

Enterprise Class Ubuntu Management with Canonical Landscape

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Executive Summary

Traditional management practices for enterprise support of Ubuntu systems have relied on scripts and manual processes for provisioning, patching, security compliance, and maintenance. As an increasing number of organizations deploy large numbers of Ubuntu desktops and servers, the accelerated adoption of more effective management techniques becomes essential. Enterprise-class automation, such as Canonical's Landscape, works in concert with industry established best practices to facilitate significant performance enhancements, operational cost reductions, tighter security and an improved work experience for Ubuntu administrators. EMA's analysis has determined that Landscape can significantly cut operational costs, providing a projected return-on-investment of over 1000% and an investment payback period of just two months.

Ubuntu in the Enterprise

There is little contention as to why Ubuntu has risen to become the single most popular desktop Linux platform. Ease of use, stability, security, and cost-effectiveness all contribute to the platform's success as a viable alternative to Windows. Enterprise adoption has taken off as well, with multiple Fortune Global 500 customers of Canonical deploying 20,000+ desktop fleets. But the value of the platform is not limited to just its use on desktops and laptops – it is also extensively employed on both physical and virtual server deployments. In fact, Ubuntu has risen to being the leading guest operating system in public clouds and the most popular environment employed for building OpenStack clouds. Ubuntu has also risen to the role of server of choice for emerging workloads, with a Canonical Fortune-500 customer hosting a mission-critical 5,000-node strong Hadoop cluster. For many organizations, the success of the Ubuntu operating environment is directly linked to the success of the business. Until recently, however, Ubuntu management was reliant on manual processes, independent point products, and/or a handful of primarily Windows management platforms that were able to perform some basic tasks on Linux deployments.

Recognizing the gap in enterprise tooling, Canonical – independent sponsor for the open development of Ubuntu – undertook the development of the world's first enterprise-class automated solution suite fully dedicated to the monitoring and management of Ubuntu deployments. Landscape provides a flexible interface for Enterprise Systems Management, with Canonical signature customers leveraging it to centrally manage thousands of devices distributed at multiple sites. A single lightweight agent is employed on supported endpoints to perform administrative tasks and collect critical asset, status and system health data. Granular information about systems is collected in a single dedicated database repository that is easily accessible from a centralized Web-based interface. Landscape provides the holistic management tools for simplifying administrator activities and ensuring organizational success.

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Managing Ubuntu

To understand the value Landscape automation brings to organizations, a brief review of common enterprise requirements and best practices employed in Ubuntu management is necessary. Organizations relying on Ubuntu for desktop deployments will need to contend with implementations

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on a large number of endpoints. Each supported desktop will require provisioning, patching, security compliance, and regular maintenance and each end user will have a unique set of requirements for applications, services, and configurations in order to achieve their specific job function. Naturally, the administration of hundreds or even thousands of systems can be extremely time-consuming, and the lack of standardization due to the need for customization of endpoints only adds to the level of management complexity. Laptop deployments further complicate the support process due to a lack of persistent connectivity – that is, administrative processes can only be performed when laptops are actually connected to the enterprise network.

For servers operating on Ubuntu a different set of requirements needs to be addressed. Many organizations accept a support ratio of one administrator for every 40 non-identical IT servers to be optimal for balancing costs and reliability, but this disregards the reality of day to day operations, and the scale introduced by cloud and virtualization implementations. Server environments typically operate on very complex architectures – including blade servers, virtualization implementations, and storage networks – often requiring stringent levels of service for reliability, high-availability, security, and performance. It seems that IT support staff sizes are never sufficient to handle all the challenges necessary for meeting SLAs and other support goals. This is particularly true with the management of consolidated service-focused environments such as clouds. By its very nature, a cloud must support rapid expansion and dynamic reconfiguration to achieve elasticity of services, which requires constant proactive monitoring and careful predictive analysis – capabilities that are extremely difficult to achieve in traditional manual and scripted support practices. Canonical’s customers have been quoted in published case studies reporting administrator-to-machines ratios as high as several thousand devices being managed by a team of five administrators¹ – support ratios of one administrator for every 800 machines can be achieved, with even higher numbers expected with new deployments currently underway.

It seems that IT support staff sizes are never sufficient to handle all the challenges necessary for meeting SLAs and other support goals.

