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Business Value Highlights

619%
five-year ROI

6 months
to payback

59%
lower cost of operations

73%
faster to deploy

83%
less staff time to complete
business extensions

81%
less staff time to
deploy storage

98%
less unplanned downtime

42%
improved application
performance

The Business Value of Modernizing Infrastructure with Hyper-Converged Systems

IDC OPINION

Technology is quickly moving to the forefront of business priorities as organizations undertake digital and IT transformation projects that enable strategic differentiation in a world where users leverage applications and data in new ways. Organizations in all industries must better align with changing customer preferences to avoid being disrupted by a new crop of nimble competitors. Technology will increasingly determine how businesses define and distinguish themselves in the market. IDC has noted that most organizations were not born digital but instead have legacy business processes, applications, and infrastructure that require modernization and automation. As a result, businesses must embark on an IT transformation initiative to modernize and automate their legacy infrastructure to prime themselves to achieve their digital business goals and initiatives.

There are many moving parts to such modernization projects. Specific to IT assets, organizations should be thinking about two broad categories: the core stack of datacenter infrastructure (server, storage, networking, virtualization, infrastructure management, etc.) and the cloud stack related to service delivery (orchestration, deployment management, and applications). When the challenge is broken down this way, organizations can focus on modernizing IT infrastructure in parallel with automating service delivery while holistically transforming IT operations across the entire IT infrastructure and cloud stack.

Key benefits sought by organizations that engage in the rapid modernization of IT infrastructure include improved operational and cost efficiency for existing workloads and the ability to rapidly scale out new workloads. To achieve these goals, IT departments are increasingly looking for datacenter infrastructure that provides all compute and data services as a single system that can be managed holistically at rack scale. IDC refers to such solutions as converged infrastructure.

The fastest-growing segment of the converged infrastructure market is known as hyper-converged infrastructure (HCI). Hyper-converged infrastructure is distinguished from traditional converged systems in that it natively collapses core storage, compute, and storage networking functions into a single software solution or appliance. In addition to integrating storage and compute functions into a single node (or a cluster of nodes, each offering compute and storage functions), hyper-converged infrastructure employs a distributed file system or object store for data organization and access, an abstraction mechanism for pooling hardware resources and providing a substrate for workload adjacency. Today's well-designed, commercially available hyper-converged solutions are based on web-scale architectures and share attributes of a distributed everything architecture, scale-out design, and analytics but don't require businesses to develop their own new technology stack. Hyper-converged architectures are being used as a platform of choice when building out today's public and private cloud infrastructure as organizations look for fast deployment of IT, reduced time spent managing datacenter assets, and easy scale out.

IDC believes hyper-converged infrastructure has moved past its early market phase and is now being leveraged by a large number of organizations for a wide range of uses. In fact, global spending on HCI was more than \$2 billion in 2016 and is set to surpass \$7.6 billion by the end of 2021. This striking growth rate is happening because a large and growing number of companies are deploying HCI solutions to run a mix of workloads, including those that are deemed mission critical.

IDC interviewed organizations that have deployed Dell EMC VxRail and VxRack hyper-converged solutions (collectively referred to as Dell EMC HCI solutions) to support their expanding IT and business operations. Study participants reported that Dell EMC HCI solutions serve as a foundation for innovation across their distributed organizations by providing a cost-effective, agile, and high-performing IT infrastructure foundation. The result is that these organizations are realizing a 619% five-year return on their investment in Dell EMC HCI solutions, which IDC puts at a value of \$150,776 per 100 users per year, resulting in a six-month payback period. The use of Dell EMC HCI facilitates innovation across study participants' business operations by:

- Enabling staff and business operations with high-performing business applications and services at noncentral locations
- Providing an agile infrastructure that enables the business and requires less staff time to deploy (73%) and support (51%)
- Causing fewer impactful outages (98% less unplanned downtime)
- Costing almost one-quarter (22%) less than comparable infrastructure approaches considered

TECHNOLOGY IS DRIVING THE NEXT WAVE OF BUSINESS INNOVATION

Digital transformation (DX) is the process of creating value, growth, and competitive advantage through new offerings, business models, and business relationships. It's about changing the way that business gets done.

That change begins in the datacenter and requires that companies first undergo an IT transformation (ITX) — the conversion of the IT organization from being the back-office enabler of internal business processes to playing a prominent role as the engine powering digital business.

