

10 Reasons LinuxONE is the Best Choice for Linux Workloads

Wherever an organization is in the world today, it relies on IT in its quest to drive revenues, improve profit margins, and service customers. Yet most small- to mid-sized businesses (SMBs) and government agencies select IT infrastructure solutions that drive higher costs and limit the business' ability to respond to changes in the marketplace. This is driven by perceptions that many IT executives running Linux and open source applications have regarding server platforms. Specifically, they erroneously believe that their best option is to execute the applications either on standalone or virtualized on x86 servers. RFG finds that there are 10 compelling reasons why an IBM LinuxONE solution is superior to an x86 one, including the fact that LinuxONE is a better, more economical choice. This holds true for entities in developing countries that have as few as 30 Linux workloads or 20 Linux servers, as well as large enterprises with an IT infrastructure that spans across multiple data centers. The total cost of ownership (TCO) for the Linux applications on x86 servers is more than 65 percent more expensive than on LinuxONE servers in these environments. Additionally, the LinuxONE return on investment (ROI) is quicker and total cost of acquisition (TCA) is less than that of x86 Linux solutions for organizations having more than 20 Linux servers.

The Business Environment and IT Impacts

2016 appears destined to be a slow growth year globally. Most economies and companies will experience a number of global economic headwinds that will mean little or no growth – and even recession for some. For IT it means budgets will remain constrained and it will be more difficult to keep current in technology, meet new business demands, and develop the skills necessary to satisfy corporate requirements. Nonetheless, business executives will push IT to deliver more – more innovation, additional applications, enhancements, and advanced analytics and big data capabilities. IT executives will also struggle with limited technical skills, high energy costs, underdeveloped infrastructure, support challenges, and geopolitical and regulatory issues.

The best way for IT executives to satisfy the business requirements is through business process improvements and cutting operations expenditures through data center transformation. In simpler terms this means less complexity, more agility, greater productivity and higher utilization of resources – all driving down IT operational costs.

One of the major inhibitors to satisfying business requirements and driving transformation is the perception that x86 distributed systems are the best platform of choice. While operating a handful of x86 servers may be economical, the costs and management complexity associated with the proliferation of x86 distributed systems exposes the fallacy and demonstrates why the LinuxONE alternative is a more desirable approach.



The LinuxONE Value Proposition

The IBM LinuxONE offerings are low-cost, scale-up specialized enterprise servers designed exclusively to run Linux applications. LinuxONE servers provide users with greater agility and flexibility than that available from x86 servers. Moreover, there is no doubt the LinuxONE servers yield more stable production environments since they require much less human interaction (and potential for human error) and experience less downtime through the elimination of the constant addition of new servers. Containers and virtual servers can be activated in minutes while physical resources can usually be added automatically in seconds, unlike x86 solutions that require extensive, error-prone human intervention. Furthermore, LinuxONE servers enable unmatched scalability with linear diminishing costs per unit of work, unlike x86 servers where the economies of scale are limited. Plus, the LinuxONE systems provide the highest levels of availability (near 100 percent uptime with no single point of failure), performance, throughput, and security. There is end-to-end security built in as well as isolation at each level in the stack and the highest level of certified security in the industry.

One of the rarely mentioned, but often acclaimed, advantages of LinuxONE is the disaster recovery premium. Because LinuxONE Systems utilize a shared-everything data architecture, there is no need for multiple copies of files or databases. This not only eliminates out-of-sync conditions but also simplifies the set up and execution of the recovery point objectives (RPOs) and recovery time objectives (RTOs). All of these advantages make the LinuxONE enterprises less complex and easier to operate effectively than other alternatives, whether running regular or irregular operations.

Top 10 reasons excluding TCO:

1. Agility/flexibility
2. Scalability – supporting exponential growth with linear costs
3. Availability – virtually no downtime (99.999%)
4. Highest level of Security
5. Staffing / productivity / Skills / simplicity
6. Disaster/Recovery – RPO, RTO, and single version of truth
7. Performance – response time consistency – latency elimination and best price/performance
8. Stability - elimination of constant change which causes human errors; change control
9. Investment protection – no x86 obsolescence cost and lowest initial and total cost
10. IBM support


Since LinuxONE processors are designed to run Linux applications, code written for x86 environments will run largely "as is" on any LinuxONE server, and from an end-user vantage point, the appearance remains unchanged. It also simplifies staffing as businesses can hire Linux professionals or reach out to the IBM LinuxONE community for access to developers, students and entrepreneurs. Customers do not need to worry about locating and training staff on

developing on or operating LinuxONE systems – they can consider this just one more Linux environment.

