WHITE PAPER

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

Sponsored by: Red Hat

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EXECUTIVE SUMMARY

Linux has become a key foundation for supporting today's rapidly growing IT environments. Linux is 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 has evolved from handling basic file, print, and utility workloads to running mission-critical applications and databases, physically, virtually, and in the cloud. As Linux grows in importance in terms of value to the business, managing Linux environments to high standards of service quality — availability, security,

Business Value Highlights

- ☑ Reduced annual costs of IT infrastructure by nearly $304,000
- ☑ Increased IT productivity by 37%
- ☑ Reduced downtime by 75%
- ☑ 38% of the organizations experienced an average $2.9 million increase in revenue
- ☑ Overall three-year ROI of 398%
- ☑ Red Hat Satellite paid for itself in 6.8 months

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 Satellite, a systems management platform designed to be deployed on a server located in a customer's datacenter. Red Hat Satellite provides patch management, provisioning, configuration management, and monitoring of Red Hat Enterprise Linux systems. This ROI study focuses on the quantitative benefits gained from using Red Hat Satellite.

In 2013 IDC updated the study to include three organizations in Asia/Pacific (APAC). 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 Red Hat Satellite. The data from these three interviews was aggregated with data from 10 interviews that had been conducted previously.

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 Red Hat Satellite. Data from the survey was used as the basis for the IDC ROI analysis. IDC's ROI analysis methodology is described in the Appendix.

The analysis is based on the full data set from interviews with IT managers from organizations in North America; Europe, the Middle East, and Africa (EMEA); and APAC. According to IDC's ROI analysis, the organizations in this study using Red Hat Satellite gained an average 398% ROI — almost four times the initial investment — and experienced an average payback period for the initial investment of a short 6.8 months.

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 more than doubled, increasing from an average of 28 Linux servers per administrator before the Red Hat Satellite deployment to 60 Linux servers (physical and virtual) per administrator after the Red Hat Satellite deployment.

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.

> 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 deployment to 60 Linux servers per administrator after the Red Hat Satellite deployment.

FIGURE 1

Average Annual Benefits of Red Hat Satellite
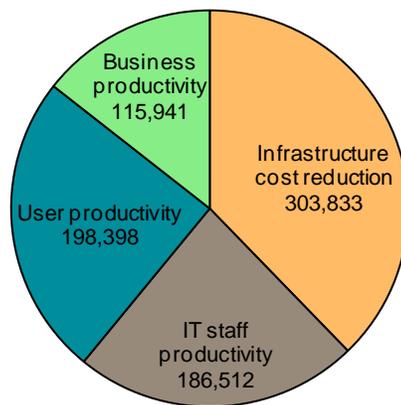
Total = $804,684

Source: IDC, 2013

Deployment of Red Hat Satellite achieved an impressive average annual benefit of $804,684. Infrastructure cost reductions accounted for 38% of this benefit, while nearly one-quarter of the benefit came from improvements in IT efficiency. Improvements in user productivity and revenue increase accounted for 40% of the total.

STUDY DEMOGRAPHICS

To assess the benefits of Red Hat Systems Management, IDC conducted in-depth telephone interviews with staff members from 13 IT organizations located in companies headquartered in North America, EMEA, and APAC that have deployed Red Hat Satellite. The industries of the companies supported by the IT organizations include manufacturing, healthcare, transportation, oil and gas, data warehousing, home furnishing, and office products. The addition of three organizations from APAC altered the data — the average company is smaller, with fewer IT users and a much lower salary structure for IT users and IT support staff. Table 1 shows the survey demographic averages across the 13 IT organizations.

TABLE 1	
Demographics	
Employees	28,254
IT users — internal	24,292
IT users — external	75,000
IT staff	450
Staff supporting Red Hat Satellite	11
Red Hat servers — physical	490
Red Hat servers — virtual	167
Workloads on Red Hat servers	120
Geography	North America; Europe, the Middle East, and Africa; and Asia/Pacific

Note: The table provides averages for each category, with the exception of the Geography category.

