

WHITE PAPER

Linux Management with Red Hat Network Satellite Server: Measuring Business Impact and ROI

Sponsored by: Red Hat

Tim Grieser

Eric Hatcher

Randy Perry

October 2009

INTRODUCTION

Linux is increasingly being used to deploy business applications and databases, trading on its reputation as a low-cost operating environment. For many IT organizations, Linux is a mainstay for deploying Web servers and is evolving from handling basic file, print, and utility workloads to running mission-critical applications and databases. As Linux grows in importance in terms of value to the business, the need to manage Linux environments to high standards of service quality — availability, security, and performance — becomes an essential requirement for business success.

Red Hat Inc. distributes and supports the Red Hat Enterprise Linux (RHEL) operating environment, which is based on the Linux open source kernel. Red Hat provides Red Hat Network (RHN) Satellite, a systems management platform designed to be deployed on a server located in a customer's datacenter. RHN Satellite provides patch management, provisioning, configuration management, and monitoring of RHEL systems. This ROI study focuses on the quantitative benefits gained from using RHN Satellite Server.

EXECUTIVE SUMMARY

IDC conducted in-depth interviews with staff members of 10 IT organizations that have deployed RHN Satellite Server. A structured set of questions was used to assess and quantify the internal and external costs of performing certain administrative, operational, and support functions and how costs changed as a result of implementing RHN Satellite Server. Table 1 shows the key results of this study.

TABLE 1**Red Hat Network Satellite Server ROI Analysis**

Category	Value
Three-year cost of investment	\$274,410
Annual cost savings	\$500,905
Net present value (NPV) of three-year savings	\$927,778
Payback period	4.8 months
Three-year ROI	338%

Source: IDC, October 2009

The study was based on standard IDC return on investment (ROI) methodology used to calculate average cost savings resulting from higher availability, including changes in downtime, improved IT efficiency, and increased user productivity resulting from using RHN Satellite Server. Data from the survey was used as the basis for the IDC ROI analysis. IDC's ROI analysis methodology is described in the Appendix.

KEY FINDINGS

Based on data from interviews with IT managers from 10 organizations using RHN Satellite Server, IDC's ROI analysis yielded an average 338% ROI — more than three times the initial investment — and an average payback period for the initial investment of a short 4.8 months for the IT organizations in this study, as shown in Table 1.

A key metric was the improvement in the number of Linux servers managed per system administrator. The number of Linux servers managed per system administrator essentially doubled, increasing from an average of 28 Linux servers per administrator before Red Hat Satellite Server to 54 Linux servers per administrator after deploying Red Hat Satellite Server.

The IT organizations reported a substantial savings in staff hours expended on managing Red Hat Enterprise Linux environments, resulting in annual IT productivity increases. IT managers also claimed improved end-user productivity while the number of downtime hours per month was reduced. Participants also identified other annual savings through improvements in IT efficiency, absolute software/hardware savings, and other indirect cost savings.

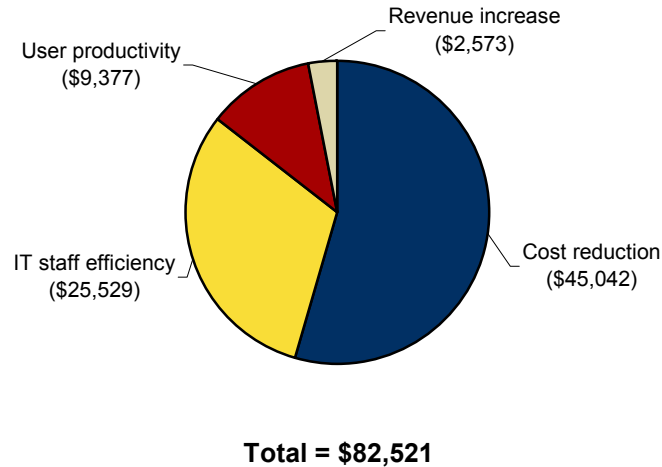
These results are illustrated in Figure 1 in terms of average annual savings per 100 Red Hat Enterprise Linux servers.

IDC's ROI analysis yielded an average 338% ROI — more than three times the initial investment — and an average payback period for the initial investment of a short 4.8 months.

The number of Linux servers managed per system administrator essentially doubled, increasing from an average of 28 Linux servers per administrator before the Red Hat Satellite Server deployment to 54 Linux servers per administrator after the Red Hat Satellite Server deployment.

