National Survey on Data Center Outages

Sponsored by Emerson Network Power

Independently conducted by Ponemon Institute LLC

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National Survey on Data Center Outages

Ponemon Institute, 30 September 2010

Part 1. Executive Summary

Ponemon Institute and Emerson Network Power are pleased to present the results of the *National Survey on Data Center Outages*. The purpose of this study is to determine the frequency and root causes of unplanned data center outages. We believe organizations are underestimating the impact unplanned outages have on their operations.

We surveyed 453 individuals in U.S. organizations who have responsibility for data center operations. Of these organizations, 95 percent have had an unplanned outage. Following are the most salient findings from this study.

Perceptions about data center criticality, availability and outages

The findings suggest companies need to improve their practices and invest in technology, services or resources to reduce or respond to outages. Sixty-five percent of respondents agree their company's business model is dependent upon the data center to generate revenue and conduct ecommerce. Moreover, 51 percent believe every application in the data center is mission critical. However, 59 percent agree that the risk of an unplanned outage has increased as a result of cost constraints inside the data center.

Despite the importance of their company's data center, most every organization in this study has had at least one unplanned outage in the past 24 months. Respondents averaged 2.48 complete data center shutdowns over the two-year period, with an average duration of 107 minutes. The lengthy duration of the data center outages correlates to lack of resources and planning as only 37 percent agree there are ample resources to bring their data center up and running if there is an unplanned outage.

Less than half of respondents (42 percent) believe senior management fully supports their efforts to prevent and manage unplanned outages. Other indications that organizations are not proactive in addressing the risk of unplanned data center outages include the finding that only 32 percent believe they utilize all best practices in data center design and redundancy to maximize availability.

Perception differences between senior level and rank-and-file respondents

Dividing our sample according to respondents' positions in their companies yields interesting differences. Sixty percent of senior-level respondents have greater confidence that leadership is supportive of efforts to prevent outages. Rank-and-file respondents are more likely than senior management to believe that unplanned outages happen frequently.

Types of data center outages and their frequency and duration

While complete data center shutdowns are frequent, there is a far greater occurrence of row-or rack-based outages. Row-based or localized downtime had an average occurrence of 6.8 times during the two-year timeframe with an average duration of 152 minutes. Rack-and server-based downtime had an average occurrence of 11.2 times during the two-year timeframe with an average duration of 153 minutes.

Revelation of industry and data center size differences

Financial service organizations appear to have fewer total and partial unplanned data center outages than other industry segments analyzed in our study. In addition, organizations in financial services tend to have a shorter duration of outage than other industries. In sharp contrast, healthcare organizations appear to have both a higher frequency and longer duration of unplanned outages than other industries analyzed.

The frequency and duration of data center outages also varies by the size of the data center. Outages become less frequent and shorter in duration as data centers increase in size. The smaller the data center the longer and more common the outages.

Root causes and responses by organizations

Eighty percent of respondents know the root cause of the unplanned outage. The most frequently cited root causes of data center outages are: UPS battery failure (65 percent), UPS capacity exceeded (53 percent), accidental EPO/human error (51 percent) and UPS equipment failure (49 percent). Most common responses to unplanned outages are to repair, replace or purchase additional IT or infrastructure equipment (60 and 56 percent, respectively) followed by contacting the equipment vendor for support (51 percent).

Fifty-seven percent believe all or most of the unplanned outages could have been prevented. The most common prevention tactics to avoid downtime are investing in improved equipment (50 percent), increasing the budget and staff of the data center (34 and 20 percent, respectively), improving infrastructure design/incorporating redundant components (19 and 18 percent, respectively) as well as performing preventative maintenance of critical infrastructure (16 percent).

Part 2. Key Findings

Respondents' perceptions about data center availability and outages

Figures 1a, 1b, and 1c summarize respondents' opinions about data center availability, unplanned outages and governance in their organizations. Opinions were captured using a five-point scale ranging from strongly agree to strongly disagree.

Figure 1a: Attributions about data center availability
Disagree combines strongly disagree, disagree and unsure responses
Agree combines strongly agree and agree responses

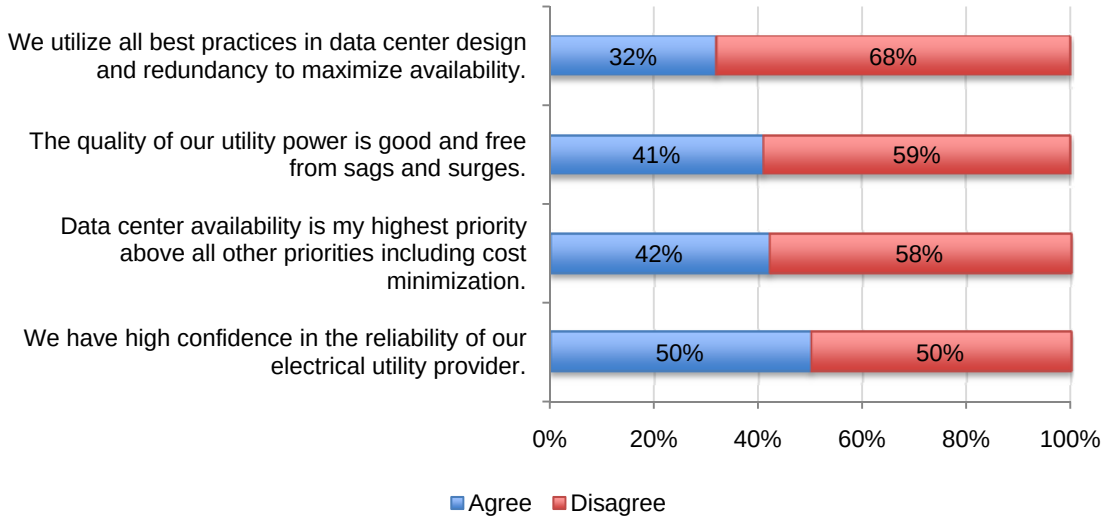


Figure 1b: Attributions about unplanned outages
Disagree combines strongly disagree, disagree and unsure responses
Agree combines strongly agree and agree responses

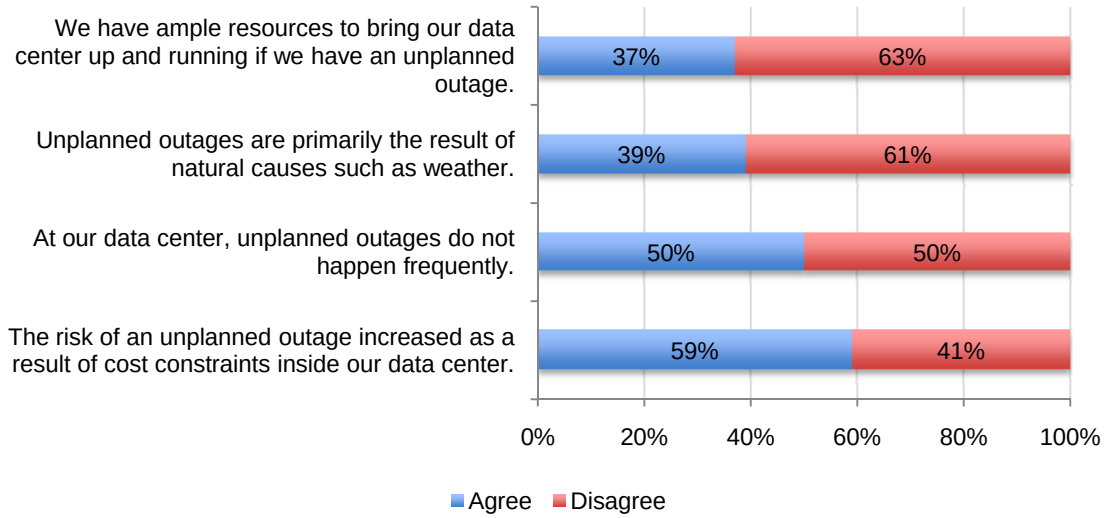
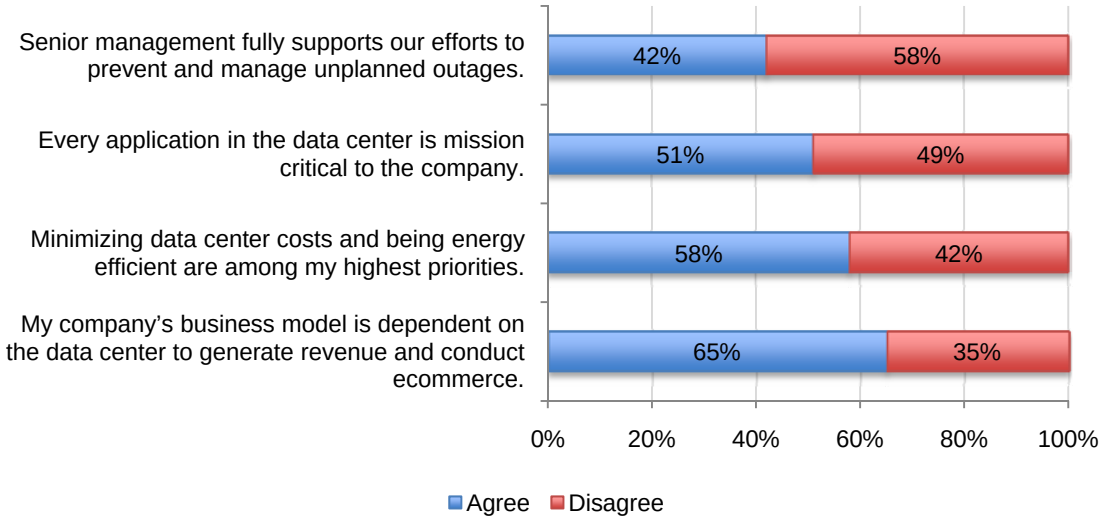


