

ANALYST INSIGHT

DevOps: Advances in Release Management and Automation

The Ovum Rainbow Map for DevOps solutions comparing 11 vendors

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SUMMARY

Catalyst

DevOps originated with operations as a means of streamlining and improving the effectiveness of operations in the face of increasing workload. Traditionally operations had the time to deal with application stability, risk, and performance issues separately from infrastructure management and procurement tasks. This changed with the adoption of Agile practices in development at one end, resulting in increased deployment frequency, while at the operations end the trend towards cloud and virtualization speeded up and lowered costs relating to hardware procurement. Consequently, operations became the bottleneck. The availability of new deployment solutions has significantly helped operations by automating many manual operations. The solutions from a range of leading vendors and innovators in release management and automation are compared side by side in the Ovum rainbow map for DevOps. This solution guide and comparison will help IT managers choose a good fit for their operations needs.

Ovum view

DevOps is variably defined as a movement or a set of principles, practices, methods, or concepts – it is actually a mix of all these attributes. In addition, especially as vendors begin to address the concerns of DevOps and the pain points that IT operations are suffering, DevOps is evolving.

DevOps: Advances in Release Management and Automation (OI00127-072)

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Perhaps unsurprisingly given the relative newness of the subject, Vendors differ in their emphasis on DevOps and related ITIL terminology. In particular, they refer to different shades of meaning between continuous delivery and continuous deployment. What can be agreed is that DevOps originated from within IT operations.

Ovum has researched the leading players in release management automation (an area that is receiving renewed focus), and conducted a comparative study of these solutions. A DevOps features matrix was created, and the resulting comparison shows that Electric Cloud, HP, IBM, Serena, and UrbanCode have the most comprehensive coverage of the features desired in advanced DevOps solutions. The areas that were most lacking among solutions were build and performance testing, with vendors typically relying on third-party solutions to offer these features.

The Ovum report *DevOps: Agile Operations and Continuous Delivery* was written to accompany this report, examining the issues around DevOps for development and operations and how vendors are extending concepts. See the further reading section at the end of this report.

In summary:

- DevOps is supported by release management and deployment tools. This market is diverse, attracting renewed vigor from established players and new entrants.
- The focus of deployment solutions is on supporting the planning and orchestration of releases. Some tools have origins in development and include build management; others have operations backgrounds and are strong on process workflow.
- The maturity of integration between development and operations is indicated by whether the solution can support continuous delivery: straight-through release from code check-in to final staging (test or production as required).

Key message

DevOps has revitalized the release management and automation tools market.



