



The PHP Company

# Application Leadership in 2013

*DevOps: Agile Delivery for Competitive Edge*

**February 2013**



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# Introduction

What does it take to be a market leader? In today's fiercely competitive landscape, application leadership holds the key. Modern web and mobile applications are the new face of business and a key driver of revenue, and agility is the new competitive edge.

## Agile World

Today's business leaders are looking to their IT organizations to deliver high quality, revenue-generating applications within the context of an agile world. The era of marathon projects to launch monolithic applications on a single platform is giving way to mobile-first strategies and rapid, iterative application releases on multiple platforms and devices. The application lifecycle is now characterized by a complexity, scale and velocity never seen before.



In the midst of a merger, NYSE Euronext<sup>1</sup> brought in a new COO, who asked his team to reduce a 2-year web development cycle and deliver iteratively on a 2-week production cycle. They adopted agile methods and a new web application platform, and achieved this goal, releasing 40 new business-critical apps in 18 months.



Pinterest<sup>2</sup> saw online visits to its 'pinboard' social network skyrocket by 5,124 percent to more than 28 million per week during its second year of business. They were able to support rapid growth through automation, agile tools and strong collaboration between developers and operations.



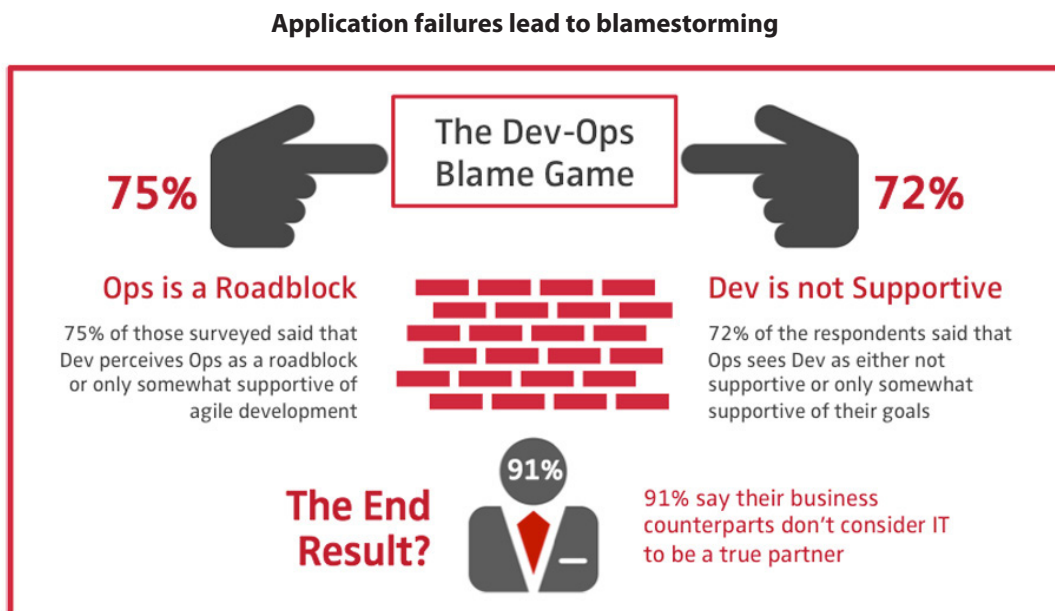
At Facebook<sup>3</sup>, application releases are now conducted twice a day. While few companies manage projects of Facebook's scope—with its 700 developers, 1.5GB of binary code, and many thousands of servers supporting one billion users—for most companies the ability to manage fast, reliable releases transparently to users is still just as vital to their business competitiveness.

## Applications in Crisis

While these examples underscore the kind of leadership that can be achieved with successful adoption of agile methodologies, the reality for most organizations is quite different. To be sure, the shift to agile has been welcomed by developers, who are tasked with innovation and change, but what about the operations teams who must maintain high availability, stability and security of business-critical apps in production?

Agile development and continuous iteration places new demands on operations to support continuous delivery, in which small changes are released often and apps must be tested on an ongoing basis. This has created a major disconnect between development and operations and given rise to a crisis of application delays and failures. In a recent survey<sup>4</sup> of development and operations professionals, 50% admitted missing application release dates altogether.

Organizations that embrace agile development while relying on disconnected operations processes are making the painful discovery that the value gained from agile development will be lessened without agile delivery to support it.



Source: ITSM/Serena.com 2012 study of IT professionals<sup>5</sup>

## Bridging the Development and Operations Divide

Recently, DevOps has emerged as a way to bring down the invisible wall that has traditionally separated development and operations, and replace it with automation and collaborative workflow. According to research from Carnegie Mellon University<sup>6</sup>, the leading causes of application failure are directly related to issues that development and operations teams must solve together—including failed software upgrades, inability to scale to meet unforeseen demand, resource exhaustion, configuration errors and poor diagnostic support for application errors.

