Optimizing Infrastructure Management with Predictive Analytics: The Red Hat Insights Approach

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IN THIS WHITE PAPER

This IDC White Paper discusses the role of management software in today's complex virtualized hybrid and multicloud environments. Key requirements and benefits for infrastructure management are identified. The increasing role of predictive analytics is discussed. An overview of the Red Hat Insights SaaS solution for managing and optimizing Red Hat Enterprise Linux (RHEL) infrastructure environments is presented. Challenges and opportunities for the future are examined.

SITUATION OVERVIEW

IT organizations are being challenged more than ever before to deliver fast, reliable, secure, and highly available applications and services to a wide variety of customers, including internal clients and end users expecting a responsive, consumerlike experience. IT-based services are being deployed on increasingly complex infrastructures, including virtualized, public, private, hybrid, and multicloud environments, which are being accessed using a variety of methods including handheld and mobile devices. Virtualized and cloud environments present increasing management challenges because of large-scale deployments and high levels of activity. Success in these highly complex environments is measured by the ability to deliver critical applications with consistently high service levels in order to meet competitive business challenges.

THE ROLE OF MANAGEMENT SOFTWARE

Management software and SaaS solutions are needed to monitor the behavior of applications and infrastructure; detect and report exceptional conditions including bottlenecks, slowdowns, and outages; pinpoint the location and root cause of problems; and support processes for problem remediation. Management solutions can be general purpose across platforms or be focused on specific operating environments such as Red Hat Insights management for Red Hat Enterprise Linux. Red Hat Enterprise Linux is an agile, high-performing Linux distribution, and Red Hat Insights provides additional security by enhancing visibility into potential issues regarding security, availability, performance, and scalability. Specific knowledge of an operating environment enables deeper knowledge for problem detection and identification and root cause analysis and problem resolution as well as providing information that can be used proactively to prevent incidents from happening in the future.

Growth in Complexity and Increasing Data Volumes Challenge IT

Rapidly increasing volumes of monitor and event data from complex infrastructures including physical, virtual, private, public, hybrid, and multicloud environments are challenging IT organizations to understand the health and performance of the datacenter infrastructure. Data volumes and infrastructure complexity are overcoming the ability of IT staff to keep up with rapidly changing conditions. Management software is needed to capture, analyze, and visualize the datacenter environment.

The Need for Advanced Analytics

Increasingly, management software is incorporating advanced analytics for more accurate problem determination and root cause identification. Analysis of incident-causing conditions can be used to identify patterns and problem causes and contributing factors. Predictive analytics can be used to proactively understand that a problem is likely to occur and take actions to prevent incidents from occurring and impacting end users. While major IT emphasis is placed on troubleshooting and root cause analysis, the use of predictive analytics can often avoid pending incidents and prevent the necessity of emergency maintenance sessions.

CONSIDERING RED HAT INSIGHTS

Red Hat Insights is a SaaS solution from Red Hat used to manage and optimize Red Hat Enterprise Linux environments using predictive analytics. Red Hat Insights is included with every supported version of Red Hat Enterprise Linux, providing users an enhanced view of their workloads and active systems, along with proactive system and patch fixes for detected issues. According to Red Hat, the Insights SaaS solution is informed by the technical knowledge and deep expertise of over 700 Red Hat support engineers with information from over 1 million Red Hat knowledge base cases creating more than 100,000 unique solutions to help companies efficiently and intelligently manage their increasingly complex infrastructures.

The Red Hat Insights SaaS solution collects measurement data from systems running Red Hat Enterprise Linux; analyzes the data for potential problems and risks based on analytics, rules, and the knowledge base; and provides results and recommendations for remediation. The following are key capabilities of Red Hat Insights:

- Red Hat Insights provides comprehensive analytics across physical, virtual, container, private, and public cloud environments for assets deployed on Red Hat Enterprise Linux. Analytics and the knowledge base are updated periodically through the Red Hat Insights SaaS deployment model.

- Red Hat Insights supports real-time, in-depth analysis of Red Hat Enterprise Linux infrastructure to proactively identify threats to security, performance, availability, and stability. It provides visibility for problems such as configuration issues and urgent technical issues.

- The Red Hat Insights SaaS solution proactively identifies security configuration threats and provides actionable remediation recommendations based on the comprehensive knowledge and experience of Red Hat's Certified Engineers.

- Remediation plans can be automated via integrations with Red Hat Ansible. Red Hat Insights can generate Ansible playbooks to automatically implement remediation steps.

The key benefits of Red Hat Insights include reduced security and compliance risk by identifying vulnerabilities, improved performance and overall application service levels, reduced downtime, and improved IT operations staff efficiency and productivity.

Insights Console Identifies Service Issues

Issues discovered by Red Hat Insights are identified and displayed on the web-based Insights console accessed through the Red Hat customer portal or with the Red Hat Satellite interface. Figure 1 shows an example of a Red Hat Insights console display.

As shown in Figure 1, issues are classified according to the functional service area that is being affected, including performance, availability, security, compliance, and stability. Customers can drill down to see which systems are being affected, understand issues, and view recommended actions and remediation steps.

