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The Business Value of Red Hat Solutions Versus Non-Paid Open Source Alternatives

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Executive Summary

Linux has over time become the de facto choice of developers and IT departments around the world. This is not something that happened by accident, however. Over the past decade particularly, Linux has made great gains in the mindshare of everyday practitioners through careful cultivation via a vibrant and diverse open source community. In turn, Linux has rapidly expanded beyond traditional data center use cases and has grown to include the cloud as well as the edge for those in pursuit of deploying next-generation IT.

Commercial Linux vendors such as Red Hat have taken this a step further, building upon this paradigm and creating a vast ecosystem of hardened software and services. Enterprise customers engaging with these vendors have benefited as a result and have derived significant business value while streamlining their capex and opex investments — resulting in impressive returns on investment (ROIs), which IDC research measures and highlights in this business value (BV) study.

IDC spoke with organizations using Red Hat Enterprise Linux (RHEL), Red Hat Insights, and Red Hat Satellite to understand the value of paying for supported Red Hat solutions instead of using non-paid alternatives with self support. Study participants reported that Red Hat solutions provide the features, performance, and confidence they need to drive their development activities and business operations across their on-premises and cloud IT environments. Further, they explained that they benefit from cost and operational efficiencies by establishing more cost-effective and streamlined IT infrastructures.

Based on interviews, IDC calculates that these Red Hat customers will achieve benefits worth an annual average of $27,300 per 100 users ($9.38 million per organization) by:

- **Empowering development teams** to meet business demand for highly functional new applications and features
- **Ensuring security and performance** of key applications and workloads, thereby limiting risk and risk-related business costs
- **Achieving better business results** by having the ability to confidently address business opportunities and better serve existing customers

Business Value Highlights

Click each highlight below to navigate to related content within this document.

540%
three-year ROI

20%
development team productivity gain

75%
more new features

23%
faster development lifecycle, new applications

52%
faster security updates

72%
less unplanned downtime

$17.31M
higher revenue per year

32%
more efficient IT infrastructure teams

38%
higher virtualization density

- **Making IT operations more cost effective** by optimizing use of compute and other IT resources and freeing up IT teams from more repetitive day-to-day tasks

Situation Overview

Today's IT customers not only need the ability to move their infrastructure closer to the points at which data is being generated (e.g., on a manufacturing floor, in an oil field, in a remote office or other location, etc.), but they also need the ability to harvest that data and process it in order to drive decision making and outcomes. This, however, is a task that is not as simple as it seems. Organizations often struggle to stand up the infrastructure needed to undertake these types of digitally transformative tasks or they do so in incomplete or unwieldy ways. Complicating matters further are cost concerns related to these types of IT projects that need to be balanced with other core needs of the business. Some organizations will opt to try to address these cost matters themselves and will attempt to implement homegrown solutions with varying degrees of success. Many of these solutions happen to be built on open source solutions, including at the operating system (OS) level, which can achieve its goal of minimizing costs in the short run. That said, what these organizations often fail to realize until further down the line is the burden of support that goes with opting for DIY frameworks that include (but are not limited to) staffing, installation and implementation, management, support and maintenance, and security of their OS and broader IT environments. In many cases, what these types of organizations need instead is a strategic partner with the experience and products necessary to undertake these types of projects.

This is where a company like Red Hat enters the picture. With 30 years of experience, Red Hat provides customers with the needed technical expertise and deep software portfolio to bridge the gap between IT and business value. By partnering with commercial OS vendors such as Red Hat, customers are afforded a variety of benefits and support that are most often well beyond what their internal IT staffs can support by themselves.

Some of the most significant benefits when opting for commercial levels of support include:

- **Accessing hardened, commercially ready software.** A commercial software vendor provides the highly valued service of "hardening" inputs adapted from available open source code bases and other project initiatives. This includes rigorous testing of the vendor's software to ensure it operates robustly, scales appropriately, and functions as expected. The

role of a commercial software vendor may also expand to include adding in or editing code to provide additional layers of security and stability compared with non-paid alternatives. Moreover, commercial software products are typically well-integrated with the rest of a vendor's portfolio, which offers customers the added benefit of a "one-stop" experience when deploying and managing their infrastructure stacks.

- **Ensuring security of their IT environments.**
  When it comes to security, the value of a commercial software partner cannot be understated. Should problems arise, a commercial vendor can quickly provide qualified patches, which lowers the amount of support that would otherwise be placed on individual customers. These fixes are tested by the vendor before being implemented within a customer's infrastructure, with additional levels of support offered post-installation if there are any issues with deployment. Commercial vendors also tend to be notified of security risks ahead of the general public, allowing them to be ahead of the curve when it comes to building solutions for their customers. None of this is possible for organizations that choose to self-support their software and deploy homegrown, open source-based technologies.

- **Making IT costs more predictable.**
  In an increasingly hybrid IT world, customers frequently cite the "surprise" bill among their biggest pain points, particularly as they familiarize themselves with their evolving, distributed IT environments. Predictable licensing and support costs can go a long way in helping to alleviate these types of cost-related concerns. Commercial software vendors typically offer a streamlined and transparent cost structure, most often based on a customer's number of servers (including sockets, physical or virtualized cores, and VMs), total installations, or other use metrics that can be easier for customers to track internally.

- **Providing a clear and consumable upgrade path.**
  Organizations tend to upgrade their infrastructure once every several years in concert with their core business needs. In the world of IT, this is a lot of time. Often several versions of an individual piece of open source software have been released since then with no guarantee of compatibility after upgrading, which can cause further business disruption during the process. A commercial software vendor, on the other hand, will roll forward previous builds and features into current OS versions while ensuring compatibility with older application programming interfaces (APIs) and other software dependencies that could serve as points of failure during the upgrade process. Many vendors will also maintain older OS versions with the same levels of service and support as the most recent version for customers still running legacy workloads or who for other reasons are waiting to upgrade their infrastructure. Some (including Red Hat) will offer this level of support for their older operating systems for as many as 10 years.

Over time, commercial vendors such as Red Hat have continued to build around the ecosystem of their core products. While operating system products themselves have become more technologically capable over the past several years, users have increasingly required additional tools to observe and manage their OSs and overall IT environments. This is where Red Hat's products such as Insights and Satellite come into play. Red Hat Insights is a managed service included with RHEL subscriptions that analyzes users' infrastructure platforms and applications and provides predictions and recommendations to users to help them gain insight into and track the cost profiles of their environments. Red Hat Satellite is the management tool that allows users to deploy, scale, and control their Red Hat environments. In tandem, RHEL, Red Hat Insights, and Red Hat Satellite form a powerful trio that lays the software foundation of organizations' infrastructure stacks and allows for them to drive outcomes and create business value. More details about how individual Red Hat customers of these three products have benefited are included in the sections that follow.