DEVOPS HAS REVITALIZED THE RELEASE MANAGEMENT AND AUTOMATION TOOLS MARKET

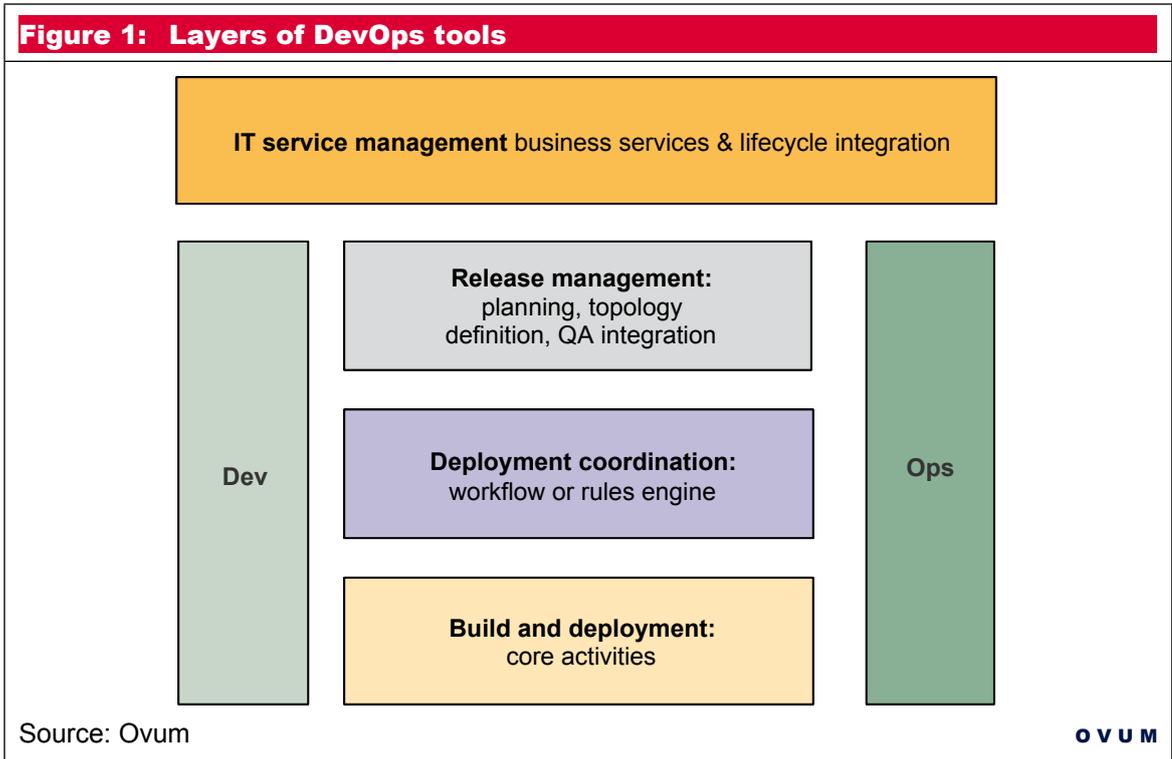
Release automation market players and trends

A new breed of solutions in release management and automation has emerged. Key vendors include BMC, HP, IBM, Electric Cloud, Nolio, Puppet Labs, rPath, Serena, ServiceNow, StreamStep, ThoughtWorks Studios, UrbanCode, and XebiaLabs. These new-generation tools automate the deployment process, providing source and binary file version control for scripts and configuration files, a workflow or process engine for automating complex build processes, and automated deployment from development through to the production/testing stage, taking out numerous manual steps in traditional deployment processes.

The DevOps tooling space can be thought of as four layers, with a left (Dev) and a right side (Ops) representing the historical roots of the vendors. (See Figure 1.) The lowest category consists of the actual build and continuous integration tools, all of which are open source: Ant, Maven, Gradle, Opscode Chef, Glu, Puppet, Jenkins, and Hudson. The middle layer covers deployment coordination, in which the workflow or rules engine provides the deployment process definition and execution. The next layer offers release management, with planning, topology definition, and integration between the developer's defect management tools and the business-side helpdesk. All vendors that participated in this report's solution comparison study span the second and third layers. The top layer represents integration with IT service management (ITSM) and products offered by larger IT vendors. The key benefit is in integration between helpdesk tickets and defect management logs.

In addition IBM and HP, with their wide solution portfolios, are taking DevOps automation one step further. They are addressing performance testing and management and QA activities in one end-to-end lifecycle activity, with feedback from production back into development.

Ovum invited some of the leading players in the DevOps space to participate in a comparative study of their release management and automation solutions. The list of participating vendors in this space is not exhaustive; there are other players that should be considered, including CA, CFEngine, Cisco, Citrix, Microsoft, Nolio, Opscode, Oracle, Puppet Labs, Red Hat, and VMware.



BMC

BMC Application Release Automation (ARA) covers application packaging, deployment, configuration changes, and access control, including deployment to and configuration changes of application middleware such as Java application servers. The ARA solution is part of the BMC BladeLogic Automation Suite, whose capabilities span server, network, database, and cloud automation. ARA is integrated with BMC’s wider solutions for ITSM, CMDB, orchestration, discovery, analytics, and service-level management. BMC’s history in the automation, ITSM, and performance management markets makes it well positioned to integrate operations and ITSM services within its portfolio. For example, BMC can escalate incident diagnostics from “Ops” to “Dev” in an integrated workflow to avoid “swivel-chair integration.” BMC ARA performs strongly in most sections of the Ovum DevOps Rainbow. It is currently lacking in closer integration into the development lifecycle. However, the company is building in this area for the future.



