

DOING MORE WITH LESS

How Red Hat Enterprise Linux shrinks total cost of ownership (TCO) compared to Windows

In a study measuring the TCO of Windows and Red Hat Enterprise Linux servers, Red Hat Enterprise Linux platforms exhibited

34%
lower annual
TCO per user.

EXECUTIVE SUMMARY

IT organizations face the constant challenge of juggling two almost opposing priorities: continuously delivering business-critical application services while keeping IT expenses in line with budget constraints. The primary function of IT departments is to supply core infrastructure and applications to attract new business, generate revenue, and facilitate profitability—and IT managers strive to meet this goal in spite of flat or shrinking IT budgets.

According to an article in Computer Weekly, approximately 80% of IT expenses are spent on maintenance and support for the existing infrastructure.¹ Beyond maintaining current platforms and mission-critical applications, IT must also address new mandates, such as reporting requirements for regulatory compliance or corporate “green” IT initiatives. In addition, IT managers must allocate budget to tackle emerging strategic initiatives that are needed for future success.

By decreasing the total cost of ownership (TCO) for infrastructure systems, IT managers can potentially free budget dollars, re-allocating them to other essential or more pressing projects. The challenge lies in figuring out how to reduce TCO by increasing IT efficiency and driving down operational costs—or, to put it simply, how to do more with less.

In a research study commissioned by Red Hat, a premier global market intelligence firm compared costs and efficiencies of two commonly deployed IT infrastructure platforms: Red Hat® Enterprise Linux® and Microsoft Windows. The firm conducted independent research, examining impacts on TCO for infrastructure servers deployed across 21 companies. The study sample represented a variety of industries and geographies across multiple regions in North America, Europe, the Middle East, and Africa (see the sidebars on the next page for demographics and sample set characteristics). The study compared a like number of platforms that, on average, featured similar utilization rates.

¹ http://www.computerweekly.com/blogs/computer_weekly_data_bank/2013/01/80-of-data-centre-spending-goes-on-maintenance.html



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Demographics	Average
Employees	41,792
Internal users	2,899
External users	116,096
IT staff	249
Annual IT budget	\$18.5M
Physical servers	7,883
Storage	950TB
Industries:	Airlines, Banking, Education, Healthcare, Travel, Government, Insurance, Media, Natural Gas, Service Providers, Pharmaceuticals, and Business Services

Comparable environments	
Number of servers	
Red Hat	3,592
Windows	3,557
Utilization rate	
Red Hat	46%
Windows	49%
Ave. number of users/server	
Red Hat	304
Windows	219

By collecting comprehensive usage statistics, server profiles, and data about IT expenses, the firm determined that **infrastructure platforms based on Red Hat Enterprise Linux experienced 34% lower annual TCO per user compared to Windows servers**. The data showed that servers running Red Hat Enterprise Linux offered superior operational efficiencies and could support more users. The superior scale and density of the Red Hat Enterprise Linux platforms translated directly into lower overall infrastructure costs.

Based on expenses measured per year per user (Figure 1), the study recorded significant annual savings for Red Hat Enterprise Linux versus Windows in three cost categories: server infrastructure costs (29% lower), IT staffing costs (41% lower), and costs from lost user productivity (54% lower). Taken together, Red Hat Enterprise Linux systems provided an annual TCO savings of 34% per user over Microsoft Windows.