Source: IDC, 2013

BENEFITS OF RED HAT SATELLITE

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 (see Figure 2).

One customer said, "If we didn't have the tool [Red Hat Satellite], 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 Red Hat Satellite didn't exist, I would need another person or more." On average, the companies in this study are avoiding hiring an additional 1.96 full-time employees (FTEs) because of Red Hat Satellite and the improvement they have gained in server maintenance.

Red Hat Satellite 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 over $60,000 annually.

When comparing Red Hat Satellite with a previous management tool, one customer mentioned that "Red Hat Satellite has made my life much easier. I save a lot of time because before, we would build every server individually. But with Red Hat Satellite, 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 Satellite. On average, companies in this study are saving time and licensing costs of over $34,000 per year.

IT organizations have been able to deploy Linux servers faster, cheaper, and in a more standardized fashion after their Red Hat Satellite implementation. As one manager said, "Red Hat Satellite 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.
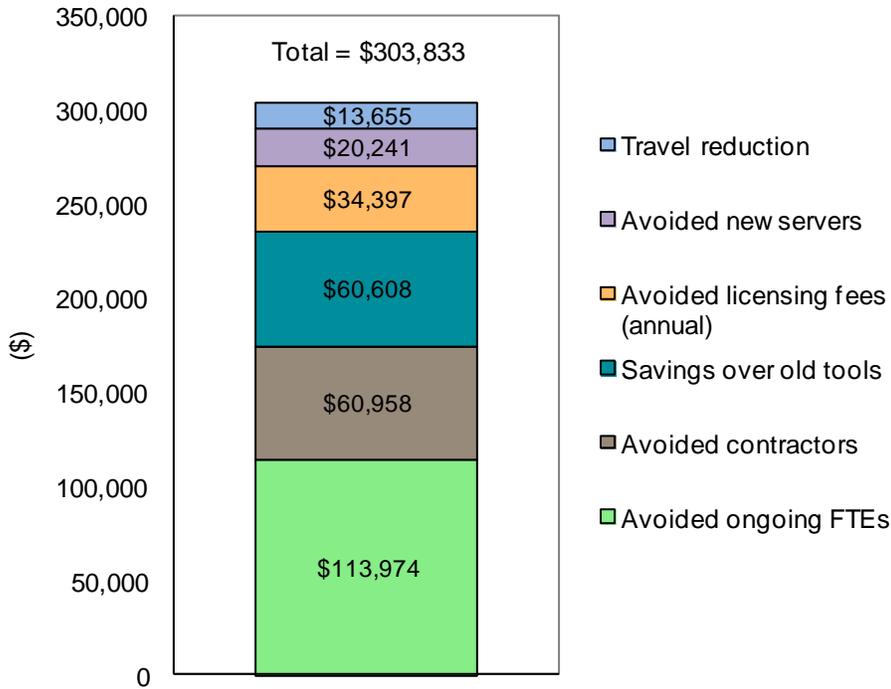
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> "If Red Hat Satellite didn't exist, I would need another person or more."

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

FIGURE 2

Average Annual Infrastructure Cost Reduction Benefits of Red Hat Satellite

Total = $303,833	
$13,655	Travel reduction
$20,241	Avoided new servers
$34,397	Avoided licensing fees (annual)
$60,608	Savings over old tools
$60,958	Avoided contractors
$113,974	Avoided ongoing FTEs

Source: IDC, 2013

IT Staff Productivity

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 Satellite.

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 nearly $41,000.

Because of the automated processes made possible by implementing Red Hat Satellite, 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, "Red Hat Satellite 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 Red Hat Satellite 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 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 Red Hat Satellite. 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.

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Business Productivity

Some customers reported improvements in their time to market and avoided lost revenue implementing Red Hat Satellite. 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 Red Hat Satellite, 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."

Table 2 shows the average annual business productivity benefits of implementing Red Hat Satellite.