FIGURE 1

Average Annual Benefits of Red Hat Network Satellite Server per 100 Linux Servers



Source: IDC, October 2009

Deployment of Red Hat Network Satellite Server achieved an impressive average annual benefit of \$82,521 per 100 Linux servers. Cost reductions accounted for 55% of this benefit, while nearly one-third of the benefit came from improvements in IT efficiency. Improvements in user productivity and revenue increase accounted for 14% of the total.

STUDY DEMOGRAPHICS

To assess the benefits of Red Hat Systems Management, IDC conducted in-depth telephone interviews with staff members from 10 IT organizations located in companies headquartered in North America and Europe, the Middle East, and Africa (EMEA) that have deployed Red Hat Network Satellite Server. The industries of the companies supported by the IT organizations include manufacturing, healthcare, transportation, oil and gas, data warehousing, home furnishing, and office products. Table 2 shows the survey demographic averages across the 10 IT organizations.

TABLE 2

Demographics	
Category	Average
Employees	36,933
IT end users	30,215
IT staff	576
Servers running Red Hat Enterprise Linux before the Red Hat Network Satellite Server deployment	475
Servers running Red Hat Enterprise Linux after the Red Hat Network Satellite Server deployment	607
IT staff supporting Red Hat Enterprise Linux before the Red Hat Network Satellite Server deployment	17
IT staff supporting Red Hat Enterprise Linux after the Red Hat Network Satellite Server deployment	11
Red Hat Enterprise Linux servers managed per administrator before the Red Hat Network Satellite Server deployment	28
Red Hat Enterprise Linux servers managed per administrator after the Red Hat Network Satellite Server deployment	54
Geography	North America; Europe, the Middle East, and Africa

Source: IDC, October 2009

BENEFITS OF RED HAT NETWORK SATELLITE SERVER

Cost Reduction

All of the companies in this study were able to reduce their maintenance and external vendor costs, lower their expenses by moving away from other less efficient tools, avoid new hires, and reduce costs for new hardware.

One customer said, "If we didn't have the tool [RHN Satellite Server], we would either hire more people or have diminished capability. We want our server farm to be in a supportable, solid, and secure state. If RHN Satellite Server didn't exist, I would need another person or more." On average, the companies in this study are saving 1.3 full-time employees (FTEs) because of Red Hat Network Satellite Server and the improvement they have gained in server maintenance.

"If we didn't have the tool [RHN Satellite Server], we would either hire more people or have diminished capability."

"If RHN Satellite Server didn't exist, I would need another person or more."

Red Hat Network Satellite Server customers have reduced external contractor costs. As one manager said, "For an OS install, we used to hire someone outside to do the work. We would buy the hardware, and then we pay them to come on site, answer questions. So now, we are completely avoiding that cost." On average, customers in this study reduced their vendor costs by \$59,592 annually.

When comparing Red Hat Network Satellite Server with a previous management tool, one customer mentioned that "Red Hat Network Satellite Server has made my life much easier. I save a lot of time because before, we would build every server individually. But with Satellite Server, once things are set up and it is in place, managing 200 servers is as easy as managing one."

"...with Satellite Server, once things are set up and it is in place, managing 200 servers is as easy as managing one."

Customers have been able to move away from in-house management tools as well as tools supported by other vendors. One company maintained all of its own server management code and is now saving over five hours per week in IT time since deploying Red Hat Network Satellite Server. On average, companies in this study are saving time and licensing costs equal to \$58,116 per year.

IT organizations have been able to deploy Linux servers faster, cheaper, and in a more standardized fashion after their Red Hat Network Satellite Server implementation. As one manager said, "Satellite Server makes the Linux servers more valuable because server acquisition costs are lower and we don't have a hardware support contract — we are self-maintainers." On average, in this study, customers were avoiding approximately \$20,000 in server costs per year.

IT Staff Efficiency

Improvements in scheduled maintenance, application support, and hardware support were significant benefits to the IT organizations. On average, customers in this study spend 27% less time on these tasks since deploying Red Hat Network Satellite Server.

The time to set up new servers has been reduced by an average of 4.3 hours. On average, companies in this study set up 16 servers per month — the time savings for setting up those servers over the course of a year is \$40,077.