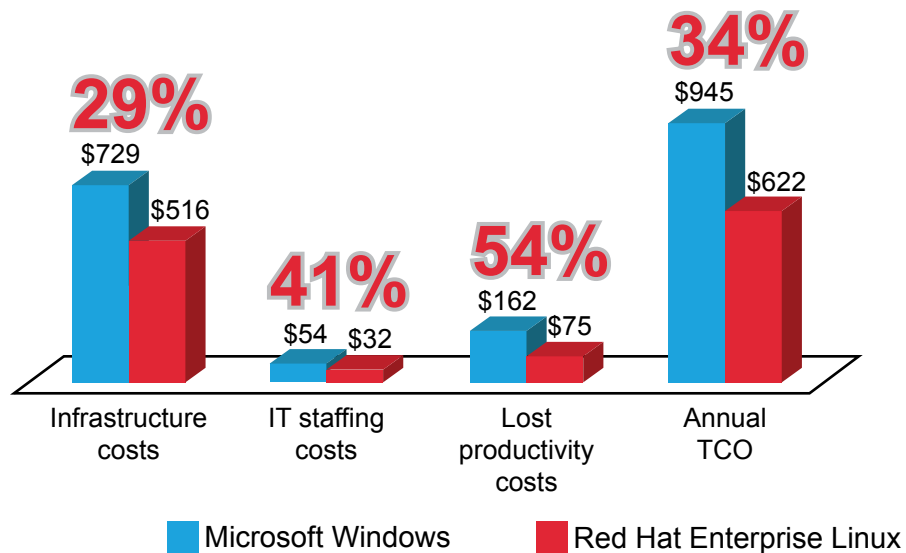


Figure 1. Red Hat Enterprise Linux featured 34% lower TCO per user

This paper summarizes the study's metrics and results, showing how Red Hat Enterprise Linux is a more cost-effective platform choice.

LOWER IT SERVER INFRASTRUCTURE COSTS

IT server infrastructure costs represent non-personnel related operational costs—server expenses, maintenance fees, software licensing, the cost of add-on management tools, and so forth. These costs are easily the largest portion of the overall TCO spend. As shown in Figure 1, annual server infrastructure costs per user for the Red Hat Enterprise Linux servers were \$516 out of a total TCO of \$622; for Windows servers, they were \$729 out of a total TCO per user of \$945.

As shown in the chart below, annual IT server infrastructure costs per user were 29% lower for Red Hat Enterprise Linux platforms in comparison to Windows platforms. This is because Red Hat Enterprise Linux servers scale to support more users per server—an average of 304 users per server compared to an average of 219 users per Windows server. Such scalability means fewer servers, fewer software licenses, and thus lower costs.

By spending less on server costs, hardware maintenance, and software licensing to provision applications, you'll free up funds that can finance other strategic IT projects.

Infrastructure costs	Red Hat Enterprise Linux	Microsoft Windows	% savings
Initial server hardware	\$621	\$818	24%
Annual server costs, per user	\$153	\$201	24%
Annual HW maintenance & upgrade	\$155	\$250	38%
App/DB software licensing	\$98	\$181	46%
Annual management tools	\$110	\$97	-13%
Annual server infrastructure costs, per user	\$516	\$729	29%

Annual hardware maintenance expenses were an average of 38% lower. Application and database licensing fees, which are typically determined by the number of servers and number of cores used, were an average of 46% lower per user per year. The cost of management tools was the only metric where Windows servers showed a cost advantage, 13% lower per year per user (this is likely because Windows management tools are sometimes included at no charge with enterprise licenses). Overall, however, using Red Hat Enterprise Linux servers resulted in significantly lower infrastructure costs.

The study classified the collected cost data according to application type, capturing costs for database, SAS, web services, and other application segments. For web services, annual infrastructure costs were \$1,388 per user for Windows servers and \$590 per user for Red Hat Enterprise Linux servers—a remarkable 57% lower. Web application demographics show that 79% of web services were directly revenue-generating, responsible for creating average annual revenues of \$1.668M from more than 7 million customers.

Across all application segments, the results indicate that you can spend less to build and maintain a Red Hat Enterprise Linux infrastructure, especially for mission-critical applications that generate revenue. By spending less on server costs, hardware maintenance, and software licensing to provision applications, you'll free up funds that can finance other strategic IT projects.

LOWER IT STAFFING COSTS

The study also examined efficiencies in IT support operations related to personnel costs. Highly efficient IT support operations require fewer administrators, which implies savings. According to the 2012 IT Salary Survey by Robert Half Technology, the average annual salary for a network administrator is \$58,750 - \$87,250, so the need for additional support personnel can have a big impact on TCO.

The study evaluated administrative costs across a broad range of IT maintenance and support operations, including setup, configuration, maintenance, backup, management tasks, and training. The chart below is an excerpt of the collected metrics. Red Hat Enterprise Linux servers generally

exhibited lower support costs in comparison to Windows servers. Operations associated with maintaining and supporting Red Hat Enterprise Linux servers cost an average of 41% less than the cost of supporting Windows servers (\$32 versus \$54 per year per user).

IT efficiency	Red Hat Enterprise Linux	Microsoft Windows	% savings
Initial setup & config	1.00	1.15	13%
Change management	1.01	1.35	25%
Configuration management	0.73	1.40	48%
App management	7.65	9.56	20%
Incident management	0.57	1.14	50%
Storage management	7.77	15.54	50%
Data backup	0.09	0.11	18%
Disaster recovery	0.07	0.09	22%
Software patching and updates	0.31	0.60	48%
Network performance management	11.68	23.36	50%
Security management	4.96	6.61	25%
Training	0.32	0.31	-3%
Annual IT staff costs, per user	\$32	\$54	41%

For the category of IT staffing costs, Red Hat Enterprise Linux exhibited lower costs in all aspects with the exception of training, in which Windows costs were marginally lower (3%). Of note, Red Hat Enterprise Linux servers had a 48 to 50% cost advantage in metrics for configuration management, incident management, storage management, software patching, and network performance management.