FIGURE 1

Red Hat Insights Console
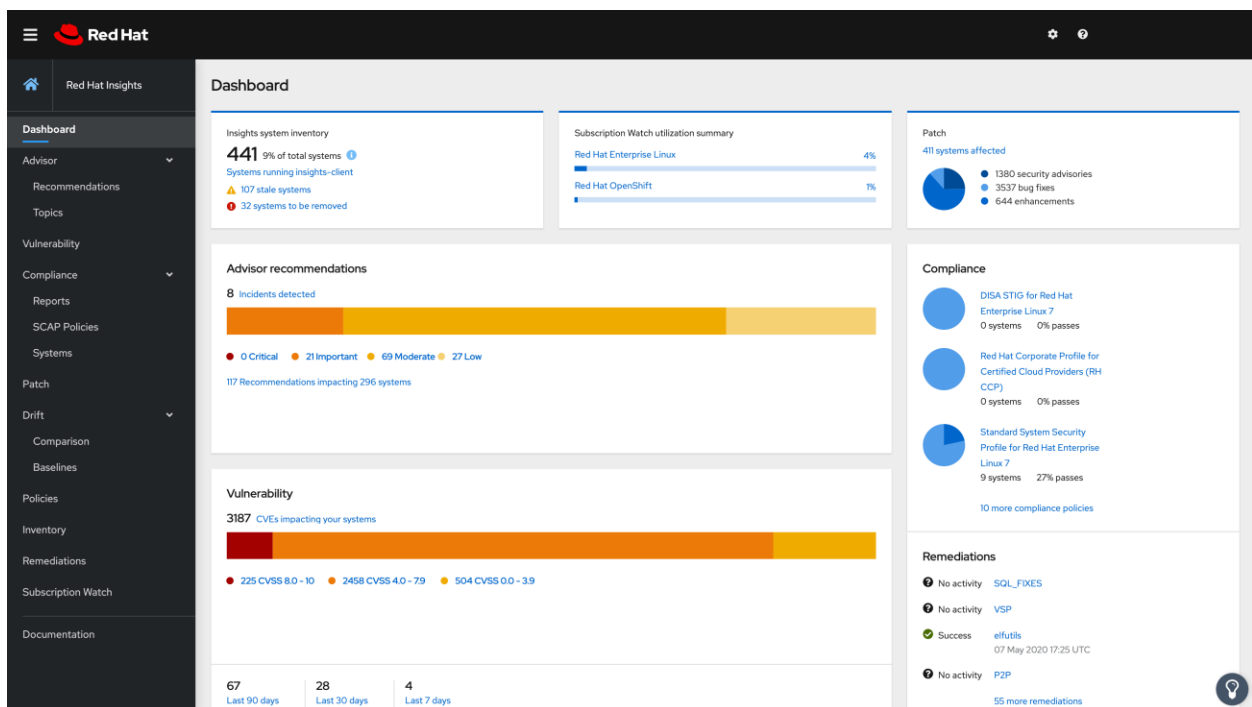
Source: Red Hat, 2020

Red Hat Insights Customer Experience

IDC spoke with a large regional government agency that provides information and services in support of natural resource management. The agency's Office of Information Technology is responsible for providing information technology for the agency to fulfill its mission. The IT organization works to optimize existing technology and implement new technologies that will improve productivity, manage costs, and meet the business needs of the agency.

According to the agency's system administrator, Red Hat Enterprise Linux is deployed in approximately 40 virtual servers running in an on-premises datacenter. RHEL supports multiple applications including

the agency's website. The primary system management objective at the datacenter is ensuring that servers and applications are up and available to users as much as possible.

Another key concern is around security. Red Hat Insights is being used as an integral part of the agency's security management process. Security alerts are received from multiple sources. Red Hat Insights is used to review security alerts and identify which servers are vulnerable based on this information. Remediation of vulnerabilities can be accomplished through timely application of patches. Red Hat Insights makes suggestions on which patches to apply and provides downloads of Red Hat Ansible playbooks to implement the patching process.

Prior to Red Hat Insights, the agency's security patching process was accomplished by running scripts. Using this approach, the organization found it difficult to determine whether or not patching had been successful. According to the agency's system administrator, the verification capability is a chief benefit of using Red Hat Insights. Now the system administrator can run Red Hat Insights for verification to see what security vulnerabilities have been patched and whether all servers have been uniformly updated.

In terms of overall benefits, use of Red Hat Insights has enabled the agency to be more proactive and take advantage of automated, prescriptive processes by using Ansible playbooks. As part of a government agency, operational efficiencies, improving productivity, and leveraging of staff resources are important requirements. Use of Red Hat Insights has reduced the time needed to identify security vulnerabilities and to apply patches for remediation.

CHALLENGES

As a SaaS solution, Red Hat Insights provides very rapid implementation for existing RHEL customers. Key metrics are obtained from server infrastructures and are analyzed by Red Hat Insights. Some customer segments such as healthcare and financial services organizations with on-premises datacenters and data privacy and security concerns can be reluctant to provide data from on-premises systems to the cloud. Red Hat has addressed these concerns by strictly limiting and anonymizing system information that is uploaded to the cloud for analysis. Red Hat needs to continue to socialize this approach.

CONCLUSION

IT organizations are facing enormous challenges in meeting the performance, availability, and security demands of highly interactive always-on digital business applications spanning public, private, hybrid, and multicloud environments. These demands will only increase as digital business applications proliferate, and more and more users expecting to receive a consumerlike experience will drive up the management requirements. IT infrastructure management tools such as Red Hat Insights are needed to help IT organizations meet the challenge of providing critical digital business services.

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