To achieve optimal IT service improvements, industry adopted best practices – such as the Information Technology Infrastructure Library (ITIL) – recommend the standardization of processes and the consolidation of management resources. Process improvements begin with the identification of all supported assets and their configurations. Information on all assets in the support stack must be recorded and stored in a centralized data repository. Standardized processes (such as for package management, configuration assurance, security and compliance) can then be introduced to maintain IT productivity. Any environment failures must be quickly identified and promptly remediated. Also, proactive problem prevention and performance improvements must be introduced to minimize the frequency of failure events. Finally, environment enhancements need to be continually introduced to meet changing business requirements. Examples of this include an increase in the number of supported endpoints, the addition of new business projects, and the introduction of new technologies.

Whereas other operating systems have previously held the advantage with automation tools specifically designed to help them achieve these process improvements, Landscape now brings industry established best practices to Ubuntu environments as well. This levels the playing field for Ubuntu adoption. Organizations that may have previously been reluctant to adopt Ubuntu for desktop, server, or cloud implementations due to concerns about the manageability of the platform can now be assured that Landscape addresses these issues to meet or exceed enterprise compliance and support requirements.

¹ “Capgemini BPO deploys hybrid thin client solution with Ubuntu Advantage,” 2012 – <http://www.canonical.com/whitepapers/capgemini>

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Landscape's Web-based interface is well suited to the needs of tablet and smart-phone enabled administrators

Challenges to Enterprise Linux Systems Management

Despite extensive effort and a commitment to service quality, organizations often fail to achieve organizational goals. Unfortunately, the usual targets for blame include insufficient funding, lack of skilled support personnel, and improper management, when the true cause of the problem is more likely increasing infrastructure complexity. Lacking proper management tools, organizations often spend the bulk of their time on maintaining complex environments and on performing systemic problem “firefighting.” A typical example of this is evident when an incident occurs, but only the symptoms of the problem are resolved rather than the underlying root cause. Maintaining this break/fix cycle ensures problems will perpetually recur, absorbing valuable administrator time and increasing failure rates.

Scripting can provide some relief with its ability to automate simple repeatable processes, but a proliferation of custom, homegrown scripts can often increase, rather than decrease, complexity. Scripts require constant updating to ensure they are consistent with changes in the operating environment and when script sprawl occurs it becomes impossible to quickly identify which elements need to be updated every time a package or configuration change is introduced – a process that must be manually initiated at each occurrence. Over time, the extensive reliance on custom scripts erodes away at the standardization of the environment as configurations drift from established baselines. Lacking a standardized environment, organizations often fail to meet regulatory compliance and decrease their ability to perform root cause analysis on

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failure events. This is, in fact, a common cause for the break/fix cycle of systemic failures – scripts being created to patch holes in other scripts. Also, since there is really no API for custom scripts, integration with other more reliable automation services becomes impossible.

It is also important to consider that support for custom scripts is almost entirely dependent on the availability of their creators. If the script fails, other members of the support team are less able to quickly identify and resolve the problem. Worse, if that key individual should leave the organization, a lack of knowledge of the customized environment could cause severe disruption, and the training of new personnel can take extensively longer than necessary as they learn all the uniquely scripted management elements.

Simple management tools (sometimes referred to as “point products”) are an option for automating some capabilities, but these are designed to perform specific tasks and lack the flexibility to extend support to unique environment conditions and business requirements. While the open source community has created some very powerful monitoring tools, the field is rather barren when it comes to complete systems management suites. It’s a hideous choice – either adopt inflexible point products or continuously support scripts that are not guaranteed to be reliable. What enterprises need are automation solutions that are both reliable *and* fully customizable.