The study shows that, from an IT staffing and operations perspective, it costs less to maintain Red Hat Enterprise Linux systems than Windows systems. This frees resources from day-to-day system maintenance operations, allowing personnel to take on new IT deployment projects and initiatives.

LOWER COSTS FROM LOST PRODUCTIVITY

Since IT infrastructures typically provide application services to employees, partners, and customers, application access is key to productivity. When users have help desk issues or experience system downtime, there is a measurable reduction in productivity that translates into lost revenue

and indirect personnel costs. That's why the study measured the number of hours lost on help desk as well as downtime incidents. The chart below summarizes these cost impacts on productivity. The average loss in revenue per hour was fixed for both environments at \$47,938.

User productivity	Red Hat Enterprise Linux	Microsoft Windows	% savings
Productivity loss from Help Desk incidents, per user	\$37	\$57	35%
Productivity loss from downtime, per user	\$38	\$105	64%
Total productivity loss, per user	\$75	\$162	54%

Compared to Windows, Red Hat Enterprise Linux systems exhibited 35% fewer hours lost due to help desk incidents (9.0 versus 14.0 hours per user per year). Productivity losses from system downtime were significantly lower for Red Hat Enterprise Linux servers—a substantial 64% less. Overall, the cost of lost productivity for Red Hat Enterprise Linux servers was 54% less than that of Windows users.

The downtime metrics below show that Red Hat Enterprise Linux was deployed for tasks that are more critical to revenue generation. Red Hat Enterprise Linux servers supported more users per server, which means there was a higher percentage of users impacted when a downtime incident occurred. Although downtime for a Red Hat Enterprise Linux server results in a greater impact on both people and revenue, these systems experienced 64% fewer hours of downtime per user per year. This statistic makes Red Hat Enterprise Linux the smart choice for your most important revenue-generating applications.

Downtime metrics	Red Hat Enterprise Linux	Microsoft Windows	% advantage
Percent of downtime incidents that impact revenue	18%	13%	-38%
Percent of users impacted per downtime event	42%	32%	-31%
Downtime hours per user per year	2.10	5.86	64%

CONCLUSION

This study demonstrates how Red Hat Enterprise Linux platforms can yield dramatic cost savings over an infrastructure based on Microsoft Windows. Across the sample set of 21 companies, deploying Red Hat Enterprise Linux resulted in a 34% lower annual TCO per user than Windows. The study reported considerable savings for Red Hat Enterprise Linux servers across all three categories: IT server infrastructure costs, IT staffing efficiencies, and in costs stemming from lost productivity.

Cost category	Red Hat Enterprise Linux	Microsoft Windows	% savings
Infrastructure costs	\$516	\$729	29%
IT staffing costs	\$32	\$54	41%
Lost productivity costs	\$75	\$162	54%
Annual TCO, per user	\$622	\$945	34%

The study validates the efficiency of Red Hat Enterprise Linux and its ability to support a greater number of users per server than Windows platforms. The tremendous scalability of Red Hat Enterprise Linux is particularly noticeable in the user density metrics for the mission-critical workloads of database, SAS, and web services.

Workload type	Ave. no. of users/server Red Hat Enterprise Linux	Ave. no. of users/server Microsoft Windows	% density advantage
Database	119	39	205%
SAS	31	20	55%
Web	605	314	93%

Such high user densities per server result in lower costs for the IT infrastructure, so you can be sure to get the most from your IT budget. For strategic, mission-critical applications, you can confidently deploy Red Hat Enterprise Linux knowing that you are implementing an extremely scalable, highly efficient, and cost-effective infrastructure. Imagine how you would redirect and invest an annual TCO savings of 34% per user in your own organization.

Contact your Red Hat representative today and learn how easy it is to move your workloads to cost-efficient Red Hat Enterprise Linux platforms.

ABOUT RED HAT

Red Hat is the world's leading provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux, and middleware technologies. Red Hat also offers award-winning support, training, and consulting services. Red Hat is an S&P company with more than 70 offices spanning the globe, empowering its customers' businesses.



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