IDC finds that leaders in driving this critical IT transformation focus on three goals:

- Modernizing the core IT infrastructure to meet exponential increases in the performance and scale of critical systems of record without sacrificing integrity, security, or reliability
- Automating the provisioning and delivery of IT resources through adoption of cloud-based operating models to speed time to develop, deploy, and upgrade existing systems of engagement and insight at the heart of digital transformation
- Transforming the IT organization and processes to enable the IT team to drive new thinking around becoming a driver of innovation and ensure that transformation efforts are complementary, resilient, scalable, and secure

Success in digital transformation also requires new thinking about the creation, analysis, and consumption of data not only at the core of the business but also at increasingly “smart” edge locations, such as hospitals, factories, and transportation hubs, where businesses connect with people or “smart” things.

To enable an agile environment across core and edge, IT leaders are modernizing their datacenters with scalable hyper-converged systems to provide standardized hardware and software-defined infrastructure without sacrificing performance or reliability.

BUSINESS VALUE OF DELL EMC HCI SOLUTIONS

Interviewed Dell EMC customers reported that they are leveraging Dell EMC's HCI solutions to meet business demand for innovation and performance across their organizations. Study participants have leveraged this flexibility to both capture more revenue and increase the productivity levels of employees, as described in this study. One study participant explained: *"We're seeing benefits for our manufacturing with VxRail because some of those systems have to be run on location."* Another IT manager commented on the agility VxRail enables: *"VxRail costs about half as much as the other solution we considered, and we trust the VxRail solution. So we're getting the ability to deploy quickly at a low cost point."*

Firmographics of Study Participants

The seven interviewed organizations varied in size and scope of operations ranging from several hundred employees to over 20,000 employees, with an average of 7,417 employees (see Table 1). Interviews for the study reflected experiences of Dell EMC customers in North America, EMEA, and APAC and the experiences of retailers, public sector organizations, higher education institutions, and software developers. These organizations all have distributed operations across locations or buildings, requiring them to deliver applications and IT services beyond their core locations. At the time the interviews were conducted, study participants were using an average of two Dell EMC HCI machines with 10 servers and running over 60 business applications on this infrastructure.

TABLE 1 Demographics and Dell EMC Scale-Out Solution Use by Interviewed Organizations

	Average	Median
Number of employees	7,417	3,750
Number of IT staff	133	30
Number of business applications	159	100
Revenue per year	\$1.8 billion	\$800 million
Number of VxRail/VxRack servers	10	8
Number of VxRail/VxRack business applications	61	15
Number of users of applications on VxRail/VxRack	1,451	938
Number of terabytes, VxRail/VxRack environment	93	50
Countries	United States, Germany, Australia	
Industries	Higher education, public sector, retail, software development	

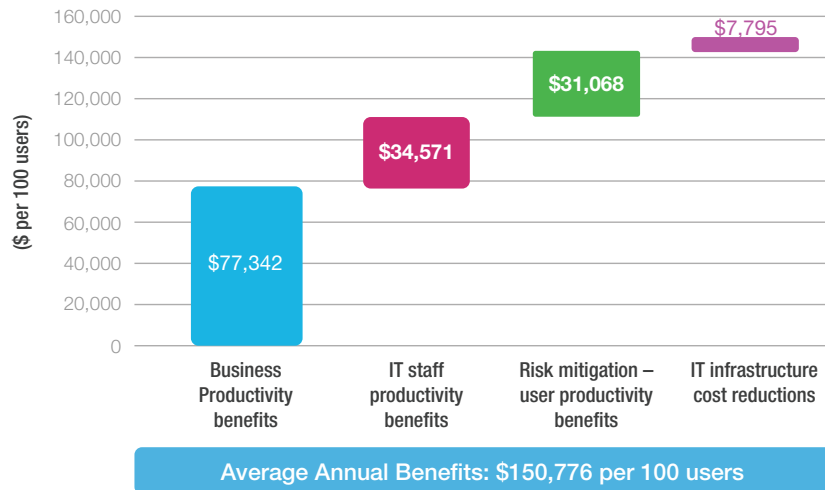
n = 7 Source: IDC, 2017

Quantifying the Value of Dell EMC Scale-Out Solutions

Dell EMC customers reported that their use of VxRail and VxRack is helping them innovate and become more operationally efficient across their business environments. As a result, they are realizing strong value by supporting distributed business applications with Dell EMC HCI solutions (see Figure 1). IDC calculates this value at an annual average of \$150,776 per 100 users, with organizations on average realizing \$2.19 million per year in benefits in the following areas:

- **Business productivity benefits.** Study participants are winning more business and enabling employees across their distributed operations. IDC calculates that study participants will realize revenue and employee productivity gains worth an average of \$77,342 per 100 users per year (\$1.12 million annually per organization).
- **IT staff productivity benefits.** Study participants are benefiting from the ease of deploying, maintaining, and supporting their Dell EMC HCI solutions, as well as efficiencies from using the solution as a development platform. IDC puts the value of related time savings and productivity gains at an average of \$34,571 per 100 users per year (\$501,600 annually per organization).
- **Risk mitigation — user productivity benefits.** Study participants are experiencing fewer impactful application and system outages and resolving such situations faster. The result is the reduction, by 98%, of lost productive time and lost revenue caused by unplanned downtime, which IDC estimates will have a value of \$31,068 per 100 users per year (\$450,800 annually per organization) on average.
- **IT infrastructure cost reductions.** Study participants are spending less on their Dell EMC HCI solutions than on their legacy or alternative infrastructure environments. IDC calculates that they will save an average of \$7,795 per 100 users per year (\$113,100 annually per organization).

FIGURE 1 Average Annual Benefits per 100 Users



Source: IDC, 2017

Business Productivity Benefits: Delivering Performance and value at the Edge

Dell EMC HCI solutions are helping interviewed organizations innovate and drive business. With varied locations, these organizations require a modern IT infrastructure that can ensure the reliability, scalability, and performance of applications and services across their organizations. In turn, this helps the organizations become more operationally efficient and effective, and it supports the delivery of better business results

Reliability, Scalability, and Performance Across Locations

Study participants cannot maximize their business potential without an IT infrastructure that allows them to operate at full velocity across their locations. This means that IT infrastructure solutions —located centrally, either onsite or in the cloud — that cannot deliver the needed levels of IT performance and agility will not be sufficient. When performance and agility are lacking, organizations cannot be sure that they will be able to respond to business demands or opportunities and risk losing business opportunities or incurring operational inefficiencies caused by this IT-related friction.

Interviewed Dell EMC customers reported that their HCI solutions have delivered higher reliability, performance, and agility. As shown in the sections that follow, the improvements and efficiencies have been substantial, serving to enable these organizations, especially in locations where they are operating Dell EMC HCI solutions.

Reliability

Study participants need business applications and services to be available to support their customers and employees, and they are experiencing 83% fewer impactful unplanned outages, which has translated to 98% less unplanned downtime since deploying Dell EMC HCI solutions (see Table 2). One organization explained the criticality for high availability: *“Higher reliability has been a big win for us because we provide emergency services, and we need it to be working.”*

TABLE 2 Dell EMC HCI Impact on Unplanned Downtime

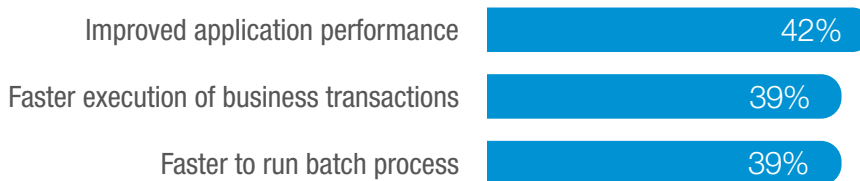
	Before/Wihtout Dell EMC HCI	With Dell EMC HCI	Difference	Change (%)
Unplanned outages per year per organization	5.5	0.9	4.6	83
MTTR (hours)	2.5	0.2	2.3	92
Hours per user of lost productivity per year	5.0	0.1	4.9	98
FTE impact, lost user productivity per year	3.8	0.1	3.7	98

n = 7 Source: IDC, 2017

Performance

Improved performance in terms of latency (42% improved application performance on average) and time to execute processes (39% faster execution of batch processes) benefits users of applications (see Figure 2). One interviewed Dell EMC customer noted: *“The biggest benefit is that the responsiveness of the system is greatly increased because of how much more IOPS the back end has now compared [with] our previous system.”*