Because of the automated processes made possible by implementing Red Hat Satellite Server, companies have been able to save over a third of an FTE per year on network operations. One customer said, "As far as time savings goes, I would say we are easily saving 20 hours per month because we aren't doing things manually." In addition, the time spent on problem and incident management has been reduced by an average of 297 hours per year.

Red Hat customers are also seeing benefits related to the help desk. One manager said, "Satellite Server has helped reduce the number of calls coming in — it applies to the tickets that are escalated and the resolution time has improved. Before, we were not centralized, we didn't know where the servers were, and resolution could have been at least a couple hours. Now it is more like 10 to 20 minutes." On average, customers in this study reduced mean time to repair by 30 minutes for each incident.

User Productivity

Downtime has been reduced by approximately one hour per month, which has a direct impact on user productivity. Fewer hours "in the dark" means users have more time to complete more tasks. As one manager noted, "We have users that are very heavily dependent on their systems. Many of them are geophysical engineers working at hazardous job sites, and they can't afford much downtime at all. Since the RHN Satellite Server deployment, I would say we have been able to cut that by 50%."

Another customer has been able to reduce the number of critical events from six down to just two per year. A manager at that company said, "If we have a server that is in actual hardware failure, we can create it back to where it was in less than four hours using RHN Satellite Server. Before that, it may have taken two days. There are a couple of hundred people relying on these servers, so there is definitely user impact."

On average, in this study, customers experienced an equivalent of \$23,207 in annual user productivity increase.

On average, in this study, customers experienced an equivalent of \$23,207 in annual user productivity increase.

Revenue Increase

Some customers reported improvements in their time to market and avoided lost revenue implementing Red Hat Satellite Server. Linux servers are essential to a retailer's Web-based business, and faster application deployment times translate into quicker new revenue generation. A company manager said, "Time to market is important to the business, and we use Linux servers for everything, including business-critical applications. Our ecommerce runs on it, and when we get a new application, we just hit a button and get that out to 100 servers in about 20 minutes. If we didn't have RHN Satellite Server, it would take two to three days."

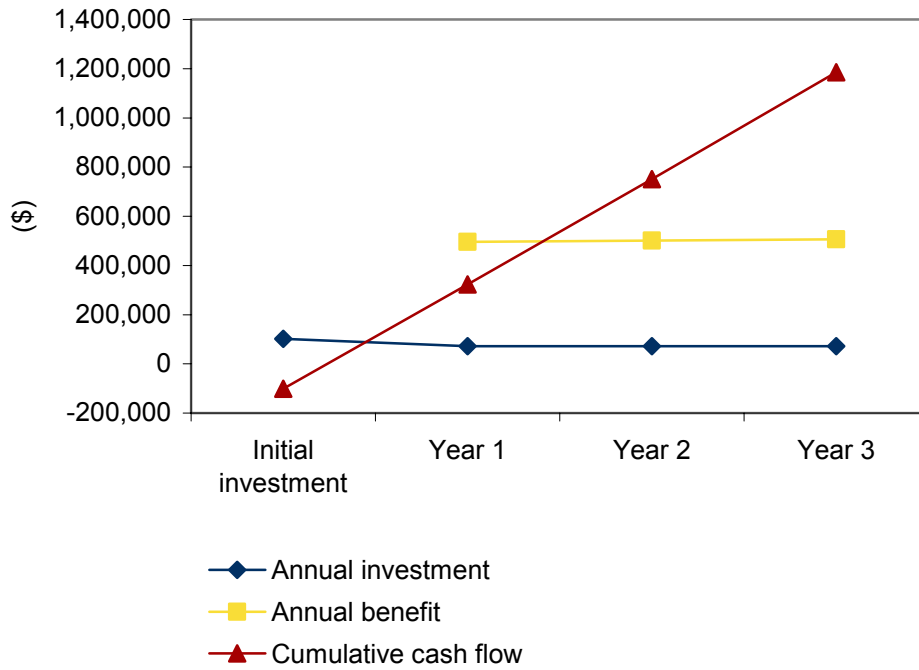
Another customer said, "In terms of the impact, I always count what we can sell in an hour. If the system is down, we can't sell and that's a revenue impact. In just one hour, we might lose millions of euros, so the impact is huge."

Benefit and Cash Flow

The annual benefit, investment, and cumulative cash flow over three years are shown in Figure 2. Benefits tend to increase over time as the solution gains greater traction in the organization. Investments are highest in the year Red Hat Network Satellite Server is purchased; once the initial cost is accounted for, investment in the following years declines and levels off over time. Ongoing investment includes annual subscription fees, standard hardware turnover, IT time required to maintain the solution, and staff training.