Figure 1c: Attributions about data center governance
Disagree combines strongly disagree, disagree and unsure responses
Agree combines strongly agree and agree responses



As shown in Figure 1a, many respondents have serious doubts about their organization's ability to withstand unplanned outages or ensure a high level of availability. The root cause of these negative perceptions appears to be based on the belief by many (68 percent) that their organization is not instituting all best practices in data center design. Further, less than half believe data center availability is their highest priority. It is interesting to note that 50 percent have confidence in the reliability of their electric utility provider, but as shown in Figure 3 (later in this report), 88 percent have experienced loss of primary utility power in the past 24 months.

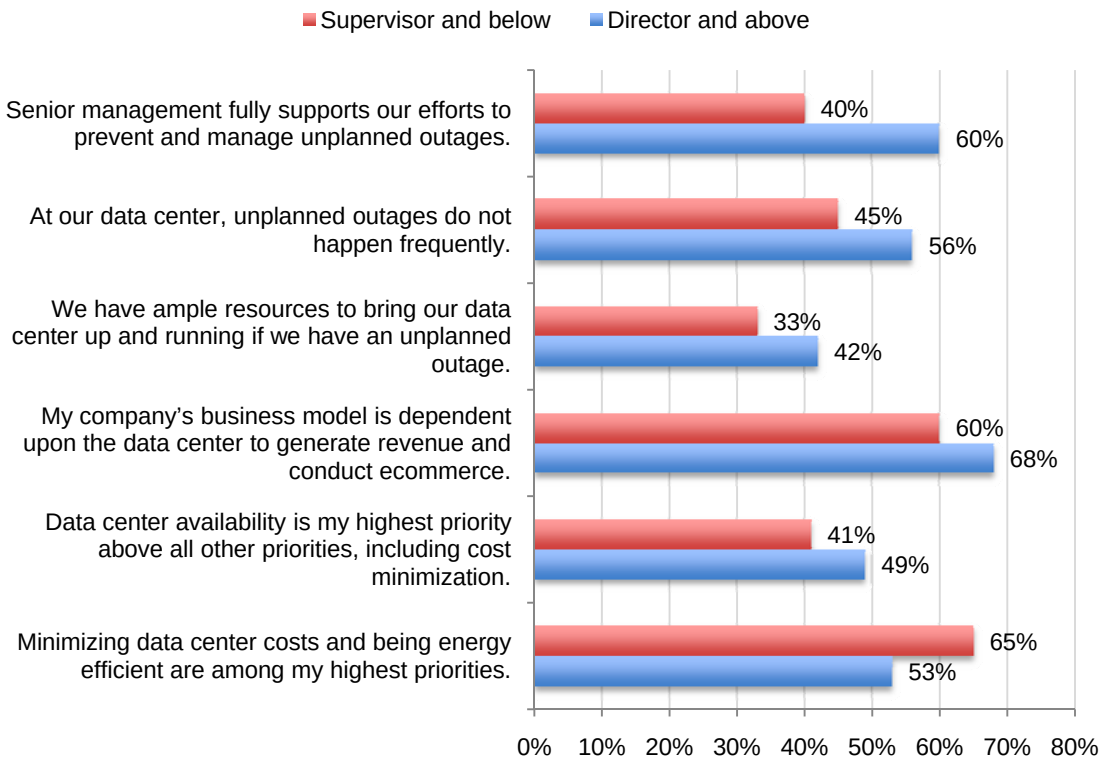
Figure 1b shows the perceptions respondents have about unplanned outages. The perceived root causes of unplanned outages and problems associated with these events seem to be related to cost constraints and resources necessary to bring the data center up and running after an unplanned outage. Again, there seems to be a difference between perceptions and reality. While 50 percent believe unplanned outages do not happen frequently, 95 percent have had an unplanned outage in the past 24 months (see Figure 7 later in this report).

In Figure 1c the perception among respondents is that their company's business model is dependent upon the data center to generate revenue and conduct ecommerce (65 percent). However, more than half (58 percent) does not believe senior management fully supports their efforts to prevent and manage unplanned outages. The priority is weighted towards cost management and energy efficiency versus data center availability. See Figure 1a, which shows that only 42 percent agree that data center availability is their highest priority.

Perceptions of senior-level versus rank-and-file respondents

Positions respondents hold in their companies influence their perceptions about the ability to manage the risk of unplanned outages. In our analysis, we created two subgroups of respondents: those who are at or above the director level (representing 32 percent of the sample) and those who are at or below the supervisory level (representing 33 percent of the sample). Figure 2 reports the six attributions with the largest absolute differences between these two subgroups. These attributions also are shown in Figure 1.

Figure 2: Perception differences between senior-level and rank-and-file respondents
Agree combines strongly agree and agree responses



As shown above, the largest absolute difference between these two groups is 20 percent for the attribution, "senior management fully supports our efforts to prevent and manage unplanned outages." Clearly, rank-and-file respondents are much more likely to disagree with this statement than senior-level respondents. Another notable difference (11 percent) concerns the attribution, "at our data center unplanned outages do not happen frequently. Here again, rank-and-file respondents are less likely to agree with this statement than those at a senior level. In contrast, lower-level respondents are more likely to agree that, "minimizing data center costs and being energy efficient is among my highest priorities" than their more senior-level colleagues.

Respondents' experience with primary utility power outages

Figure 3 shows that most respondents (88 percent) experienced at least one primary utility outage over the past 24 months.

Figure 3: Have you experienced any loss of primary utility power in the past 24 months?

