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DevOps: Why IT Operations Managers Should Care About the Cloud

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INTRODUCTION

Spurred by the hypercompetitive global business market and tough economic climate, many enterprises are rethinking their traditional business processes. Whether their goals are to increase productivity, improve quality, hasten time to market, reduce costs, or enhance customer satisfaction, it's increasingly likely that the cloud will play some role in the solutions they adopt.

According to Frost & Sullivan, the number of businesses using cloud services will more than double in the next two years.[1] They are driven by business-impacting objectives, including the need to reduce costs (cited by 55 percent of businesses), improve application availability (38 percent), and scale their applications (35 percent).

At the same time, savvy enterprises are discovering that the cloud holds the power to transform IT processes and support business growth objectives. In this context, a robust Platform as a Service (PaaS) is more than a toolset for developers; and Infrastructure as a Service (IaaS) can be more than a place to host apps. Instead, IT departments can use the cloud to redefine the continuum of development and operations—a process that is becoming known as DevOps.

In this paper, we define DevOps and examine how the new process can benefit not only developers but IT operations. We look at the concept of "patterns," introduced by IBM as a basis for automating labor-intensive development and deployment processes. We also assess how IBM SmartCloud Application Services goes beyond standard development tools to provide a robust platform that streamlines the end-to-end process and ongoing management of applications.

[1] Frost & Sullivan *2012 Cloud User Survey*

DEFINING DEVOPS

DevOps is a concept that is starting to take hold in the industry. The broad term describes a type of software development process that acknowledges the interdependence of software and the IT infrastructure on which it runs.

In a traditional software project, the relationship between development and operations is linear. Developers create the software application and hand it off (some would say "throw it over the transom") to the IT team, which then determines how much server capacity is needed and how the capacity should be configured to enable the application to work as envisioned. The process is inherently inefficient, introducing delay (and cross-organizational tension) as operations teams attempt to determine, after-the-fact, what is required to deploy and scale the application in the production environment.

DevOps makes discrete processes into an end-to-end process by inserting operations-aware tools and patterns into the development process. The result is a more streamlined and efficient process that benefits both development and operations teams.

An effective cloud-based DevOps process does for IT what mass production did for manufacturing in the early days of the Industrial Revolution—with similarly transformational results. DevOps functionality automates and standardizes elements of the development and deployment process (like the "interchangeable parts" of modern manufacturing), enabling the finished product to go to market faster and with more consistent quality.

Of course, software development can't really be likened to mass production of goods. When creativity and innovation drive development activities, businesses are able to grow and differentiate themselves from competitors. Adoption of a cloud-based platform that supports DevOps processes will enable businesses to free up time and budget for creative solutions, by minimizing time spent on development "grunt work" and operational reworks. When the development-to-production timeframe is shortened and new applications are deployed and scaled with confidence, the entire business benefits.

HOW DEVOPS BENEFITS IT OPERATIONS

Unlike a traditional IT deployment process, in which operations personnel are brought in late in the development cycle, DevOps enables operations to collaborate with developers to ensure the application is built to be "deployment-aware." This streamlines the end-to-end process, enabling the business to respond faster and more cost-effectively to changing market conditions. In addition, DevOps can increase productivity and performance among IT operations personnel, enabling them to:

- **Improve internal client satisfaction** – Line of business managers have little understanding of (or patience with) the complex processes required to deploy

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their applications. Because an automated DevOps process reduces time-to-deploy and improves quality and performance once the workload is deployed, internal clients are more likely to meet their own objectives and, therefore, provide high satisfaction ratings.

- **Improve user satisfaction** – For businesses that employ best practices in measuring end-user satisfaction, ratings can be expected to increase following deployment of DevOps processes. End users (whether customers, employees, or partners) will likely experience fewer bugs and performance glitches when new applications or features are rolled out. Furthermore, enterprises may be encouraged to use the streamlined platform to update their software more often, adding more sophisticated capabilities.

- **Manage the budget** – In many companies, IT projects are notorious for going over budget. With a DevOps platform, Operations managers can be confident that their cost estimates will remain on track, with fewer unexpected surprises.

- **Minimize complexity** – Business applications will continue to grow in size and complexity, as trends call for integration of functionality such as collaboration, data analytics, and streaming video. To manage performance and scaling across multiple deployment options, operations personnel can depend on a DevOps-enabled cloud platform.

IT'S ALL ABOUT PATTERNS

The term DevOps can be used for just about any process that encourages collaboration between developers and their operations counterparts. However, the most effective DevOps approaches are enabled by sophisticated PaaS platforms, which allow developers to build DevOps-friendly tools into their software. These tools can take the shape of standardized reusable strings of code, sometimes called "patterns."

IBM introduced the concept of patterns in early 2012, as part of its expanding SmartCloud portfolio of services and products. Patterns are building blocks of code that can be inserted, as needed, into software during the development process. Patterns may be complex (e.g., defining how a particular software application will scale) or simple (defining the font size for a user interface). Because patterns are consistent, replicable and reusable, they speed the development process and reduce errors.

An effective development platform will offer developers a selection of patterns, in the form of templates or coding "shortcuts," from a comprehensive library. The more comprehensive the library, the greater the freedom afforded the developer to be innovative while still meeting company needs to reduce development and deployment cycles.