Red Hat Solutions

Red Hat products covered in this IDC business value study include:

- **Red Hat Enterprise Linux (RHEL):**
  Red Hat's eponymous operating system, Red Hat Enterprise Linux, has remained the company's flagship product since its founding 30 years ago. RHEL is the commercial OS leader in the Linux space (in 2021, with 80% of all core commercial Linux OS revenue, according to IDC research) and serves as the bedrock foundation for Red Hat's wide portfolio of other infrastructure software and middleware products. The operating system remains a popular choice among organizational IT buyers looking to modernize their on-premises, edge, and cloud-based IT environments in pursuit of digital transformation (DX), with Red Hat releasing its ninth major commercial version of RHEL last year in support. Red Hat also remains an active thought leader in the open source OS community via its contributions to the Fedora Project.

- **Red Hat Insights:**
  Red Hat Insights aims to improve risk management for an enterprise's Red Hat environment. Insights comes bundled with the RHEL operating system, Red Hat OpenShift, and Red Hat Ansible Automation Platform. Insights' goal is to proactively help IT operations teams better manage their Linux environment by adding analytics and centralized dashboard.

Using this reporting and Insights' integration with the Ansible Automation Platform's playbooks, Insights can aid IT in identifying and resolving incidents. For example, insights can identify configuration mismatches and missing security patches, which may cause compliance issues. In addition, the ability to look across private and public clouds and virtual and physical instances gives Insights complete visibility into the enterprise's landscape. Insights can then give IT recommendations based on 20+ years of experience stored in its engineering knowledge base.

- **Red Hat Satellite:**
  Red Hat Satellite is designed to help IT organizations manage and configure Linux infrastructure. Operations teams can spend time on more value-added business projects by using Satellite to automate basic system tasks like patching and updating content. Satellite also provides a centralized console for provisioning of all environments, including bare metal, virtualized, and private and public cloud. In addition, Satellite can manage all subscriptions-based Red Hat products to ensure license compliance and report on usage. Satellite can improve security by automating role-based access controls (RBAC) across thousands of systems. Finally, Satellite can mirror content and patches to remote data centers or other locations to enable faster updates for edge infrastructure.

The Business Value of Red Hat Solutions Versus Non-Paid Open Source Alternatives

Study Demographics

IDC conducted in-depth interviews with organizations using Red Hat solutions, including Red Hat Enterprise Linux, Red Hat Insights, and Red Hat Satellite, to understand the cost, operational, and business impacts of using these Red Hat solutions instead of non-paid open source alternative solutions with self support. Interviews were in-depth and designed to obtain both quantitative and qualitative information pertaining to the differences between Red Hat solutions and non-paid open source solutions.

Table 1 provides an overview of key firmographics for study participants. As shown, interviewed organizations had an enterprise profile both in terms of number of employees (average of 34,378 employees, median of 24,000) and annual revenue (average of $20.53 billion, median of $6.0 billion). Interviewees were based in the United States but spoke to the experiences of organizations from various industry verticals, including the consumer, higher education, healthcare, pharmaceutical, retail, software, and telecommunication industries.

TABLE 1

Demographics of Interviewed Organizations

	Average	Median
Number of employees	34,378	24,000
Number of IT staff	4,621	600
Number of business applications	1,654	188
Revenue per year	$20.53B	$6.0B
Countries	United States	
Industries	Consumer (2), higher Education (2), healthcare, pharmaceutical, retail, software, telecommunications	

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Choice and Use of Red Hat Solutions

Interviewed organizations spoke to why they chose to invest in Red Hat–supported solutions instead of using non-paid open source alternative solutions. In short, they realized that, while Red Hat solutions require a subscription cost, they provide back substantially more in efficiencies, assured performance, business and operational enablement, and cost savings. In other words, they concluded that Red Hat would allow them to provide a more efficient and effective IT foundation for their business-critical workloads and applications.

Interviewed Red Hat customers described their considerations:

Assured scalability, Pharmaceutical:

"The reason we chose Red Hat goes back to the security and scalability of the supported version, as well as the service support. You can't get that as easily with the open source free version. … We can scale better with RHEL because we have assurance that we can scale up to thousands of instances without performance degradation."

Need for deeper functionality, Consumer:

"We chose Red Hat solutions because needed management features in addition to the base operating system. For example, upgrades, monitoring, notifications, connected services, being able to make multiple cutovers via APIs, and partner support."

Guaranteed and timely support, Retail:

"We chose Red Hat because of the guaranteed support for key business applications. Also, receiving support is immediate, as soon as you contact Red Hat, whereas with an open source version, someone may get back to you."

Study participants are running significant business operations on their Red Hat–supported infrastructures. All interviewed organizations use Red Hat Enterprise Linux, with most using Red Hat Insights and several using Red Hat Satellite. **Table 2** (next page) provides an overview of how they use Red Hat solutions to support hybrid IT environments, with an average of 773 on-premise servers and 1,933 VMs. Virtualization density levels (i.e., the number of VMs per physical server) varied by interviewed organizations, but averaged 10 VMs per physical server across study participants. Further, they counted an average of 891 cloud instances, with the combined on-premise and cloud infrastructure running 471 business applications. The extent to which interviewed customers use Red Hat to run business-critical workloads and services is reflected in their linking both an average and median of more than half (58%) of their revenue to their Red Hat environments.

TABLE 2

Use of Red Hat Solutions

	Average	Median
Number of on-premises servers	773	200
Number of VMs, on-premises	1,933	1,000
Number of cloud instances	891	100
Number of business applications	471	50
Percentage of business supported	58%	58%

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Business Value Results

IDC's research demonstrates the value for study participants of using paid Red Hat solutions, including Red Hat Enterprise Linux, Red Hat Insights, and Red Hat Satellite, compared with non-paid open source alternatives. They leverage Red Hat features, capabilities, and support to enable development activities, ensure security and application availability, and achieve improved business outcomes, even while making their hybrid IT operations more efficient and cost-effective.

Interviewed organizations described key areas of value they attribute to paying for supported Red Hat solutions as opposed to non-paid open source alternatives:

Strong functionality and quality of support, Higher Education:

"Red Hat gives us great functions. We love using Red Hat Satellite to manage the fleet that we have, and we get strong support from Red Hat. This is particularly true for certain workloads where getting Red Hat support is working out well for us."

Enhanced visibility and overall systems performance, Telecom:

"We benefit with Red Hat from visibility into the infrastructure and resolving issues quickly through the functionality that Red Hat has through Insights. Also, Red Hat improves our security, patching, and performance, which are big things for us."

Quality of support allows for focus on core business and capabilities, Software:
"The support from Red Hat is most important and knowing that we don't have to provide internalized, structural support — that's kind of the big thing for us. We're very good at making software but not great at providing support for internal operations."

Figure 1 (next page) shows IDC's analysis of the value that study participants gain through use of Red Hat solutions instead of non-paid open source alternatives.

