



Reducing Complexity in IT infrastructure Monitoring: A Study of Global Organizations

Sponsored by Splunk

Independently conducted by Ponemon Institute LLC

Publication Date: April 2018

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Presented by Ponemon Institute, April 2018

Part 1. Introduction

Ponemon Institute is pleased to present *Reducing Complexity in IT Infrastructure Monitoring: A Study of Global Organizations*, conducted by Splunk. The purpose of this research is to determine the challenges companies face in troubleshooting and monitoring the cloud and on-premises environments within their organizations. As shown in this study, there is a lack of visibility, especially into cloud services. As a result, finding problems is a challenge for organizations. Further, when there is a loss of service or downtime, it takes too much time to identify the location of the problem, determine what needs to be done and fix the problem.

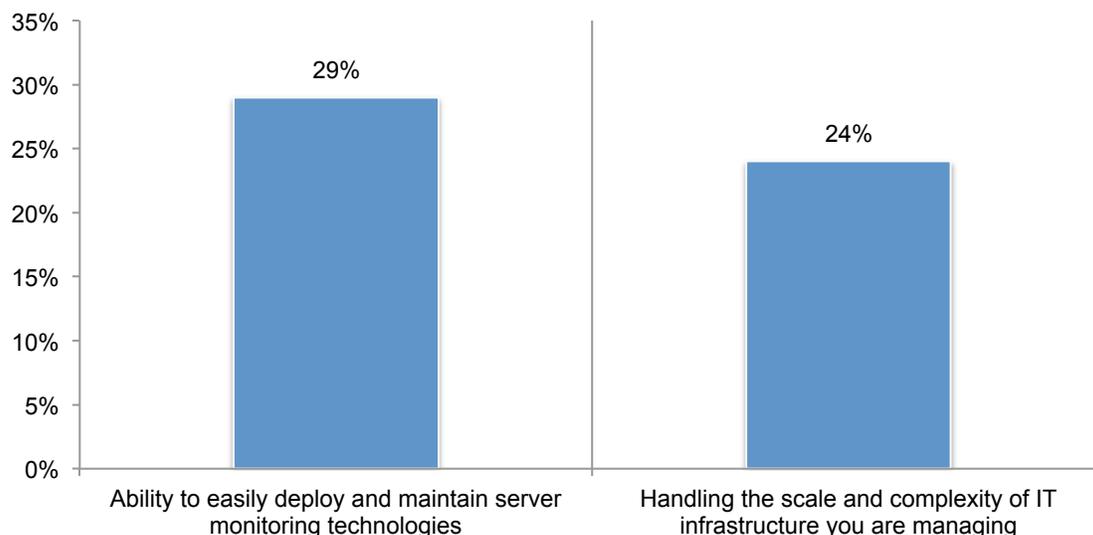
Ponemon Institute surveyed 2,497 IT and IT security practitioners in organizations in the United States, the United Kingdom, Germany, France, Australia, Singapore and Japan. Most respondents are director or manager of IT operations (30 percent of respondents), director or manager of cloud operations (20 percent of respondents) and director or manager of application development (10 percent of respondents).

Complexity and scale are challenging professionals responsible for infrastructure monitoring. According to the findings, these professionals are responsible for monitoring an average of 59 servers. As a result, they can be overwhelmed in meeting expectations about performance and availability. The most influential factors in deciding an organization's approach to infrastructure troubleshooting and monitoring are the simplification of IT complexity through consolidation of technologies and systems and the automation of IT maintenance/management processes.

As shown in Figure 1, only 24 percent of respondents say the handling of scale and complexity of IT infrastructure has improved in the past year and only 29 percent of respondents say the ability to easily deploy and maintain server monitoring technologies has improved over the past year. Clearly companies are in need of better monitoring solutions.

Figure 1. How has confidence changed in the ability to handle IT infrastructure in the past year?

Significantly better and somewhat better responses combined



Following are key takeaways from the study

Companies are looking to simplify IT infrastructure monitoring. The most influential factors in deciding an organization's approach to infrastructure troubleshooting and monitoring are the simplification of IT complexity through consolidation of technologies and systems and the automation of IT maintenance/management processes.