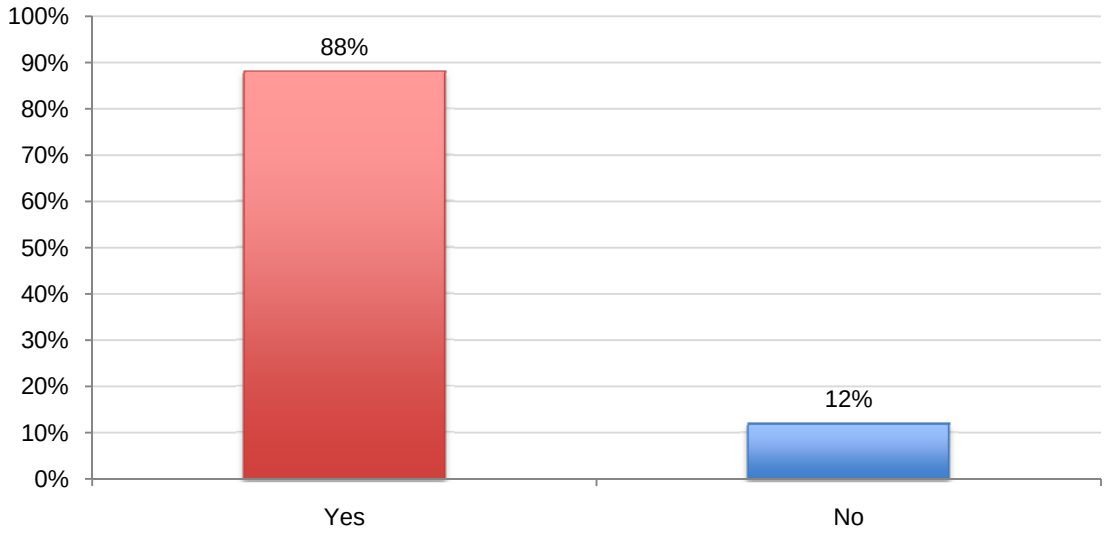
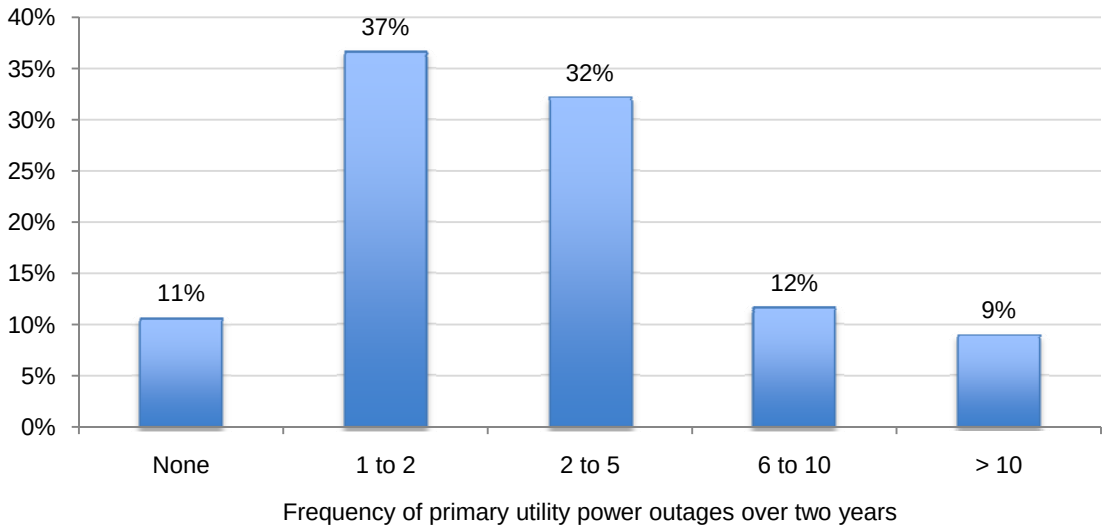


Figure 4 shows the frequency of primary utility power outages experienced over two years. Sixty-nine percent of respondents state their organizations have experienced between one and five primary power utility outages over two years. In an interesting comparison and discussed earlier, 50 percent of respondents agree their electric utility provider is reliable. In other words, about half of all respondents appear to have confidence in their electric utility despite the high incidence of outages.

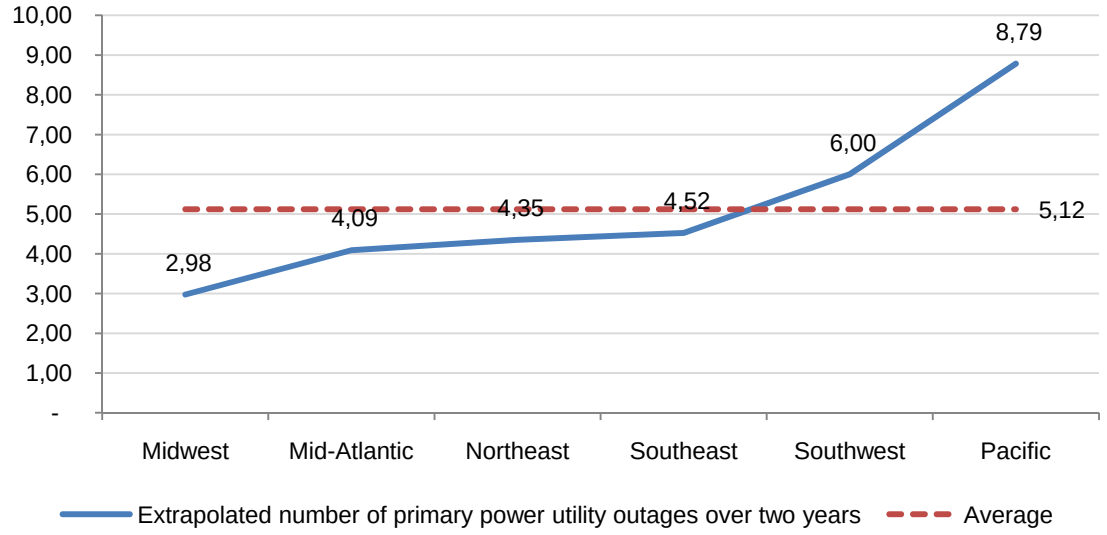
Figure 4: Frequency of primary power utility outages experienced by respondents



Using an extrapolation method we derive an average number of primary power utility outage for respondent organizations – which is 5.12 outages over two years. Figure 4 provides a cross-

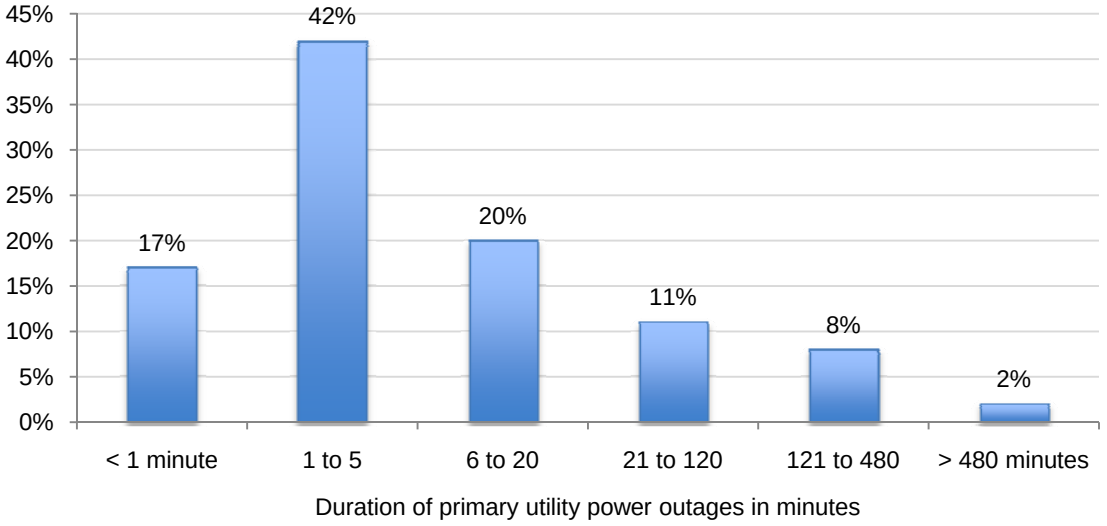
tabulation of this result for six geographic regions in the United States. As can be seen in Figure 5, there are significant differences in extrapolated averages by region. Specifically, the Pacific region at 8.79 outages yields the highest estimated number of primary utility power outages. In contrast, at 2.98 outages, the Midwest region has the lowest estimated number over two years.

Figure 5: Extrapolated average number of primary utility outages for six US regions



The extrapolated average of a power loss resulting from a primary utility power outage is 106 minutes (or 1 hour 46 minutes). As shown below, more than half of the respondents (59 percent) have experienced a duration that was less than five minutes in length. Please note many outages caused by primary utility providers do not directly result in data center downtime as designers and managers take measures to mitigate the impact of utility outage. Downtime occurs when those measures fail (root cause analysis will be discussed later in this report).

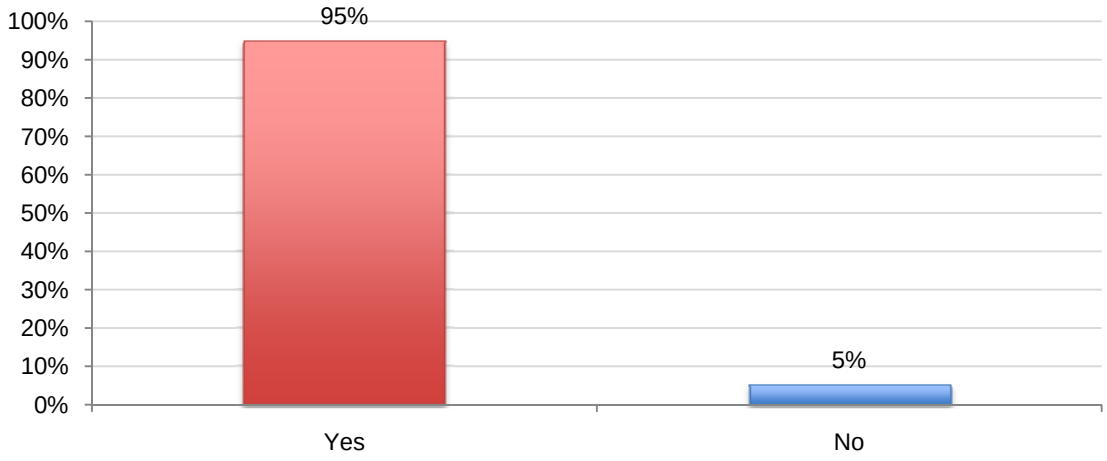
Figure 6: Average duration of primary utility power outage



Respondents' experience with complete or partial unplanned data center outages

Figure 7 again shows most respondents (95 percent) experienced at least one unplanned power outage that affected their organization's data center over the past 24 months. As previously reported in Figure 1b, however, 50 percent of respondents believe unplanned outages do not happen frequently – thus suggesting perception does not match reality.