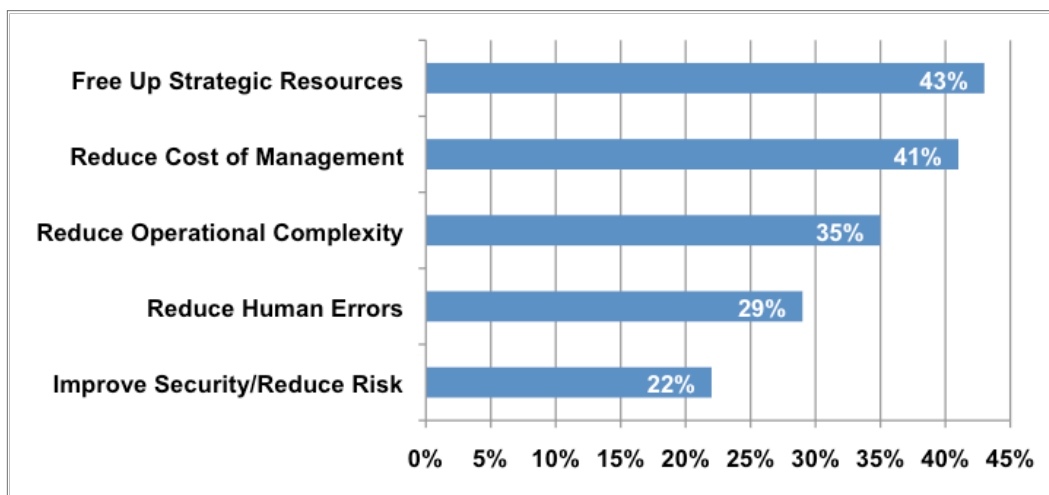


Figure 1: EMA survey results identifying top challenges to IT management by percentage of respondents.

The Value of Enterprise-Class Automation

Scripting and point products are clearly not the answer to dealing with increasing infrastructure complexity and attaining control over management processes in an Ubuntu support stack. True service improvement is established with the introduction of enterprise-class automation – that is, automated solutions designed and maintained to ensure viability across all supported enterprise implementations and that can be customized to meet unique business requirements. Where homegrown scripts are limited in scope, may fail, and are rarely updated, enterprise-class automation is dynamically optimized to perform reliably and continuously maintained to support changes to the operating environments. Enterprise-class automation simplifies every aspect of IT management, including processes for provisioning, configuration, maintenance, and remediation and is fully configurable to extend capabilities to meet unique enterprise requirements.

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To begin, automation is used to standardize environment configurations ensuring all endpoints are installed and maintained in a consistent fashion. In this way, updates to the environment can be applied across all supported endpoints, reducing the rate of wasteful repetitive tasks. What's more, enterprise class automation is pre-configured and maintained by the vendor to ensure it is reliable, secure and up-to-date. For instance, an enterprise-class automation vendor will provide package updates and configuration changes for the solution where in-house tools will need to be continually managed manually – and with no guarantee on the timeliness and accuracy of the updates. Additionally, APIs for enterprise-class automation are also maintained by the vendor, ensuring their consistency regardless of how the platform changes and greatly increasing the reliability of any scripting to the API.

It is also important to recognize that management capabilities must work hand-in-hand with monitoring processes that provide real-time information on the status of supported systems. Most organizations have already adopted some type of monitoring solution, whether it is an open source platform, a commercial monitoring product, or an in-house solution that leverages Ubuntu's extensive built-in monitoring capabilities. Manipulating that status information into a form that enables prompt problem identification and resolution, however, requires strong integration with management resources – capabilities most organizations are still lacking. Enterprise-class automation, such as Landscape, bridges this gap by enabling integration through a flexible API. This linking of monitoring to management enables the identification and remediation of the root cause of problems that ends the break/fix cycle of systemic “firefighting,” greatly reducing the frequency of failure events.

For IT administrators, decreased failure incidents represent a significant improvement in work conditions. For instance, less time is spent on menial tasks and there is typically a significant reduction in required out-of-hours support. Additionally, support personnel have more time available to introduce environment improvements, deploy new implementations, and meet expanding business-focused requirements. Knowledgeable IT professionals that are enticed to focus on new and innovative projects are much easier to hire and retain than those faced with menial tasks, such as regular package deployments or system status data collection.

Organizations also achieve significant value with IT control and standardization derived from the use of enterprise-class automation. Naturally, increased IT performance and reliability provide direct improvements to productivity, but there are also indirect benefits such as the improved ability to achieve regulatory compliance goals, greater IT agility to meet changing business requirements, and improved overall business service quality. Finally, all of these improvements result in an improved return on investment in both IT resources and IT operations.

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Simplifying Ubuntu Management with Landscape

Canonical's Landscape delivers enterprise-class automation specifically tailored to support the needs of Ubuntu administrators. Leveraging Canonical's extensive, in-depth knowledge of Ubuntu, the solution set provides a variety of management tools designed to address the dynamic and changing requirements of the Ubuntu community.

All Landscape tasks are administered from a centralized management interface that consolidates support across the entire Ubuntu support stack, including physical, virtual, and cloud implementations.