When system availability and performance degrades, there is friction between IT and lines of business and loss of revenue. Sixty-one percent of respondents say the consequences of a lack of system availability and poor performance is friction between IT and lines of business.

Complexity and lack of visibility are the greatest challenges. The top two challenges to troubleshooting, monitoring and cloud migration are a lack of insights to quickly pinpoint issues and identify the root cause (50 percent of respondents) and complexity and diversity (heterogeneity) of IT systems and technology (47 percent of respondents).

Application complexity and lack of skills and expertise pose the biggest risk. Fifty-five percent of respondents say the biggest risk to their ability to troubleshoot, monitor and migrate to the cloud is the increase in complexity of applications running on infrastructure.

When migrating to the cloud, ensuring application performance and availability causes the most stress. Sixty-eight percent of respondents say application performance and availability is one of their biggest concerns when migrating to the cloud. This is followed by cost and the inability to monitor and troubleshoot applications (both 51 percent of respondents).

The use of data to diagnose IT issues and determine root cause is cumbersome and difficult to make real-time decisions. The biggest problem experienced by companies is that data ingestion and normalization is cumbersome and tedious (70 percent of respondents) and data is in different formats and types (difficult to normalize) (63 percent of respondents). Current monitoring tools also do not provide the capability to ingest real-time data (59 percent of respondents) and there is uncertainty over what data is relevant for problems that arise (56 percent of respondents).

Following the loss or service or downtime, the most time is spent on identifying the location of the problem. Twenty-six percent of the time spent is allocated to the identification of the location of the problem in servers, applications or networks. This is followed by the need to determine what needs to be done to fix the problem and then fix the problem, both 23 percent.

Most companies are not prepared to respond to interruptions to IT systems or loss of service. Only 29 percent of respondents say their organization has documented workflows and automated processes to follow in the event of a system failure (e.g. unplanned downtime) and has the ability to pinpoint problems early because of the adoption of automation and current monitoring toolsets.

Companies want the ability to perform infrastructure monitoring and troubleshooting in the cloud or an on-premises environment. The most important feature, according to 87 percent of respondents, is automated investigations to find trends and root causes easier and faster based on machine learning. Seventy-three percent of respondents say it is the ability to scale automated processes from small to very large deployments.

Automation and operational analytics are considered to improve the delivery of projects on schedule and within budget. Fifty-one percent of respondents say implementing automation and operational analytics will improve the ability to deliver projects within budget and 46 percent of respondents say it will improve the ability to deliver projects on schedule.

Part 2. Key findings

In this section of the report, we provide the detailed findings of the research. The complete findings are presented in the Appendix of this report. We have organized the report according to the following topics.

- The complexity of current approaches to infrastructure monitoring
- Gaps in current monitoring tools
- Reducing complexity through better monitoring tools

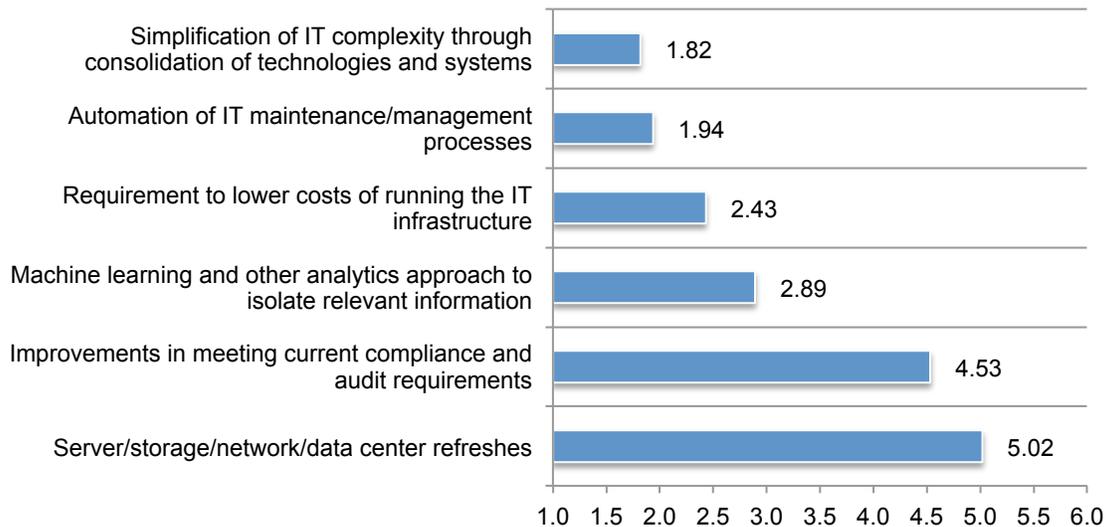
The complexity of current approaches to infrastructure monitoring