Another hidden advantage of a LinuxONE system is the way it is packaged. IBM treats this server like any other enterprise compute server and, therefore, it is upgradable. Adding new LinuxONE cores or upgrading to a new generation of servers is treated as an upgrade (not a purchase of new equipment) and either can be accomplished over a single weekend. From the CFO's viewpoint the life cycle of the server is extended, which maps well to the way companies like to account for hardware purchases, and makes the payback for LinuxONE cores that much more attractive. On the other hand, almost all x86 servers do not have that capability and a move to the next generation means acquisition of a new server and retirement (or reallocation) of the old. It can also mean up to six months of provisioning and deployment time and resource costs.

The best workloads to put onto LinuxONE are applications requiring rapid disaster recovery, business-critical ISV applications, business connectors, data services, development of WebSphere and Java applications, email and collaboration applications, network infrastructure, virtualization and security services, and Web servers and Web application servers. LinuxONE servers are also excellent for applications whose processor and memory utilization vary significantly throughout the day.

IBM is not new to the Linux operating environment. It has been selling Linux solutions for 15 plus years, and 40 percent of its enterprise customers have Linux processors installed. The LinuxONE servers, which are sold as standalone Linux servers, are different in that they offer unprecedented flexibility in pricing. IBM has created an "Elastic Pricing" program that lets customers pay-for-use (hardware and software), pay-per-core, or rent with no upfront payment and right of return after only one year. Additionally, the entry-level LinuxONE server can consolidate up to 40 virtual servers per core (depending upon workload and level of server utilization in the x86 environment) and up to 8000 virtual machines in a single footprint for as low as \$1.20 per day per virtual server.



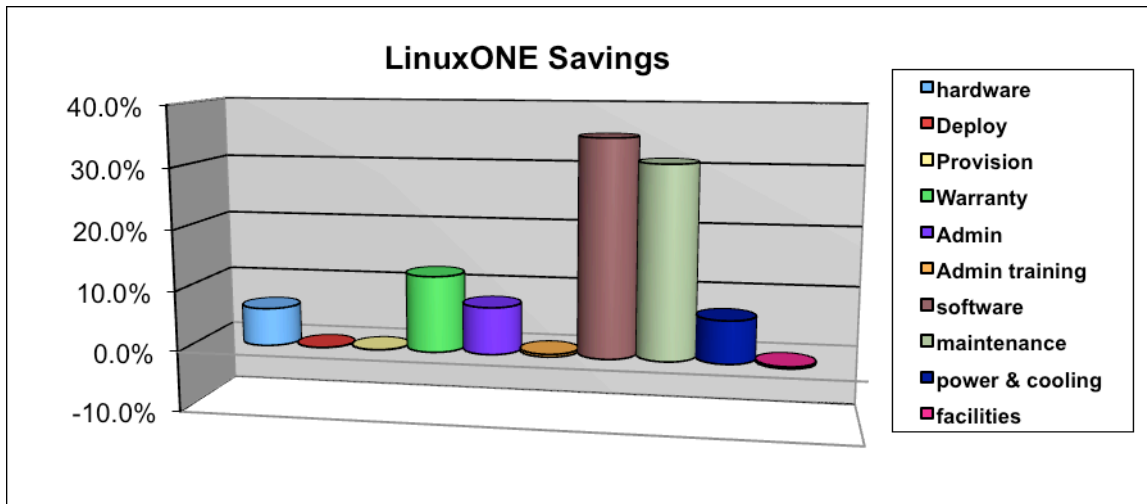
- Pay-for-Use IBM Hardware AND Software**
 - Fixed monthly payments
 - Costs can scale up or down based on usage
- Per-Core Pricing Model on IBM Software stack for Linux**
 - Software licenses only on designated core
 - Order what you need, when you need it
 - Decrease licenses with 30 days notice
 - Cancellation with 30 days notice
- Rental model with No up front payment required**
 - 36 month term: title remains with IBM
 - Choice at contract end – return, buy, replace
 - Right to return hardware after only 1 year

