridging the gap between the flexibility of open standard technology, and the support delivered through traditional commercial software offerings.

Site Architecture

The myLifetime.com sites run on a platform that includes Red Hat Enterprise Linux, the community version of MySQL, and the most current version of Memcache. The myLifetime.com site runs on a combination of Drupal 5 and 6 – the main site currently runs on Drupal 5, with community sites running on Drupal 6. Both Drupal 5 and 6 have met scalability needs, and Nathan provides some insight into their approach to upgrading. “We have found no technical barriers to managing 5 and 6 in parallel, and we don’t see the need to upgrading just for upgrading’s sake. As we find reasons to rebuild and design portions of the site running on Drupal 5, we use that opportunity to move those sections over to Drupal 6 in the process.” Lifetime Digital employs rewrites to Apache, the open source webserver, to help manage content running in different areas of the site, regardless of Drupal version.

As Lifetime Digital began to address the performance of their site infrastructure, they recognized the need to improve how caching was handled, and the performance of their database architecture.



Addressing Database Architecture

It was quickly determined that their existing single database approach was not going to meet their needs. As testing and development continued, Lifetime Digital moved to a more robust and scalable database model, including a master database, a backup database, and 2 slave databases. Introducing database replication provided much-needed load balancing. Heartbeat monitoring is used to manage the load between the master and the backup database.

Leveraging Akamai for Performance

Akamai provides caching tools used by many of the most visited destinations on the Internet, including Drupal-powered sites. Lifetime Digital utilizes Akamai technology for caching of rich media and for anonymous users. Anonymous user caching allows Lifetime's entire Drupal site to be bypassed for anonymous traffic. As a result of this partnership, Lifetime Digital was able to successfully manage the heavy traffic generated by the Lifetime Network debut of the highly popular Project Runway® series.

While re-architecting the database infrastructure, Lifetime Digital also performs ongoing database tuning, specifically looking at how queries are constructed and submitted. New queries are reviewed before they are introduced, and existing queries are also reviewed. Frequently, as the site increases its traffic, previously acceptable queries begin to slow down the database. Query tuning is part of regular site testing for myLifetime.com.

Caching for Performance

It became clear that myLifetime.com would not meet volume requirements without utilizing memcached servers. In the process of re-architecting the site to establish scale, Lifetime Digital introduced 5 memcached servers, enabling them to speed up dynamic web applications and content delivery.

Drupal's relationship to Akamai is similar to many large commercial content management systems and other custom applications. A premier content delivery provider, Akamai can serve 90+% of static content to anonymous users. In this way, Drupal can leverage lightweight pages intended for anonymous users. Lifetime Digital currently uses two levels of Akamai subscriptions. The first is a media asset caching system that serves images from a local caching Point Of Presence (POP) rather than Lifetime's servers. The second performs full page caching, which segments and invokes caching behavior according to authenticated and anonymous users. A cookie determines if the visitor is anonymous or not; if determined to be anonymous, Akamai bypasses the entire Drupal site, and serves up the cached static content directly.

As mentioned previously, Lifetime Digital has sites using shared site resources, as well as independently hosted sites. This segmentation is based upon the number and percentage of authenticated to anonymous users. While most of the sites are visited primarily by anonymous users, several specific sites have a much more even mix. Contest and game driven sites are visited by up to 50% authenticated users. Because caching and performance demands are different for these types of specialized sites, Lifetime Digital has placed them on separate servers to optimize performance for the family of sites as a whole.

As volume continues to increase, Lifetime Digital is looking at opportunities to increase the role of caching to deliver content to authenticated users as well, including the use of Fast Page caching, which is designed specifically to improve caching for logged in users.

Supporting myLifetime

The myLifetime.com site is supported by 5 full time developers, 3 project managers, and a consulting company based in India. This staff is responsible for establishing scalability, as well as building the custom modules on which myLifetime.com primarily relies. Scalability tests are frequently run using j-meter. Testing is administered both to single servers, as well as across the entire server stack, during off-peak hours. The India team's hours of operation are well suited to incorporate off-peak testing into standard site maintenance practices.