Companies are looking to simplify IT infrastructure monitoring. Respondents were asked to rank the influence of six specific factors used in developing their organizations' approach to infrastructure troubleshooting and monitoring from 1 = greatest influence to 6 = least influence.

As shown at the top of Figure 2, the most influential factor (the lowest number) in deciding an organization's such an approach is the simplification of IT complexity through consolidation of technologies and systems. This is followed by the automation of IT maintenance/management processes.

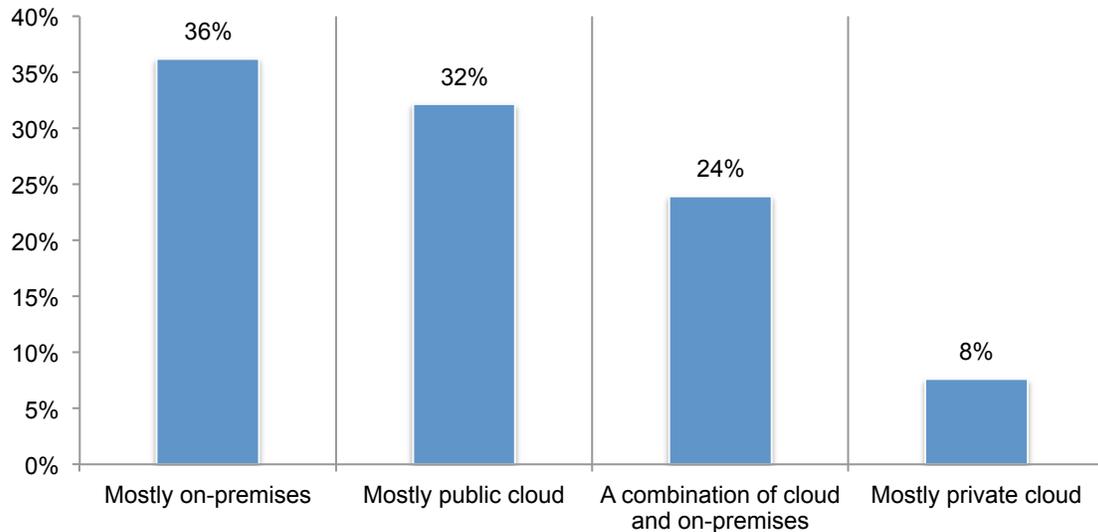
Figure 2. What factors are most influential in deciding an organization's approach in infrastructure troubleshooting and monitoring?

1 = greatest influence to 6 = least influence



As shown in Figure 3, 36 percent of respondents say their organization’s IT infrastructure is mostly on premises and 32 percent of respondents say their IT infrastructure is mostly in the cloud. Multiple architectures spanning different vendors’ technologies and required skill sets clearly adds to the complexity of IT’s job.