Figure 7: Have you experienced an unplanned data center outage in the past 24 months?



The extrapolated average number of data center outages is shown in Figure 8. This figure provides three different levels of data center outages – namely, complete data center outages, partial data center outages (e.g., limited to certain sections or rows) and device-level data center outages (e.g., limited to individual racks or servers). As shown below, the average number of complete data center outages is 2.5 every two years. The estimated number of partial data center outages is 6.8 every two years. Finally, the estimated number of device-level data center outages is 11.3 every two years.

Figure 8: Extrapolated frequency of data center outages over two years

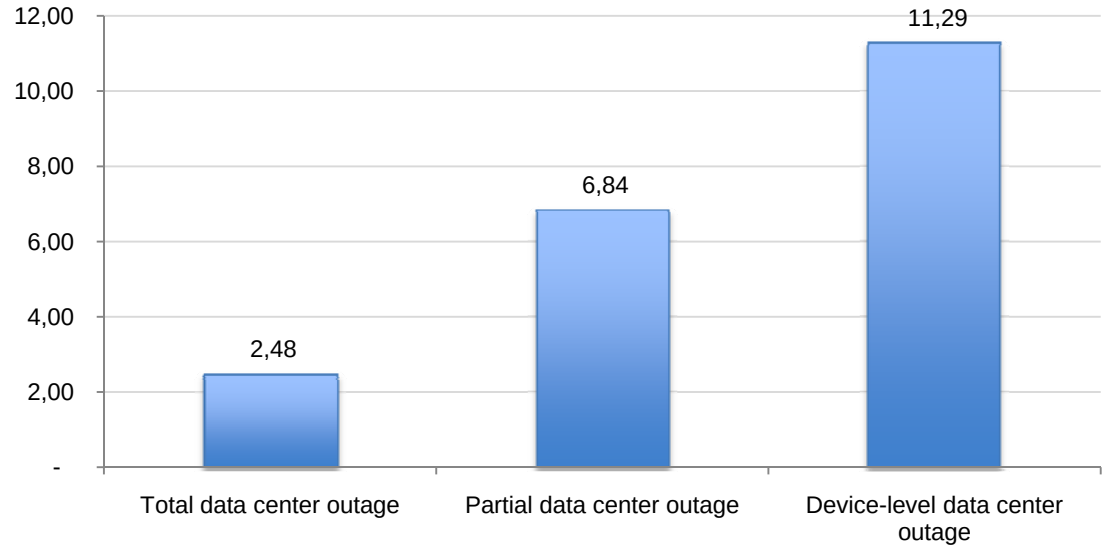


Figure 9 graphs the extrapolated frequency of complete data center outages by the square footage of the data center. This figure clearly shows that the frequency of complete outages is substantially higher for small-sized data centers (less than 5,000 sf) than large-sized data centers (greater than 10,000 sf). This may be due to the critical nature of large data centers (e.g. the larger the data center the more critical it is and vice versa).

Figure 9: Extrapolated frequency of complete data center outages by square footage

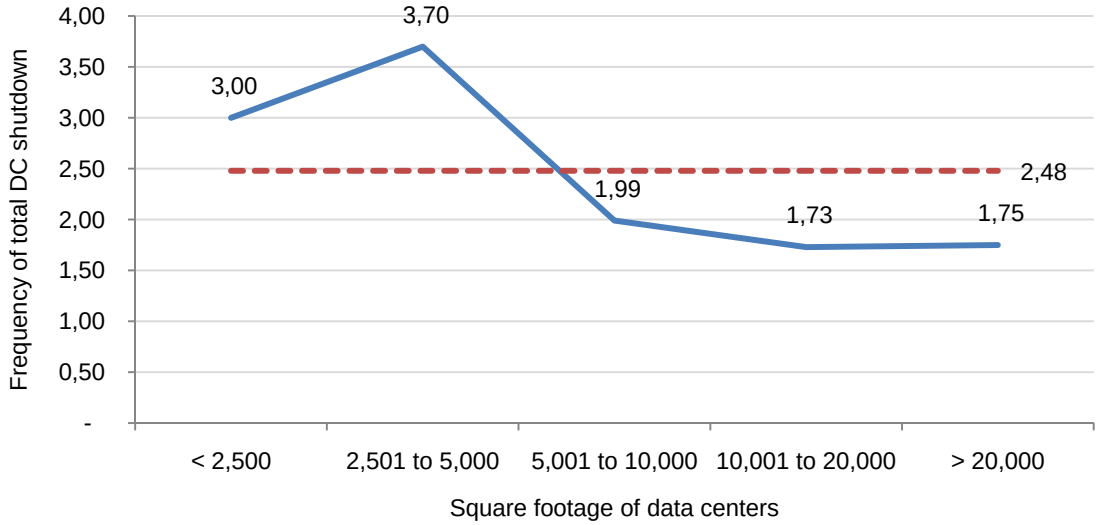
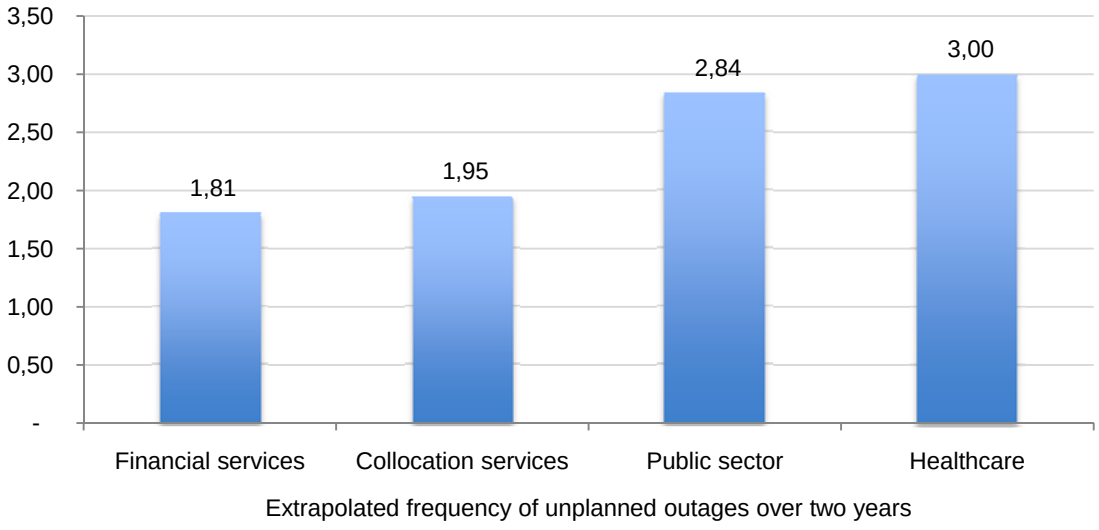


Figure 10 compares the extrapolated frequencies of complete data center outages by four industry segments in our sample. Companies in financial services experience the lowest number of complete data center outages (with 1.8 outages every two years), while healthcare organizations experience the highest number with 3.0 total data center outages every two years.

Figure 10: Extrapolated frequency of complete data center outages by industry segment



The extrapolated average duration of unplanned data center outages is shown in Figure 11. As reported, the average duration of unplanned complete data center outages is 107 minutes. The estimated duration of partial data center outages is 152 minutes. Finally, the estimated duration of device-level data center outages is 153 minutes.

