

# DevOps

## Production Operations - The Last Mile of a DevOps Strategy



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## Executive Summary

The emergence of DevOps into the mainstream is well underway. There continues to be some confusion, even with companies that have already started to implement a DevOps strategy, as to the ultimate scope and major components that will be required. Most DevOps strategies start as either “Dev+Dev” or “Ops+Ops” as it is easier to get approval for a project within a single management structure. Mid-level managers often find it difficult to describe, coordinate and justify cross-functional project teams that include all stakeholders.

While this is an acceptable start, to achieve the business goals of decreasing cost and time from vision to benefits, a truly cross-functional DevOps strategy is required. This includes the full involvement of Production Operations, not just Development. Having a DevOps Strategy that includes Production Operations is the “last mile” for a comprehensive DevOps Initiative.

A core objective of DevOps is to make smaller software releases faster and improve the outcome when released into production. Production Operations has a unique and different challenge than Development - how to successfully achieve the mandate of stability and 100 percent uptime yet allowing for speedier software deployment. Change is the major cause of system downtime. 80% of downtime of mission critical applications is caused by mistakes, miscommunications or misunderstanding around change. Increasing the velocity of change within the existing toolset and processes will not work.

The solution is a DevOps Environment Management platform. It eliminates 20% -25% of mistakes, miscommunications and misunderstanding around change that affect system downtime and when problems occur reduces time to problem resolution by between 40% - 50% compared with today’s existing tools and processes.

The platform provides the operational efficiency and outcomes for environments that need to be managed. A core component is its ability to track all types of changes with its unique horizontal approach based on an environment-centric view, not the traditional silo view of servers, databases, and applications. It also allows for many of the interactions and processes between Development and Production Operations to be simplified or automated.

Companies that implement a comprehensive DevOps strategy that includes a DevOps Environment Management platform to address the needs of Production Operations will finally be able to realize the predicted increase in business metrics.

## The current state of DevOps

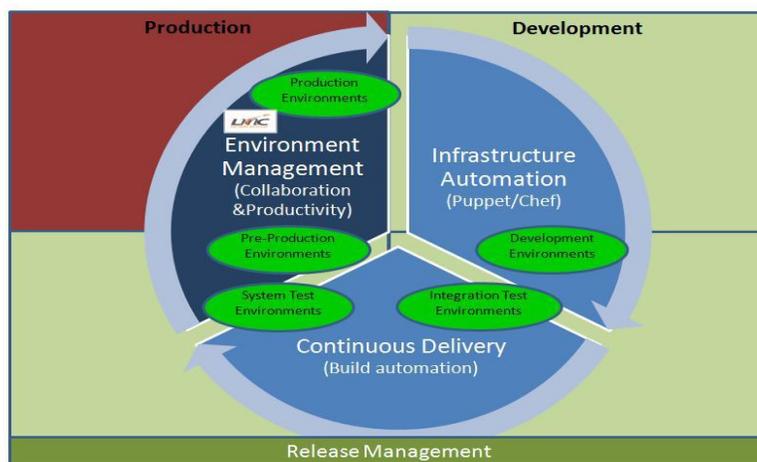
A recent study by Vanson Bourne shows that nearly 66% of companies earning \$500M in revenues or higher are in the planning stages or have already started implementing a DevOps strategy. Many of the problems that DevOps is intended to solve are contained within the silos of Development and Production Operations. Until now, this has made the justification of a true cross-functional team DevOps initiative difficult to justify and prioritize. As the need for a collaborative, shared processes – DevOps – continues to be recognized by the mainstream, more traditional, accepted metrics are becoming available to make this justification easier. According to the Vanson Bourne study, the benefits of implementing a DevOps strategy can increase core business metrics such as revenue and time to market by 17% to 23%.

## DevOps within Development

Development teams have been embracing the concepts of agile software development for some time. Companies that have embraced agile have seen tremendous advances in the speed of software development and satisfaction within the Development team. However, agile increases the need for additional, more flexible development environments. The lead-time to build and deploy additional environments using manual processes is unacceptably slow. For many companies this is the first DevOps project that they initiate.

The DevOps solutions most associated with resolving the availability and flexibility of Development environments are infrastructure virtualization and automation. Tools such as Puppet and Chef exist to solve the infrastructure problem and products like Urbancode (IBM) and Nolio (CA) exist for continuous application deployment (build automation). These automation and virtualization tools offer Development a solution for increasing the speed and consistency of environment infrastructure that otherwise can cause many delays and redundant workload.