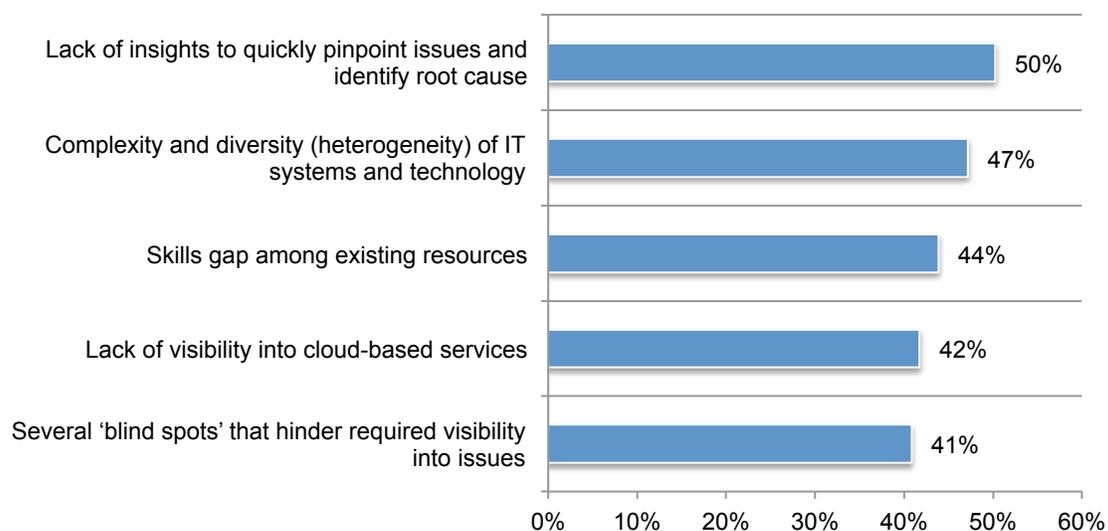
Figure 3. What best defines your organization’s IT infrastructure?



Complexity and lack of visibility are the greatest challenges. As shown in Figure 4, the top two challenges to troubleshooting, monitoring and cloud migration are a lack of insights to quickly pinpoint issues and identify the root cause (50 percent of respondents) and complexity and diversity (heterogeneity) of IT systems and technology (47 percent of respondents). Other difficulties are the skills gap among existing resources (44 percent of respondents), lack of visibility into cloud-based services (42 percent of respondents) and the several “blind spots” that hinder required visibility into issues (41 percent of respondents).

Figure 4. What are the greatest challenges in managing IT infrastructure?

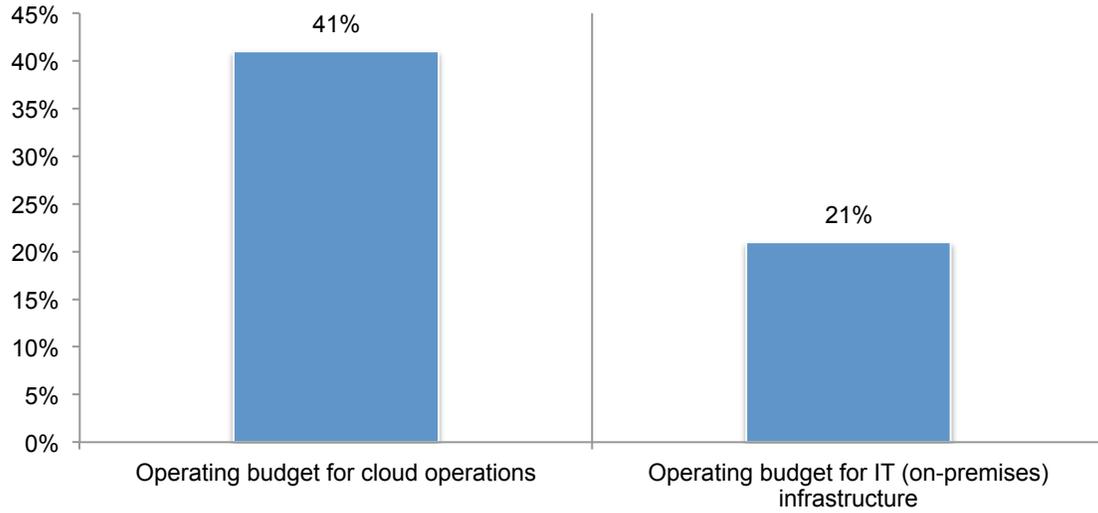
More than one response allowed



Many respondents say operating budgets for cloud operations will increase. As shown in Figure 5, 41 percent of respondents say the operating budget for cloud operations will increase. However, only 21 percent of respondents predict operating budgets for IT (on-premises) infrastructure will increase.

Figure 5. Will operating budgets for IT (on-premises) infrastructure and cloud operations increase?