Patterns can be an effective element of a DevOps process, for several reasons:

- **Patterns leverage common experiences.** Chances are, the problem your development or operations team is trying to solve (or a similar one) has been solved somewhere before. It may even have been previously solved within your own organization. Whether you're creating software or deploying it, reinventing the wheel is costly and inefficient. A better option is to access the best code available, in the form of patterns, to enhance your application functionality and performance.

- **Patterns in the provider's library are consistent**, providing a clean image, every time. This minimizes the introduction and replication of errors as the software is tested and deployed.

- **Patterns can be customized.** While a rich pattern library can meet many development and deployment needs, most enterprises have some unique requirements. In the most effective PaaS services, patterns can be customized and saved after tweaking; accessible only to your developers, as part of your private pattern library. This ensures consistency for your company's unique needs.

- **Patterns save development time.** By eliminating the "grunt work" of routine coding, the use of patterns increases speed-to-market by reducing time spent on development and testing.

- **Patterns save deployment time.** Patterns replace the inefficient "trial and error" approach to deploying software in the production environment. This increases speed-to-market, delighting line of business managers who are depending on a fast and successful rollout to meet their objectives, and enabling the business to be more nimble and responsive to the market.

- **Patterns can automate operations functions.** The most highly advanced PaaS offerings, like IBM SmartCloud Application Services, support sophisticated patterns that can automate operations functions. For example, with IBM's solution, a developer can incorporate into the software code a sophisticated "virtual application pattern" that instructs the software how to scale itself, without any operator intervention. One pattern enables the software to track capacity usage and launch additional images, as needed. Another pattern leverages shared services like load balancing to provide "elastically scaling and retracting" solution deployments. By using patterns that encode scaling and deployment instructions right into the software (essentially teaching the software to take care of itself), the solution minimizes operational administrative effort and ensures consistent performance.

A developer can incorporate into the software a sophisticated IBM Virtual Application Pattern that instructs the software how to scale itself, without any operator intervention.

HOW IBM SMARTCLOUD APPLICATION SERVICES SUPPORTS DEVOPS

Enterprises can choose among a variety of cloud-based development options, ranging from proprietary toolsets to integrated PaaS and IaaS solutions. However, businesses that are serious about transforming IT through DevOps would do well to turn to IBM's PaaS offering—SmartCloud Application Services.

Part of the IBM SmartCloud portfolio, SmartCloud Application Services offers a comprehensive array of tools and patterns for developing, deploying, managing, and integrating corporate applications. With support for the full range of IT environments (including private and public clouds, on-premises and hosted), the services simplify installation, setup, configuration, and scaling of applications, regardless of the underlying infrastructure environment.

IBM SmartCloud Application Services offers the following unique benefits to enterprises, whether they are implementing a DevOps approach or just considering it:

- **Extensive Pattern Library** – To a developer, the value of a provider's platform is tied to the size and usefulness of its pattern library. With the IBM SmartCloud Application Workload Service, developers can access a rich and continually updated catalogue of patterns to facilitate development. Included in the catalogue are the sophisticated virtual application patterns that support DevOps functionality, such as scaling and deployment.

- **Collaboration Tools** – DevOps is all about bringing awareness of operational issues into the software development process. In many cases IT personnel are required to provide real-time input into which pattern is appropriate for the unique software. With IBM SmartCloud Application Services, collaboration tools such as the Rational Collaborative Lifecycle Management Service are built into the platform to enable developers, IT, line of business owners and other non-technical stakeholders to provide input and participate in code reviews.

- **Cross-platform Support** – IBM SmartCloud Application Services supports the full range of corporate IT environments, providing visibility and management tools for corporate cloud applications, whether they are hosted in private, public, or hybrid clouds. Because IBM's PaaS technologies and IaaS technologies are fully integrated, the service offers an unprecedented degree of visibility into IaaS-based virtual machines.

- **Common Core Technology** – IBM uses the same underlying technology for its private and public cloud solutions, including IBM SmartCloud Foundation for deploying on-premises private clouds, as well as IBM Enterprise and Enterprise+ infrastructure services, and the SmartCloud Application Services platform. The technologies include robust capabilities such as IBM Workload Deployer, Cast Iron, DB2 and Rational tools, which are fully integrated into the platform. This helps ensure seamless application portability across the full spectrum of cloud delivery models.

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The Last Word

A business can't be innovative if developers are mired in mundane coding tasks. A business can't be nimble if it takes weeks to deploy new applications, and if those applications freeze if usage exceeds expectations. To meet the needs in a competitive business environment, enterprises have to be willing to trade in old, cumbersome development and deployment processes for a DevOps approach. In DevOps, developers utilize cloud-based platform tools and patterns to build operational instructions right into their software applications. The result is fewer errors, faster deployment times, and lower costs than traditional development/deployment processes.

IBM SmartCloud Application Services supports DevOps with a rich catalogue of patterns that are easily customized, replicated, and saved. IBM's virtual application patterns are sophisticated patterns that encode complex instruction sets for deployment and scaling—essentially instructing the software to monitor itself and respond to demands without operator assistance. Thus, by utilizing the IBM platform, enterprises can streamline operational efficiency through automated availability and elastic scaling.

DevOps, supported through pattern-based PaaS, enables enterprises to combine development and operations processes into a simple, efficient process for test, development, deployment, and scaling of applications, from any cloud model (public, private or hybrid). Part of the IBM SmartCloud portfolio, SmartCloud Application Services enables businesses to re-think the cloud as a way to transform their businesses.

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