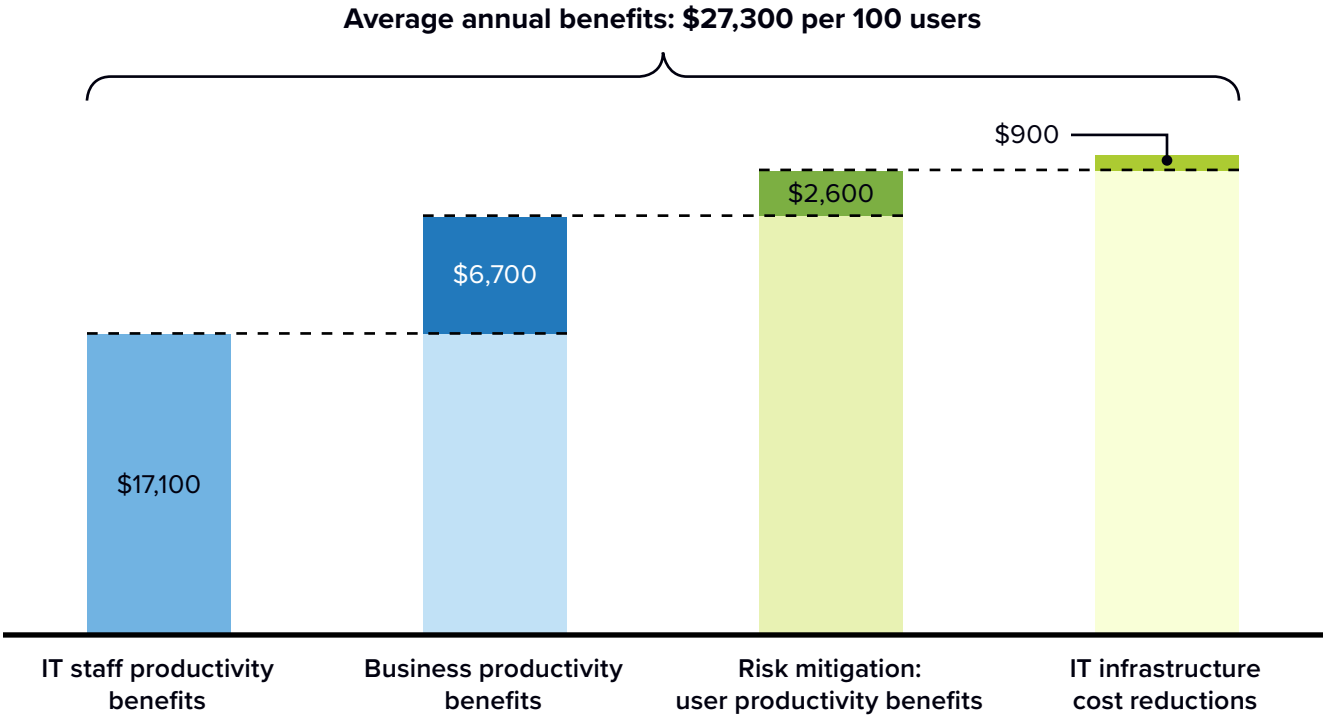
Based on interviews, IDC calculates that these benefits will be worth an annual average of $27,300 per 100 users ($9.38 million per organization) in the following areas:

- **IT staff productivity benefits:**
  Development teams deliver relevant applications and features with greater regularity and speed, while IT infrastructure, security, and application management teams benefit from reducing the time they must spend on repetitive day-to-day tasks. IDC projects value in IT staff productivity gains and efficiencies worth $17,100 per 100 users ($5.88 million per organization).
- **Business productivity benefits:**
  Enhanced security, greater scalability, and increased confidence allow study participants to better address business opportunities and retain existing customers. IDC puts the resultant net revenue gains at an annual average of $6,700 per 100 users ($2.30 million per organization).
- **Risk mitigation — user productivity benefits:**
  Application users experience fewer interruptions to their work and compliance teams benefit from integrated regulatory capabilities. IDC values net productivity and revenue gains at annual average of $2,600 per 100 users ($887,800 per organization).
- **IT infrastructure cost reductions:**
  More efficient use of IT resources and increased virtualization levels across on-premises and cloud environments mean that study participants require fewer physical servers and cloud resources to run equivalent workloads. IDC calculates average IT infrastructure-related cost savings of $900 per 100 users ($307,600 per organization).

FIGURE 1

Average Annual Benefits per 100 Users

($ per 100 users)



n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Development Efficiencies

Study participants reported that their Red Hat infrastructures provide a more robust foundation for development activities than non-paid open source alternatives. Their development teams rely on having agile, flexible, and feature-rich infrastructures to deliver relevant and timely software functionality to their businesses. Infrastructures that cannot meet these requirements can exert friction on development activities and ultimately hinder organizations' ability to deploy new applications and upgrade existing applications through new features and updates.

Interviewed organizations consistently reported that Red Hat Enterprise Linux provides the right foundation for their development teams to maximize their throughput and capabilities. Study participants cited the value of compatibility of Red Hat Enterprise Linux both with other Red Hat solutions and other IT tools, as well as incremental functionality compared with non-paid open source alternatives such as automation, templates, and tools.

They spoke to how their use of Red Hat Enterprise Linux has improved their development capabilities:

Foundation for effective and automated development activities, Consumer:

"When we know that Red Hat Enterprise Linux is the underpinning operating system, we code our apps to run on it, and then we can leverage the automation that comes out of the box with Red Hat solutions to merge our code together to so that it versions correctly and executes."

Compatibility and support enable development, Retail:

"We have more options to deploy key applications with RHEL than with [the non-paid solution] because RHEL provides a level of compatibility and the needed level of support to drive application development activities."

Value of templates and recommendations for deployment, Software:

"It's easier to deploy and provision new applications and features with RHEL because of templates and recommendations, whereas we rely on the community with unpaid software."

Access to documentation and tools, Consumer:

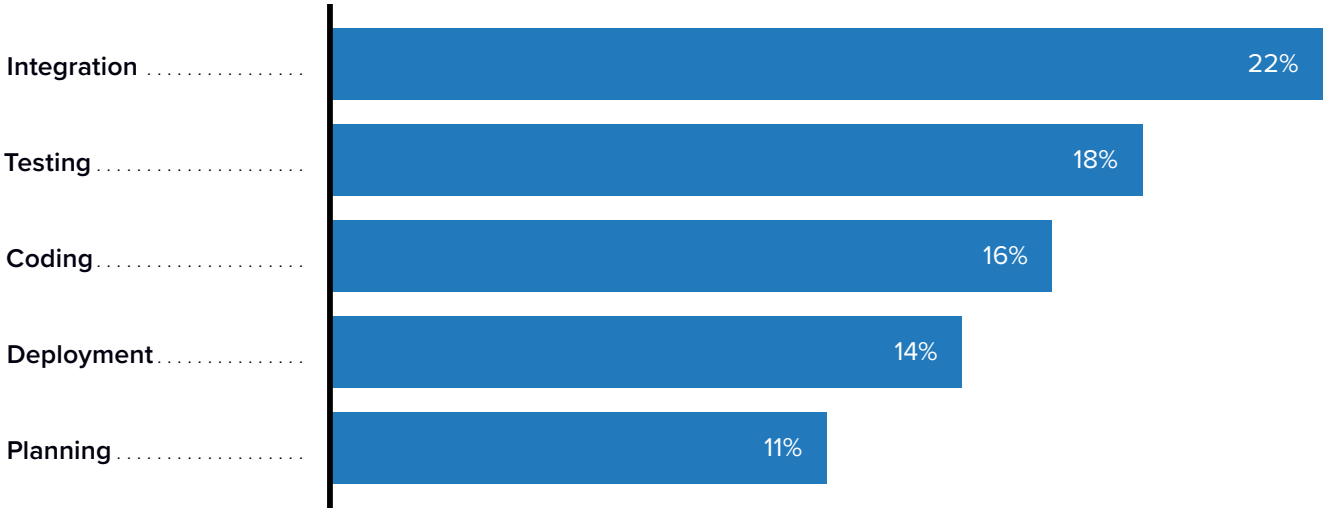
"Red Hat has a developer suite of documentation and tools and we can map those tools into the applications and services that we build, as a development team. We leverage that within our architecture and the availability of the Red Hat tools in our custom application development."

Study participants attributed efficiencies to their use of Red Hat solutions, and especially Red Hat Enterprise Linux, across the development process. They noted that automation, templates, and support help them complete development steps with greater ease, which in turn allows them to move more readily to the next step and ultimately to deliver new applications and functionality faster to their businesses. Efficiencies by development activity with Red Hat ranged from 11% (planning) to 22% (integration), with interviewed Red Hat customers also speaking to substantial efficiencies in testing (18%), coding (16%), and deployment (14%).

FIGURE 2

Development Efficiencies by Activity

(% efficiency)



n = 9; Source: IDC Business Value In-depth Interviews, January 2023

With RHEL reducing friction associated with development activities, interviewed organizations reported achieving important gains in core KPIs that reflect their development capabilities. They deliver substantially more new applications (59% increase) and new features (75% more) for employee use. Further, they provide this new functionality in far less time, ensuring the relevance and impact of new applications and features. On average, study participants cut development lifecycle time for entirely new applications by an average of 23% and new features by an average of 27% with Red Hat solutions compared with non-paid open source versions (see **Table 3**, next page).

TABLE 3

Impact on Development KPIs

	With Non-Paid Open Source Solutions	With Red Hat Solutions	Difference	Percentage Benefit
New Applications				
Number of new applications per year	27.4	43.6	16.2	59%
Development lifecycle in weeks, new applications	24.1	18.7	5.5	23%
New Features				
Number of new features per year	3,378	5,911	2,533	75%
Development lifecycle in weeks, new features	5.6	4.1	1.6	27%

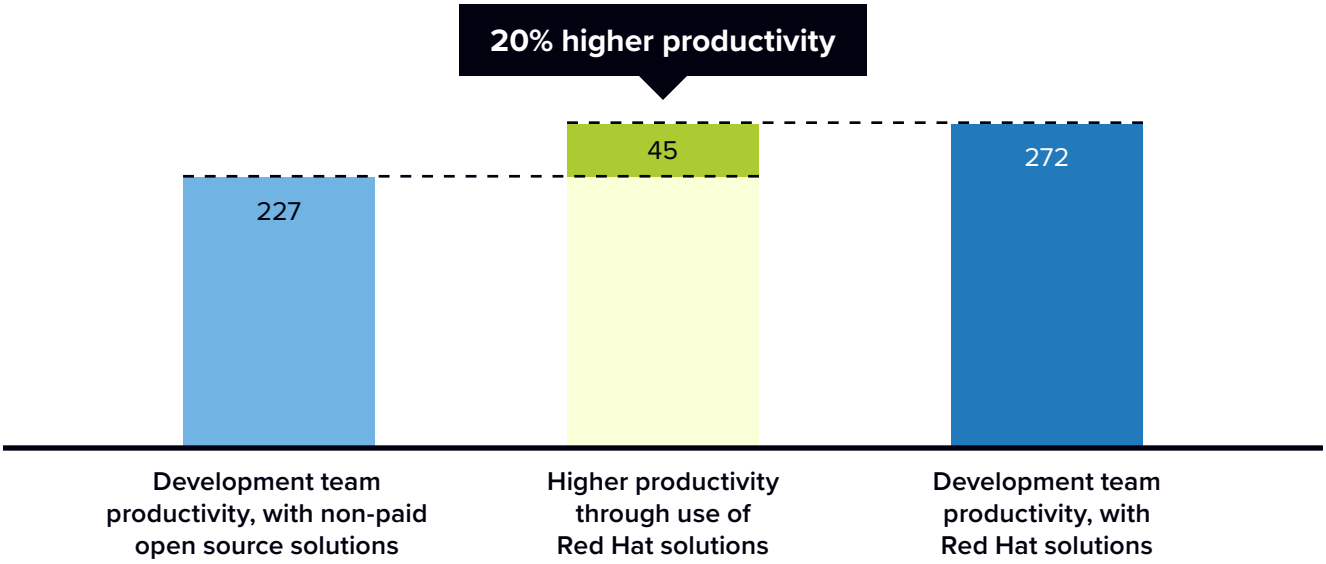
n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Development teams that provide new application functionality to employees and customers more frequently and with less lead time have higher value for their organizations. Otherwise stated, higher productivity levels with Red Hat and RHEL more specifically mean that the same development teams can achieve more. As shown in **Figure 3** (next page), IDC calculates that development teams working on their organizations' RHEL infrastructure see an average productivity gain of 20% compared with using non-paid open source alternatives. Given the extent to which development of new software and functionality drive business results for many organizations, this productivity gain serves as an important competitive differentiator for study participants.

FIGURE 3

Impact on Development Team Productivity

(Equivalent productivity, FTEs per organization)



n = 9; Source: IDC Business Value In-depth Interviews, January 2023

For an accessible version of the data in this figure, see Figure 3 Supplemental Data in Appendix 3.

Security, Risk, and Performance Gains

As security threats multiply and the potential cost of impactful security events escalates, many organizations are placing an increasing emphasis on ensuring the security of their infrastructures and applications. Accomplishing this depends on the ease with which they can identify and address potential threats and update and patch their environments in response to evolving security threats. This makes the security capabilities of operating system and system management solutions essential; when organizations must use process-laden approaches to security, it hinders their ability to move with the timeliness and efficiency required.

Study participants were unanimous that Red Hat solutions have helped them achieve better security postures more efficiently than they could have with non-paid open source solutions. They cited numerous advantages of Red Hat solutions, chief among them pre-validation, automation, and adaptable threat identification functionality.

