WHITE PAPER

Frictionless IT Management Disrupts the Status Quo

Sponsored by: Red Hat

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IDC OPINION

The convergence of cloud, containers, and big data – combined with the arrival of DevOps agile development methodologies and continuous delivery strategies – is placing enormous demands on hybrid cloud and IT management teams. Many organizations are struggling to maintain service levels while supporting rapid infrastructure growth. Reliance on traditional fragmented management tools and operational processes further complicates the situation.

IT decision makers are looking for new management software alternatives that can quickly step in to improve the scalability and reliability of cloud management and automation. Community-developed, open source solutions can provide IT teams with access to a new generation of innovation. Open source can help reduce operational friction and enable organizations to optimize infrastructure configuration, provisioning, and life-cycle management. In so doing, open source management solutions are poised to disrupt the IT operations status quo.

Red Hat's hybrid cloud management portfolio consists of several commercially supported open source offerings that are part of this new wave of management innovation and disruption. They include:

- **Red Hat CloudForms:** Based on cloud management technology acquired from ManageIQ in December 2012, CloudForms orchestrates and automates governance, workload provisioning, and performance across a heterogeneous mix of physical, virtual, and hybrid cloud environments.
- **Ansible and Ansible Tower:** Ansible is an application-centric automation open source project that relies on human-readable YAML coding and a lightweight, agentless architecture that can be used by generalist sysadmins and developers to automate application deployments, patches, and upgrades. It was acquired by Red Hat in October 2015.
- **Red Hat Satellite:** Red Hat Satellite provides integrated configuration and provisioning for bare metal and virtual servers, containers, private cloud servers, and public cloud compute services.

IN THIS WHITE PAPER

This white paper discusses the role that open source cloud management, automation, and orchestration solutions play in disrupting traditional enterprise IT management approaches. While traditional IT management depends on dedicated, domain-specific tools and processes operating in silos, today's fast-moving digital transformation strategies require tools that can be shared across DevOps teams. This white paper also explores how Red Hat's hybrid cloud and IT management portfolio can help IT organizations accomplish this transformation.

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SITUATION OVERVIEW

Digital Business and IT Transformation Drive Need for Frictionless IT Management

Enterprise IT infrastructure, operations, and application development strategies are in the midst of a massive restructuring. DevOps is breaking down barriers and empowering developers to take control of computing resources. The resulting continuous delivery of new applications, features, and functions has IT operations teams scrambling to accommodate constantly changing resource demands.

Cloud, containers, microservices, big data, software-defined infrastructure, and agile development technologies are combining to rapidly reinvent both internal and external processes and business models as organizations embrace online, digital business strategies to engage with customers and create new revenue opportunities.

Over the next three to five years, IDC expects that:

- Two-thirds of CEOs at Global 2000 enterprises will place digital transformation at the center of their corporate strategy. Many of them will fundamentally rearchitect customer engagement systems, thereby dramatically increasing the number of customer touch points and interactions.
- Over half of enterprises' IT infrastructure and software investments will be cloud based, reaching 60–70% by 2020.
- Enterprises pursuing digital transformation initiatives will more than double the size of their software development teams while embracing agile, continuous delivery strategies.
- Over half of developer teams will embed cognitive analytics services into their apps, driving tens of billions of dollars in productivity gains.

The resulting digital business environments will require that on-premises and public cloud computing resources be continually matched to the needs of applications and end users.

In many enterprise IT environments, the infrastructure and application management tools traditionally used to provision, configure, and update resources are struggling to keep up with demand. As a result, many IT decision makers are searching for more integrated, flexible, and automated ways to support faster rates of change and innovation. They need to seamlessly integrate on-premises operations with third-party cloud services using open APIs and standards to share data and optimize end-to-end performance.

Organizations that once took days, weeks, or even months to order and configure computing resources must now provision resources and migrate workloads in seconds or minutes. Development strategies that relied on highly controlled governance processes and the slow evolution of customized code now call for continuous updates using DevOps processes.

Over the next few years, IT organizations will mix containers and virtual machines (VMs) side by side to optimize computing resource consumption and application performance. Open standards and enterprise-grade open source management solutions will provide an alternative to proprietary, packaged solutions. Yet many existing conventional applications will continue to support mission-critical business processes and will need to be managed and supported by the same staff that supports the modern applications.

IDC expects that the majority of enterprise IT organizations will see conventional client/server computing environments coexist with emerging cloud-native platforms and applications for the foreseeable future. In a recent IDC survey of organizations that are currently developing cloud-native applications alongside conventional apps, 48% of IT decision makers said they will continue to roll out and update new conventional applications while testing and validating cloud-native architectures. Overall, 83% of cloud-native application users expect to continue to support at least some existing conventional systems for several years.

