THE HIDDEN COSTS AND HEADACHES OF DO-IT-YOURSELF SYSTEMS MANAGEMENT

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Managing an enterprise IT environment seems to become more challenging every day. While lower hardware costs and virtualization are increasing the number of systems in the environment, the time and resources available to manage them is shrinking. In addition, IT complexity is increasing at an exponential rate due to compliance requirements, such as PCI, FISMA, and SOX. In times like these, what options do systems administrators have to bring order out of this chaos?

These issues are not always clear to management. From a non-technical perspective, creating and managing a new server should be as easy as copying a few files. But any system administrator who is responsible for a complex and growing enterprise environment knows that it is far from that simple, even if you can just copy a virtual machine.

Comprehensive automation and an emphasis on consistency is the key to reducing complexity and bringing balance to your IT environment. In order to do this, it is important to have the right tools for the job. A resourceful system administrator can build, manage, and support an environment using a variety of tools, from homegrown scripts and applications to open source and commercial packages. While this do-it-yourself (DIY) approach can seem like a good place to start, as the enterprise grows and its needs rapidly change, it becomes a difficult approach to maintain. Additionally, while some may have the perception that open source equals free, managers and administrators often do not take into account the costs buried in personnel time, software and script development, and support of an entire ecosystem of servers, applications, and data used in a DIY management scenario.

As those buried costs grow, organizations have to take a hard look at how they are building and managing their systems and ask, "Is our home-grown, DIY approach sustainable over the long term?" For most organizations, the answer is clearly "No." As demand grows for support and scalability of the enterprise IT environment, the supportability and scalability of systems lifecycle management becomes even more critical.

So how can a system administrator be properly equipped to manage the systems needed today, prepare for tomorrow, and make it relatively simple to train and equip new system administrators to operate and support the systems?

This paper will present the issues surrounding DIY systems management and give a clear and affordable solution based upon Red Hat Enterprise Linux and Red Hat Network Satellite.

WHAT'S NEEDED FOR SYSTEMS MANAGEMENT?

Even the most basic enterprise-grade server environment is growing increasingly complex and difficult to maintain. A continuous stream of updates and a shocking growth in the number of threats and vulnerabilities are ever-present, including the increasingly strict requirements from government and governing bodies. In order to properly manage systems, it is critical to have a clear systems management methodology.

Without a reliable systems management process, there is a danger of systems falling through the cracks. Systems may fall out of compliance, possibly resulting in fines. Systems may become vulnerable to a wide range of security threats, putting competitive, customer, or other business information at risk. If systems go long enough without proper management, the process of bringing them in line can result in business continuity concerns. Combine these risks with the risk of having all of the knowledge to operate and maintain systems locked inside the heads of only few key employees. You now have a recipe for an IT disaster.

It is clear that a modern enterprise needs a solid platform to build, maintain, and support a growing computing environment across physical and virtual resources. Such a platform should meet the following five requirements:

1. Deploy software, manage updates and configurations, provision new systems, and monitor the status of all systems.

2. Scale to manage any size environment, from a few systems to several thousand systems.

3. Audit everything to know who did what, when, and to which systems, and be able to undo what was done if necessary.

4. Be understood and adopted quickly by staff.

5. Be dependable and supportable so that if anything goes wrong, there is a clear path to issue resolution.

It is tempting to cobble together tools and processes to support the increasing size of the environment and constantly evolving needs. Doing so inevitably results in spot solutions, or "firefighting," whereby quick fixes are implemented to solve problems at hand without a vision for how today's hack will scale into tomorrow. Over time, building the proverbial "chewing gum and baling wire" solution can result in something that can manage the environment one moment but may completely fall apart without warning the next.

Red Hat Network Satellite is the logical enterprise alternative to a DIY approach for managing Red Hat Enterprise Linux environments and represents a solution that meets the five requirements for a systems lifecycle management platform.

WHY DO ORGANIZATIONS USE DIY SOLUTIONS?

Organizations will frequently use what seem to be compelling reasons to build a DIY systems management solution. They start down the path of Linux and open source with the hope of dramatically reducing costs while building robust and maintainable systems. After some time, they become disillusioned with the difficulty and hidden costs of not having had a solid plan from the beginning.

Here are four common assumptions that organizations make in building DIY systems management solutions and the unexpected outcomes that can result from them:

1. DIY approaches are best for solving our immediate problems. When a mission-critical issue arises, systems administrators are called to action to update systems. A real fix is needed now. A script is written, and it fixes today's problem. Perhaps a quick online search offered a partial solution to apply lots of updates. It might not matter if it is pretty or elegant. What matters is that the fix works. Shortly thereafter, a similar problem arises elsewhere, and the solution is slightly modified. Sooner or later, this solution has morphed into a monstrosity with tendrils reaching throughout the enterprise. These spot solutions can often stay in place for years while the original reason for using them is long forgotten, which exposes the organization to risk if the solution breaks, often for some unrecognized reason. The result: DIY solutions can lead to longer unexpected downtime addressing the fix before the real problems can be addressed.