Interviewed organizations provided specific examples of how Red Hat solutions compare favorably to non-paid open source solutions in terms of security:

Fast identification and resolution of security issues, Healthcare:
"For traditional and container-based infrastructure, Red Hat Insights basically figures out, or pinpoints, the issues and the targeted action that are needed to address issues quickly instead of digging around for hours with an unpaid solution."

Validated updates, ease of rolling out security updates, Higher Education:
"Red Hat Satellite is a major help with security because the updates are already validated, and the patches are already there when we become aware of the need. Because they are validated, we just push them out and it's very streamlined. On [the non-paid open source solution], it's not terribly difficult, but Red Hat Satellite is a significant value-add for this kind of stuff."

Quality of Red Hat security tools and patches, Telecom:
"We use Red Hat tools and patches to detect vulnerabilities and similar problems. This determines what type of risk it is, and how we address those. It helps us prioritize the risks."

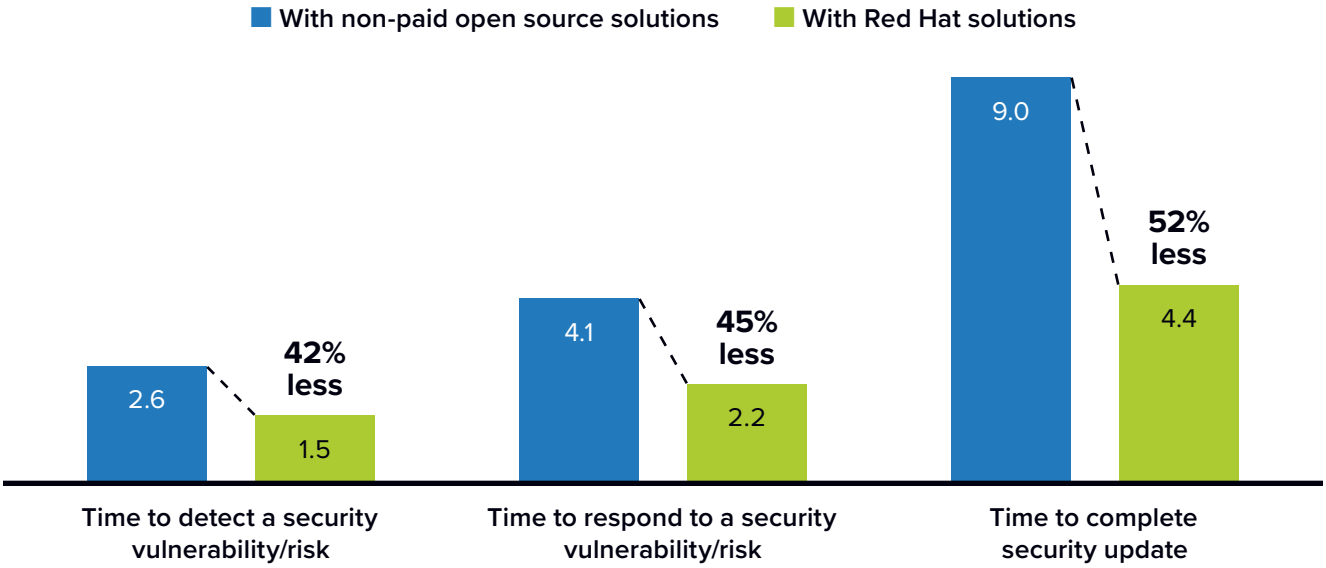
Much faster to complete needed configuration changes, Pharmaceutical:
"With Red Hat, we can make a configuration change in one day compared with three days with unpaid open source … because there would be all kinds of manual checks that would have to be made to ensure security and stability."

As shown in **Figure 4** (next page), study participants have made pronounced gains with Red Hat in their ability to detect and respond to security updates (42% and 45% faster, respectively), and complete security updates (52% faster). This means that they face less exposure to major security events that could potentially affect employee productivity, business results, or even their organizations' reputations. Further, they noted that their security teams are significantly more efficient (30% on average) with Red Hat solutions compared with non-paid open source alternatives.

FIGURE 4

Impact on Security KPIs

(Hours)



n = 9; Source: IDC Business Value In-depth Interviews, January 2023

For an accessible version of the data in this figure, see Figure 4 Supplemental Data in Appendix 3.

Study participants also reported limiting business and operational risk associated with unplanned outages with Red Hat solutions. Compared with non-paid open source alternatives, interviewed organizations explained that Red Hat–based infrastructures experience fewer unexpected outages (48%) and benefit from faster problem resolution (34%). In turn, this means that unplanned outages have shorter durations and less overall effect on employees and business activities. An interviewed pharmaceutical company explained: *"Red Hat supports revenue growth for us because of the additional productivity, which means we're producing more product. This is reflected in lower downtime with Red Hat and avoiding those losses. There's also higher productivity for tens of thousands of employees as a result — it's all about the uptime and avoiding that downtime impact."* As shown in **Table 4** (next page), IDC calculates that study participants will lose 72% less employee productivity and 73% less revenue due to unplanned downtime, equivalent to productivity gains worth an average of $474,300 per year and revenue gains of $2.22 million per year.

TABLE 4

Impact on Unplanned Downtime KPIs

	With Non-Paid Open Source Solutions	With Red Hat Solutions	Difference	Percentage Benefit
Number of unplanned outages per year	19.3	10	9.3	48%
Mean time to repair, hours	5.7	3.8	1.9	34%
Hours of productive time lost per user per year	0.5	0.1	0.4	72%
Productivity loss per year in FTEs per organization	9.5	2.7	6.8	72%
Value of lost productivity time per organization per year	$663,000	$188,700	$474,300	72%
Lost revenue per year per organization	$3,051,900	$830,800	$2,221,100	73%

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Study participants also linked having Red Hat solutions to better ensuring the robustness and efficiency of their compliance efforts. Many interviewed organizations face frequent changes to regulatory requirements, making it challenging to ensure that their IT infrastructures and ecosystems remain compliant.

They know that they face the possibility of fines and other penalties if they do not meet often stringent requirements, so having certified Red Hat solutions goes a long way to minimizing the burden of compliance that non-paid open source solutions typically cannot provide. Interviewed Red Hat customers described the benefits:

Reduced likelihood of regulatory compliance issues, Healthcare:

"We're less likely to encounter regulatory problems with Red Hat and when they occur, we're pretty covered by Red Hat's capabilities as opposed to with the unpaid version."

Ability to demonstrate compliance, Software:
"When we go internal development work, we have to prove that we're compliant. Red Hat helps us adhere to that compliance recommendation and ensures audit trails and frameworks."

In addition to minimizing risk related to compliance, study participants linked their use of Red Hat solutions to more efficient regulatory compliance teams. On average, they attributed a 25% efficiency to having Red Hat solutions, reflecting their ability with Red Hat to better allocate compliance team time to the most significant regulatory challenges while relying on Red Hat to provide the foundation for compliance efforts.