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Endpoints can be tagged and grouped based on common characteristics – such as user job function or system type – allowing tasks to be performed on multiple similar endpoints simultaneously. Tagging enables systems to be grouped arbitrarily in as many sets as the administrator sees fit – often performed on the result of a search for hardware (free disk space, available RAM, etc.) or software (distribution:natty) discrete criteria. For example, all desktops managed for an accounting team (or marketing team, or sales team, etc.) will have the same application and configuration requirements, so a standardized environment can be established for them as a group. Package downloads, updates, and other changes, then, only need to be executed once to apply to all members of the group. Access to the centralized console can be set to accommodate user roles so that administrators or auditors can be granted authorization to access management and reporting capabilities specific to meet their job requirements. Role based access control enables the site security administrator to delegate as much (or as little) control as is needed for users to perform their required tasks. For example, auditors would be granted read-only access, barring them from making changes to the systems.

Landscape's extensive scalability allows the automation of very large-scale installations – ranging from several thousand machines supported by a standalone server to several tens of thousands of systems supported in a multi-server configuration. Centralized automated management capabilities in Landscape include:

Software Management

The introduction of each new software package can be a time-consuming process – especially if it is being deployed on a large number of endpoints. Landscape greatly simplifies this process by automating package installations and updates, as well as for their removal. Details of package contents are provided, taking the guesswork out of determining their value and ensuring they are applicable to the targeted endpoint. Landscape also automatically identifies package updates that include security fixes so these can be prioritized to promptly mitigate risk and ensure compliance goals are met (Figure 2).

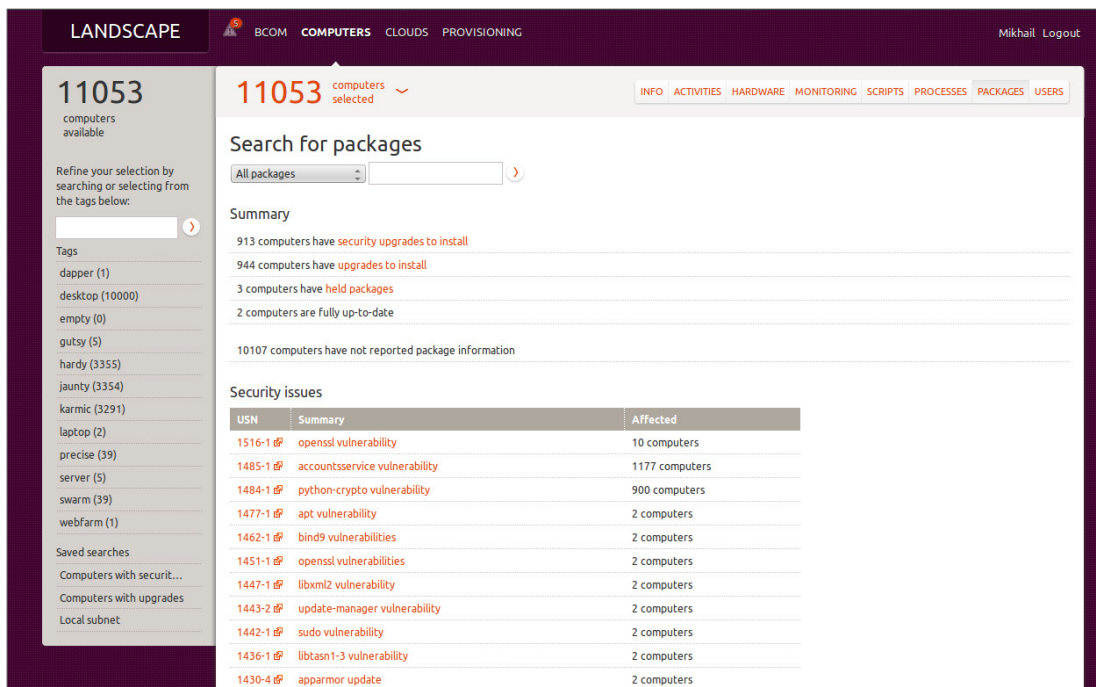


Figure 2: Landscape identifying security notices applicable to a large desktop fleet.

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Any dependency requirements for package sets are also checked for prior to deployment to ensure they will operate properly once installed. Supported systems can be set to automatically pull updates during designated maintenance windows to minimize impacts on networks and end users. In the event an installation should introduce unexpected side-effects or if the software causes performance issues on the client system, Landscape automates the process for the complete removal – or “roll back” – of the package to recover lost functionality (Figure 3).

Further enhancing the software management process, Landscape recently introduced support for custom repositories, which enables the mirroring of the Ubuntu repository to the local environment. This allows administrators to select which updates they wish to publish to the internal network. The custom repository effectively enables a staged testing-to-production process for software updates that mitigates the risk of unexpected disruption that could be caused by changes introduced in an update.