2. Our system administrator is familiar with a particular tool—using it for everything. Much like every painter has a favorite set of brushes, every systems administrator has a favorite set of tools. When time is tight, it is common to fall back on what is already known. The administrator du jour is called to action and implements a solution based on his or her preference. The solution may be quick, easy, and handles the problem at hand. The unfortunate downside is that the familiar solution is often not the best solution, and one administrator's preference for tools may limit other options in the future. The tools of the trade are constantly evolving, and over time the solution may grow increasingly out-of-date and inefficient, limited by the knowledge and experience of the system administrator who adopted it.

3. No existing system meets our specific needs—we have to build our own. Some organizations have a tendency to build everything from scratch. Scratch-built solutions may be extremely powerful and may efficiently and quickly handle the specific task for which they were designed. These solutions may work well for small, well-contained systems, but they can become cumbersome when things need to scale up rapidly. If a large number of systems are migrated from another platform onto Linux, or if another business is acquired and the systems must be brought into the fold, it could take years to re-adopt the existing solution to handle the new focus of the enterprise.

4. DIY = Free. IT budgets are always tight and in many cases are shrinking. Software is viewed as a cost center if it is purchased, so building a solution in-house appears to be free when considering the bottom line. The reality is that there is a real, hard cost in the hours personnel use to implement a DIY solution. The DIY solution must evolve as the needs of the organization evolve, which essentially creates a time pit into which countless system administrator hours are thrown. The total cost of building and maintaining a solution over time needs to be factored into the equation, not just initial acquisition costs.

There are many more reasons to justify DIY approaches. Inventiveness and code tinkering is something that is ingrained in the minds of many Linux system administrators. Enthusiasm for these activities is something that should always be encouraged and rewarded.

However, it may make sense to redirect that energy and enthusiasm to ensure that system administrator and developer talent is being leveraged where it will do the most good. That is likely not the case in designing, building, and maintaining a DIY systems management solution. Organizations can ensure that systems administrators and developers spend time on activities that are of high value to the enterprise by not falling into the trap of DIY systems management solutions and by using a tool that limits the time the organization spends on managing the IT environment.

COMMON PROBLEMS ARISING FROM DIY APPROACHES

The following list outlines several common problems that can arise out of DIY approaches to systems management.

SINGLE POINTS OF FAILURE

Typically, a single point of failure exists with DIY solutions. This point of failure is often the system adminis-trator who originally built and currently maintains the solution. If that person leaves the organization, then most of the organization's systems management expertise leaves with him or her. DIY solutions to systems management are notoriously susceptible to the expert employee retention/promotion problem. If your orga-nization follows a DIY approach today, ask yourself these questions:

- Do you have employees who cannot be assigned or promoted to other positions because their adminis-tration skills are "too valuable"?

- How many systems do you have that no one is familiar with and no one knows how to manage?

LACK OF DOCUMENTATION AND TRAINING

In most cases, there is little to no documentation of DIY solutions. At best, there may be cryptic comments listed in the solution's various scripts and configuration files. There is likely no master flowchart that shows how all of the different pieces work together. Often the only place that knowledge resides is inside the head of the administrator who built it. The lack of documentation also makes it difficult to train new people on how to use the solution. Ultimately, while these DIY solutions can be great for ongoing management of systems, most organizations who use a DIY approach do not know enough about their systems to put them all back together should a disaster happen.

LACK OF LIFECYCLE MANAGEMENT BEST PRACTICES

Organizations' IT needs are constantly evolving, which often demands production environment changes. DIY systems management solutions typically come without a plan for how they will be used beyond the immediate needs of break/fix. Organizations employing DIY solutions may often deploy changes or enhancements directly to the production environment, hoping that nothing goes wrong and scrambling to implement fixes on the fly when things inevitably do. This can lead to a general distaste regarding updating systems and disheartens everyone when enhancements are desired. Without disparate systems lifecycle environments, the DIY solution can quickly come up short as the enterprise scales.