Business and Operational Benefits

Study participants also confirmed that operational enablement and strong performance achieved with Red Hat solutions helps them realize better business results than they could have with non-paid open source solutions. Specifically, Red Hat helps drive better business results in both tangible and less tangible ways. From a tangible perspective, the enablement of development activities discussed previously means that organizations can often get new services and products to customers faster, thereby better meeting customer demand. Further, improved overall system and application performance help ensure requisite performance levels, leading to improved customer satisfaction, customer retention, and upselling and cross-selling opportunities. More intangibly, interviewed organizations commented on how Red Hat instills confidence that their IT can fully support business activities. As a result, they are often more proactive and responsive to demonstrated customer needs and demand.

Study participants provided examples of how Red Hat solutions have enabled better business outcomes than they could have achieved with non-paid open source alternatives:

Need availability and support for customer-facing workloads, Consumer:
"Red Hat Enterprise Linux is the foundational operating system for some of our business products. Typically, we use the unpaid version for research and R&D, when we're not in production for selling to consumers. Our Red Hat environment is in production for selling to customers because availability and support becomes important."

Significant business impact, Consumer:

"Red Hat has a huge impact on our business because we can bring new ideas to market faster, even for internal needs, and build the tools our company needs in a custom way without too much oversight, like in-house development activities."

Ensure higher-performing operations while optimizing costs, Retail:

"Red Hat has impacted our overall operations because a lot of requests now can be handled in an automated fashion. Having those pre-determined workflow automations helps us focus on products that require less overhead, like RHEL, in comparison, not only do we save on costs, but we get a more reliable product that stays up and is supported. It's part of our strategy to improve performance, improve reliability, but save costs."

Increased confidence in performance and security drives business gains, Consumer:

"RHEL supports around ten percent of the business. Because we're on RHEL, we can be more aggressive and sell more … We can basically double the revenue [of this business area] because we have that confidence with RHEL. Specifically, our industry gets regulatory attention, so we only put in front of our customers what we're comfortable is solid, secure, and available, and RHEL helps us do this."

Table 5 shows IDC's assessment of the business impact of using Red Hat solutions in terms of revenue gains. On average, IDC calculates that study participants will earn $17.31 million in higher revenue per year through their use of Red Hat solutions. For purposes of assessing the net revenue benefit, IDC applies a 15% operating margin assumption, leaving an average net revenue gain of $2.60 million per organization per year.

TABLE 5

Business Productivity Benefits, Higher Revenue

Revenue Impact	Per Organization	Per 100 Users
Total additional revenue per year	$17.31M	$50,400
Assumed operating margin	15%	15%
Total additional net revenue per year	$2.60M	$7,600

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

IT Infrastructure and IT Staff Efficiencies

Study participants also consistently referenced their ability with Red Hat to establish more efficient and cost-effective IT infrastructures than they could using non-paid open source solutions. These benefits accrue both in terms of IT staff efficiencies and direct IT infrastructure cost savings, and allow interviewed organizations to run equivalent workloads at a significantly lower cost across on-premises, cloud, and hybrid cloud environments.

Interviewed organizations spoke to clear differentiation with Red Hat solutions in terms of managing, supporting, and securing their IT environments compared with using non-paid open source solutions.

IDC's research shows that study participants leverage Red Hat solutions to capture specific benefits in terms of IT staff efficiencies:

- **Red Hat Enterprise Linux** provides automation capabilities and robust tools that minimize the frequency with which IT administrators must perform day-to-day tasks and responsibilities.
- **Red Hat Insights** provides data-driven insights that help highlight paths for efficiencies and enable proactive steps to minimize the likelihood of problems that will later take more time and effort to resolve.
- **Red Hat Satellite** allows for management activities such as patching and updates to occur with less friction and direct staff involvement.

Study participants spoke to efficiencies related to their use of Red Hat solutions instead of non-paid open source alternatives:

Ease of management and ability to apply insights to ensure efficiencies, Telecom:

"We can manage our IT environment better with Red Hat Enterprise Linux because we get better information about what is going on with the infrastructure performance and security so we can then set up playbooks and automate tasks. As a result, Red Hat is much better and takes at least 50 percent less time … Red Hat Insights provides more information about areas within the infrastructure, for example, the applications, the security, the patching, and the network."

Ease of configuration and troubleshooting with Red Hat Insights, Consumer:

"Red Hat Insights pulls information from across our server environment as a whole, which provides us data reporting that we use to make configuration and troubleshooting easier."

Speed of patching, Higher Education:

"With unpaid open source, we have to figure out patching when one is required, whereas it is more automated and standardized with Red Hat Enterprise Linux which allows for faster deployment."

As shown in **Table 6**, IDC finds that IT infrastructure teams are an average of 32% more efficient with Red Hat solutions than non-paid open source alternatives. This opens up significant amounts of staff time to accommodate growth or focus on other business-impacting initiatives. Viewed differently, it means that each IT infrastructure team member can handle 47% more workloads, or almost 45 more VMs and cloud instances each.

TABLE 6

Impact on IT Infrastructure Teams

	With Non-Paid Open Source Solutions	With Red Hat Solutions	Difference	Percentage Benefit
Equivalent FTEs required for same workloads	29.5	20.1	9.4	32%
VM/Cloud instances per IT infrastructure team member	95.7	140.3	44.6	47%
Value of equivalent FTE time required ($ per organization per year)	$2.95M	$2.01M	$937,900	32%

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Study participants also reported that they can better optimize their hardware and IT resource use with Red Hat solutions compared with non-paid open source alternatives. With Red Hat, they reported requiring 12% fewer physical servers for equivalent workloads and reducing cloud infrastructure costs by an average of $172,200 per organization per year.

For interviewed Red Hat customers, infrastructure optimization comes back to performance, configuration, and confidence.