TABLE 2

Business Productivity

|	
Revenue increase from new sources or increased volume	$1,000,000
Revenue savings from reduced downtime	$1,840,000
Revenue from faster time to market	$100,000
Percentage of companies with revenue-related benefits	38%
Profit margin	10%
Average annual business productivity benefit	$115,941

Source: IDC, 2013

Benefit and Cash Flow

The annual benefit, investment, and cumulative cash flow over three years are shown in Figure 3. Benefits tend to increase over time as the solution gains greater traction in the organization. Investments are highest in the year Red Hat Satellite 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 3

Benefit, Investment, and Cash Flow
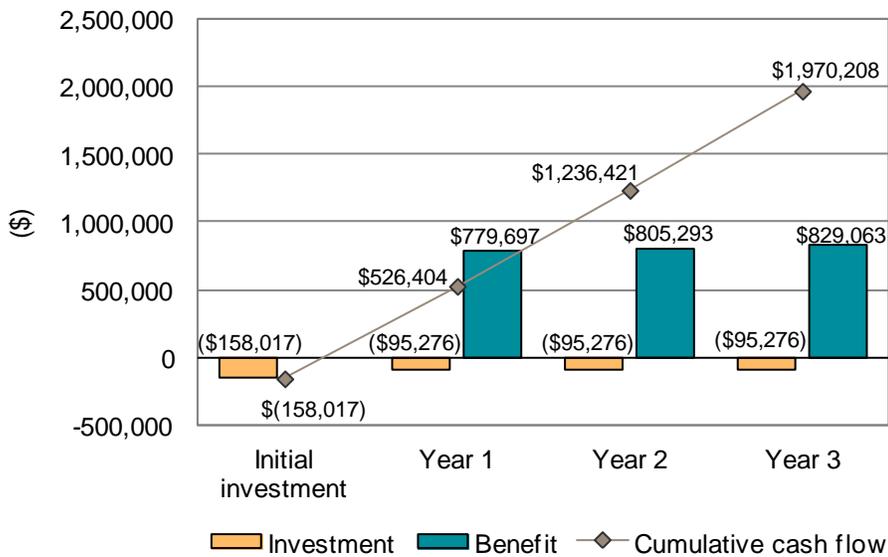
Source: IDC, 2013

Return on Investment

The three-year IDC ROI analysis on Red Hat Satellite 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 398% and payback occurs at 6.8 months. Table 3 displays the ROI results (details on how these figures are calculated are available in the Appendix).

TABLE 3

Three-Year ROI

Benefit (discounted)	$1,928,243
Investment (discounted)	$386,854
NPV	$1,541,389
ROI	398%
Payback	6.8 months
Discount rate	12%

Source: IDC, 2013

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 Satellite

Red Hat Satellite 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. Red Hat Satellite provides 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 Red Hat Satellite includes provisioning of new systems, configuration management, change and patch management, monitoring, and enhanced security with less dependence on Internet connections. Red Hat Satellite 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 and cloud 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 organizations in North America, EMEA, and Asia/Pacific that are using Red Hat Satellite to manage Red Hat Enterprise Linux environments. Based on this study, the IT organizations experienced strong positive returns on their investments, yielding an average 398% ROI over a three-year period — almost four 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 6.8 months.

Another key metric that demonstrates the positive effects of using Red Hat Satellite 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 60 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 Satellite to manage their Red Hat Enterprise Linux environments.

CASE STUDY: MANUFACTURING COMPANY

A large manufacturing company has been using Red Hat Satellite to manage Red Hat Enterprise Linux servers for two years. The company estimates that it is saving over 20 hours per month since automating several IT staff tasks and has also enjoyed a cost reduction of nearly $4 million since the Red Hat deployment.

The company has over 75,000 employees and 1,300 IT staff supporting those users. Seven IT staff support 200 Red Hat Enterprise Linux servers using Red Hat Satellite. According to one IT manager, "The implementation was very easy, taking about a week to deploy those servers. We did it all without outside help — it took maybe a week to install. We needed one person for 40 hours. We compared that to one of our previous solutions that we worked on for over four months." Another IT manager said, "Patch maintenance is administered three times per year, and beyond that, the IT staff spends only a few hours per quarter tending to the servers."