Electric Cloud

Electric Cloud is a specialist vendor with flagship product ElectricCommander for automation of the build-test-deploy process, and parallel build support through ElectricAccelerator and visual build analytics through ElectricInsight. The tools support physical, virtual, or cloud environments and are designed for accelerating complex build processes. The product suite is development language and build tool agnostic; any source code can be compiled and built using a wide range of build scripts and popular tools such as Ant and Visual Studio. It allows users to define tasks through a visual interface, schedule jobs, and provide comprehensive reporting and charting capabilities. In addition, it extracts and displays data from the defect tracker along with relevant build and test results. Managers receive notification when QA has resolved the issue. The product supports multiple teams across distributed locations through the use of a web interface that was built using Ajax to provide a rich user experience. Electric Cloud performs strongly in most sections of the Ovum DevOps Rainbow, with the exception of performance testing. It has future product plans for version control of plans, workflow, and topology.

HP

HP has a wide DevOps view and a solutions portfolio to support it, spanning application lifecycle management (ALM) and ITSM. Thus, HP sees DevOps from the perspectives of both the interaction between the application development and operations teams, and of the larger release management lifecycle. For HP the critical factors in DevOps are release planning and governance, release coordination (application modeling, configuration management, version control, and scheduling), and delivery automation (automated workflow for delivery of applications to operations). As part of the larger lifecycle, HP believes a successful DevOps implementation must account for integrations with the software development lifecycle (for the build-verify-test process), application performance management (for monitoring and automated workload management), and security (including data services). HP performs strongly throughout the Ovum DevOps Rainbow, and its roadmap promises further integrations along the operations seam in the ALM and ITSM solutions.

IBM

IBM has two divisions, IBM Rational and IBM Tivoli, which span the wider DevOps space. This allows IBM to take a broader definition of DevOps and see the larger challenge as one of people, process, and technology integration and collaboration across all parts of the application development and ITSM lifecycles. Applicable products include IBM Tivoli Asset Management, IBM Rational Change and Release Management (including IBM Rational Team Concert), and IBM

Rational Build Forge. IBM's strategy is to tie the Jazz-based Rational and Tivoli products together through its Open Services for Lifecycle Collaboration (OSLC) integration standard. The support for Agile is built into Rational Team Concert. IBM is strongly presented throughout the Ovum DevOps Rainbow. It has further integration between “Dev” and “Ops” in the pipeline, and has future product plans for visual design and modeling of workflow. The only weakness in an otherwise top result is its lack of support for continuous delivery. However, it is possible to manually configure Rational Team Concert to achieve this, and IBM has been doing so internally. Out-of-the-box continuous delivery is on IBM's roadmap as the Rational-Tivoli suite integration gathers momentum.

rPath

rPath X6 is focused on build- rather than workflow-based release management, and allows development, QA, and release engineers to construct, deploy, configure, and repair software stacks and business services. Users can visually create a version-controlled blueprint for generating system images and easily manage changes. X6 offers unified software and configuration automation managed as metadata within a version-controlled system blueprint that includes the bill of materials for a software system. rPath X6 configuration capabilities are interoperable with Puppet, CFEngine, and Chef. The rPath offering covers physical, virtual, and cloud environments, but requires servers to be reimaged according to the proprietary rPath standard. rPath is mainly a build specialist in the DevOps space with a unique approach, and does not feature strongly in the Ovum DevOps Rainbow. Future product plans include an integrated artifact repository; defining configurations for database, system, and network; defining private, public, and hybrid clouds and virtual environments; and defining configuration property mappings/dependencies between tiers.