In the following pages we'll look at how Dev and Ops professionals can work collaboratively to embrace agile approaches, and bring innovations to market faster.

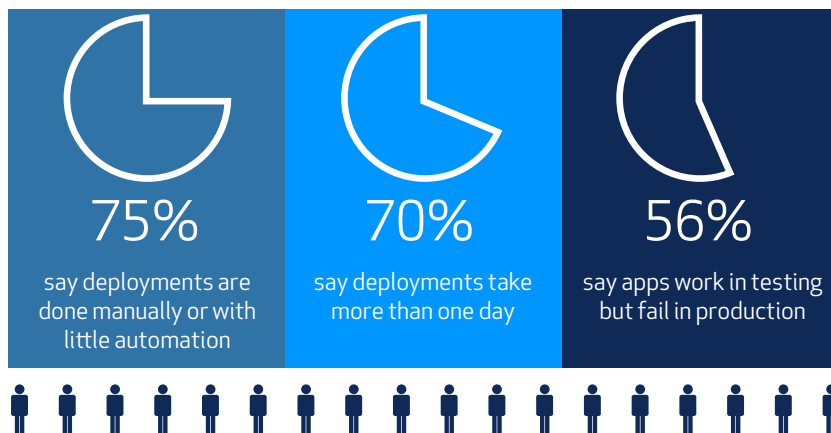
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# Flagship Deployments

## Establish leadership with early, rapid and iterative application releases

Here's a scenario many organizations experience with the release of new applications. As a new application approaches its launch, developers finish the code, check in final changes, and toss the code over the proverbial wall to operations. Without a collaborative approach or an automated process for hand-off from dev to ops, developers must take the time to generate manual instructions. This can be a painful process and developers may not have full visibility into everything the operations team needs to know. Inconsistent environments across development, staging and production add further complexity to the situation.

The application may have complex pre-requisites such as updates to database schema, configuration changes, and new versions of support libraries—all of which must be handled by the ops team in a specific sequence as part of the deployment process. Often they are forced to follow manual process steps, which can introduce errors and delay the smooth progress of an application from development and staging through production. There is always the chance that instructions are incomplete, and the ops team may not understand what questions to ask of the developers.



Source: Channel Insider.com, July 2012<sup>4</sup>

### DevOps Collaboration Drives Release Success

To move releases from dev/test to production faster and with less errors, Dev and Ops teams need an application platform where applications are packaged with automated deployment processes baked in, so the hand-off from Dev to Ops teams can become seamless and efficient, with less risk of deployment process errors that can harm code quality, reliability and performance.

With the right application platform, the developer can write scripts that incorporate all of the necessary application pre-requisites and are packaged with the application code itself. These scripts are executed during development and test as new QA tasks are performed. The result is tested deployment processes that when executed on the operations side—as when the application is pushed out to a production system—arrive complete with the correct configuration of libraries, and extensions.

In addition, when Dev and Ops teams have shared real-time visibility into an application's performance at the point it is moved into production, they will know immediately if its behavior is any different than it was in the dev/test environment.

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# The Challenge of Rapid Scale

## Align Dev and Ops to support business goals together

Once a flagship application is successfully launched, what does it take to sustain it? Whether an app is customer-facing or internally-focused, sustained user engagement requires a consistently positive user experience. This can be especially challenging when web sites and apps are impacted by what has been referred to as 'the Oprah effect', where traffic can surge to hundreds of thousands or millions of visitors within a 24-hour period following mass media promotions or endorsements. The same holds true for sites whose companies are impacted by major news, holiday season traffic or any kind of anticipated or unforeseen spike in traffic volume.

Take the case of Netflix, which suffered a service delivery failure<sup>7</sup> in 2012 that prevented customers from ordering movies online during the busy Christmas holidays. Netflix is among Amazon's high-profile customers for their cloud backend services, possibly generating Amazon's highest traffic volume. This was the second time in six months that an Amazon outage (this one was later attributed to a load balancing issue) brought Netflix service delivery to its knees, and its reputation and revenues suffered as a result.

When apps gain traction and then fail to perform as expected under load, it can be difficult to understand the source of scalability issues. This is particularly true in siloed environments where Dev and Ops teams lack a common view of app performance. Working together, they need to understand: what it takes to scale an app quickly to meet demand spikes, how performance can be optimized across all stages of the request/response cycle, and if it occurs, what is slowing an application down after it moves into production.

In a high tech industry study<sup>8</sup>, 89% of consumers began doing business with a competitor following a poor customer experience.