Figure 11: Extrapolated duration of data center outages over two years

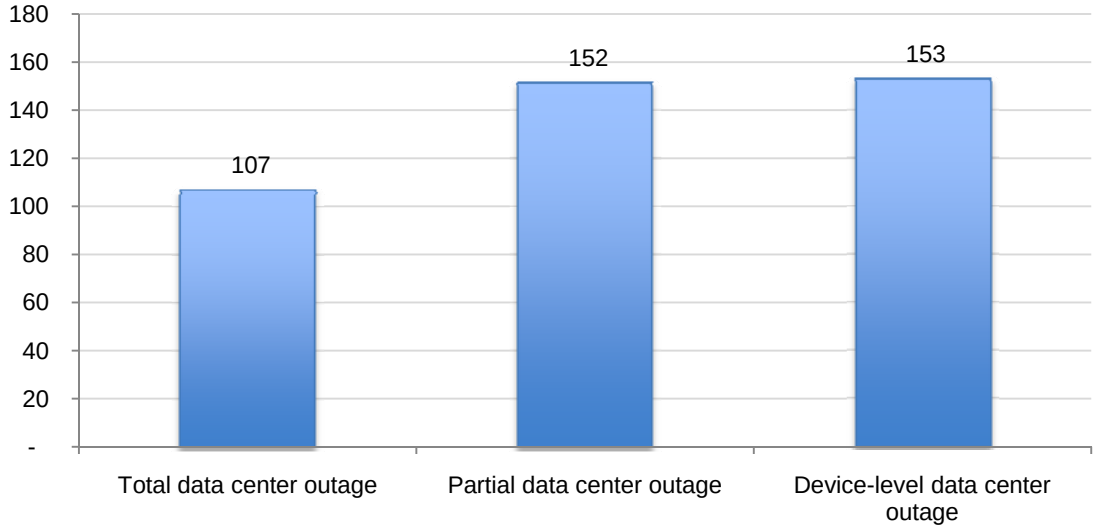


Figure 12 graphs the extrapolated duration of complete data center outages by the square footage of the data center. Similar to Figure 8 (above) on frequency, this graph clearly shows that the duration of complete data center outages is substantially higher for small-sized data centers (less than 5,000 sf) than medium or large-sized data centers (greater than 5,000 sf).

Figure 12: Extrapolated duration of complete data center outages by square footage

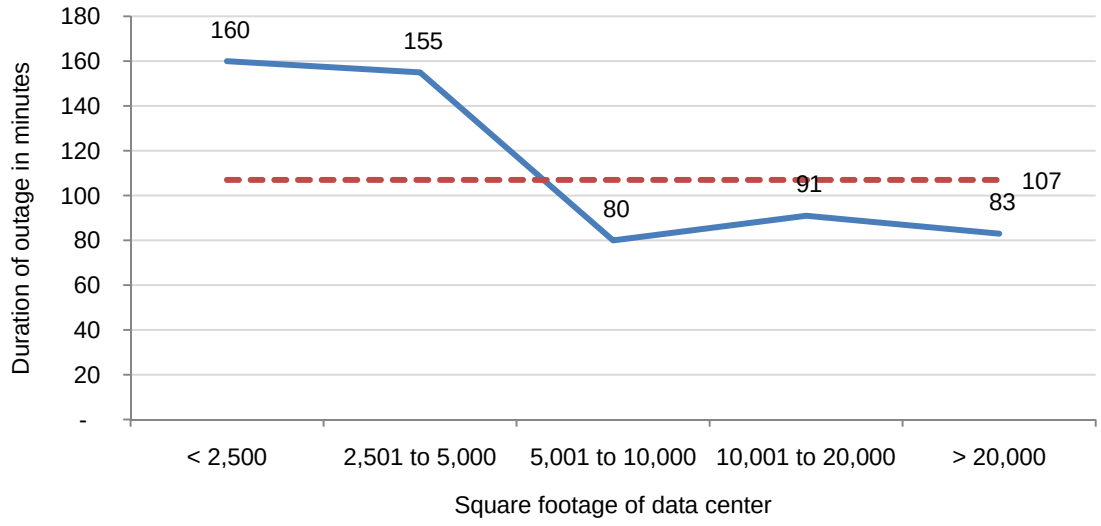
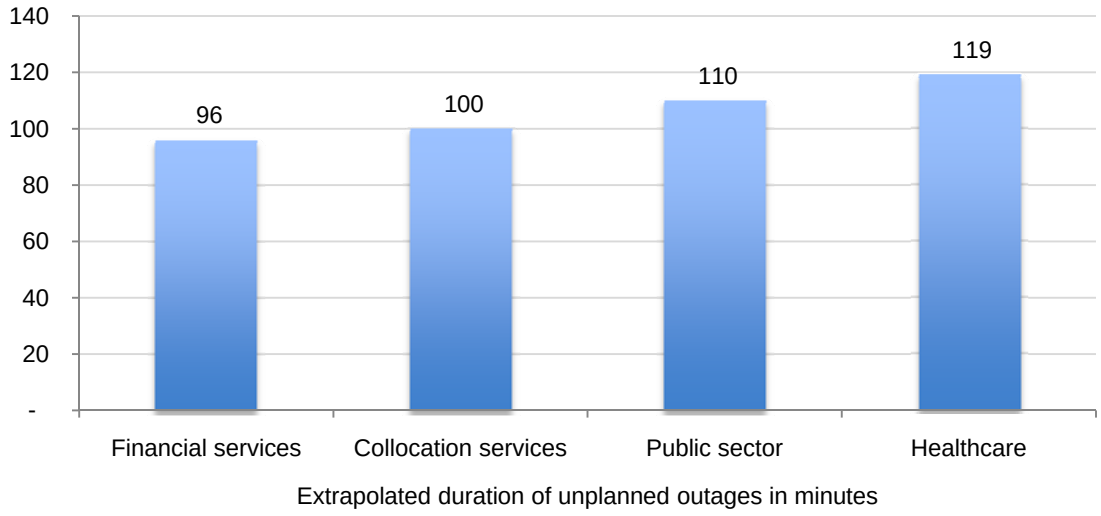


Figure 13 compares the extrapolated duration of complete data center outages by four industry segments in our sample. On average, companies in financial services experience the shortest duration at 96 minutes, and healthcare organizations experience the longest duration at 119 minutes.

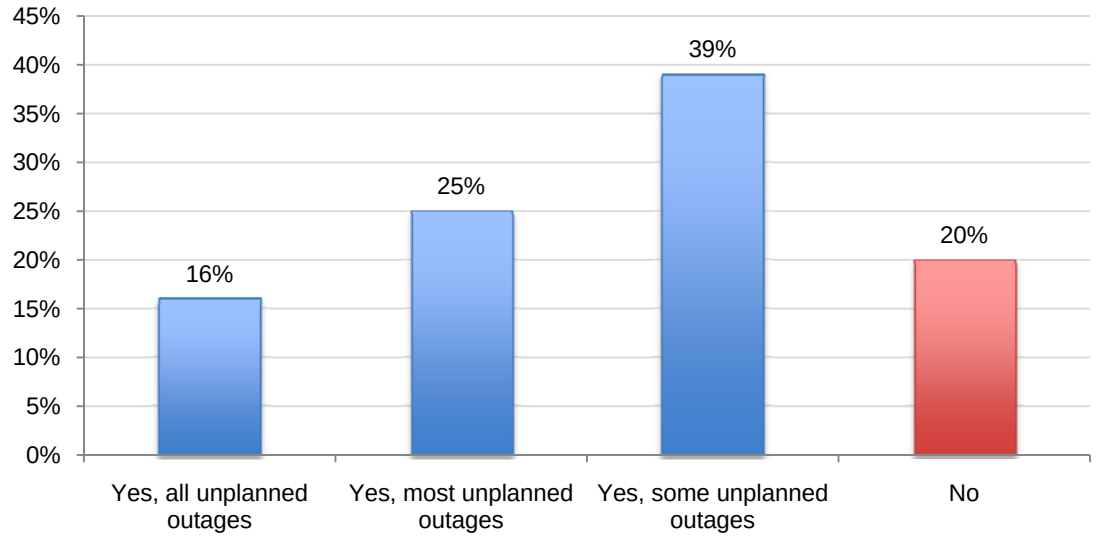
Figure 13: Extrapolated duration of complete data center outages by industry segment