Serena

Serena has embarked on a strategy to address the needs of DevOps through the Serena Release Management Solution. The strategy comprises three modules: Release Control, powered by Serena Business Manager (SBM) for planning, management, and release approval; Release Vault, powered by Dimensions CM and ChangeMan ZMF for a secure, auditable path to production; and Release Automation, powered by Nolio (under an OEM agreement) for the automation of application configuration and deployment tasks. Serena Service Manager provides a process-based approach to orchestrating the service management lifecycle, Release Manager provides a view into Serena's ALM dashboard with release management KPIs, and Release Control makes use of release trains and release calendars to schedule and coordinate releases. The final link in Serena's plans around ITSM integration is in the pipeline. The solution performs



strongly in most sections of the Ovum DevOps Rainbow, except performance testing, though Serena has indicated that this area is in its future product plans.

ServiceNow

As a SaaS solution, ServiceNow can be thought of as the Salesforce.com of the ITSM world. With its roots in ITSM it is expanding into the software lifecycle management space, and the ServiceNow DevOps coverage provides organically grown, tight integration between the ITSM, operations, and development segments, with helpdesk and configuration management integration already in place. The ServiceNow CMDB, Discovery, Change, Release, and Software Development Lifecycle applications are already integrated and accessed through the same platform and console. The solution focuses on release management and the actual build is left to third-party tools, as is performance testing. In all other respects the solution performs well through the Ovum DevOps Rainbow sections. Future product plans include integration with a configuration management database (CMDB), workflow capacity planning, capacity modeling, security analysis, and performance testing.

StreamStep

StreamStep is three years old and self-funded by three owners who have histories in venture IT startups. It has been a year and half since the launch of SmartRelease, a service for managing the release process, which is built on Ruby on Rails. SmartRelease is designed to be a lightweight Agile/DevOps solution. It takes existing deployment scripts and wraps them into an automated process, using prompts for approvals at key steps and keeping with compliance demands. Customers to date are enterprises with Agile development for which the pressure is highest on operations. StreamStep has close integration with Rally Software for Agile development and BMC on the operations and ITSM side. SaaS- and subscription-based offerings are in the pipeline. The solution is dependent on external build tools, and the topology features are tied into a third-party solution (BMC); overall, the offering performs well in the Ovum DevOps Rainbow. Future product plans include linking operational incidents to defect reports and coordination of defect root-cause analysis between development and operations.

ThoughtWorks Studios

ThoughtWorks Studios offers Go, an Agile release management solution that has evolved from Cruise Control (itself an evolution of open source continuous integration tool Cruise). Go has advanced in enabling continuous delivery (CD), the concept of automating the development-to-operations process as much as possible. CD requires collaboration between developers,



QA/testers, and IT operations, which in typical large organizations tend to be siloed teams. Go manages large numbers of CI, testing, and production environments centrally and performs push-button deployments of software into these environments while auditing the origins of all sources. Future product plans include detecting out-of-process changes to the operational environment.

UrbanCode

UrbanCode started out as the originator of Anthill Build Manager, a continuous integration server that evolved into AnthillPro. UrbanCode recently announced a rebranding of its product suite to UrbanCode DevOps Platform, which comprises UrbanBuild (based on AnthillPro), UrbanDeploy for operations and middleware support teams (this product has only recently been released), and UrbanRelease for release management (in the pipeline for 3Q/4Q11). UrbanDeploy allows users to model the structure of a multi-tiered or service-oriented application and orchestrate the processes required to deploy code, configurations, and associated assets to each tier. This provides the ability to create approvals and allows users to promote deployments across multiple environments on their way to production, tracking which versions were deployed, where, and when. UrbanCode shows strongly throughout the Ovum DevOps Rainbow sections, with limitations in performance testing, although it captures test output for governance purposes. Future product plans include creating programmatic loops in the workflow, integration with a CMDB, workflow capacity planning, capacity modeling, and capturing operational performance metrics for applications in normal production situations.