INABILITY TO DELEGATE MAINTENANCE AND ADMINISTRATION TASKS

DIY systems management solutions often end up being built by one administrator. This administrator typically has the keys to the castle. The solution is not built with the idea that many people may one day need to use it. Having only one user control and one password unlock all environment updates is a security nightmare, and with the growth of various regulatory requirements, may not even be compliant. Because the DIY solution is so powerful and has no delineated controls for different users, it often has to be marked as "off limits" for anyone but the most senior administrators. This ties up the most talented and valuable administrators in the organization with the mundane task of updating systems.
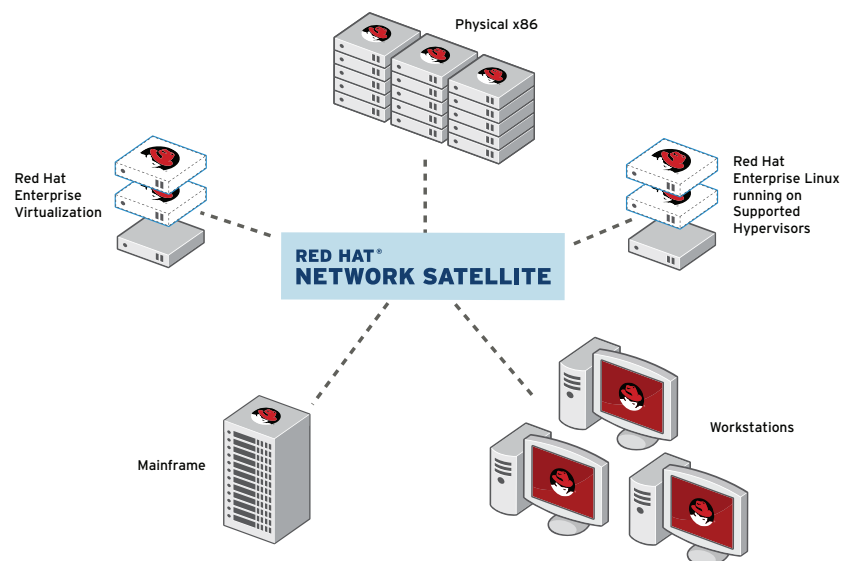
RED HAT NETWORK SATELLITE OVERVIEW

Red Hat Network Satellite is the solution for a scalable, easy-to-use, and auditable systems lifecycle management platform for Red Hat Enterprise Linux. Red Hat Network Satellite has been used by system administrators for years to manage physical servers. As organizations embark on enterprise-wide virtualization initiatives, this tool can be used with both physical and virtual systems without the cost and overhead of purchasing and learning a different systems management tool for the virtual environment.

By using Red Hat Network Satellite, administrators can:

- Update hundreds of systems as easily as one

- Group systems together for easier, faster administration

- Manage more systems per single administrator

- Schedule updates for optimal times

- Manage Red Hat-provided, in-house built, and third-party software throughout the complete lifecycle of systems

- Audit system administrator actions and much more

In addition to the robust web-based user interface, Red Hat Network Satellite provides an extensive XMLRPC-based API that enables integration with other management and business intelligence tools, enhanced automation via scripting, and detailed and thorough reporting for compliance and other audit purposes.

RED HAT NETWORK SATELLITE: SYSTEMS MANAGEMENT FOR RED HAT ENTERPRISE LINUX RUNNING ANYWHERE

BENEFITS OF USING RED HAT NETWORK SATELLITE OVER DIY SOLUTIONS

All is not lost when considering the possibilities for a systems management solution for the modern IT enterprise. As the various reasons for and pitfalls of DIY solutions have been discussed, it is clear that an alternative is needed. Red Hat Network Satellite is an ideal alternative, as it addresses the needs outlined for a systems lifecycle management platform while handily defeating the caveats of DIY solutions.

EASE OF USE, EASE OF MANAGEMENT

Because Red Hat Network Satellite's primary interface is a clear and concise web UI, it does not take long for users to get accustomed to it. While many administrators often value their abilities to master various command line interfaces (CLI) and appreciate the speed and control that they can offer, learning these tools can be very time consuming. Failure to use them properly can result in disaster. Red Hat Network Satellite's web-based user interface makes it simple to access all of the features required quickly, regardless of the skill level of the user.

Because the interface is so simple, even junior-level administrators can be given management tasks around mission-critical systems, which frees senior administrators to focus on high-value activities.

Red Hat provides hundreds of pages of detailed documentation on the finer points of using Red Hat Network Satellite. Additionally, Red Hat offers extensive training curricula around all of its products, and Red Hat Network Satellite is no exception. The RH401 course provides comprehensive exposure to setting up and using Red Hat Network Satellite and can help to ensure that all of your administrators are on the same level when it comes to managing the enterprise.

FULLY AUDITABLE, FINE-GRAINED CONTROL

If a solution only involves one user and password, how does the organization know which administrator did what? If the solution does not log when changes happened, how can an organization be sure that they actually happened? If something goes wrong, how does an organization know how to undo what was recently done?

Red Hat Network Satellite is designed to log every action of its users. It makes it extremely easy to see and report on which user performed which actions on which systems. Red Hat Network Satellite was built with multi-user functionality, and individual administrators can be restricted to control only certain systems or allowed to modify only certain content.