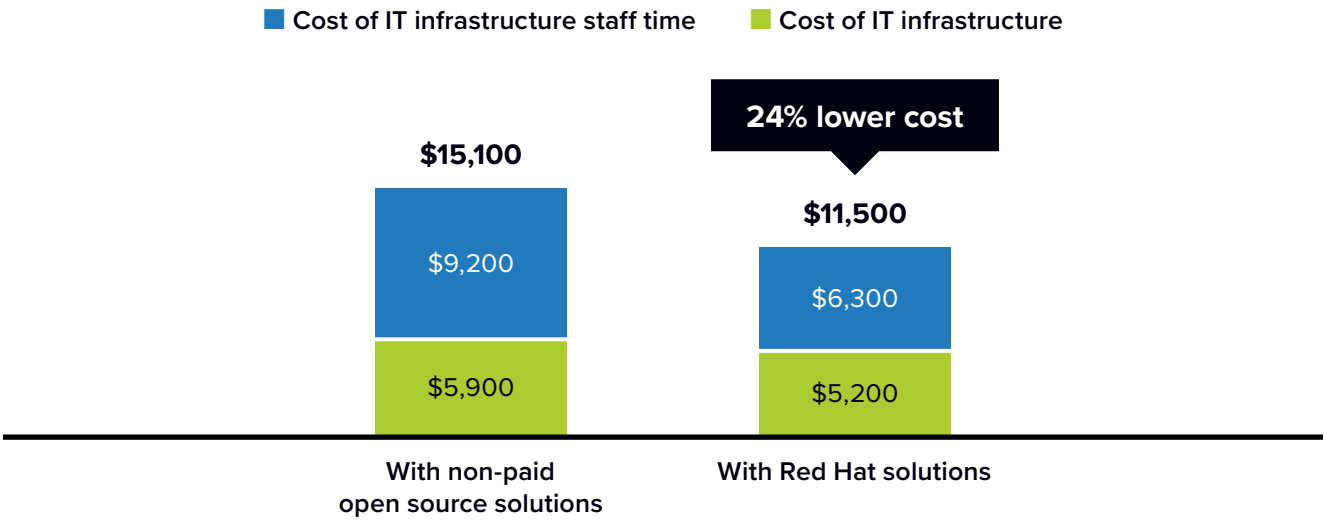
With Red Hat, they know that they have features and support that will ensure performance levels, which in turn encourages them to make more efficient use of capacity and leave less spare capacity. One study participant noted how RHEL tools help it better match the capacity it provisions to its needs, thus reducing costs associated with under-utilized infrastructure. As noted earlier, another study participant noted that it has confidence in its ability to scale virtualization with Red Hat without negatively affecting performance. This impact can be seen in virtualization density for on-premises infrastructure; study participants reported having 38% higher virtualization density levels (number of VMs per physical server) with Red Hat servers than those with non-paid open source solutions. Thus, they require fewer servers by increasing the number of workloads they can run on each physical server.

Figure 5 reflects the combined value of IT staff efficiencies and infrastructure cost optimization through use of Red Hat solutions compared with non-paid open source solutions. As shown, IDC calculates that organizations will spend 23% less on average for their on-premises environments with Red Hat, with additional savings for their cloud environments using Red Hat solutions (see Appendix 2, **Table 9** for additional details on infrastructure savings).

FIGURE 5

Three-Year Cost of Operations

($ per physical server, three years)



n = 9; Source: IDC Business Value In-depth Interviews, January 2023

For an accessible version of the data in this figure, see Figure 5 Supplemental Data in Appendix 3.

In addition to efficiencies for teams that manage infrastructure, study participants also reported benefits for IT staff who manage their applications environments running on Red Hat solutions. On average, they reported 18% efficiencies for their application management teams, as shown in **Table 7** below.

TABLE 7

Impact on Application Management Teams

	With Non-Paid Open Source Solutions	With Red Hat Solutions	Difference	Percentage Benefit
Equivalent FTEs required for same workloads	68	56	12	18%
Value of equivalent FTE time required ($ per organization per year)	$6.80M	$5.59M	$1.21M	18%

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

ROI Analysis

Table 8 (next page), presents IDC's analysis of the benefits and costs of study participants' use of Red Hat solutions, including Red Hat Enterprise Linux, Red Hat Insights, and Red Hat Satellite. IDC calculates that study participants will realize average three-year discounted benefits of $21.91 million per organization ($63,700 per 100 users) compared with using non-paid open source alternative solutions. These benefits compare with average discounted three-year investment costs of $3.43 million per organization ($10,000 per 100 users). Based on these benefits and costs, IDC projects that interviewed organizations will realize a three-year ROI of 540% based on incremental value achieved by using Red Hat solutions instead of non-paid open source solutions and break even on their investment in an average of nine months.

TABLE 8

ROI Analysis

	3-Year Average per Organization	3-Year Average per 100 Users
Benefit (discounted)	$21.91M	$63,700
Investment (discounted)	$3.43M	$10,000
Net present value (NPV)	$18.49M	$58,800
Return on investment (ROI) (%)	540%	540%
Payback period	9 months	9 months
Discount rate	12%	12%

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Challenges/Opportunities

Notwithstanding, Red Hat faces several immediate competitive challenges, which IDC believes if addressed and positioned correctly in relation to its customers, should reveal themselves as opportunities for the company looking forward.

Challenge: Despite the clear benefits Red Hat products offer in terms of increasing organizational revenue and reducing implicit IT and staffing costs, communicating these messages to technology buyers in a slowing economic and business climate will be key. Given increased scrutiny and potential reductions being made to IT budgets over the coming months, buyers will be looking for areas to cut costs and/or to strategically realign spending, which for some may mean considering whether to move to or maintain non-paid/free operating system deployments in their IT environments.

Opportunity: Over the past several years, Red Hat has strongly emphasized the capabilities and flexibility of its products, regardless of where users' IT is located, while remaining true to its hardened, secure, and open source roots — which is a message that resonates well with customers. That said, many organizations will face headwinds over the coming months and will increasingly need to focus on the revenue-generating activities that are central to their lines of business.

For Red Hat, this is an opportunity to underscore its value to current and potential customers as a strategic partner in support of their current mission critical workloads as well as future IT projects aimed at unlocking further business potential.

Challenge: The core operating systems and subsystems (OSS) market continues to be commoditized, specifically by open source, free OS variants as well as non-paid offerings made available by public cloud service providers. Perhaps not too surprisingly, many customers today are highly cost-sensitive, and battling the notion that "free" is better continues to remain a challenge for commercial vendors.

Opportunity: Red Hat is one of a small handful of vendors that can combine its longstanding technical expertise with a product portfolio and the levels of support needed to create a fully cross-platform experience, which IDC views as a noteworthy differentiator for the company. Most users' IT environments span a variety of deployment types (on-premises, private and public cloud, and edge) or in some cases, all of them, which fits the description of a truly hybrid world, and they require help managing them. Most infrastructure vendors' offerings (including those from public cloud service providers), on the other hand, can only feasibly support a smaller subset of that list. RHEL seamlessly extends to all these locations and is available on all major public cloud providers, which when combined with Insight and the management tools offered by Satellite only further enhances its value to customers as part of a unified hybrid IT experience.

Conclusion

The importance of the relationship between businesses operations and core IT teams cannot be understated. In an increasingly dynamic and ever-changing digital world, IT teams have been tasked with supporting a variety of business demands that require them to innovate consistently to drive further value. While fulfilling these types of demands by themselves can be challenging enough, IT teams must do so while balancing other core KPIs, including — but certainly not limited to — performance, reliability, flexibility, and security of their operations and remaining within their allotted budgets. Some organizations, in response, will opt to deploy free and open source technologies to try to meet their needs, but what IDC research continues to find is that this is a strategy that is not in their best interest in the long run. As we have seen, the incremental savings on costs are inevitably outweighed over time by the burden of support that goes along with self-servicing a full infrastructure stack. Instead, these organizations would be best served by selecting specialized partners such as Red Hat, which would allow them to focus on the key revenue-generating activities that they do best.