XebiaLabs

XebiaLabs' Deployit is an application release automation platform designed for large-scale enterprise deployments. Deployit uses an algorithm-based deployment engine to match the requirements as specified by the user against the infrastructure environment, both as it is and as it is desired. This approach removes the need for a workflow engine as the tool automatically works out the necessary process. Fine-tuning by the user is possible, but the strength of the tool is in automating the deployment process. For environments that are likely to vary, this approach can reduce the time it takes to plan and configure the deployment process and ensure the reliability of the release process. The tool mainly offers the deployment management features covered in the Ovum DevOps Rainbow. Future plans include release authorizations, improved support for parallel execution of deployment plan sections, extended .Net support, and defining private, public, and hybrid cloud and virtual environments.



The Ovum Rainbow Map for DevOps: solution feature comparisons

Ovum invited 11 leading vendors in the DevOps space to participate in a comparative study of features. Each vendor completed a comprehensive Ovum Features Matrix for DevOps, and this information was rolled up into sections and rainbow-mapped according to the key given below. The Ovum Rainbow Map for DevOps is shown in Figures 2 and 3.

The results of the comparative study show that Electric Cloud, HP, IBM, Serena, and UrbanCode have comprehensive coverage of the features desired in advanced DevOps solutions. A number of the vendors have policies of relying on third-party tools to fulfill areas of functionality and will be suitable for users with existing tools in place. Build and performance testing were the most common gaps in the DevOps solutions examined here.

Many factors go into the selection of a solution, and it is important to note that this study is restricted to solution features. Other considerations are price, customer service and customer relationship, choice of hosted cloud/SaaS offering, and specific integrations unique to each customer. However, Ovum believes all the vendors in this comparative study are worthy of consideration when selecting a release management and automation solution.