Significant and Some increase responses combined

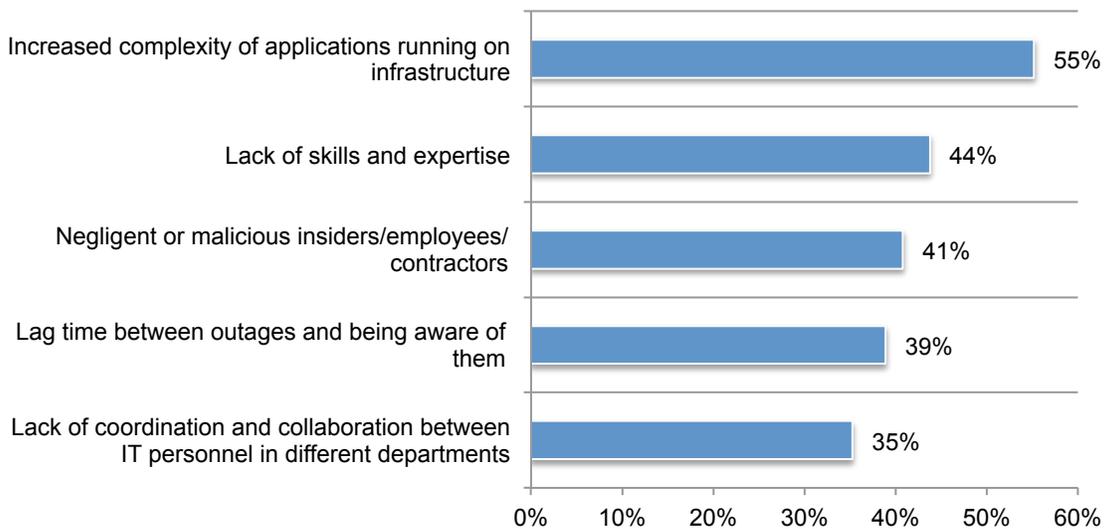


Application complexity and lack of skills and expertise pose the biggest risk. Fifty-five percent of respondents say the biggest risk to their ability to troubleshoot, monitor and migrate to the cloud is the increase in complexity of applications running on infrastructure.

The lack of skills and expertise to deal with this complexity is another significant risk according to 44 percent of respondents, as shown in Figure 6. Other risks are negligent or malicious insiders/employees/contractors, lack of a consistent and formal IT outage response process and lack of coordination and collaboration between IT personnel in different departments, according to 41 percent, 39 percent and 35 percent of respondents.

Figure 6. What are the biggest risks to their organization in managing IT infrastructure?