Root causes of the unplanned outage

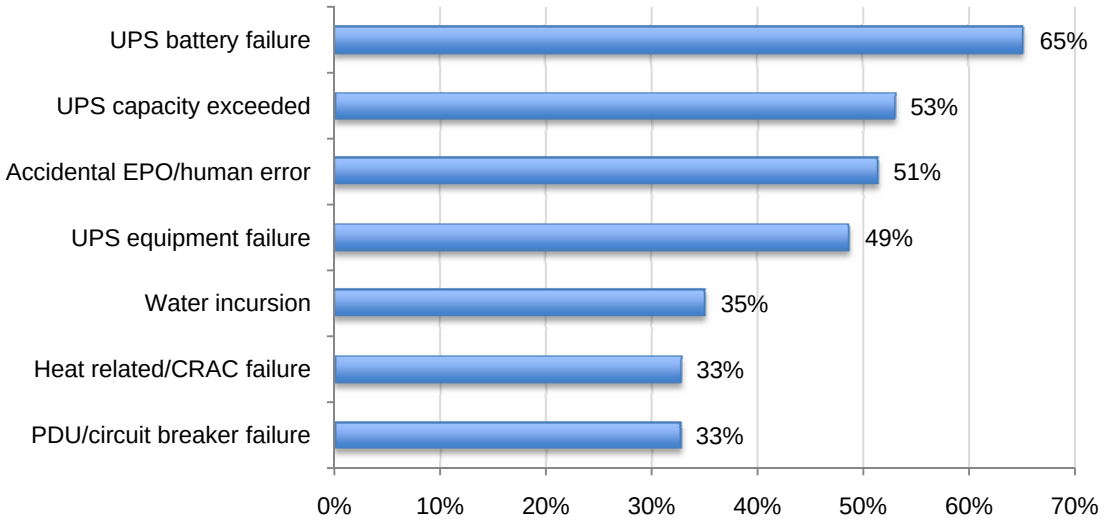
Figure 14 indicates 80 percent of respondents believe they know, at least in part, the root causes of unplanned outages experienced by their organizations over the past two years. Only 16 percent, however, appear to be certain about these root causes.

Figure 14. Do you know the root causes of unplanned outages during the past 24 months?



For the 80 percent of respondents stating a "yes" response, the following figure provides a list of those root causes cited by respondents in ascending order of importance. As can be seen in Figure 15, the top root causes of partial or complete unplanned outages selected most frequently by respondents include: UPS failure, UPS capacity exceeded, accidental EPO/human error, Water incursion, heat related/CRAC failure and PDU/circuit breaker failure.

Figure 15: Top root causes of unplanned outages experienced during the past two years.



The primary causes of data center downtime have a direct correlation to the current trends and challenges being faced by today's data centers. Below are four key industry drivers that directly impact availability and brief explanations of how they cause downtime.

Increasing Data Center Capacity. As demand for IT applications grow and more servers and storage are added to the data center, the supporting IT infrastructure must grow as well. If the IT demand outgrows what the critical infrastructure can supply, downtime will occur. Downtime root cause correlation: UPS Capacity exceeded & PDU/circuit breaker failure.

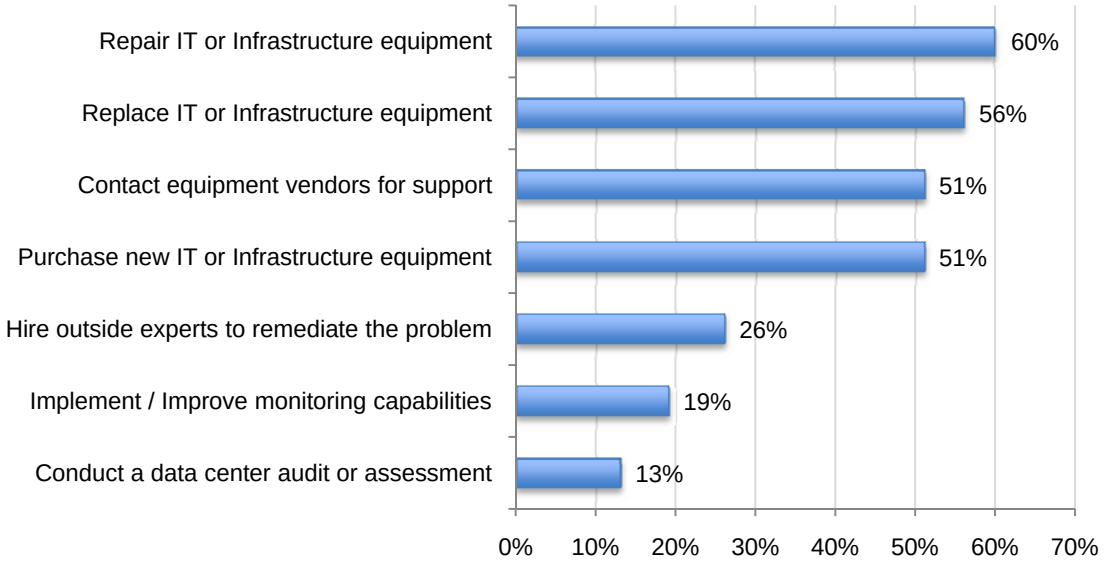
Rising Rack Densities. With the introduction of blade servers and other high-performance IT equipment, the typical server rack will contain well over 10 kW of IT. High heat densities will require precision cooling closer to the server. However, depending on the cooling design, this also could bring water closer to the server. Downtime root cause correlation: Water incursion & heat-related/CRAC failure.

Data Center Efficiency. Data centers consume a lot of electricity and many data center managers are evaluating alternative power and cooling technologies that provide cost reductions but may not provide the highest reliability or ideal server operating environment. Efficiency should not come at the expense of availability, especially in critical data centers. Downtime root cause correlation: UPS failure & heat-related/CRAC failure & IT equipment failure.

Need for Infrastructure Management and Control. The data center manager's requirements of improving availability, increasing efficiency, maximizing density and planning for capacity all can be managed through infrastructure management. Monitoring the float charge of a battery, knowing optimal placement of a new server to even having a people-free facility with remote resolution all are aspects of successful infrastructure management. Downtime root cause correlation: UPS battery failure & Accidental EPO/human error.

Figure 16 lists the response to correcting root causes of partial or complete unplanned data center outages. As listed below, the most frequent responses are: repair or replace damaged IT or infrastructure equipment, or contact equipment vendor for support.

Figure 16: The organization's response to fixing or correcting the root causes



According to Figure 17, most respondents believe that unplanned outages in their data centers over the past two years could have been prevented, at least in part.

Figure 17: Were the unplanned outages during the past 24 months preventable?

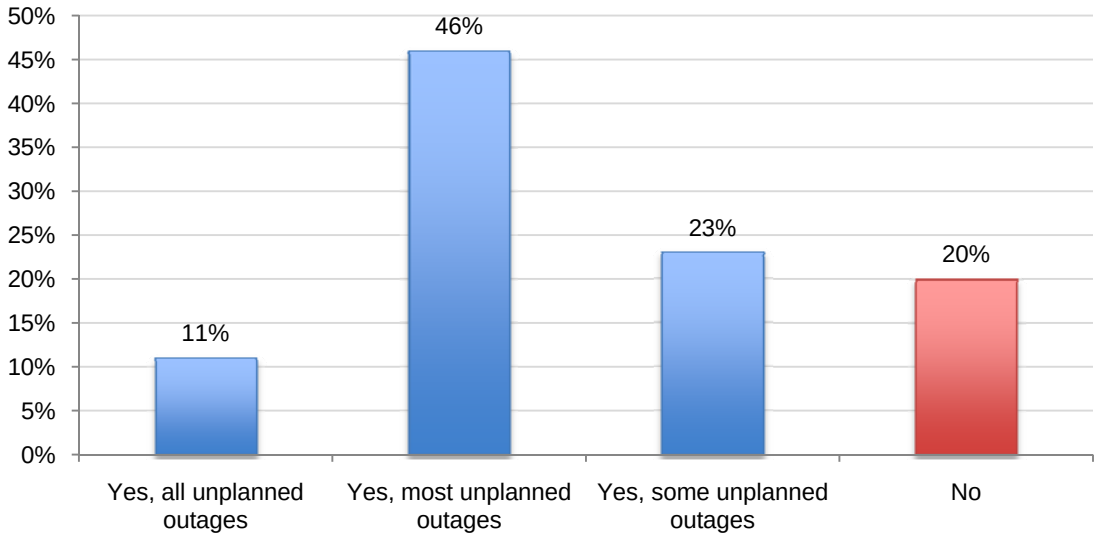
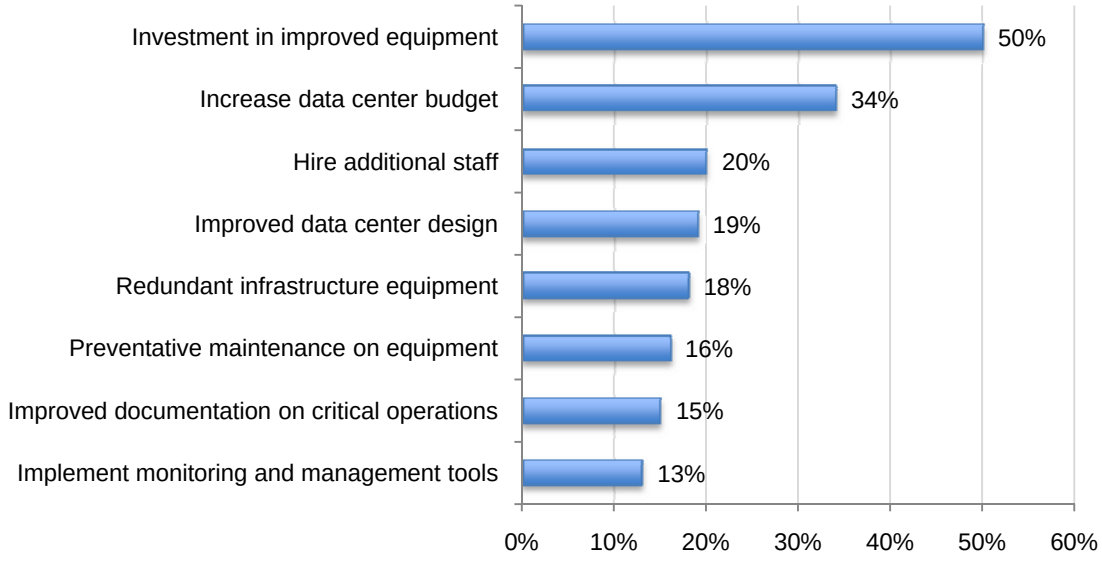