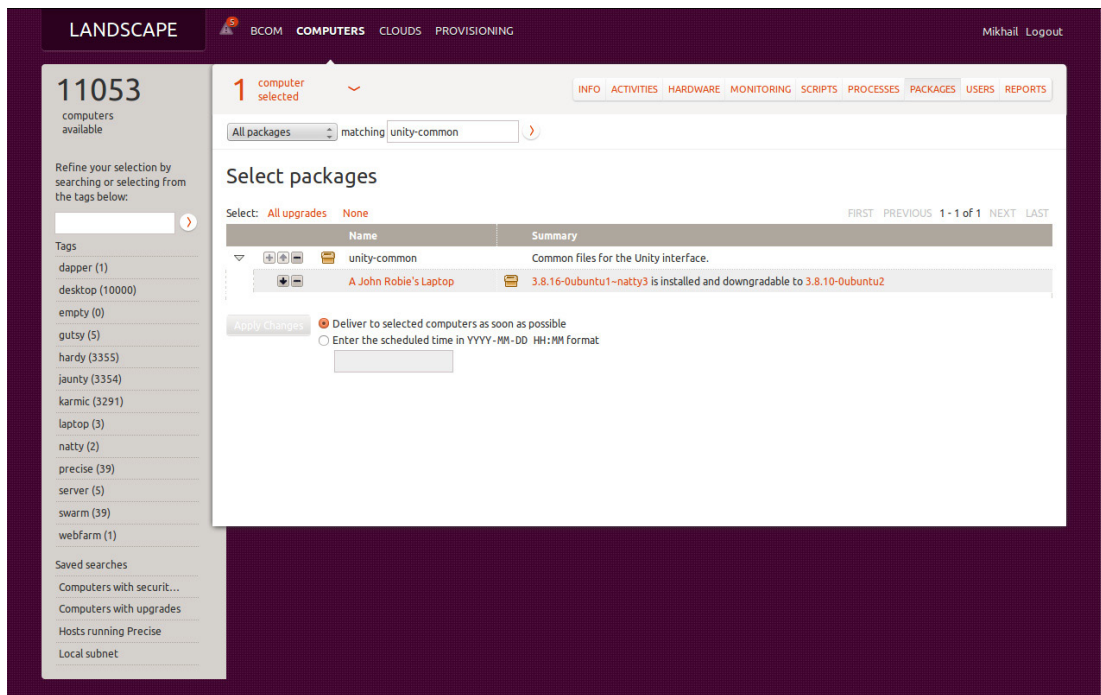


Figure 3: Landscape offering a package downgrade option to repair a system issue.

Inventory Management

Consolidated management processes in Landscape begins with the installation of a lightweight agent on target systems. The agent oversees the collection of detailed hardware and software asset information and stores the data in a centralized database repository on the management console. In this way, administrators only need access a single interface to identify details about all supported endpoints. Hardware inventory elements – including system model, type and configuration information – can be used to logically group supported systems for administration. For example, queries like `network.vendor:atheros`, `memory.size:2GB`, and even `serial:MT7084K01201320` are possible. Landscape can also be used to identify what software packages have already been installed on managed systems, and the solution maintains a complete “package profile” for each managed client, so administrators can easily identify what is installed on endpoints to quickly determine any potential problems and steps for remediation.

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System Deployment

A complete Ubuntu system installation can be performed with Landscape to a “bare metal” endpoint – that is, a target system that is physically connected to the network, but has no pre-existing operating environment installed. It does this by initiating the system with a preboot execution environment (PXE) and systematically laying down an operating system, drivers and software elements. Administrators pre-determine which software components and configurations will be installed and can associate targets with specific groups to standardize deployments. In the event remote installations are required, the Landscape centralized management console can initiate deployments from satellite servers that are co-located with the target endpoint. This eliminates the performance impacts that would occur if the installation were to be performed over the WAN and allows a consolidated administrative team to support systems globally.

Audit & Compliance

Landscape is focused on helping organizations achieve compliance to meet regulatory and business process requirements. Moreover, Landscape provides reports on the software installed on each managed system, as well as on any known security vulnerabilities in installed versions that might be exploited against. Reporting includes data required by industry standards (e.g. PCI DSS) on how rapidly such vulnerabilities were patched locally since the system vendor made a fix available. Landscape’s ability to generate such reports with a single click can save IT staff a significant amount of time (Figure 4). By employing the package profile as a standardized baseline, IT managers and auditors can quickly and easily remedy out-of-compliance configurations. The reports also provide proof-of-compliance to greatly simplify the auditing process – which is extremely important for regulatory compliance, such as SOX, HIPAA/HITECH, and PCI. The Landscape console can report on all managed systems, so IT managers can see exactly how compliant they are at any given time and can proactively resolve any inconsistencies before an official audit is initiated. The solution also allows audit data to be exported to a CSV file so it can be opened in a spreadsheet, allowing for further consolidation and manipulation of audit data.