This IDC study compares the value that organizations can achieve by using paid Red Hat solutions, including Red Hat Enterprise Linux, Red Hat Insights, and Red Hat Satellite, instead of using self-supported non-paid open source alternatives. Interviewed customers consistently cited the benefits of Red Hat features, capabilities, and support that they could not access with non-paid open source alternatives. By investing in Red Hat solutions, they described capturing significantly more in value from IT staff efficiencies, development enablement, improved business results, and IT cost savings than the costs they take on with Red Hat subscriptions. Further, they can establish hybrid IT environments with Red Hat solutions that are fully capable of allowing them to address changing market conditions and customer demand patterns in a robust, efficient, and cost-effective manner. Overall, IDC calculates that interviewed Red Hat customers will realize more than a six-to-one ratio of benefits to investment costs, which would result in an average three-year ROI of 540 % and breakeven on their investment in an average of nine months.

Appendix 1: Methodology

IDC's standard Business Value and ROI methodology was utilized for this white paper. This methodology is based on gathering data from organizations currently using the following Red Hat solutions: Red Hat Enterprise Linux, Red Hat Insights, and Red Hat Satellite as the foundation for the model. For purposes of this study, these Red Hat solutions are referred to collectively as "Paid Red Hat Solutions." Based on interviews with these study participants, IDC has calculated the benefits and costs to these organizations of using Red Hat solutions compared with non-paid open source alternative solutions.

IDC used the following three-step method for conducting the ROI analysis:

1. **Gathered quantitative benefit information during the interviews using a before-and-after assessment of the impact of using Red Hat solutions.** In this study, the benefits included staff time savings and productivity benefits, revenue gains, and IT infrastructure–related cost reductions.
2. **Created a complete investment (three-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using Red Hat solutions and include additional costs related to migrations, planning, consulting, and staff or user training.
3. **Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of Red Hat solutions over a three-year period. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

IDC bases the payback period and ROI calculations on a number of assumptions, which are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings. For purposes of this analysis, based on the geographic locations of the interviewed organizations, IDC has used assumptions of an average fully loaded $100,000 per year salary for IT staff members and an average fully loaded salary of $70,000 for non-IT staff members. IDC assumes that employees work 1,880 hours per year (47 weeks x 40 hours).

- Downtime values are a product of the number of hours of downtime multiplied by the number of users affected.
- The impact of unplanned downtime is quantified in terms of impaired end-user productivity and lost revenue.
- Lost productivity is a product of downtime multiplied by burdened salary.
- The net present value of the three-year savings is calculated by subtracting the amount that would have been realized by investing the original sum in an instrument yielding a 12% return to allow for the missed opportunity cost. This accounts for both the assumed cost of money and the assumed rate of return.

Because every hour of downtime does not equate to a lost hour of productivity or revenue generation, IDC attributes only a fraction of the result to savings. As part of our assessment, we asked each interviewed organization what fraction of downtime hours to use in calculating productivity savings and the reduction in lost revenue. IDC then taxes the revenue at that rate.

Further, because IT solutions require a deployment period, the full benefits of the solution are not available during deployment. To capture this reality, IDC prorates the benefits on a monthly basis and then subtracts the deployment time from the first-year savings.

Note: All numbers in this document may not be exact due to rounding.

Appendix 2: Calculations

Average Annual Benefits per Organization

Table 9 presents IDC's analysis of the average annual benefits per organization achieved through use of Red Hat solutions instead of non-paid open source alternatives. In total, IDC calculates that study participants will achieve average annual benefits worth $9.38 million in the cost savings, staff efficiencies and productivity gains, and revenue gains listed below.

TABLE 9

Calculations: Annual Benefits from Use of Red Hat Solutions

Category of Value	Average Quantitative Benefit	Calculated Average Annual Value
Infrastructure cost reductions	12% fewer physical servers, reducing 102 physical servers at $4,000 each with 10% maintenance per year, saving $406,300 over three years, reduced cloud infrastructure costs of $172,200 per year	$307,600
IT infrastructure team efficiencies	32% more efficient, saving 9.4 FTEs, $100,000 salary	$752,900
Application management team efficiencies	18% more efficient, saving 12.1 FTEs, $100,000 salary	$969,400
IT security team efficiencies	30% more efficient, saving 6.8 FTEs, $100,000 salary	$542,600
Development team productivity gains	20% more productive, worth 45.0 FTEs in higher productivity, $100,000 salary	$3.61M
Unplanned downtime – higher productivity	72% less productive time lost, worth 6.8 FTEs, $70,000 salary	$380,800
Unplanned downtime – higher net revenue	$2.22M in revenue loss per year avoided, 15% margin assumption applied	$267,500

continue...

Category of Value	Average Quantitative Benefit	Calculated Average Annual Value
Compliance team efficiencies	25% more efficient, worth 4.3 FTEs, $70,000 salary	$239,600
Higher net revenue	$17.31M in higher revenue per year, 15% margin assumption applied	$2.08M
Higher user productivity, self-service	Time savings worth 3.9 FTEs, $70,000 salary assumption	$219,800
Total annual benefits	**$9.38M per organization**	

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

Appendix 3: Supplemental Data

The tables in this appendix provide an accessible version of the data for the complex figures in this document. Click "Return to original figure" below each table to get back to the original data figure.

FIGURE 3 SUPPLEMENTAL DATA

Impact on Development Team Productivity

	Development Team Productivity, with Non-Paid Open Source Solutions	Higher Productivity Through Use of Red Hat Solutions	Development Team Productivity, with Red Hat Solutions
Base productivity	227	227	272
Enhanced productivity		45	

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

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FIGURE 4 SUPPLEMENTAL DATA

Impact on Security KPIs

	With Non-Paid Open Source Solutions	With Red Hat Solutions	Difference
Time to detect a security vulnerability/risk	2.6	1.5	42% less
Time to respond to a security vulnerability/ risk	4.1	2.2	45% less
Time to complete security update	9.0	4.4	52% less

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

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Appendix 2: Supplemental Data (continued)

FIGURE 5 SUPPLEMENTAL DATA

Three-Year Cost of Operations

	With Non-Paid Open Source Solutions	With Red Hat Solutions
Cost of IT infrastructure	$5,900	$9,200
Cost of IT infrastructure staff time	$5,200	$6,300
Total	**$15,100**	**$11,500**

n = 9; Source: IDC Business Value In-depth Interviews, January 2023

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About the IDC Analysts

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Greg is a Senior Research Analyst within IDC's Enterprise Infrastructure Practice. His coverage area consists of a mix of server, storage, converged, and PBBA markets in the hardware space in addition to contributing to a variety of IDC's Enterprise Infrastructure Trackers. He also covers storage software as well as operating systems both on-premises and in the cloud with particular interest in the open source developer community.

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Matthew is responsible for carrying out custom business value research engagements and consulting projects for clients in a number of technology areas with a focus on determining the return on investment (ROI) of their use of enterprise technologies. Matthew's research often analyzes how organizations are leveraging investment in digital technology solutions and initiatives to create value through efficiencies and business enablement.

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Message from the Sponsor

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