FIGURE 2 Dell EMC HCI Impact on Performance

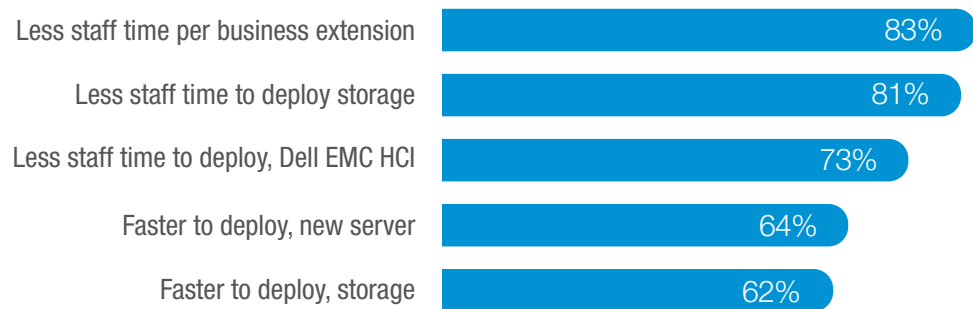


Source: IDC, 2017 (% of improvement)

Agility

The impact of Dell EMC HCI solutions has been most evident in terms of time to get the solution itself up and running (73% less staff time on average among study participants), deploy storage (81% less staff time), and provision new servers (64% faster deployment) (see Figure 3). In turn, this helps the organizations execute business extensions with one-sixth the staff time compared with their legacy environments (83% less staff time on average). One VxRail customer referenced how these efficiencies help it: *“With VxRail, we’re able to respond to demand from the business much quicker. If the system needs more space, compute, or RAM, we have the resources to do that now When people need things, it’s almost instantaneous.”*

FIGURE 3 Dell EMC HCI Impact on IT and Business Agility



Source: IDC, 2017 (% of improvement)

Supporting Business and Operational Expansion

Study participants have leveraged reliability, performance, and scalability with their Dell EMC HCI solutions to create value in the form of higher revenue and increased employee productivity (see Table 3). With VxRail and VxRack deployed, these organizations can put in place IT resources as needed to address business opportunities and ensure that employees — especially outside of central locations — have consistent access to high-performing business applications.

Dell EMC HCI solutions have helped study participants increase revenue by both better addressing business opportunities and reducing revenue lost during outages. One study participant explained how VxRail helps it win more business: *“With VxRail, we are able to keep up with business demand at our sites. If we couldn’t, it would be very impactful to manufacturing and shipping. Now, we are able to run additional warehousing shifts. I would say that it’s millions of dollars per year in additional revenue, but it could be a lot more.”*

Meanwhile, improved performance also has a significant impact on how employees, especially at noncentral locations, work. Efficient and timely delivery of high-performing business applications helps them increase productivity levels. One study participant commented: *“The applications running on VxRail are performing tremendously better Normal queue times were 15–20 milliseconds before, and I now see 0.1 milliseconds on my storage queue times. So storage problems are no longer an issue, and there are no longer bottlenecks.”*

TABLE 3 Business Productivity Benefits

	Per Organization	Per 100 Users
Revenue impact due to better addressing business opportunities		
Additional revenue per year	\$421,100	\$29,024
Recognized revenue per year — IDC model*	\$63,200	\$4,354
Revenue impact due to unplanned downtime		
Additional revenue per year	\$1.2 million	\$85,785
Recognized revenue per year — IDC model*	\$186,700	\$12,868
User productivity impact		
Number of users impacted	252	17
Equivalent FTE gain	9.9	0.7
Other operational cost reductions per year	\$363,000	\$25,021