“Auditors love the fact that we have centralized tools for updating servers and reporting on every element of our infrastructure”

~ Kelly Corbin, Senior Systems Administrator at NA Bancard, which uses 100+ Ubuntu Servers managed by Landscape to process 12 billion dollars in transactions for more than 135,000 customers.²

² “NA Bancard Streamlines PCI Compliance with Canonical Landscape” canonical.com/whitepapers/nabancard, 2012

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Figure 4: Landscape's newest version includes a comprehensive patch compliance dashboard providing rapid access to key metrics.

API

Landscape's latest version exposes a comprehensive API providing programmatic access to all the functionality in the Web-based user interface. This capability introduces remarkable integration possibilities with other components in an enterprise's infrastructure, ranging from an existing monitoring service, to paging systems, to the application of configurations triggered by simply tagging a machine appropriately in Landscape. This capability is delivered through an HTTP-based API that can be driven by a shell-based client or a Python library for rapid scripting.

Reducing Total Cost of Ownership of a Desktop Deployment

Although desktop deployments deliver essential value to any business operation the costs associated with desktop deployments can be quite substantial. Evaluating the Total Cost of Ownership (TCO) in delivering enterprise desktops is something of an arcane art. Both direct and indirect cost elements need to be reviewed, some of which may be easily quantifiable, but others will be difficult to attach specific financial numbers to. Nonetheless, there are a number of areas where Landscape can reduce the TCO of enterprise desktop deployments. Here are just a few:

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Direct Operations Cost Savings

The most direct enterprise cost reductions that can be attributed to Landscape are associated with the minimizing of effort necessary to maintain the support stack. The less effort Full Time Employees (FTEs) must expend on mundane tasks, the more they can focus on meeting enterprise goals and increasing business profitability. This reduces overall FTE costs by allowing individual administrators to perform tasks that would otherwise require multiple support personnel. It also reduces or eliminates any additional expenditure necessary to provide out-of-hours support and minimizes costs associated with training of new personnel.

Endpoint Cost Savings

The use of Landscape's enterprise-class automation makes Ubuntu endpoints more secure, reliable, and efficient, promoting the expanded adoption of Ubuntu. With the proliferation of Ubuntu in an enterprise, organizations can see significant reductions in endpoint deployment costs. License cost savings alone can be quite substantial. Additionally, Ubuntu has lower memory utilization than any other major desktop operating environment (including Windows), reducing hardware requirements and extending the serviceable life of client devices.

Indirect Cost Savings

Establishing stability and reliability in a support stack also results in a number of cost factors that are not easily quantifiable, but that have definite, long-term positive impacts on business performance. For instance, when environment failures are reduced, business productivity increases, employees are better able to respond to changing requirements, and overall customer satisfaction is improved – all resulting in increased profitability and lower operational costs. Also, by closing security holes, risk is reduced for data loss and breach events that would otherwise result in financial loss for the business. Similarly, a failure to achieve compliance could result in fines or an inability to compete in the marketplace, so compliance assurance translates into financial improvements.

TCO Evaluation Example

To give an indication of how a TCO evaluation should be performed, EMA has provided a series of charts below comparing direct (i.e. quantifiable) cost elements between Landscape and a typical example of a Windows-based management platform. These particular charts also exemplify how significant cost savings can be achieved with Landscape due to a pricing model that bundles the management solution with the purchase of the endpoint operating systems under the brand name of Ubuntu Advantage.

TCO Comparison Cost Elements

The chart below indicates assumed pricing models for the comparison elements included in our evaluation. Leading Windows automated management solutions charge between \$40 and \$100 per managed endpoint for product licenses. Those with lower direct license costs typically make up the difference with higher maintenance contract fees or infrastructure costs. The numbers adopted for this evaluation represent an average of total solution costs and readers are encouraged to insert and calculate actual pricing numbers if a direct comparison of product sets is performed. As noted in the chart, the Landscape pricing model is scaled to offer discounts to organizations purchasing the solution for larger implementations or requiring support for longer periods of time.