> 74% of IT decision makers believe they will need new management tools to effectively maintain and optimize hybrid cloud and software-defined infrastructure architectures. — *IDC*

A recent IDC survey showed that 74% of IT decision makers believe they will need new management tools to effectively maintain and optimize hybrid cloud and software-defined infrastructure architectures. Specifically, as shown in Figure 1, IDC research found that the top 5 hybrid cloud management challenges focus on:

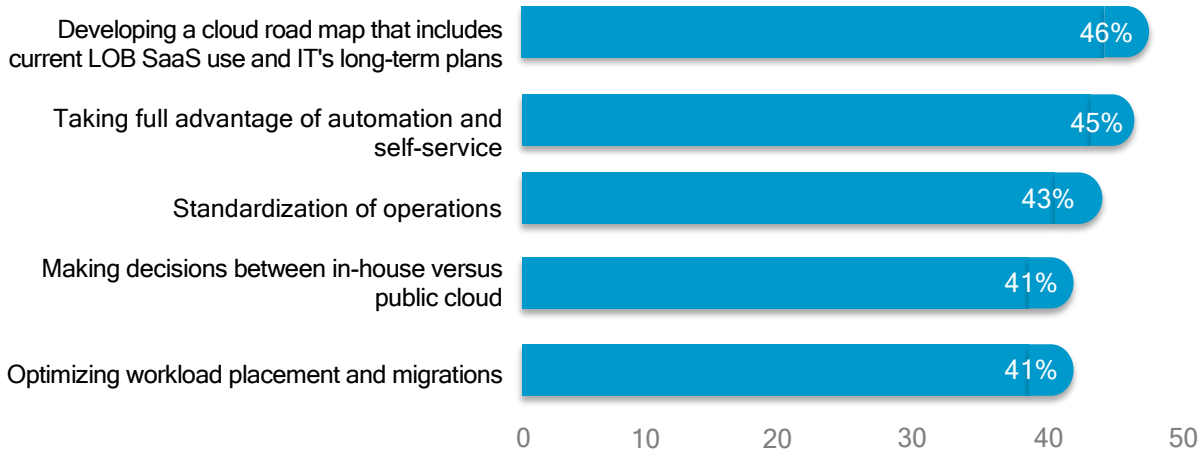
- Aligning with line-of-business priorities
- Improving use of automation
- Consistently standardizing processes
- Optimizing workload placement and migrations across various cloud and noncloud resources

To be successful in this new era, IT organizations need to reduce operational friction and inefficiency by eliminating management tool complexity. They need to take advantage of open standards and APIs to implement consistent processes, interfaces, and analytics across multivendor and multicloud platforms.

FIGURE 1

Top 5 Enterprise Cloud Management Challenges

Q. What are the most difficult management challenges your organization faces with regard to your current and planned cloud strategy?



Source: *Hybrid Cloud Strategies Create Management Challenges* (IDC #252655, December 2014)

Major Attributes of Modern Hybrid Cloud and Multivendor IT Management Strategies

IT organizations that are looking to extend, replace, or update existing, inefficient, siloed cloud and IT management solutions need to evaluate solutions for both immediate functional impacts and the extent to which the offerings can scale and evolve over time. In particular, IT decision makers should consider the architectural approach that the solution takes to ensure ongoing flexibility and scalability while avoiding single-vendor lock-in. Buyers should consider the following product attributes when evaluating whether solutions will be able to support new levels of agility and complexity:

- Open standards support that ensures end-to-end integration and API compatibility across functional modules and multivendor platforms (This enables IT organizations to avoid reliance on single-purpose management tools that require highly specialized expertise to operate.)
- Modular product architectures that enable vendors to make updates, patches, and changes to software components without disrupting the overall behavior and performance of the product (User interfaces and workflows should be able to adapt without requiring significant levels of downtime or extensive employee retraining.)
- Open, composable software architectures that allow vendors to easily reuse code and support plug-and-play tool chains across multiple platforms, including integrations with open source innovation and container-based microservices
- Multilayer, full-stack consistency that helps simplify processes and improve staff productivity by allowing use of a single management environment to configure, provision, and manage applications, middleware, and infrastructure on a unified basis
- Multivendor support, including integrations with the IT buyer's strategic vendors and market leaders such as VMware and Microsoft Hyper-V, as well as support for important open source communities such as Docker, ManageIQ, and Ansible
- Vendor-provided training, support, and certification resources to ensure successful deployment and access to ongoing security patches and code updates

The open source community continues to be a vital source of technology to fuel the evolution of cloud and IT management environments. Community-based innovation, coupled with commitments to open APIs and modular, composable architectures, provides customers with opportunities to access the latest functionality more quickly and at lower costs. By offering real alternatives to the status quo, open source–based automation and orchestration tools will increasingly become disruptive enablers that trigger new approaches to enterprise IT management.