### DevOps Collaboration to Support Scale

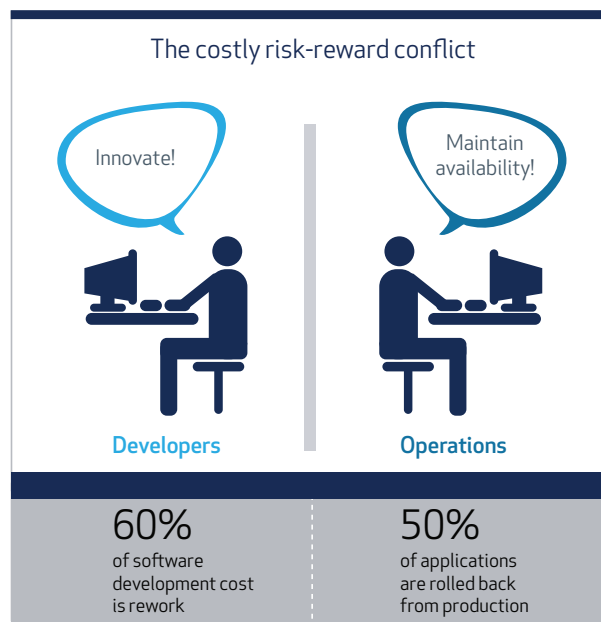
To deliver the best possible service to customers during peak traffic, DevOps efforts must be aligned with this goal and supported by a common application platform that delivers on-demand scalability and fault tolerance.

- Begin by thinking about infrastructure and application requirements for auto-scaling both on premise and in the cloud. Ensure that the infrastructure can flex to handle variable loads while maintaining high availability.
- Equip developers with tools to build apps from the ground up that can scale to meet the demands of today's mobile, global and social world. For example, building in support for parallelizing tasks and avoiding bottlenecks during scale up, and optimizing performance across the full HTTP request/response cycle.
- Provide Dev and Ops teams with shared visibility into app performance in production with automated monitoring and management capabilities built in. With access to common dashboards, both teams benefit from real-time monitoring and alerts so they can respond quickly to resolve performance issues.
- Continuous monitoring helps Dev and Ops teams to track usage trends, gaining deeper insights into application behavior through time, which can benefit iterative development.
- In agile development, the desired metrics for an app can be specified as part of the deployment package before its hand-off to the ops team. An app platform should support integration with common monitoring tools so metrics can be viewed through existing dashboards and management consoles in the IT environment.
- Seamless application failover helps ensure high availability of web and mobile apps around the clock.

# App Health and Longevity

## Balancing the need for velocity and quality with stability and security

While developers are tasked with rapid, iterative development of high quality apps, the operations team still needs to maintain a level of control for the sake of stability and security for applications in the production environment. And yet a recent study<sup>9</sup> showed that 60-80% of software development cost involves rework, and up to 50% of applications released to production are later rolled back. One team's reward is the other team's risk, leading to conflict and finger-pointing when things go wrong. One goal of DevOps is to balance the risk-reward conflict and help these teams collaborate on problem-resolution for the sake of application health and longevity.



Source: IBM<sup>9</sup>

It's not unusual for a new problem to crop up in an application months after its launch. What if an app begins to fail suddenly and inexplicably, but the original developer has moved on to another project and the original dev/test environment has been redeployed? The current developer must first recreate that environment and then attempt to replicate the issue. Without visibility into the production environment, the developer may not know if he's dealing with a configuration mismatch or code issues. Rebuilding the development environment and trying to replicate the error may take days or weeks and trigger project cost overruns while disrupting scheduled releases.

Meanwhile, the operations team is under constant pressure to meet their application SLA commitments. They need to have audit and access control capabilities that show exactly what changes were made to production systems, when and by whom. Ops is all too familiar with the need to document answers to questions such as:

- How is system access granted, monitored and controlled?
- Where is the detailed history of security patches?
- How is security preserved for end-of-life versions of apps?
- What method of version control is in place?

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## **DevOps Collaboration Promotes Healthy Apps**

A DevOps approach requires an application platform that can both provide shared visibility into application behavior in production environments, and support a collaborative workflow for troubleshooting in order to reduce mean-time-to-resolution.

In today's cloud-based server architectures, configuration changes are among the chief causes of application errors, so the ability to automatically detect unauthorized changes to server configurations will save time and eliminate the need for manual troubleshooting steps.

When an audit trail is part of the application platform, the operations team can also see a clear view of essential changes to production system configurations. This provides visibility into who changed which settings and when, so Ops is better prepared to prevent issues such as out of sync config changes.

Application-specific permissions can provide developers with the access they need to production debugging information— but in a controlled manner. When developers can see a detailed history of underlying code execution, they can more rapidly solve app problems. If an issue cannot be resolved in a timely manner, then the ability to automatically roll back to the most recent working version means Ops teams can maintain higher availability.