With growing requirements for both internal and external compliance and increased security requirements, it is critical that the changes made are understood and can be reversed if necessary. Red Hat Network Satellite's audit capabilities can save the numerous hours spent tracking down issues and quickly correcting them.

ALLOWS FOR ESTABLISHING AN END-TO-END MANAGEMENT PROCESS

Red Hat Network Satellite is designed to manage the entire lifecycle of Red Hat Enterprise Linux systems, from initial deployment through retirement. By using Red Hat Network Satellite, a management process that makes sense for the organization can be easily developed and documented. If a clear process already exists, then Red Hat Network Satellite can be adapted to follow the existing processes and help to reinforce them.

SCALES WITH YOU EFFORTLESSLY

Because Red Hat Network Satellite is a standalone system engineered by Red Hat from the ground up to be the best tool to manage Red Hat Enterprise Linux deployments, it is easily scalable for any size enterprise. Whether an organization has ten systems or ten thousand systems, Red Hat Network Satellite can manage the environment with the same amount of effort.

INTEGRATES WITH YOUR EXISTING TOOLS

Red Hat Network Satellite offers an extensive application-programming interface (API) that allows for integration with existing tools. Whether an organization makes extensive use of business intelligence software or wants to make a customized interface for certain functionality, Red Hat Network Satellite's API can help the enterprise with a vast array of integration tasks. Using Red Hat Network Satellite's API also allows for an organization to develop highly customized reports.

FULLY SUPPORTED BY RED HAT

Red Hat Network Satellite eliminates the single point of failure of a DIY systems management solution. Regardless of how many administrators come and go, the intimate knowledge of the inner workings of Red Hat Network Satellite is always fully understood by Red Hat. With Red Hat Network Satellite, administrators don't have to spend time in forums or chatting on IRC to find solutions to problems. With Red Hat Network Satellite, an organization's administrators do not have to be on call to support both the systems and the management solution.

If issues do come up, Red Hat is just a phone call away. Most problems can be resolved quickly. For more extensive assistance with implementation of Red Hat Network Satellite, with integration of Red Hat Network Satellite into existing processes, and with help standing up Red Hat Network Satellite as the cornerstone of a comprehensive standard operating environment (SOE), organizations can easily leverage Red Hat Consulting and Red Hat Training and Certification expertise and offerings.

NO HIDDEN OPERATIONAL COSTS AND IMMEDIATE ROI

DIY systems are full of hidden costs, namely the costs associated with the time that highly skilled system administrators spend on routine maintenance tasks instead of on higher-value projects. As the scope of the IT needs of an enterprise evolve, the cost of time managing, developing, testing, and modifying the systems management solution should not spiral out of control. Using Red Hat Network Satellite as a solution has a predictable cost based on Red Hat's highly successful subscription model. Because administrators will not have to spend time coding the systems management solution, the real cost of managing the environment can be more accurately predicted.

In 2009, IDC commissioned a study entitled "Linux Management with Red Hat Network Satellite Server: Measuring Business Impact and ROI." (https://inquiries.redhat.com/go/redhat/idc-rhn-satellite). In this white-paper, IDC reviewed 10 IT organizations that had deployed Red Hat Network Satellite. The results are clear:

- The organizations yielded an average 338 percent ROI—more than three times the implementation costs over three years of usage.

- Typically, a 100 percent return of the initial cost was reached in less than five months.

- Each organization reported a substantial savings in staff hours while the number of Linux servers managed per administrator was doubled.

- An annual benefit of $82,521 per 100 Linux servers managed was achieved.

SUMMARY

Whether an organization is building a Red Hat Enterprise Linux environment for the first time or whether there is an established Red Hat Enterprise Linux deployment, there is no better systems management solution than Red Hat Network Satellite. Using Red Hat Network Satellite is simple, powerful, and auditable. With Red Hat Network Satellite, it is possible to know more about your Red Hat Enterprise Linux environment than ever before, providing a degree of control and confidence that might have seemed previously unobtainable.

It's time to move beyond DIY and take advantage of the best-of-breed tools that will provide full control of the enterprise environment.

For more information on Red Hat Network Satellite, please visit redhat.com/red_hat_network or contact a local Red Hat sales representative or reseller.

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Erik Jacobs is a field solutions architect for the southeastern US team at Red Hat. He has been in the infor-mation technology industry since 1998, with experience in project engineering, systems administration, and consulting. Erik is a Red Hat Certified Engineer (RHCE) and Red Hat Certified Datacenter Specialist (RHCDS) and is on the systems management subject matter expert team at Red Hat. He has a bachelor's degree in electrical engineering from Columbia University.