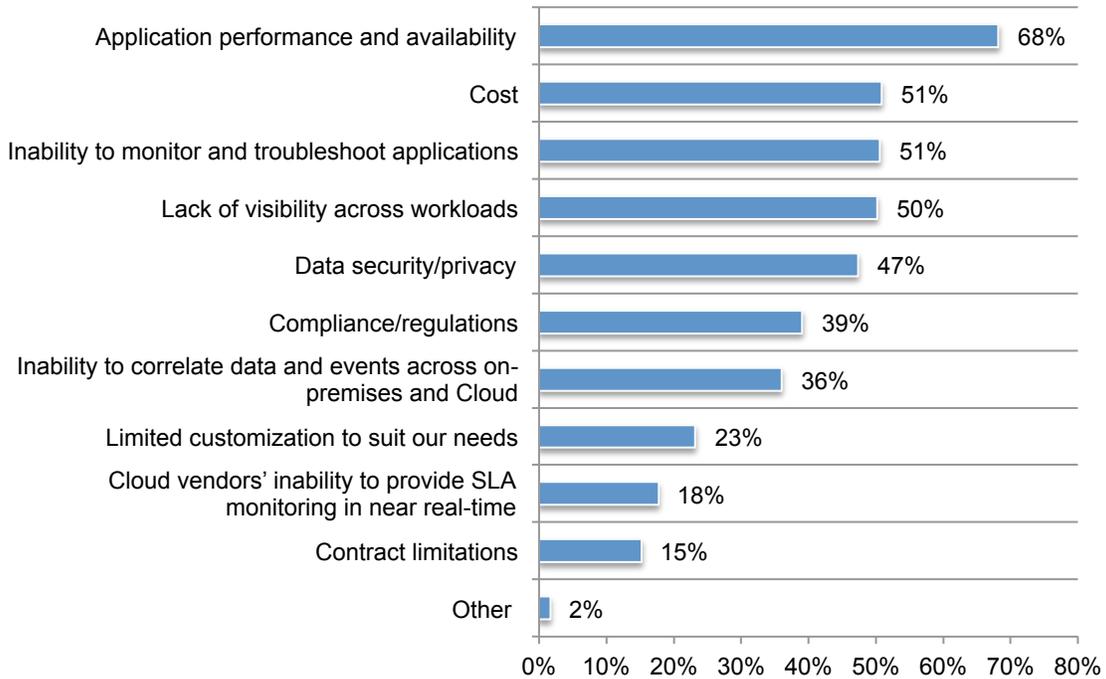
More than one response allowed



When migrating to the cloud, ensuring application performance and availability causes the most stress. According to Figure 7, 68 percent of respondents say application performance and availability is one of their biggest concerns when migrating to the cloud. This is followed by cost and the inability to monitor and troubleshoot applications (both 51 percent of respondents).

Figure 7. What are your biggest concerns when your organization migrates to cloud platform/solutions?

More than one response allowed

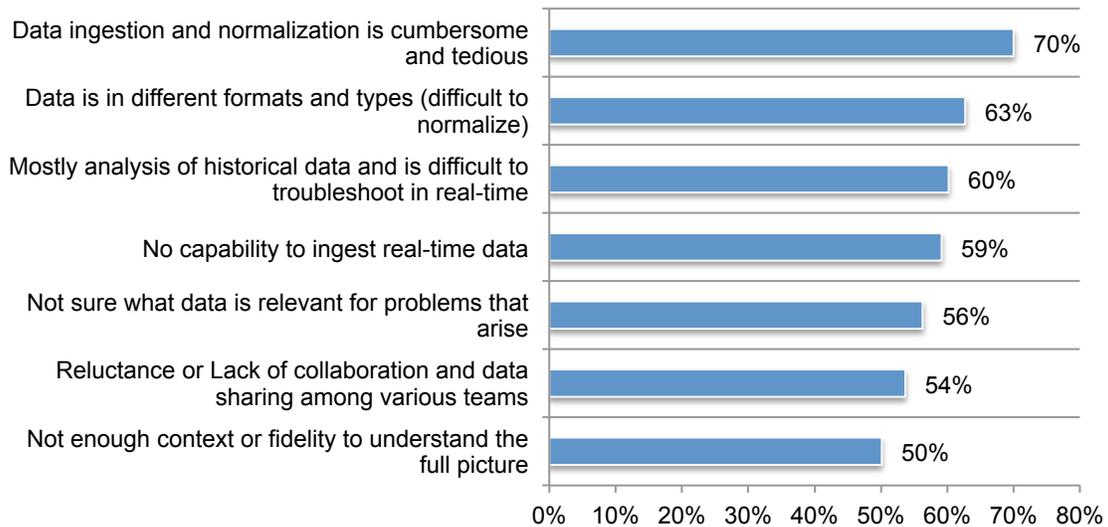


Gaps in current monitoring tools

The use of data to diagnose IT issues and determine root cause is cumbersome and difficult to make real-time decisions. According to Figure 8, the biggest problem experienced by companies is that data ingestion and normalization is cumbersome and tedious (70 percent of respondents) and data is in different formats and types (difficult to normalize) (63 percent of respondents). Current monitoring tools also do not provide the capability to ingest real-time data (59 percent of respondents) and there is uncertainty over what data is relevant for problems that arise (56 percent of respondents).

Figure 8. When using data to diagnose IT issues and determine root cause, what problems have you experienced?