*This chart shows how each of the major components of a comprehensive DevOps strategy fits across Development and Production.*



*Tools and processes that work in Development do not necessarily work well in Production. For example, in Development, if an environment is changed causing the application to fail, it is often easiest and quickest to simply delete the environment and recreate it.*

*This is would clearly not be a solution for Production.*

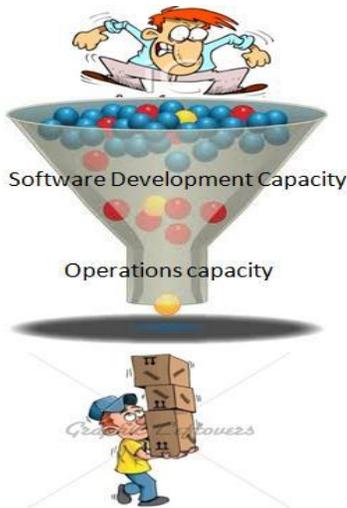
*A comprehensive DevOps solution must include a set of features that address the needs of Production Operations.*

It's not surprising therefore that some people consider the Ops in DevOps to be "Development Operations." The traditional configuration management teams that are responsible are usually contained within the Development management structure, so getting them coordinated and aligned behind a common objective of faster software development is not normally an issue.

However, Dev + Development Operations is still just "Development" (Dev + Dev). While important for Development, it does not incorporate the issues of the wider business stakeholders. Just solving Development Operations, while an important subset, is insufficient for a comprehensive DevOps strategy. Production Operations, the Ops in DevOps still remains a challenge and needs to be addressed.

## The DevOps Production Operations challenge

The challenge of implementing a comprehensive DevOps strategy is the separation of responsibilities and priorities across the organization. This is necessary as it ensures balance between the speed of new software deployment and the stability and continuity of business operations. A necessary part of any DevOps strategy includes a component that enables Production Operations to successfully achieve its mandate of stability and 100 percent uptime yet allowing for speedier software deployment. This component is defined as DevOps Environment Management - a set of features and processes that are used by both Development and Production Operations to manage environments that simply cannot be deleted and recreated if they become corrupted (such as integration, system test, pre-production and production environments).



A primary objective of DevOps is to make smaller software releases faster and improve the outcome when it's released into production. This means increasing the velocity of change. There are additional operational requirements such as automating application configuration specifications; the ability to compare environment configurations and the control of automations scripts but the primary DevOps requirement for Production Operations is for improved management to reduce the impact of change.

*Increasing the speed in Development becomes meaningless if Production Operations is unable to cope with the increased rate of change.*

## The impact of change on Development and Production Operations productivity

According to a 2007 report from industry analysts IDC, 80% of downtime of mission critical applications is caused by mistakes, miscommunications or misunderstanding around change. The DevOps challenge for Production Operations teams in mid to large companies is how to handle the increasing rate of change. Once a software release has been deployed, any problems become the responsibility of Production Operations and the regular support process. When problems occur they are difficult and time consuming to troubleshoot and identify and impact both Development and Operational productivity.

The typical problems that arise are:

- Application code worked yesterday but is not working today.
- Complex environments “break” after new releases/upgrades are deployed.
- Application code works in one environment but not in another.

The first question always asked is what changed?

From the Development perspective, when a problem occurs they are required to help troubleshoot and identify what changed, often in a reactionary mode as customers are affected. Changes are often likely to be caused by “care and feeding,” the normal processes of supporting and maintaining the applications and infrastructure within daily Production Operations such as infrastructure patch management, data storage management and application user support activities. These changes are the most difficult to identify and take up a lot of time and productivity.

From an Operational perspective, change also negatively impacts the mandate of stability and 100 percent uptime. It is understandable why Production Operations is reluctant to increase the rate of changes within their existing toolset and processes.

For both Development and Production Operations to be successful, any comprehensive DevOps Production strategy must include the ability for both sides to have faster and more efficient visibility into what changed.

## **The DevOps Environment Management Platform solution**

DevOps Environment Management is a software platform and methodology that combines previously separate and often sequential shared processes across Development and Production Operations organizations into a continuous, collaborative process supported by a common set of tools – a true union of people, process and technology.

It eliminates 20% -25% of mistakes, miscommunications and misunderstanding around change that affect system downtime and reduces time from problem to resolution between 40% - 50% when compared with today’s existing tools and processes.