Because Lifetime Digital has avoided a proprietary web content management system, it realizes the benefit of greater flexibility, and a lower cost of ownership. By being able to allocate more of their budget into hardware and open-source platforms, Lifetime Digital is confident that this approach will enable them to continue to meet traffic requirements.

Scaling with Confidence

As a platform, Drupal is not built with a preset volume of traffic or throughput, nor does it set limits on scalability. With its flexible structure, Lifetime Digital developers were able to build enterprise level scalability for the 500th most visited site on the Internet. By building out a server farm that includes backup and slave databases, implementing heartbeat monitoring, and tuning database queries, Lifetime Digital dramatically improved the scalability of their sites. Lifetime Digital built on these database improvements with multiple memcached servers to improve the efficiency with which content is served to users. Akamai's content delivery service further improved this efficiency by detecting and providing separate caching behaviors for logged and anonymous users.

The current version of Drupal offers many opportunities for organizations to build and strengthen scalability. As the platform matures, many developers are eyeing opportunities such as scalability, rather than any particular module. Database sharding is a prime example of Drupal development moving towards greater performance. Sharding the database will allow it to reside across multiple physical machines – effectively removing a traditional barrier to scalability.

Conclusion

What is important to understand about Drupal and scalability is that while there are opportunities for improvement, Drupal has the agility to meet challenges at the pace of innovation. Organizations like Lifetime Digital understand there is a sea change in thinking about software investment and ownership. The roles and responsibility over the site are brought back within the organization.

By adopting Drupal, Lifetime Digital has virtually eliminated software licensing costs. In doing so, budget resources can be invested in superior hardware, top-shelf caching and maintaining a staff of in-house developers. It could be argued that a traditional software vendor better addresses performance, but myLifetime.com has proven the opposite. At Lifetime Digital, web properties are critical extensions of the Lifetime brand, and instrumental to their business. To ensure a maximum return, Lifetime Digital has invested the resources and staff to make Drupal and related infrastructure scale to meet their needs. The move to Drupal is considered a success, and Lifetime Digital considers its current Drupal architecture more than capable of meeting the high traffic demands of its popular family of sites.

Lifetime's Drupal Benefits

- Lower cost of ownership versus proprietary
- Savings can be reinvested into support expertise and hardware
- Combines the savings of "build" strategies, with the stability of a "buy" strategy
- Flexibility provides agility to keep pace with broadcast programming changes



The flexibility of open-source allows the team to quickly make modifications and tune performance according to the rapidly changing entertainment interests that drive visitors to their sites. The agility and reliability that myLifetime.com has achieved through Drupal would be much more difficult to realize in a custom environment, and much more costly through proprietary software.

Due in large part to the collaborative nature of open-source software, the successes that sites like myLifetime.com realize will help pave the way and raise the bar for enterprise Drupal implementations to follow.

About Acquia

Acquia helps organizations of all sizes build social publishing websites quickly, easily and with a lower total cost of ownership by leveraging Drupal, the Open Source social publishing platform that blends content and community. Our products, services and support enable companies to leverage the power, technical innovation and economic value of Drupal while simplifying the experience, removing the complexity and minimizing the risk. Please visit: <http://acquia.com>. Download Acquia Drupal, the completely free Drupal distribution, at <http://acquia.com/downloads>.

About Lifetime Digital Media

Lifetime Digital Media, the ultimate digital source for women's entertainment, escape and play, reaches women wherever and however they connect, play and share. Combined with the reach of the Lifetime Networks, Lifetime Digital Media provides sponsors an unrivaled opportunity to reach women with a powerful, singular-branded experience across all platforms. More than 3.6 million women per month (May, 2009; ComScore Media Metrix) visit Lifetime Digital's robust properties (myLifetime.com, Roiworld.com, DressUpChallenge.com, LMN.tv, LifetimeMoms.com and MothersClick.com) and consume Lifetime's content on mobile devices and partner platforms. MYLIFETIME and the LIFETIME logo are registered trademarks of Lifetime Entertainment Services, LLC. All other trademarks are the property of their respective owners.