In addition, enterprises that leverage open source technologies need to be prepared when the open source community begins the end-of-life process for a particular tool or part of an application's software stack. It is important to choose vendors who can provide automatic updates and security hot fixes, and extended lifetime support, even for out-of-support versions.

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# Embrace DevOps for a Competitive Edge

Establish leadership by delivering early, rapid and iterative application releases

Align Dev and Ops to support business goals together

Maintain the health and longevity of your apps

The spotlight is shining on IT and its ability to keep pace with business demands. We've seen how important it is to align agile delivery with agile development. To achieve application leadership, organizations are learning to embrace DevOps processes in a more holistic way, and help their development and operations teams collaborate effectively to support their business counterparts on the path to achieving market leadership.

Every organization wants a high velocity deployment environment in which to deliver high quality apps. The key is to avoid making speed/quality tradeoffs that can undermine this goal.

The right mobile and web app platform will support faster releases of high quality apps while at the same time providing real insurance against the application issues that are emerging in our mobile, global and social world. With software tools, teamwork and best practices that promote DevOps collaboration across the full app lifecycle, Dev and Ops teams can tackle the root causes of application delays and failures—together. The operations team can contribute to agile delivery, and developers can refocus time and energy on innovation.

On the following page, we'll look at how Zend Server can help organizations adopt DevOps and collaborate effectively in order to release small changes early and often, measure and respond to both immediate and longer-term change effects on business goals, and use that knowledge to achieve market leadership.



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# About zend<sup>®</sup>Server

## Next-generation application platform for mobile and web apps

In today's agile world, Zend Server offers the tools, processes and infrastructure that Dev and Ops teams require for automation and collaborative workflow. With Zend Server, it's possible to avoid common types of application delays and failures and improve application success. Here are some highlights:

- Automation of the deployment process from development & test to production, reducing potential for human error and accelerating releases
- Visibility into the production environment for developers, without loss of control for operations tasked with maintaining application stability and security
- Diagnostic capabilities provide a snapshot of the flow/call sequence of underlying code execution, saving developers from time-consuming manual steps in an attempt to reproduce the original test environment and replicate any errors
- Real-time monitoring with proactive alerting and lockdown of unauthorized configuration changes
- Advanced troubleshooting with an audit trail that captures all configuration changes to production systems (which settings have been changed, by whom, and when)
- Performance metric dashboards provide long-term insight, and the ability to proactively predict and manage performance through expected or unexpected load changes
- Automated and safe rollback of applications to an earlier version when needed
- Seamless application failover to ensure high availability around the clock
- API architecture that supports easy integration of the Zend Server Application Platform with familiar tools, for example: Hudson and Jenkins for CI, Chef and Puppet for Deployment, Nagios for Monitoring, etc.
- Application infrastructure that flexes to handle variable load by incorporating or integrating with standard auto-scaling technologies
- Reliable scalability in on-premise as well as public, private or hybrid cloud environments running on Amazon Web Services, VMware, Red Hat, RightScale, IBM Smart Cloud and other cloud infrastructure and management software. Zend Developer Cloud provides a no-risk opportunity to experience Zend Server in the cloud for development purposes.



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## About Zend Technologies

Zend partners with businesses to rapidly deliver modern apps across mobile and cloud. Zend helped establish the PHP language, which today powers more than one-third of the web. Zend's flagship offering, Zend Server, is the leading Application Platform for developing, deploying and managing business-critical applications in PHP. Zend solutions are deployed at more than 40,000 companies, including NYSE Euronext, BNP Paribas, Bell Helicopter, France Telecom and other leading brands worldwide.

Learn more at [www.zend.com](http://www.zend.com).

## References

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<sup>2</sup>GigaOm, <http://gigaom.com/2012/09/07/pinterest-to-startups-devops-is-hard-but-do-it-anyway/>

<sup>3</sup>Zkybase.org, <http://zkybase.org/blog/2012/12/02/pushing-twice-daily-our-conversation-with-facebooks-chuck-rossi/>

<sup>4</sup>Channel Insider.com,

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<sup>5</sup>ITSM Survey, <http://www.serena.com/solutions/itsm/itsm-trends-infographic.html>

<sup>6</sup>Carnegie Mellon University, "Causes of Failure in Web Applications", Soila Pertet and Priya Narasimhan.

<http://repository.cmu.edu/cgi/viewcontent.cgi?article=1047&context=pdl>

<sup>7</sup>Slashgear.com, <http://www.slashgear.com/amazon-sorry-for-netflix-downtime-heres-what-we-got-wrong-01262685/>

<sup>8</sup>Oracle, <http://www.oracle.com/us/products/applications/cust-exp-impact-report-epss-1560493.pdf>

<sup>9</sup>IBM, <http://www-01.ibm.com/software/rational/devops/>

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