Considering Red Hat's Hybrid Cloud and IT Management Solutions

Red Hat is a company built on providing commercially supported, enterprise-grade open source solutions. The core products in the company's hybrid cloud and IT management portfolio are:

- **Red Hat CloudForms:** Based on cloud management technology acquired from ManageIQ in December 2012, CloudForms orchestrates, governs, and provisions workloads across physical, virtual, and hybrid cloud environments, including OpenStack, VMware, KVM, Red Hat, Microsoft, and Amazon. In addition to typical cloud self-service automation and consumption tracking functionality, CloudForms supports tag-based event monitoring, analytics, and correlation capabilities that can be used to drive policy-based workload placement, capacity optimization, and quota enforcement as well as chargeback and showback. CloudForms is sold as a standalone product and as part of the Red Hat Cloud Infrastructure solution. Red Hat continues to actively lead the ManageIQ open source community.

- **Ansible and Ansible Tower:** Acquired in October 2015, Ansible is an application-centric automation system that relies on human-readable YAML coding and a lightweight, agentless architecture. It can be used by generalist sysadmins and developers to automate application deployments, patches, and upgrades across Linux, Windows, and networking devices. Currently, the Ansible Galaxy open source community has over 12,000 subscribers and over 250,000 downloads per month. Ansible Tower is a commercial automation platform that assists customers in managing and maintaining Ansible playbooks, discovering and inventorying assets, tracking configuration drift, scaling the deployment of playbooks, and maintaining access control. Red Hat has pledged to continue to support the Galaxy community and add Ansible Tower to the community as well.
- **Red Hat Satellite:** Red Hat Satellite provides integrated configuration and provisioning for bare metal and virtual servers, containers, private cloud servers, and public cloud compute services, including Amazon EC2, Rackspace, and Google Compute Engine. Multiple hypervisors, including Red Hat Enterprise Virtualization and VMware vSphere, are supported, as are integrations with Puppet configuration automation technologies and templates. Satellite is made up of several open source community projects, including Puppet, Foreman, Pulp, Katello, and Candlepin.
- **Red Hat Insights:** Red Hat Insights is a software-as-a-service (SaaS) offering that gives Red Hat Enterprise Linux and Red Hat Cloud Infrastructure customers proactive feedback and problem resolution on their system deployment, configurations, and performance. The service was made generally available in late 2015.

On its own, each product in the Red Hat management software portfolio enables customers to streamline and automate their IT infrastructure and cloud service environments. Each product is designed to support strong API-based integrations with major public cloud offerings and a range of infrastructure hardware and middleware vendors. Products are driven by active open source communities using modern, modular, and composable architectures to facilitate rapid community innovations. Red Hat proactively supports these communities, successfully promoting interest in ManageIQ among large customers and major technology partners such as Microsoft Azure and Google.

IDC expects that in the future, Red Hat will accelerate its level of investment in open source management software to create stronger integrations across the portfolio. IDC also expects Red Hat to continue to enhance management support for Red Hat's OpenShift PaaS, Docker, containers, and the OpenStack project. IDC believes Red Hat will continue to extend integrations with third parties such as Microsoft, VMware, Amazon, and other major public cloud services so that Ansible and CloudForms can provide expanded support for configuration, provisioning, orchestration, and workload performance across hybrid cloud environments. Analytics supported by Red Hat Insights will become more tightly threaded throughout the product portfolio to extend the range of use cases for insight reporting.

FUTURE OUTLOOK

For most enterprises, the demands of DevOps and digital transformation are racing ahead of the ability of traditional tools and processes to manage change. Organizations must increase the level of automation used to support infrastructure operations. However, they cannot do so in a vacuum. They must coordinate workflows across multiple clouds and computing platforms and ensure that DevOps teams can take full advantage of self-service automation.

DevOps Management Strategies for Successful Digital Transformation

- Plan for hybrid apps and infrastructure architectures
- Take full advantage of automation and self-service across the DevOps life cycle
- Invest in scalable, standards-based tools
- Prioritize open APIs for integration
- Leverage the open source community wherever possible
- Take advantage of vendor open source support and training
- Make cultural transformation as great a priority as technology

IDC research indicates that cultural and governance shifts can often be as important as technology investments when it comes to successfully transforming the way IT is purchased, provisioned, and managed. IT staff members need training on new tools and processes, and modular, plug-and-play management software solutions are needed to scale gracefully over time.

IDC interviewed two Red Hat customers that are already well down the road toward implementing cloud-driven business transformation. Their experiences provide useful insights for organizations that are currently in the early stages of their own journeys.

Online Consumer Loyalty Program Looks to Red Hat for Self-Service, Cloud-Based DevOps Transformation

The IT infrastructure manager for a major online consumer loyalty program views Red Hat as a strategic infrastructure software vendor. The company relies on Red Hat Enterprise Linux to power over 2,500 VMs and sees Red Hat as a "strategic partner when it comes to enabling an aggressive transition towards a cloud-based corporate enterprise software architecture." The company hopes to improve developer agility and the stability and performance of its infrastructure while creating more automated and metrics-driven IT best practices.