Figure 2: The Ovum DevOps rainbow

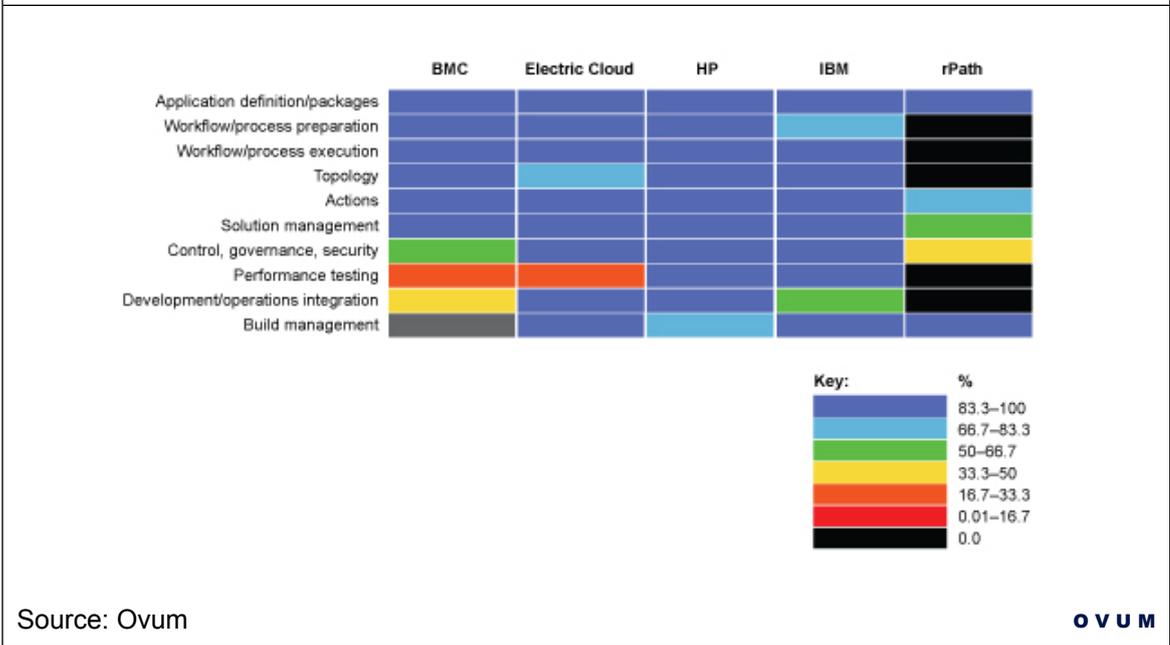
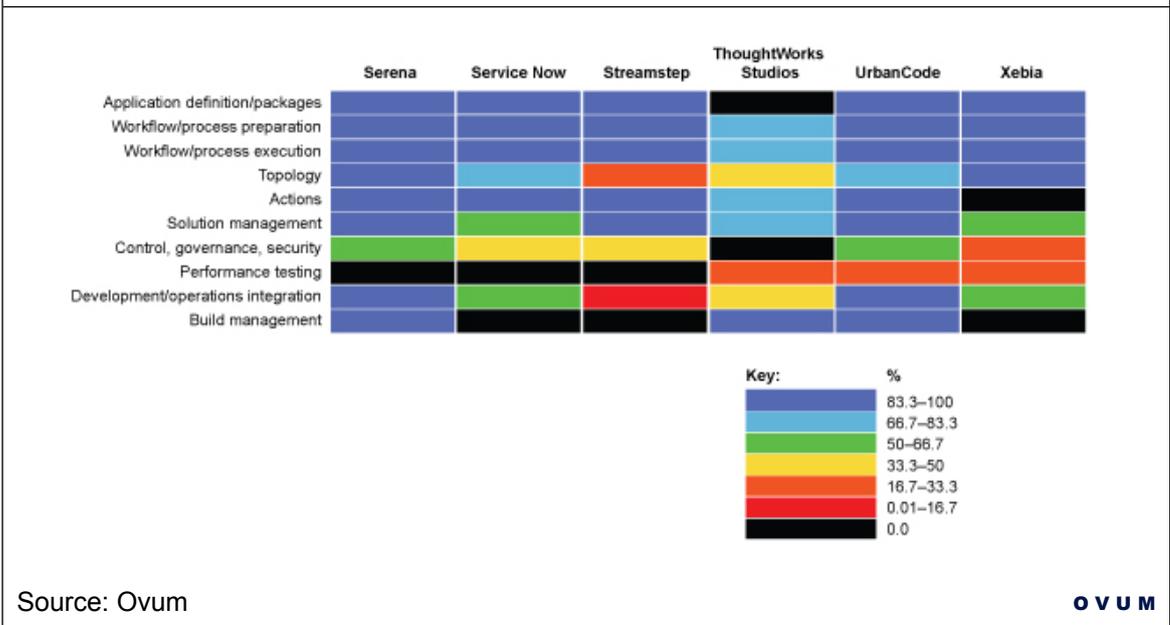


Figure 3: The Ovum DevOps rainbow continued



The features matrix is based on the following categories of solution features:

- **Application definition/packages:** Define the application and application package; be able to release both packaged and unpackaged applications; define the application configuration requirements; be able to make necessary changes in databases and application servers through advanced integration.
- **Workflow/process preparation:** Provide a visual design and modeling tool for the release workflow, allowing design by drag-and-drop or design by scripts; offer a content library of pre-built workflows for common processes.
- **Workflow/process execution:** Be able to execute the workflows directly from the visual modeling environment or from algorithm-based workflow environments; be able to execute from the workflow dashboard and create parallel workflows for complex releases; define release processes for multi-tier applications, including versions of tiers required to support tier objects; create programmatic loops for advanced release requirements; offer realtime status visibility of process steps; be able to start, pause, and stop as well as roll back processes.
- **Topology:** Discover existing application and infrastructure topologies; integrate with a CMDB to learn about assets to automate; pull versioned deployable artifacts from an asset database (an ITIL Definitive Media Library); offer integration between the deployment engine and the artifact repository and include an integrated artifact repository; define configurations for database, system, network, etc.; define private, public, and hybrid cloud and virtual environments; define configuration property mappings/dependencies between tiers.
- **Actions:** Cover installation, verification, and other actions; provide audit trails of all actions; use either scriptless interface for defining actions or scripted actions.
- **Solution management:** Server agent management; workflow and topology plans and version control of plans, workflow, and topology; workflow capacity planning and capacity modeling; permissions management/role-based access control (RBAC) compliance; reporting on what is installed, where, and when, and custom reporting; collaboration support including IM, wiki/knowledge base, automatic emails, logging, scheduling, and notifications; dashboard/console for managing deployment processes; unlimited target machines; covering Windows, Linux, Unix, and Mac

machines/cross-platform neutrality; covering mainframes; covering mobile applications.

- **Control, governance, security:** Register deployment changes in a CMDB; detect out-of-process changes to the operational environment; provide traceability between application and operations assets; perform preliminary validation; define hardware, software, and network checks; for security offer integration of development time vulnerability analysis with runtime threat management, identity, and access control. Ovum believes application security needs to be raised as a first-level concern due to the shift to web and mobile applications. The environment cannot be relied upon for security for these; therefore, the application itself needs to be responsible for security.
- **Performance testing:** Capture operational performance metrics for applications in normal production situations and automated performance testing for updated applications against current baseline performance; capture test output for governance purposes.
- **Development/operations integration:** Keep all development and operational assets in a single asset DB; be able to audit operational configurations for changes to operational environments; have integrated change and release management processes for development and operations; be able to offer continuous deployment from check-in to production (solution allows this possibility with all automated testing included); provide production incident/defect tracking and remediation; link operational incidents to defect reports; coordinate defect root-cause analysis between development and operations; share information on known defects, workarounds, etc.; provide incident/defect service level and performance tracking/reporting across the lifecycle and organizations.
- **Build management:** Capture file dependencies and perform intelligent builds so rebuilds only affect changed components; perform pre-production automated build, verify, and test.

RECOMMENDATIONS

Recommendations for enterprises

The DevOps solutions covered in this report provide the tiers of tooling and automation necessary to deal with operations pressure. In a nutshell: at the top we have planning and scheduling, in the middle is coordination and execution management, and in the lower tier is the core automation for build and deployment. The DevOps space is not static; vendors are already integrating solutions with ITSM services. These trends will have significant impact on how IT is executed in enterprises; the time to review and plan a DevOps strategy is now. Creating a DevOps role is also advisable for larger organizations.

Operations activities under focus and being improved in DevOps start in development, and this is where the complete cycle of build, test, and continuous integration has been driven by Agile methodologies such as test-driven development. Solutions that provide continuous deployment take the next step and enable straight-through deployment from development to production, when and where it is needed. Vendors with solutions covered here that can offer continuous deployment are: Electric Cloud, HP, ThoughtWorks Studios, UrbanCode, and XebiaLabs. For the needs of advanced Agile development teams, the availability of continuous deployment may be a critical factor in choosing a release management automation solution.

Recommendations for vendors

Opportunities are opening up in the DevOps automation space. The release management tools space is still a young market; penetration into IT departments is low, with many organizations relying on manual operations and open source software, which although suitable for small operations, are not adequate for those running complex applications or medium- to large-scale environments. In addition, operations are a mission-critical function for businesses today, and they will pay for the right solution. Ovum believes that opportunities exist for technical innovation in this market and for far greater penetration of release management automation into IT departments and data centers.