IT Staff Efficiency

The company utilizes Red Hat Satellite to deploy applications and patches. The IT organization deploys everything from Web servers to Oracle database servers and WebSphere application servers. Any of the company's standard applications can be deployed as long as the application is in the RPM format. The IT organization estimates that it is saving an additional 10 hours per month on application management.

Red Hat Satellite has proven valuable to server setup and maintenance. Approximately once per quarter, the solution is saving the IT staff 48 hours of effort. Prior to the Red Hat Satellite deployment, setting up a Linux server would require two to three days of work — that time has been reduced to five minutes.

An IT manager at the company said, "We recently had a problem because a configuration file was missing. And basically, we used Red Hat Satellite to run an analysis between the two systems. Red Hat Satellite was proactive — it found information about the missing file and sent that data to the other system, which could then make the alert. Without Red Hat Satellite, that alert would have never been triggered."

In the past, incorrect configurations led to downtime events that affected the staff and end users. An IT manager said in the interview, "We used to have a lot of situations like that. We would find situations where just the permission was different because it was built by a different system administrator. That would cause some downtime. There were at least twice as many events before than we have now."

The company has better incident management because Red Hat Satellite has all of the repository information. Every version of software, or every file version that is on the system, is available for review and analysis. Since the deployment, the company has been able to track changes and diagnose problems and attempt to find root causes. IT managers estimate that Red Hat Satellite is saving the staff at least two hours per month on incident management tasks.

Red Hat Satellite has allowed the IT organization to save time through automation. In the past, the staff would manually gather data that would support new purchase decisions. But since the deployment, the company estimates that they are saving at least 20 hours per month on those tasks. In addition, data supplied to the organization is higher quality than in the past — including configuration information and patch-level information.

Fully automated deployment processes are now possible. As mentioned in the interview, "Now, we can deploy a server from 'bare metal' to fully productive in less than five minutes. That's every single component from the operating system, to the application, to all of the monitoring. Everything that we run on production systems as a standard build, we can deploy in that time."

The company's experience was summarized as follows in the interview: "Red Hat Satellite has been very stable. We rarely even think about it, and it just doesn't break, ever."

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Cost Reduction

The company has been able to reduce costs by purchasing less expensive hardware than before the Red Hat Enterprise Linux deployment. As an IT manager at the company said, "The servers that we buy now are $3,000 each, where with our old solution, we would be spending between $50,000 and $100,000 per server." The Red Hat Enterprise Linux servers are managed using Red Hat Satellite. "On top of that, we would spend additional amounts on a support contract, and we avoid that now because we manage the servers in-house." The company documented that its overall savings were approaching $4 million since the Red Hat deployment.

After deploying Red Hat Satellite, the company has been able to reduce the total number of trips away from the home office. An IT manager said, "The use of Red Hat Satellite saves on our travel, about four trips per month. These probably cost us about $4,000 for each trip."

Downtime/User Productivity

It is a given that users lose productivity when systems or applications are not available. This company's Linux servers are supporting mission-critical applications, and if they are down, the entire company could be affected. IT managers estimate that during a downtime event, users lose 50% of their productivity.

An IT manager said, "Our manufacturing operation runs on Red Hat Enterprise Linux boxes. So we might have 10,000 people impacted during an event. Red Hat Satellite reduces the risk of downtime that might have been caused by a new deployment. It also reduces the variability in deployment — it allows us to deploy Linux in a much faster, cheaper, more standard way than in the past. This has cut the risk of downtime toward applications."

Business Benefit

The company has been able to increase its time to market since the Red Hat Satellite deployment. The IT organization is able to deploy virtual machines several days faster than in the past. An IT manager said, "Before, we had a fairly manual, custom-built process that would take a few days to get the virtual machines completely ready. But now, we deploy in less than five minutes per server."