FIGURE 2

Benefit, Investment, and Cash Flow



Source: IDC, October 2009

Return on Investment

The three-year IDC ROI analysis on Red Hat Network Satellite Server is based on initial and annual investments compared with the benefit over the three years. Based on the data gathered from the customers in this study, this solution offers an ROI of 338% and payback occurs at 4.8 months. Table 3 displays the ROI results (details on how these figures are calculated are available in the Appendix).

TABLE 3

Three-Year ROI

Category	Value
Benefit (discounted)	\$1,202,187
Investment (discounted)	\$274,410
NPV	\$927,778
ROI	338%
Payback	4.8 months
Discount	12%

Source: IDC, October 2009

NEED TO MANAGE LINUX SERVERS

This ROI analysis is presented in the context of the growing need to manage Linux servers. Linux has grown rapidly in importance as a server operating environment and is being used to deploy an increasing number of functions, including file and print servers, Web servers, and a variety of applications and databases — often replacing higher-cost Unix systems. As Linux moves up from a utility role to an enterprise server role, it is not enough for it to be the low-cost server operating environment; it must also be managed to achieve high-availability, security, and performance standards required for business-critical applications. Systems management software is needed to ensure service quality and support such functions as provisioning, configuration management, and change and patch management — including security patches and monitoring.

SYSTEMS MANAGEMENT BENEFITS

Linux systems management software and processes provide key benefits for managing Linux-based servers and applications. These benefits include the following:

- ☒ **Better service quality.** Systems management software can improve availability and performance with fewer slowdowns and reduced downtime. Downtime has direct costs to the business that come from loss of business opportunity as well as decreased employee and end-user productivity.
- ☒ **Leveraging of staff resources.** Systems management software can help increase the amount of staff time that can be used for productive work.
- ☒ **Automation.** Systems management software can be used to automate routine or repetitive tasks, such as server provisioning or applying patches.

- ☒ **Agility.** Systems management software can facilitate and greatly reduce the time needed to implement system and application changes.
- ☒ **Cost savings and improved ROI.** Systems management drives cost savings, including reduced hardware and software costs, reduced IT operational costs, and reduced IT management costs. Benefits also come from increased end-user productivity and enhanced availability of business applications.

RED HAT SYSTEMS MANAGEMENT

Red Hat Inc. develops, distributes, and supports the Red Hat Enterprise Linux distribution based on the open source Linux kernel. One of the key requirements for Red Hat is to provide systems management support for systems and applications deployed on Red Hat Enterprise Linux servers.

Red Hat Network

Red Hat Network is a solution that provides systems management services specifically for Red Hat technologies and for the distributed software that makes up the Red Hat Enterprise Linux operating environment, as well as for applications deployed on Red Hat Enterprise Linux. The basic delivery form of Red Hat Network is a remote hosted service, managed by Red Hat, accessed over the Internet. Red Hat Network provides key Linux management functions and also delivers software, patches, and updates for Red Hat Enterprise Linux distributions.

Red Hat Network Satellite Server

Red Hat Network Satellite Server is a locally deployed version of Red Hat Network designed to be deployed on a management server located in a customer's datacenter, typically behind a firewall. RHN Satellite Server provides the full functionality of Red Hat Network management on a local server, with key benefits that include faster performance, centralized control, and higher scalability. It can be used to manage a larger number of Red Hat Enterprise Linux servers. Core management functionality provided by RHN Satellite Server includes provisioning of new systems, configuration management, change and patch management, monitoring, and enhanced security with less dependence on Internet connections. RHN Satellite Server can manage Red Hat Enterprise Linux systems running on both physical systems and supported hypervisors in virtual environments.

CHALLENGES AND OPPORTUNITIES

As shown by the results of this ROI study, Linux systems management software can provide a number of key benefits for IT organizations, including increased IT efficiency, operational cost reductions, and service improvements such as reduction in downtime. These factors contribute to making Linux an increasingly viable platform for deploying enterprise-class applications and databases.

One challenge for Linux management is to extend functional capabilities to encompass the changes occurring in infrastructure technology, such as the rapidly spreading virtualized infrastructures in the x86 environment. Increasingly, Linux systems management will need to address both the Linux virtual images and the impacts of the virtual infrastructures in which the images are deployed.