Figure 18 provides the measures or steps respondents believe are most important for preventing unplanned data center outages. As shown in this figure, respondents say investments in improved equipment, increases in budgets and hiring of additional staff are the most important steps companies can pursue to prevent unplanned partial or complete data center outages.

Figure 18: What could be done to prevent unplanned outages in the future?



Part 3: Methods

A sampling frame of nearly 10,000 adult-aged individuals who reside within the United States was used to recruit and select participants to this survey. Our randomly selected sampling frame was built from several proprietary lists of experienced practitioners in IT, IT operations and facilities management. In total, 502 respondents completed the survey. Of the returned instruments, 49 surveys failed reliability checks. A total of 453 surveys were used as our final sample, which represents a 4.6 percent response rate.

Table 1: Sample response	Freq.	Pct%
Total sampling frame	9885	100.0%
Bounce-back	1089	11.0%
Total returns	502	5.1%
Rejections	49	0.5%
Final sample	453	4.6%

Pie Chart 1 reports the primary industry sector of respondents' organizations. As shown, the largest segments include financial services (15 percent), industrial (12 percent), healthcare (11 percent), and public sector (8 percent).

Pie Chart 3: Industry distribution of respondents' organizations

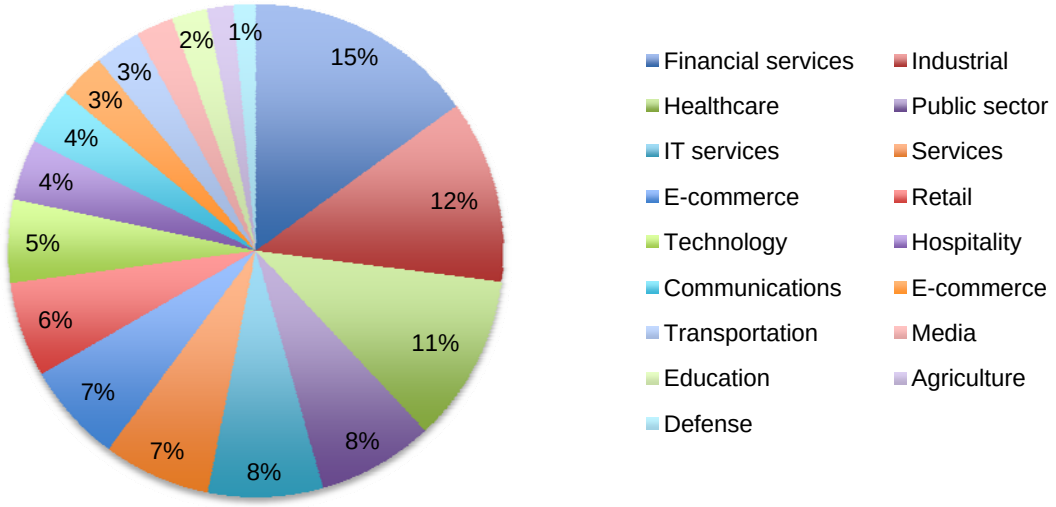


Table 2 reports the primary data center square footage for respondents' organizations. As shown, a majority of respondents represent primary data centers with more than 5,000 square feet of space. Only 6 percent of respondents are located in larger-sized data centers with more than 20,000 square feet.

Table 2: Approximate square footage of respondents' primary data center	Pct%
Less than 2,500 sf	2%
Between 2,500 to 5,000 sf	31%
Between 5,001 to 10,000 sf	42%
Between 10,001 to 20,000 sf	19%
More than 20,000 sf	6%
Total	100%

Table 3 reports the respondents' primary reporting channel. As can be seen, 32 percent of respondents report through data center management, 24 percent report through IT operations and 19 percent report through the company's facilities management.

Table 3: Respondents' primary reporting channel	Pct%
Data center management	32%
IT operations	24%
Facilities management	19%
Chief information officer	16%
Chief financial officer	3%
Chief technology officer	3%
Chief risk officer	2%
Chief security officer	1%
Total	100%

Table 4 reports the US regions where the respondents' primary data center is located. As can be seen, the Northeast represents the largest region (20 percent), and the Southeast represents the smallest region (13 percent).

Table 4: Region where respondents' primary data center is located.	Pct%
Northeast	20%
Mid-Atlantic	18%
Midwest	17%
Southeast	13%
Southwest	15%
Pacific	18%
Total	100%

Table 5 reports the approximate position level or title of respondents. As shown, a majority of respondents state they are at or above the manager level (67 percent). The mean experience of respondents in this study is 11.7 years and the mean total years in current position is 6.6 years.

Table 5: Respondents' position level	Pct%
Senior Executive	3%
Vice President	3%
Director	26%
Manager	35%
Supervisor	19%
Staff or technician	9%
Other	5%
Total	100%

Part 4. Caveats & Conclusion

There are inherent limitations to survey research that need to be carefully considered before drawing inferences from findings. The following items are specific limitations that are germane to most Web-based surveys.

- Non-response bias: The current findings are based on a sample of survey returns. We sent surveys to a representative sample of individuals, resulting in a large number of usable returned responses. Despite non-response tests, it is always possible that individuals who did not participate are substantially different in terms of underlying beliefs from those who completed the instrument.

- Sampling-frame bias: The accuracy is based on contact information and the degree to which the list is representative of individuals who are IT practitioners with data center management experience. We also acknowledge that the results may be biased by external events such as media coverage. We also acknowledge bias caused by compensating subjects to complete this research within a holdout period. Finally, because we used a Web-based collection method, it is possible that non-Web responses by mailed survey or telephone call would result in a different pattern of findings.

- Self-reported results: The quality of survey research is based on the integrity of confidential responses received from subjects. While certain checks and balances can be incorporated into the survey process, there is always the possibility that a subject did not provide a truthful response.

Final Thoughts

The findings of our research suggest unplanned data center outages present a difficult and costly challenge for organizations. In general, failed equipment, data center mishaps and insufficient resources exacerbate the frequency and duration of unplanned outages. Therefore, the challenge for data center management is to effectively communicate to senior leadership the urgent need to implement power, cooling and monitoring systems that increase availability and ensure the performance of mission critical applications.

Please contact research@ponemon.org or call us at 800.877.3118 if you have any questions.

Ponemon Institute

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As a member of the **Council of American Survey Research Organizations (CASRO)** we uphold strict data confidentiality, privacy and ethical research standards. We do not collect any personally identifiable information from individuals (or company identifiable information in our business research). Furthermore, we have strict quality standards to ensure that subjects are not asked extraneous, irrelevant or improper questions.

Appendix I: Survey Details

The survey was conducted in June and July of 2010. Our sampling frame includes qualified IT and IT facilities management practitioners located in business and government organizations in the United States.

