



Zend Provides a Foundation For CDS Global's Continuous Delivery Process

CUSTOMER:

A subsidiary of Hearst Corporation, CDS Global provides outsourced business solutions to hundreds of brands in the eCommerce, fulfillment, order management, payment processing and marketing verticals. The company, which has been operating for over 40 years, is headquartered in Des Moines, Iowa, with offices in 14 global locations. The company employs 2,500 people worldwide.

CHALLENGE:

Implement Continuous Delivery best practices for a large, sophisticated Magento app in a VMWare environment, so that bi-monthly releases could happen in a fast, automated fashion with high quality and minimal bugs.

SOLUTION:

Implemented end-to-end continuous delivery with Zend Server. Adopted Zend Server clusters on VMWare, integrated with Jenkins CI to manage the deployment pipeline. Standardized and automated deployment across environments by leveraging Zend Server's Automation APIs.

Many Moving Parts

As one of the top magazine fulfillment service bureaus in North America, CDS Global runs a large operation with a multitude of customized products. To handle the demands, the company's subscription order management system is built to be fast, streamlined and capable. The system sits on top of Magento Enterprise Edition 1.13 and enables customers to buy digital subscriptions individually, in custom bundles or packages, and at customizable loyalty levels, like gold versus platinum customers. It keeps track of when each subscription expires, as well as when recurring orders and payments are due. A single publisher's customer can have different subscriptions for different products at different levels, and can get an estimate of what the effects of a subscription or level upgrade will have on his or her monthly recurring payment.

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"With all of our Magento code, community codebase, enterprise components and about 280MB of application code, we have a lot to package and move around across servers," said Luis Colón, Director of Enterprise Architecture at CDS Global.
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Starting in early 2012, CDS Global decided to implement Continuous Delivery, for which they leveraged Zend Server's automation capabilities. Colón explained:

"The expectations of software customers today are different. I remember the days when it was permissible to release code once a year, and to not have certain degrees of automation. The game has changed. Today customers are connected everywhere, and they want instant connections without sacrificing quality. I really cannot imagine how to address that expectation without adding the automation and good processes of what we've come to call Continuous Delivery."

"DevOps has also changed," he said. "In the traditional scenario, the programmer who codes and solves business problems with features is separate from the ops person who keeps systems running. Now DevOps forces the traditional admins to know more about the codebase, and vice versa – coders must understand a lot more about operations than they had to in the past."

The Trouble with Manual Processes

Continuous Delivery enabled CDS Global to streamline their DevOps processes and meet the expectations associated with iterative releases. Establishing Continuous Delivery, however, took time. At first, the system was full of manual processes. While unit- and database tests

were automated, developers still had to manually assure that application packaging builds were properly implemented and going to the right server. “It was very painful,” said Colón. “When you have three dozen production, application, database, QA and other servers, it’s a challenge for sys admins to keep up, unless the process is automatically scripted.”

“It was rare to see three releases in a row go without a hitch,” he said. “We’ve always had three to four two-week sprints where we coded a lot of features at once. Those two-week launch windows get very small when you have to release code and put out patches for as many servers as we have. After the first set of sprints, we would have to take another sprint just to fix all the bugs.”

“We realized that it was better to not have to do that extra sprint of bug fixing in the first place. We had to find a way to stay on top of our bugs, and that is what Continuous Delivery does.”

Continuous Delivery to the Rescue

Today, CDS Global has built a Continuous Delivery environment that has most of its best practices in place. It includes continuous integration with automated testing- and app deployment; app monitoring and management, and other performance benefits. CDS Global adopted Zend Server in order leverage monitoring, troubleshooting and logging, and gain access to Zend’s PHP support. In addition, Zend Server has provided scalability and performance benefits for the CDS application.

Continuous Integration with Automated Testing and App Deployment

The CDS Global team has developed thousands of automated unit tests, component tests and Selenium browser tests that verify almost every task, from database updates to API calls. A combination of programs, including: Ant, Maven, Mercurial, Selenium, Fitnesse, and Jenkins CI with custom plug-ins, are used for ongoing regression testing.

Once these tasks are completed, Zend Server provides automatic provisioning and configuration control for CDS Global’s Magento app. The team can validate dependences and rollback versions when needed. The ability to manage and provision virtual host configurations cluster-wide—enabling users to automatically receive the proper virtual host configuration and automatically distribute changes across the cluster—adds an additional degree of automation.