Note: Clients must run ILMT to produce reports for SW compliance

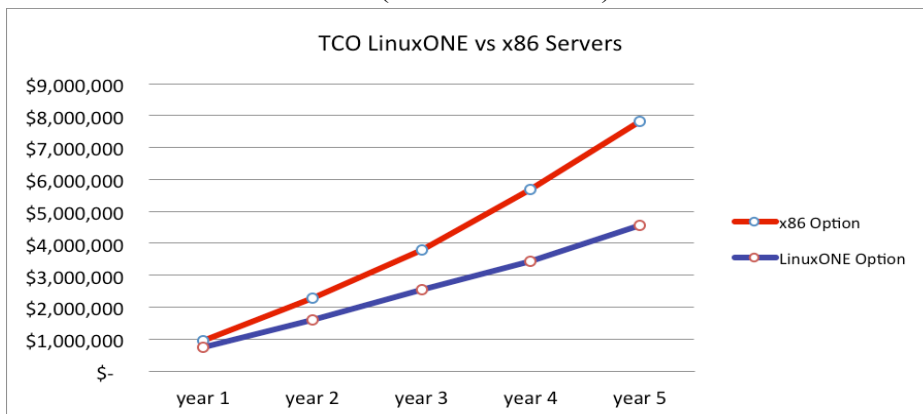
The TCO Story

Businesses that build solutions on LinuxONE environments will achieve savings at the time of acquisition and in each year of operation. Companies having dozens of Linux applications or those with wild variations in processor and memory utilization can acquire and install a LinuxONE ecosystem for much less than the equivalent x86 ecosystem costs, even if they are virtualized. From a total cost of ownership (TCO) standpoint, RFG expects a mid-market

company or larger with a reasonable set of Linux applications would be able to cut their TCO costs by 50 percent or more. The savings will be across the board – hardware warranty and maintenance, software licenses and maintenance, financing, personnel, power and facilities costs. (See below chart for a 30-workload environment.)



RFG examined the TCO for LinuxONE vs. x86 servers for multiple workloads in various geographies and found that in all cases x86 solutions are at least 70 percent more expensive than comparable LinuxONE solutions. In fact, x86 systems are 1.7x more expensive than LinuxONE solutions for 30 workloads and exceed 2x in total costs for 50 workloads in geographies where staffing costs are a fraction of those paid by enterprises in high-cost developed countries. The TCO is more than \$3 million less expensive for the LinuxONE solution vs. the x86 alternative in a 30-workload environment. (See below chart.)



Utilization and productivity will be much higher with an IBM LinuxONE than with standalone or virtualized x86 servers. The system architecture used by LinuxONE enables resources to be

shared amongst applications, which allows for far greater utilization (typically 80 percent to up to 100 percent) and better usage of resources. Contrast this with the unvirtualized or minimally virtualized x86 servers that operate at utilization levels of less than 20 percent – most at less than 10 percent – while the average virtualized servers run four to six VMs per physical server and operate at less than 30 percent utilization.

Additionally, resources can be dynamically added or moved without disrupting operations. The LinuxONE's hardware infrastructure is designed to operate with the highest levels of availability (99.999 percent), price/performance, reliability, scalability and security (EAL 5+ certification). The unique benefits of the architecture allow users to run production, development/test, and quality assurance applications on the same server without fear of interference, security exposures or impact on performance.

Summary

Existing misconceptions around server technology have misled business and IT executives into believing Linux on x86 platforms is inexpensive and easy to implement, with Intel servers running VMware seen as the lower-cost option for processor environments. These misguided beliefs have resulted in higher data center costs and sub-optimization for mid-market and larger companies. IBM LinuxONE servers are effective in-house Linux cloud server platforms that counter these myths and can provide IT executives with an alternative Linux infrastructure solution that will help organizations contain costs, become more competitive, and assist with a transformation to a least-cost consumption-based usage model.

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