> "Red Hat is a strategic partner when it comes to enabling an aggressive transition towards a cloud-based corporate enterprise software architecture."
> *– IT Infrastructure Manager, Major Online Consumer Loyalty Program*

As a fully digital online business, the customer's organization depends on development speed, agility, and performance to bring new offerings to market and to ensure that customers have a positive online experience. The company relies on Red Hat Satellite to configure and provision physical and virtual servers and counts on Red Hat CloudForms to enable developers to self-provision standardized component stacks and developer environments. After having experimented with several open source configuration automation solutions, the company has largely standardized on Ansible because of its strong built-in support for Amazon Web Services, which is widely used by DevOps teams across the organization.

The IT organization is working to become more metric driven with respect to measuring and improving on critical activities such as time to market for new applications, time to complete new service requests, and the number of times IT escalations are paged. With the monitoring and reporting provided by Red Hat CloudForms, the organization believes it is now able to track business-relevant metrics as well as more traditional IT SLAs.

The customer noted that the internal skills and culture shifts required to implement a fully cloud-based, self-service environment can be daunting. In some cases, existing administrators find it difficult to give up control over certain functions. In other cases, developers may resist self-service strategies or may struggle to learn new monitoring and configuration interfaces. The company has been successful in motivating change by working closely with small groups to optimize workflows and training. Over the next three years, the company expects to make extensive use of public cloud services and embed the IT operations team fully inside a new DevOps organization housing over 200 developers.

The customer plans to fully leverage open source technologies and take advantage of community-driven innovation around cloud management and DevOps. The customer expects that the Red Hat portfolio will provide critical enterprise-grade, open source–based automaton, orchestration, and cloud management solutions to support this new model for operations and development.

Financial Services Software Company Implements Private IaaS Automation and Orchestration with CloudForms

An internationally known financial services software company was an early user of automated infrastructure configuration and provisioning orchestration. In recent years, internally developed orchestration and automation tools struggled to keep up with the volume of virtual machine activations needed for peak-season performance. The company conducted a market review to consider commercially available alternatives, eventually putting the top contenders through rigorous proof-of-concept testing that included almost 100 different use cases. The evaluation concluded that Red Hat CloudForms was best able to support the company's requirements.

After a few months of system onboarding and template design, the company successfully used Red Hat CloudForms to deploy 1,400 VMs a day (about 1 VM a minute) on a round-the-clock basis for almost three weeks to get ready for the coming peak processing season. The build included VM provisioning, integrations with configuration automation tools, and application identity configuration.

The ability of Red Hat CloudForms to provision containerized microservices and infrastructure resources in a single process and use a standard template resulted in significant productivity and accuracy improvements. Even error checking was more effectively automated. Earlier automation resulted in a 60% success rate, while Red Hat CloudForms hit 99.8% accuracy in the most recent year.

> CloudForms provisioned a VM every minute for three weeks with 99.8% accuracy.
> *– International Financial Services Software Organization*

Red Hat's support for CloudForms was a critical element of the decision to implement the product. Because it was supporting a mission-critical set of workloads, unplanned downtime was not an option. The company recognized it didn't have sufficient internal skills and staff to address problems immediately and appreciated the level of support provided by Red Hat.

The customer emphasized that selecting the right cloud automation tool and vendor is important, but success also depends on clarity around workflows, handoffs, and touch points. The fact that the organization had been an early user of internally developed automation and orchestration tools meant that it had learned many lessons about how to optimize processes and standardize use cases. For organizations that have limited experience with defining handoffs and use cases, the customer recommends starting small to learn how to best optimize both processes and tools.

CHALLENGES/OPPORTUNITIES

Red Hat customers consistently report that managing the process and people issues associated with cloud automation and orchestration can be just as challenging as mastering the technologies. These customers applaud the innovation provided by open source communities and value the enterprise-grade support and validation provided by Red Hat. To increase adoption of its hybrid cloud management portfolio, Red Hat will need to help customers address the business, process, and people transformations created by these innovative solutions.

CONCLUSION

The open source community continues to make automation, orchestration, and infrastructure management top priorities. The disruptive potential of open source solutions is very real. These products can evolve rapidly while using open APIs and widely published standards to allow for deeper integrations across multivendor products and platforms. The availability of enterprise-grade, vendor-supported open source management software allows IT decision makers to consider these technologies for their most mission-critical workloads.

By allowing each organization to transition management automation, orchestration tools, and processes at its own pace, Red Hat's portfolio is positioned to support the type of extended and gradual transitions that many organizations are planning for their mission-critical workloads and IT infrastructure.

About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

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