It also improves the operational efficiency and outcome of environments that need to be managed. Used by both Development and Production Operations, it manages on line, and in real time, environments that simply cannot be deleted and recreated if they become corrupted (such as integration, system test, pre-production and production environments).

A core component of the DevOps Environment Management platform is the ability to track all types of changes. All changes to individual components are tracked in real time and are combined into an environment view where users are presented with a comprehensive view of all changes.

The platform is unique in its horizontal approach that is based on an environment-centric view, not the traditional silo view. This environment view contains all the components and their definitions, both physical (servers, databases, application servers etc.) and logical (connections, interfaces etc.) that the application(s) needs to function successfully. In taking a holistic view, it enables many of the interactions and processes between Development and Production Operations to be simplified or automated.

The DevOps Environment Management platform interacts with many of the traditional processes that exist between Development and Production Operations to simplify, augment or replace them. For example, it does not replace the change control process, but augments it by providing information for all changes that have actually occurred to a specific environment. The core capabilities include:

### **Real-time change control**

A core function of the platform is the ability for enhanced change control and tracking. With increasing rates of change, real-time change management is a critical component of Environment Management. All changes made whether automatically (scripts) or manually by a person logging onto a server or database are traced in real time and visible to all technical users of the environment.

### **User access control**

With 80% of system downtime attributed to the people that build, deploy, manage and support the application, tracking user access and what they are doing in real time is critical to maintaining the balance and trust between Development and Production Operations. The platform allows both sides to quickly identify what has happened when a problem arises. If the main Development requirement is to increase the speed of change, then the main Production Operations requirement is to ensure it has the visibility and control to track every change.

### **Automation**

Automation of common processes between Development and Production Operations is another core feature. To truly achieve increased speed from conception to benefit (requirements into production), traditional manual processes must be removed or automated. For example, Development is required to provide Production Operations with the exact specification for the configuration of all the components needed for an application. Today this is done via paper documents and Visio diagrams and the information is often outdated, incorrect or incomplete. Development is slowed down having to create these materials and they provide little value to Production Operations when received. The platform enables the application model developed and tested in Development to be used by Production Operations. It automatically determines if the environment for the application is configured as designed and tested.

### **Visibility and control**

The DevOps Environment Management Platform provides visibility across the entire system, including all physical and logical components that are contained within it. Increasing automation without increasing visibility and control simply results in more system downtime.

### **Configuration management**

The platform makes it simple for both Development and Production Operations to understand and communicate the configuration for an application. A real time Change Management Database (CMDB) allows for the automation and ongoing changes that occur with each release or update.

## Case Study

LMC's customer, a government contractor, has responsibility for the management and daily Production Operations for a critical government agency financial application. The infrastructure is provided by a third-party datacenter company in a private cloud that includes 32 environments and more than 250 servers servicing 144,000 end-users. The government agency's own development team heavily customizes the financial application and software changes are moved daily between the 32 environments and moved into production on a weekly basis.

The challenge for the government contractor is the management of the high velocity of change that needs to be coordinated by three different companies and multiple technical teams while still providing high levels of system availability as defined within the service level agreements with penalties for any unscheduled down time.

LMC's DevOps Environment Management platform overlays the infrastructure and provides a graphical representation of each of the 32 environments. One central application configuration model of the financial application is used to ensure that all the environments are configured exactly the same. At any time, multiple environments can be compared and any discrepancies are quickly identified.

In addition, prior to moving into production, the release team compares the created change request information for code, scripts etc. with a report of the actual before and after changes that were made to the same release request in the pre-production environment.

Early results have been outstanding:

- Level of consistency of the environments has increased, reducing configuration related problems by 17%
- Time to problem resolution of non-software related issues improved by 43%
- Identifying mistakes, misunderstandings or miscommunications prior to moving into production increased 21%

### About LMC Software Solutions LLC

*LMC Software Solutions creates products and services that address the complex DevOps issues that companies face today in deploying and operating critical business enterprise applications. LMC utilizes the latest technologies to enable its customers to achieve the highest availability at the lowest possible cost of ownership. LMC's Enterprise Technical Support Center offers a DevOps platform of tools and services that can be tailored to meet the specific enterprise application requirements across all major industries. Online at [www.lmcsoftwaresolutions.com](http://www.lmcsoftwaresolutions.com)*