Another area of high interest is managing Linux in the cloud. As cloud architectures mature, IT organizations will want to manage Linux-based applications in a variety of cloud configurations with emphasis on self-service capabilities, including provisioning, patching, and security management. Ensuring service quality including performance and availability will be an important management concern for Linux-based applications deployed in the cloud.

These technological advances pose opportunities for Linux management vendors to develop new and extended functionality for systems management software. Other opportunities exist for increased integration of core Linux management capabilities with major application platforms, commercial databases, and enterprise management suites. The further development of Linux management software by companies such as Red Hat can offer IT organizations the opportunity to achieve positive ROI benefits in expanded areas of their operations.

SUMMARY AND CONCLUSION

This ROI study is based on data gathered from structured in-depth interviews with representatives from 10 IT organizations that are using Red Hat Network Satellite Server to manage Red Hat Enterprise Linux environments. Based on this study, the IT organizations experienced strong positive returns on their investments, yielding an average 338% ROI over a three-year period — over three times the initial investment.

In today's tough economic climate, IT organizations are looking for ways to achieve cost savings in the short term. Based on this study, the IT organizations achieved this goal by realizing an average payback period of a short 4.8 months — recovering their initial investments well within the first half year of deployment.

Another key metric that demonstrates the positive effects of using Red Hat Network Satellite Server is the impact on the number of Linux servers that can be managed by a single Linux administrator. Before deployment, the surveyed IT organizations averaged 28 Linux servers per administrator. After successful deployment, the organizations averaged 54 Linux servers per administrator, essentially doubling the administrators' server management capabilities.

In summary, the IT organizations that were interviewed for this study received positive ROI results, with short payback periods, from deploying Red Hat Network Satellite Server to manage their Red Hat Enterprise Linux environments.

APPENDIX

IDC's ROI Methodology

IDC's ROI methodology measures the efficiency of management software products and processes and uses the findings to calculate ROI for the deployed management software. The method does this in four steps:

1. Evaluates the internal and external costs of administering the systems, networks, and applications before deploying the management software tools.
2. Ascertains the investment in the purchase, implementation, and deployment of the management software tools. It is important to estimate not only the initial purchase cost of software but also the required implementation, integration, and training costs. To measure the total deployment investment required, IDC is careful to include questions not only on the cost of purchasing and setup of the software but also the integration and the annual software maintenance fees.
3. Measures the cost savings and gains in productivity, availability, and efficiency achieved using the management software tools. Portions of the interviews are dedicated to the discovery of cost savings, including both "hard" IT costs, such as savings in software rental and maintenance fees, and "soft" costs, including IT staff productivity, IT management efficiency, and application availability.
 - ❑ **IT staff productivity.** To measure changes in IT productivity, IDC asks about the use of staff time in such deployment and operational areas as setting up servers, deploying and updating software, tracking hardware and software assets, and dealing with user problems. Staff time for these tasks before and after implementation is recorded, together with the fully burdened (i.e., after fringe benefits and overhead) hourly staff salary rate.
 - ❑ **IT management efficiency.** IT management efficiency pertains to efficiencies achieved in user administration and support by obtaining better management scalability. Some questions asked relate to the ability to centrally manage remote locations to achieve reductions in travel costs, while others relate to the additional staff that would be required to support expected growth in the user or server population, with and without the tools.
 - ❑ **Application availability and user productivity.** To measure the effects of application availability, IDC concentrates on determining the effect on user productivity and business revenue caused by downtime by asking questions about systems, network, and application unavailability patterns before and after implementation. The fully burdened hourly salary rates of the user base are also required, and an estimate is sought of the loss of business that would be associated with an hour of downtime.
4. Calculates the payback period and ROI for the deployed enterprise management software. Based on the interview data, IDC calculates the average payback period and rate of return based on the overall cost savings resulting from the investments in RHN Satellite Server. To normalize the data, results are presented in terms of per 100 servers.

ROI and Payback Period Calculation Assumptions

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

- ☒ Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and manager productivity savings.
- ☒ 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.
- ☒ Lost revenue is a product of downtime multiplied by the average revenue generated per hour.
- ☒ 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 company 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.

Copyright Notice

External Publication of IDC Information and Data — Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

Copyright 2009 IDC. Reproduction without written permission is completely forbidden.