The IT organization is now better able to provide capacity on demand for its customers. A customer asked for more servers to support a large marketing campaign, and the company was able to fulfill that request on the same day. As an IT manager said, "We were able to ramp up capacity in hours. Before, we would have been in trouble for a few days." Even though the IT staff was unsure of what the total capacity requirements were going to be, as demand increased, it deployed the operating system and the applications quickly and without any negative impact on the campaign.

CASE STUDY: NORTH AMERICAN RAILROAD

A premier transportation company in North America employs approximately 50,000 people with 1,500 IT staff supporting that user base. Five IT technicians manage Red Hat Enterprise Linux servers using Red Hat Satellite. The company deployed Red Hat Satellite in 2006 to manage its large installation of Red Hat Enterprise Linux.

Using a previous system management application, the company "ran into bug after bug," an IT manager said. The company performed a pilot test of Red Hat Satellite, and in a single afternoon, the IT staff was further along with the deployment than in nine months of grappling with the old solution.

IT Staff Efficiency

The company is now able to set up new Red Hat Enterprise Linux servers in less than one day using Red Hat Satellite. This includes the entire build process and registration of the new servers. The time needed to build the new servers is roughly the same, but the registration time has been greatly reduced. IT managers estimate that the time required for setup, configuration, and registration time has been reduced to 10 minutes from approximately three hours prior to the implementation.

The company deploys patches to its servers in every quarter. One person on the IT staff is able to push out all of the different versions and different phases into the environment over the course of only four days. Before Red Hat Satellite, this deployment would have taken "easily two to three times that amount of time," one IT manager said. More time was required in the past because the IT staff compared and matched all the different patch versions entirely by hand.

Company IT managers are aware of the advantages Red Hat Satellite has over other management solutions. With other solutions, the staff was not able to patch servers once per quarter because it simply could not support that workload. But patching once per quarter can be supported by Red Hat Satellite. As one IT manager said, "With Red Hat, we do not have to reboot our systems; we can patch the whole time. When we have critical security patches, we push them out on any platform."

New software is installed faster than in the past. As an IT manager said, "For us to get new software installed with Red Hat Satellite, we get it done in about five minutes — and we do that three to four times a day. Compare that to about an hour each time in the past."

The IT organization has been able to extract information from Red Hat Satellite that has helped hardware inventory management. Inventory capabilities are built into Red Hat, and the IT staff has gathered information, including the manufacturer, BIOS revisions, and other hardware characteristics. This data is valuable to the technicians because it allows them to determine what upgrades are needed for what hardware. An IT manager said, "In the past, when we needed to do BIOS updates, we did not have an automated hardware asset management tool. We would key in the information as each server came into the environment, as they were purchased and deployed. Having that information built into Red Hat Satellite is saving us a couple of hours per year working on those tasks."

The IT organization has been better able to align its processes with the overall business direction. This is attributable to automation; the organization is able to provide better provisioning with the tools available from Red Hat. An IT manager said, "We have been able to build servers right 'out of the chute,' and this helps us to meet our end users' expectations, and they don't have to come back and ask us for customizations. So, we have come up with a recipe that matches our business needs and saves money as well."

Cost Reduction

Because the hours of server maintenance have decreased and the company is able to support those tasks with the same size staff, new hires have been avoided. The company estimates that it is saving over $180,000 per year in avoided hires. As an IT manager said, "At our normal rate of server purchases per year … we have definitely avoided hiring two people." A savings of two FTEs in weighed annual salary is over $184,000 annually.

As an IT manager said, "At our normal rate of server purchases per year … we have definitely avoided hiring two people." A savings of two FTEs in weighed annual salary is over $184,000 annually.

Business Benefit

This company has been better able to align its IT processes with the overall business strategy. As a manager said, "We are able to automate and provide a better experience with the Red Hat provisioning tools — we have been able to build servers right out of the chute, so to speak." The IT organization is able to quickly meet user expectations with regard to applications, improve overall IT staff efficiency, and reduce costs by avoiding additional hires.

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 Red Hat Satellite. To normalize the data, we present the results 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.