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	Ubuntu Advantage including Landscape	Typical Windows management platform
Implementation Costs		
Solution license costs	All-inclusive solution pricing is an annual subscription fee of \$8000 for a dedicated management console plus license fees for each managed endpoint that scales with discounts based on number of supported clients and duration of contract. (See charts below for pricing examples)	\$70 per managed endpoint
Solution maintenance costs		25% p.a.
Patch update costs		\$4 per managed endpoint annually
Endpoint operating systems		\$250 per managed endpoint for Windows 7 Professional
Infrastructure Costs		
Physical console server	\$2,000 p.a.	\$2,000
Console operating system	\$595 p.a.	\$1,000 (for Windows Server Standard)
SQL License	\$0	\$6,000
Console software maintenance costs	\$0	25% p.a. for OS and SQL licenses

Small Enterprise Comparison Chart

Based on the pricing model information identified above, the chart below provides a TCO comparison for a relatively small implementation supporting 200 endpoints for a period of three years. Including both the management solutions costs and the endpoint operating system costs, Landscape displays significant cost savings at roughly half the price of a comparable Windows deployment.

	Ubuntu Advantage including Landscape	Typical Windows management platform
Solution license costs	\$37,400	\$14,000
Solution maintenance costs		\$10,500
Patch update costs		\$2,400
Endpoint operating system costs		\$50,000
Infrastructure costs	\$24,185	\$14,250
Total	\$61,585	\$91,150

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Large Enterprise Comparison Chart

The larger enterprise model below indicates costs associated with supporting 5000 endpoints for a period of five years. Note that the scaled pricing of Landscape provides substantial cost saving in larger scale and longer supported implementations: \$62.33 per managed endpoint per year in the small model above and only \$53.60 per managed endpoint per year in the large model below.

	Ubuntu Advantage including Landscape	Typical Windows management platform
Solution license costs	\$1,340,000	\$350,000
Solution maintenance costs		\$437,500
Patch update costs		\$100,000
Endpoint operating system costs		\$1,250,000
Infrastructure costs	\$38,975	\$17,750
Total	\$1,378,975	\$2,155,250

Additional Cost Savings

The savings achieved from Ubuntu adoption can extend even further than reduced OS and management costs. Productivity tools, for example, are essential software components of enterprise workstations, and the cost of Microsoft Office Professional (with a MSRP of \$500) can quickly add up to a substantial expense. On the other hand, Ubuntu includes a full user productivity suite, OpenOffice, at no additional cost. Although OpenOffice is available on Windows platforms as well, Windows users are often reluctant to make the transition. If it is assumed that all Microsoft workstations are deployed with Microsoft Office Professional, the additional savings that can be achieved with the move to Ubuntu become evident:

Small business model: 200 endpoints for a period of 3 years

	Ubuntu Advantage including Landscape with OpenOffice	Typical Windows management platform with Microsoft Office
Productivity software cost	\$0	\$100,000
OS & management costs	\$61,585	\$91,150
Total	\$61,585	\$191,150

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Large business model: 5000 endpoints for a period of 5 years

	Ubuntu Advantage including Landscape with OpenOffice	Typical Windows management platform with Microsoft Office
Productivity software cost	\$0	\$2,500,000
OS & management costs	\$1,378,975	\$2,155,250
Total	\$1,378,975	\$4,655,250

Extending Value into the Data Center

For any sizable Ubuntu deployment, desktop or server, Landscape is a worthy investment. As shown above, the combination of Landscape and Ubuntu is a cost effective enterprise managed desktop solution for the knowledge worker. Canonical claims that the combination of Ubuntu Server and Landscape can provide similar savings for the data center. The analysis from Canonical can be accessed at: <http://www.ubuntu.com/servers>

Return on Investment Analysis

Determining the total return on investment of a management platform is difficult to directly quantify. Many factors, including the breadth of business IT requirements, the technical expertise of support staff, and the complexity of the IT infrastructure will have direct impacts on how effective the introduction of a management solution will be in reducing costs. To provide an ROI comparison example, however, we can consider a baseline for Linux environment not supported by a management platform as defined by the commonly accepted administrative staffing numbers for desktop deployments – ranging from 75 to 250 devices per administrator. By contrast, the administrator-to-machine ratios reported by Canonical in a published Landscape case study show as many as 800 devices per administrator. From this (and a little basic math) a comparison can be developed identifying the ROI of the solution and displaying the value of freeing FTEs to accomplish other business critical tasks. For example, consider the following 1000-seat environment that is not supported by enterprise-class management automation:

Unsupported by Enterprise-Class Automation	
Number of desktops	1,000
Annual cost for each administrator (FTE) to cover salary, benefits, time off, and other compensation	\$150,000 p.a.
FTEs required	7
Total annual staffing cost	\$1,050,000 p.a.