“With automated testing, we catch a lot of the issues in our software before a customer touches it,” said Colón. “We have a lower chance of bugs being introduced into the environment in the first place, and a much lower chance that they’ll make it all the way to production. If a business user does find a critical bug in GA, we can push that bug to

resolution in an automated, orderly fashion in less than a day, without cutting corners or circumventing procedures.”

“Our provisioning scripts and the fully laid-out functionality of Zend deployment eliminated a lot of manual processes. Between Zend Server and Zend’s ongoing support, we’ve also gotten a lot of experience on how to do better performance testing. We also proactively monitor Zend’s contributions on places like GitHub to continue to improve our processes.”

App Monitoring and Management for Fast Feedback

As part of the Continuous Delivery process, CDS Global uses several layers of app monitoring, from an external view to network-level. The company uses metrics in performance testing runs that integrate Jenkins CI as a build master. The team closely tracks the status of each build on the Jenkins grid, which shows the pipeline for each process, and where processes are breaking during unit tests. Each action in the Magento app is reflected in multiple server logs. Zend Server’s monitoring dashboards let the company gauge application health at a glance. Users can view each application’s performance over time and across the cluster, as well as set caching and monitoring rules for each app.

“Our sys admins gravitated towards the monitoring built into Zend Server that gives them a sense of how healthy servers are and where apps appear to be inefficient, such as memory usage and function execution,” said Colón. “That gives us the constant feedback loop that is important for Continuous Delivery. When a server log shows issues, sys admins can go into Zend Server and correlate when and where the issue happened. Zend Server also helps us identify memory-hungry apps so that we can code them to be more efficient. In many cases, strategic use of cache in complex transactions has made a big difference in response times.”

“We’ve done a lot of training and mentoring on proper use of the Continuous Delivery pipeline, because it’s important to get everyone to buy in,” said Colón. “Today, as a result, a lot of IT employees take for granted how quickly we can push code from a BA (Business Acceptance) server stage into production and make critical bug fixes.”

“The key is to put your effort into the accurate, quality metrics that actually help you,” he said. “Those metrics are worth the effort.”

Other Performance Benefits

CDS Global also accessed Zend Server’s enhancement tools that help optimize the performance of applications at multiple points in the application request, from bytecode caching in the PHP engine, to job

queuing, to data and full-page caching. In particular, the company saw benefits from Zend Server Job Queue, which helped with batch processing and converting the application's subscribers. "The parallelization of the processing of tasks in our application using Job Queue is a big part of how we've been able to scale the website to handle hundreds of thousands of customer activity," said Colón.

"The number of failures has gone down," he added. "I see a lot of two-week and monthly releases happen without incident. These days, we generally won't see a release-related problem for eight releases or so, even accounting for urgent patches. Overall, we are able to release with fewer risks."

Ongoing Improvements

CDS Global has seen great success with Continuous Delivery.

"We've found that Continuous Delivery and agile practices are intertwined," said Colón. "When you're doing things manually, people tend to wait for the process to finish. With automation and Continuous Delivery, you can reverse that relationship so that the process is waiting for people."

"It has had a positive effect on our SLAs," he said. "We can release relatively quickly and make changes fast. We can respond quickly with a high level of quality. Our admins don't have to scramble to figure out fixes when we have problems—they can just stick in a readily deployable script that works every time they run it. Those benefits have a very significant effect on SLAs."

In addition: "The instant feedback we get from Continuous Delivery

lets people schedule their work and programming more effectively. Rather than adapting to restrictions that are in place—which forces people to schedule their work around those restrictions, such as slow testing—people are freed up to focus and collaborate on different things."

CDS Global continues to incrementally improve on its Continuous Delivery process. For one, the team is looking into how much CDS can speed up tests by pushing them into the cloud. For example, their Architecture team has already prototyped a version of their code using Amazon's AWS Cloud, including using Zend Server 6 in an auto-scaled EC2 cluster, and reusing many of their deployment script logic in the cloud. This promises many future opportunities for the maturation of the products, including more cost-effective Disaster Recovery procedures, running faster builds and test suites on elastic server clusters, and further deployment automation that benefits IT operations and development teams in significant ways.

"We continue to underestimate both how quickly the number of tests increases and how inconvenient it can be to perform tests as quickly as possible," said Colón. "It's a race that you have to engage in terms of how many tests you run and how quickly to get that continuous feedback."

"Part of the job of a well-rounded developer is knowing that you have no excuses," he said. "You have to test, you have to write the right type of documentation and you have to automate."