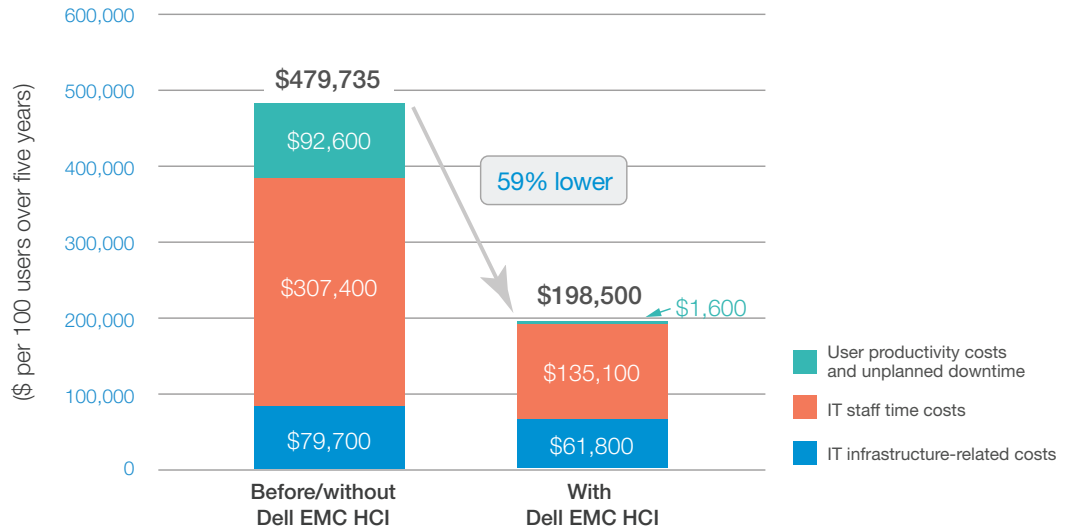
* The IDC model assumes a 15% operating margin for all additional revenue.

Source: IDC, 2017

Expanding in an Operationally Efficient Manner

Study participants noted that in addition to enabling their businesses, Dell EMC HCI solutions have facilitated operations in a cost-effective and efficient manner. IDC projects that on average, these organizations will operate their Dell EMC HCI solutions at a five-year cost of operations that is 59% lower than that of their legacy or alternative environment, helping them justify improving IT performance and agility across their organizations (see Figure 4).

FIGURE 4 Five-Year Cost of Operations



Source: IDC, 2017

IT Infrastructure Cost Reductions: Cost-Effective IT Platform

Dell EMC customers reported spending less on hardware and related maintenance and power to operate their HCI environments — 22% less — than they otherwise would have. Deploying a hyper-converged platform often means requiring fewer servers and network storage hardware, while the consolidated and efficient nature of the hyper-converged solutions reduces spending on power and space. Further, the organizations are capturing these cost efficiencies even as they take advantage of much increased flash storage capacity to drive performance improvements — going from an average of almost no flash storage to 61TB with Dell EMC HCI. One study participant commented on cost-related efficiencies it has seen with Dell EMC: *“We’re benefiting from the simple fact that there is now more capacity, power, compute, and bandwidth. We’re able to do more. To replace the system with multiple hosts, plus a SAN and a communication network, would cost significantly more and would have taken longer to get up and running.”*

IT Staff Productivity Benefits

Moving to a consolidated hyper-converged environment with Dell EMC HCI solutions has also enabled IT staff efficiencies for interviewed organizations. These efficiencies are being achieved across the life cycle, from deployment to ongoing management and ongoing support. In total, study participants reported needing less than half the staff time (56% less) to deploy and run their Dell EMC HCI datacenter environments (see Table 4). In particular, they are benefiting from software-defined processes that build in automation, high reliability, and the ability to manage single pools of compute and storage resources rather than more siloed environments.

TABLE 4 IT Staff Productivity Benefits per 100 Users Over Five Years

FTEs	Before/Without Dell EMC HCI	With Dell EMC HCI	Difference	Benefit (%)
Deployment	0.09	0.02	0.07	73
Management, keeping the lights on	0.69	0.22	0.47	68
Management, other	0.43	0.33	0.11	24
Support	2.17	0.92	1.25	58
Total	3.39	1.49	1.90	56

n = 7 Source: IDC, 2017

ROI Analysis

IDC based the ROI analysis on interviews with organizations that are using Dell EMC VxRail and/or VxRack solutions to run applications at noncentral locations in their disparate business operations. Based on these interviews, IDC calculated the benefits and costs to these organizations of deploying and running Dell EMC HCI solutions. IDC used the following three-step method for conducting the ROI analysis:

- 1. Gathered quantitative benefit information during the interviews** using a before-and-after assessment of the impact of VxRail/VxRack. In this study, the benefits included revenue gains, operational efficiencies, staff time savings and productivity benefits, and IT-related cost reductions.
- 2. Created a complete investment (five-year total cost analysis) profile based on the interviews.** Investments go beyond the initial and annual costs of using VxRail/VxRack and can include additional costs related to migrations, planning, consulting, and staff or user training.
- 3. Calculated the ROI and payback period.** IDC conducted a depreciated cash flow analysis of the benefits and investments for the organizations' use of Dell EMC HCI solutions over a five-year period. ROI is the ratio of the net present value (NPV) and the discounted investment. The payback period is the point at which cumulative benefits equal the initial investment.