APPENDIX

Further reading

DevOps: Agile Operations and Continuous Delivery, OI00127-063

DevOps: Connecting IT Development and Operations, OI00005-001

Software Lifecycle Management (Ovum Technology Evaluation and Comparison report), OI00068-004

Solutions Guide: Desktop Virtualization, OI00127-011

ALM and ITIL: Spanning the Divide with IT Operations, OVUM052423

Methodology

This report is based on Ovum's extensive research in the software lifecycle management space, interviews with vendors, and consultation with our end users. The product comparison used a comprehensive Ovum Features Matrix for DevOps, which the participating vendors completed. The features matrix and weightings used in this research are given below in Table 1.

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We hope that the analysis in this research will help you make informed and imaginative business decisions. If you have further requirements, Ovum's consulting team may be able to help you. For more information about Ovum's consulting capabilities, please contact us directly at consulting@ovum.com.



Table 1: Ovum DevOps September 2011 Features Matrix

Vendor product feature scoring (not shown): 1 = out-of-box from product portfolio, 0.5 = partial fulfillment, 0 = no capability, T = available through third party (scored as zero)

Feature	Descriptions	Weight	Subweight
Application definition/packages	Define applications	10.42	1
	Add unpackaged software		1
	Add packaged software		1
	Define application configuration requirements		1
	Advanced integrations with databases and application servers		1
Workflow/process preparation	Visual design and modeling of workflow	7.29	5
	Design by drag and drop		1
	Design by scripts		1
	Content library of pre-built workflows for common processes		1
Workflow/process execution	Executable workflow	7.29	5
	Create parallel workflows		2
	Define multi-tier processes, including versions of tiers		2
	Create programmatic loops		1
	Realtime status visibility of process steps		1
	Start, pause, and stop processes		2
	Process rollback		5
Topology	Discover existing application topologies	10.42	1
	Integrates with a CMDB to learn about assets to automate		1
	Pulls versioned deployable artifacts from an asset database (an ITIL Definitive Media Library).		1
	There is integration between the deployment engine and the artifact repository		1
	Includes an integrated artifact repository		1
	Define configurations for database, system, network, etc.		1
	Define private/public/hybrid cloud, virtual environments		1
	Define configuration property mappings/dependencies between tiers		1



Actions	Installation, verification, other actions	10.42	1
	Audit trail of all actions		1
	Scriptless interface for defining actions		1
	Scripted actions		1
Solution management	Agent management	10.42	1
	workflow and topology plans		1
	version control of plans/workflow/topology		1
	workflow capacity planning, capacity modeling		1
	Permissions management / Role Based Access Control compliance		1
	Reporting: what is installed, where, when, custom reporting		1
	Collaboration: IM, wiki/knowledge base, automatic emails		1
	Logging, scheduling, and notifications		1
	Dashboard/console for managing deployment processes		1
	Unlimited target machines		1
	Covers Windows, Linux, Unix, Mac machines/cross-platform neutrality		1
	Covers mainframes		1
	Covers mobile		1
Control, governance, security	Register deployment changes in CMDB	12.50	1
	Detect out-of-process changes to operational environment		1
	Traceability between application and operations assets		1
Preliminary validation	Define hardware, software, network checks		1
Security	Integration of development time vulnerability analysis with run-time threat management, identity, and access control	3	
Performance testing	Capture operational performance metrics for applications in normal production situations	7.29	1
	Automated performance testing for updated applications against current baseline performance		1
	Capture of test output for governance purposes		1
Development/operations integration	All development and operational assets in asset DB	15.63	1



	Audit operational configurations for changes to operational environments		1
	Integrated change/release management processes for development and operations		1
Continuous deployment: from check-in to production	Solution allows this possibility with all automated testing included		5
Production incident/defect tracking & remediation	Linking operational incidents to defect reports		1
	Coordination of defect root-cause analysis between development and operations		1
	Shared information on known defects, workarounds, etc.		1
	Incident/defect service level and performance tracking/reporting across the lifecycle and organizations		1
Build management	Capture file dependencies	8.33	1
	Intelligent builds: rebuild only changed components		1
	pre-production automated build-verify-test		1
Source: Ovum			OVUM

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