Part 1. Attributions	**Strongly agree**
Q1. Data center availability is my highest priority above all other priorities including cost minimization.	16%
Q2. Minimizing data center costs and being energy efficient is among my highest priorities.	23%
Q3. We utilize all best practices in data center design and redundancy to maximize availability.	14%
Q4. We have high confidence in the reliability of our electrical utility provider.	24%
Q5. The quality of our utility power is good and free from sags and surges.	20%
Q6. My company's business model is dependent on the data center to generate revenue and conduct ecommerce.	30%
Q7. Every application in the data center is mission critical to the company.	22%
Q8. At our data center unplanned outages do not happen frequently.	21%
Q9. Unplanned outages are primarily the result of natural causes such as weather.	16%
Q10. Unplanned outages are sometimes caused by cyber attacks that infiltrate our systems.	15%
Q11. We have ample resources to bring our data center up and running if we have an unplanned outage.	16%
Q12. Senior management fully supports our efforts to prevent and manage unplanned outages.	19%
Q13. The risk of an unplanned outage increased as a result of cost constraints inside our data center.	23%
Average	20%

Part 2. Experience	
Q14a. Have you experienced any loss of primary utility power in the past 24 months?	Freq.
Yes	399
No (Go To 15a)	54
Total	453

Q14b. What is the frequency and duration of primary utility power outages in the past 24 months?	
Frequency of **primary utility** power outages	Pct%
Between 1 and 2	41%
Between 2 and 5	36%
Between 6 and 10	13%
Between 11 and 15	0%
Between 16 and 20	0%
More than 20	10%
Total	100%
Extrapolated value (incidents)	5.12

Duration of **primary utility** power outages	Pct%
Less than 1 minute	17%
1 to 5 minutes	42%
5 to 20 minutes	20%
20 minutes to 2 hours	11%
2 hours to one day	8%
More than one day	2%
Total	100%
Extrapolated value (downtime in minutes)	106

Q15a. Have you experienced any unplanned data center outages in the past 24 months?	Freq.
Yes	430
No (Go To 19)	23
Total	453

Q15b. What is the frequency and duration of unplanned data center outages in the past 24 months?	
Frequency	Total DC outage
Between 1 and 2	58%
Between 2 and 5	39%
Between 6 and 10	3%
Between 11 and 15	0%
Between 16 and 20	0%
More than 20	0%
Total	100%
Extrapolated value (incidents)	2.48

Duration	Total DC outage
Less than 1 minute	13%
1 to 5 minutes	25%
5 to 20 minutes	30%
20 minutes to 2 hours	23%
2 hours to one day	7%
More than one day	2%
Total	100%
Extrapolated value (downtime in minutes)	107

Q16a. What is the average power density (in kW) per rack in your data center at present?	Pct%
2 kW or less	5%
2 to 4 kW	12%
5 to 8 kW	31%
9 to 12 kW	18%
13 to 16 kW	12%
17 to 20 kW	9%
21 to 24 kW	5%
Greater than 24 kW	3%
Unsure	5%
Total	100%
Extrapolated value (kW)	9.7

Q16b. What is the average power density (in kW) per rack in your data center in two years (estimate)?	Pct%
2 kW or less	4%
2 to 4 kW	6%
5 to 8 kW	17%
9 to 12 kW	30%
13 to 16 kW	17%
17 to 20 kW	11%
21 to 24 kW	6%
Greater than 24 kW	4%
Unsure	5%
Total	100%
Extrapolated value (kW)	11.4

Q17a. Do you know the root causes of the unplanned outages experienced during the past 24 months?	Pct%
Yes, all of the unplanned outages	16%
Yes, most of the unplanned outages	25%
Yes, some of the unplanned outages	39%
No	20%
Total	100%

Q17b. If yes, please check the root causes of the unplanned outages experienced during the past year. Please select all that apply.	Pct%
UPS battery failure	65%
UPS capacity exceeded	53%
Accidental EPO/human error	51%
UPS equipment failure	49%
Water incursion	35%
Heat related/CRAC failure	33%
PDU/circuit breaker failure	33%
IT equipment failure	29%
Weather related	20%
Generator failure	19%
ATS failure	16%
Cyber attack	15%
Other (please specify)	2%
Total	419%

Q17c. What was your organization's response to fixing or correcting the root causes? Please select all that apply.	Pct%
Repair IT or Infrastructure equipment	60%
Replace IT or Infrastructure equipment	56%
Purchase additional IT or Infrastructure equipment	51%
Contacted the equipment vendor	51%
No response	35%
Hire outside experts to remediate or analyze the problem	26%
Implement / Improve monitoring capabilities	19%
Conduct a data center audit or assessment	13%
Other (please specify)	2%
Total	313%

Q18a. In your opinion, were the unplanned outages experienced during the past 24 months preventable?	Pct%
Yes, all of the unplanned outages	11%
Yes, most of the unplanned outages	46%
Yes, some of the unplanned outages	23%
No	20%
Total	100%

Q18b. If yes, what could be done to prevent unplanned outages in the future? Please check only two choices.	Pct%
Investment in new or improved equipment	50%
Increased data center budget	34%
Hire additional staff	20%
Improved data center design and planning	19%
Redundant infrastructure equipment	18%
Preventative maintenance on equipment	16%
Improved documentation on how critical operations should be performed	15%
Implementation of monitoring and management tools	13%
Nothing	5%
Improved security and surveillance practices	3%
Annual audit or assessment	3%
Total	196%

Part III. Economic impact	
Q20. What are the likely cost areas that are incurred as a result of an unplanned outage? Please allocate a total of 100 percentage points for the cost areas provided.	Percentage Points
Cost to repair or replace damaged equipment	23%
Cost of downtime	17%
Cost to recover information assets	15%
Diminished productivity of data center personnel	11%
Cost to recover from the outage	9%
Increased operating expenses	7%
Cost to conduct root cause analysis	6%
Diminished productivity of end users	6%
Lost revenues	4%
Customer turnover	2%
Total points	100%

Q21. In your opinion (best guess), how much revenue would your organization lose every time it experienced an unplanned total data center outage that lasts one hour?	Pct%
None	5%
Less than $1,000	3%
$1,000 to $5,000	10%
$5,001 to $10,000	13%
$10,001 to $20,000	22%
$20,001 to $50,000	12%
$50,001 to $100,000	11%
$100,001 to $500,000	9%
$500,000 to $750,000	2%
$750,001 to $1 million	5%
More than $1 million	3%
Unable to determine	5%
Total	100%
Extrapolated value (US dollars)	136,761

Part IV. Organizational characteristics and demographics	
D1. Your current title is (please specify)	Contextual

D2. What organizational level best describes your current position?	Pct%
Senior Executive	3%
Vice President	3%
Director	26%
Manager	35%
Supervisor	19%
Staff or technician	9%
Other (please specify)	5%
Total	100%

D3. Check the Primary Person you or your supervisor reports to within your organization.	Pct%
Chief executive officer	0%
Chief financial officer	3%
Chief information officer	16%
IT operations	24%
Chief technology officer	3%
Data center management	32%
Facilities management	19%
Chief security officer	1%
Chief risk officer	2%
Other	0%
Total	100%

D4. Check the US state where your company's primary data center is located.	Pct%
Northeast	20%
Mid-Atlantic	18%
Midwest	17%
Southeast	13%
Southwest	15%
Pacific	18%
Total	100%

Experience	Mean
D5a. Total years of relevant experience	11.72
D5b. Total years in current position	6.63

D6. Approximately, what is the square footage of your primary data center?	Pct%
Less than 2,500 sf	2%
Between 2,500 to 5,000 sf	31%
Between 5,001 to 10,000 sf	42%
Between 10,001 to 20,000 sf	19%
More than 20,000 sf	6%
Total	100%

D7. What industry best describes your organization's industry concentration or focus?	Pct%
Airlines	0%
Agriculture	2%
Brokerage	3%
Chemicals	4%
Co-location/Hosting Provider	7%
Communications	4%
Credit Card	4%
Defense	1%
Education	2%
E-commerce	7%
Services	4%
Health Care	6%
Hospitality & Leisure	4%
Manufacturing	6%
Media	2%
Insurance	3%
Internet & ISPs	3%
Government	8%
Pharmaceutical	4%
Professional Services	3%
Retail	6%
Banking	6%
Energy	3%
Technology & Software	5%
Transportation	3%
Other	0%
Total	100%

D8. What is the worldwide headcount of your organization?	Pct%
Less than 100 people	9%
100 to 500 people	21%
500 to 1,000 people	23%
1,001 to 5,000 people	19%
5,001 to 25,000 people	14%
25,001 to 75,000 people	9%
More than 75,000 people	5%
Total	100%

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