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The staffing numbers discussed earlier suggest between four and thirteen FTEs, so a midpoint of seven has been assumed here. By contrast, the reduced support effort necessary after adopting the Landscape management platform directly translates into significantly reduced FTE requirements and related costs even when factoring in the cost of the management solution.

Supported by Ubuntu Advantage with Landscape	
Number of desktops	1,000
Annual cost for each administrator (FTE) to cover salary, benefits, time off, and other compensation	\$150,000 p.a.
FTEs required	2
Total annual staffing cost	\$300,000 p.a.
Cost of the management solution	\$61,395 p.a.
Total management costs	\$361,395 p.a.

Infrastructure costs for the management solution in this example were annualized over five years. Comparing the two results provides an indication of the ROI that can be expected from the adoption of the platform:

Ubuntu Advantage with Landscape ROI	
Net annual savings (annual costs of management before Landscape adoption minus annual costs after Landscape adoption)	\$688,605
Total saving over 5 years	\$3,443,025
5-year ROI (percentage of costs savings achieved from the cost of the management solution)	1,121%
Investment payback period	2 months

Although some companies have extremely qualified and well trained system administrators, it is easy to see that with Landscape, administrators can manage a larger desktop and server estate, with more reliability, and higher SLAs. Landscape is an investment for any company relying on the Ubuntu platform – an investment that can achieve an ROI of over 1000% and will pay for itself within two months of each year.

EMA Perspective

Enterprise automation has been widely adopted for Windows support for quite some time, but many Linux administrators have been reluctant to employ third-party automation to assist with managing their environments, preferring custom scripting instead. The rationale for this is actually quite understandable – Linux by design is eminently customizable, so why pay for support tools that can be built internally? The often unrecognized reality, however, is that enterprise-class automation solutions have advanced beyond the ability of individual administrator to develop and maintain themselves. Today's best practices in IT management call for internal-built scripts and processes to augment – rather than replace – quality and supported automation solution sets.

Faced with rapidly increasing infrastructure complexity, the “do it all yourself” mentality of many support organizations actually exposes the enterprise to risk. Internally generated scripts are typically not maintained for reliability and security, and human errors are much more likely to be introduced in their creation. Further, reliance on any single administrator for supporting critical scripts places an organization at risk in the event that particularly employee should leave.

Overcoming these challenges and introducing process improvements requires a cultural change among Linux administrators, where enterprise-class automation is embraced, rather than avoided. With reliable automation tools in place, administrators are empowered to meet enterprise requirements while introducing proactive and business-focused performance improvements. For IT professionals supporting Ubuntu endpoints, Canonical's Landscape provides opportunities for reducing efforts on mundane activities, increasing recognition of employment value, and overall increases job satisfaction.

With Landscape, manageability of Ubuntu is elevated to enterprise class, providing a centralized management console that better utilizes administrator time. With an automation API and support for compliance and governance auditing needs, Landscape opens the door for larger and more effective deployments of Ubuntu on both desktops and servers.

About Canonical

Canonical provides engineering, online and professional services to Ubuntu partners and customers worldwide. As the company behind the Ubuntu project, Canonical is committed to the production and support of Ubuntu – an ever-popular and fast-growing open-source operating system. It aims to ensure that Ubuntu is available to every organization and individual on servers, desktops, laptops and netbooks. Canonical partners with hardware manufacturers to certify Ubuntu, provides migration, deployment, support and training services to businesses, and offers online services direct to end users. Canonical also builds and maintains collaborative, open source development tools to ensure that organizations and individuals can participate fully in innovations within the open-source community. For more information, please visit www.canonical.com.

About Enterprise Management Associates, Inc.

Founded in 1996, Enterprise Management Associates (EMA) is a leading industry analyst firm that provides deep insight across the full spectrum of IT and data management technologies. EMA analysts leverage a unique combination of practical experience, insight into industry best practices, and in-depth knowledge of current and planned vendor solutions to help its clients achieve their goals. Learn more about EMA research, analysis, and consulting services for enterprise line of business users, IT professionals and IT vendors at www.enterprisemanagement.com or blogs.enterprisemanagement.com. You can also follow EMA on [Twitter](#) or [Facebook](#).

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