Table 5 presents IDC's analysis of the benefits and costs of using Dell EMC HCI solutions for study participants. IDC projects that on average, these Dell EMC customers will invest a discounted total of \$74,951 per 100 users over five years (\$1.09 million per organization).

IDC expects that in return, the organizations will realize discounted benefits with a value of \$539,059 per 100 users over five years (\$7.82 million per organization). This would result in a five-year ROI of 619% and breakeven on their investment in six months.

TABLE 5 ROI Analysis

	Five-Year Average per Organization	Five-Year Average per 100 Users
Benefit (discounted)	\$7.82 million	\$539,059
Investment (discounted)	\$1.09 million	\$74,951
Net present value (NPV)	\$6.73 million	\$464,108
Return on investment (ROI)	619%	619%
Payback period	6 months	6 months
Discount rate	12%	12%

Source: IDC, 2017

CHALLENGES/OPPORTUNITIES FOR DELL EMC

Smaller HCI vendors have long viewed HCI technology as a viable platform for mission-critical workloads and have worked diligently to expand the capabilities and feature set of their HCI solutions. Some larger vendors have recently increased their share within the HCI market. Importantly, IDC sees a disconnect between the expanded number of workloads (including those that are considered mission critical) running on HCI solutions and the general perception that HCI technology is still useful only for very specific/limited environments (most notably VDI, remote offices, or branch offices). Any vendor with current product strategies based on an outdated perception of HCI will find itself in an increasingly weaker competitive position.

Dell's biggest evolution in the HCI market is its acquisition of EMC, which was completed in September 2016. This acquisition allows the newly formed Dell EMC to span the entire storage market, from small and medium-sized businesses (SMBs) to large enterprises, with a wide product portfolio. To take advantage of its strengths and maintain its market position, Dell EMC will have to continue to emphasize its product portfolio, sales force, and installed base.

CONCLUSION

The impact of HCI on the IT organization is significant. Time that was previously spent configuring individual compute, storage, and network elements as well as time spent making sure all the pieces worked together can now be spent on tasks and projects that directly drive innovation within the datacenter. Rack-level HCI solutions are more extensively instrumented and automated, allowing IT departments to move one step closer to lights-out operations and position themselves for moving forward in the IT transformation journey. The most efficient and expedient way to jump-start any organization's IT transformation effort is through modernizing the datacenter with HCI. Time that was previously spent implementing and maintaining systems can now be spent on providing innovative IT services that move the business forward.

APPENDIX

Methodology

IDC's standard ROI methodology was utilized for this project. This methodology is based on gathering data from current users of VxRail and/or VxRack infrastructure solutions as the foundation for the model. Based on interviews with seven organizations using these Dell EMC HCI solutions, IDC performed a three-step process to calculate the ROI and payback period:

- Measure the benefits from the use of Dell EMC HCI solutions in terms of IT infrastructure cost savings and avoidances; IT staff time savings and productivity gains; user productivity gains; and revenue attributed to the use of Dell EMC HCI solutions.
- Ascertain the investment made in deploying VxRail and/or VxRack and associated migration, training, and support costs.
- Project the costs and savings over a five-year period and calculate the ROI and payback for Dell EMC HCI solutions.

IDC bases the payback period and ROI calculations on assumptions that are summarized as follows:

- Time values are multiplied by burdened salary (salary + 28% for benefits and overhead) to quantify efficiency and productivity savings. IDC assumes a fully burdened salary of \$100,000 per year for IT staff, including developers, and \$70,000 for other employees, with an assumption of 1,880 hours worked per year.
- 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.
- The net present value of the five-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.

Note: All numbers in this document may not be exact due to rounding.

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