More than one response allowed



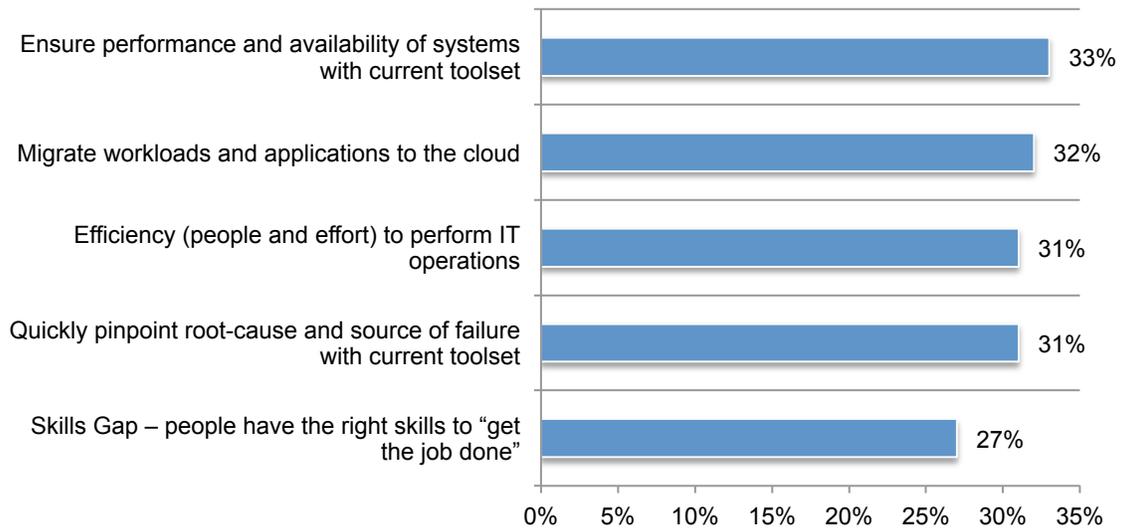
Confidence in the ability to achieve improvements in areas of IT infrastructure is lacking.

As discussed, a lack of skills and expertise are considered significant risks in monitoring and maintaining IT infrastructure. According to Figure 9, only 27 percent of respondents say having the right skills to get the job done has become better in the past 12 months and only 31 percent of respondents say staff is becoming more efficient in performing IT operations.

Other abilities have not improved significantly: to ensure performance and availability of systems with current toolset, quickly pinpoint root cause and source of failure with current toolset and to migrate workloads and applications to the cloud (33 percent, 31 percent, and 32 percent of respondents, respectively).

Figure 9. How has the ability to achieve improvements in the following areas of IT infrastructure changed over the past 12 months?

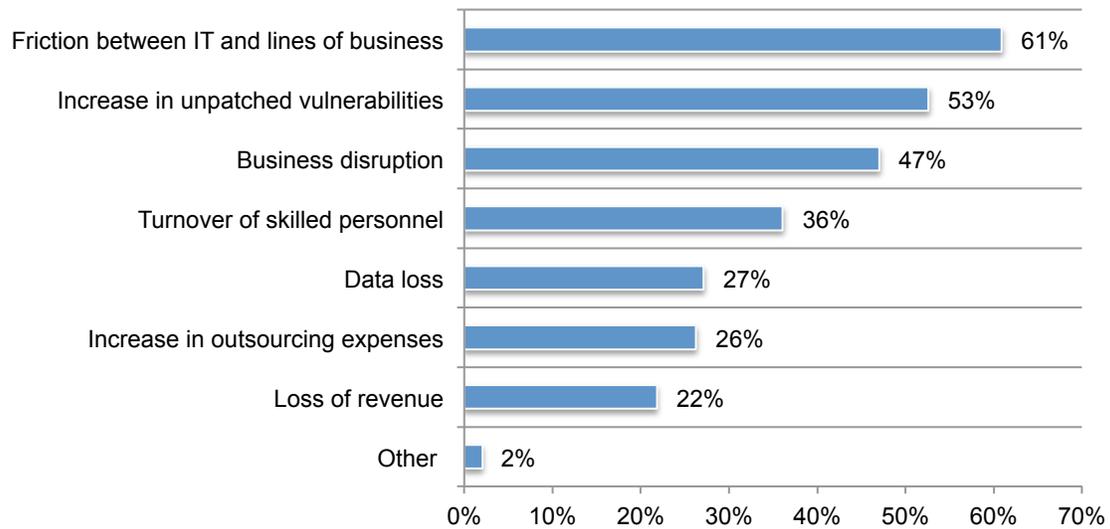
Significantly better and Somewhat better responses combined



When system availability and performance degrades, there is friction between IT and lines of business and loss of revenue. As shown in Figure 10, 61 percent of respondents say the consequences of a lack of system availability and poor performance is friction between IT and lines of business. Other consequences include an increase in unpatched vulnerabilities (53 percent of respondents) and business disruption (47 percent of respondents).

Figure 10. What happens to the IT organization when system availability and performance remains below expectations?

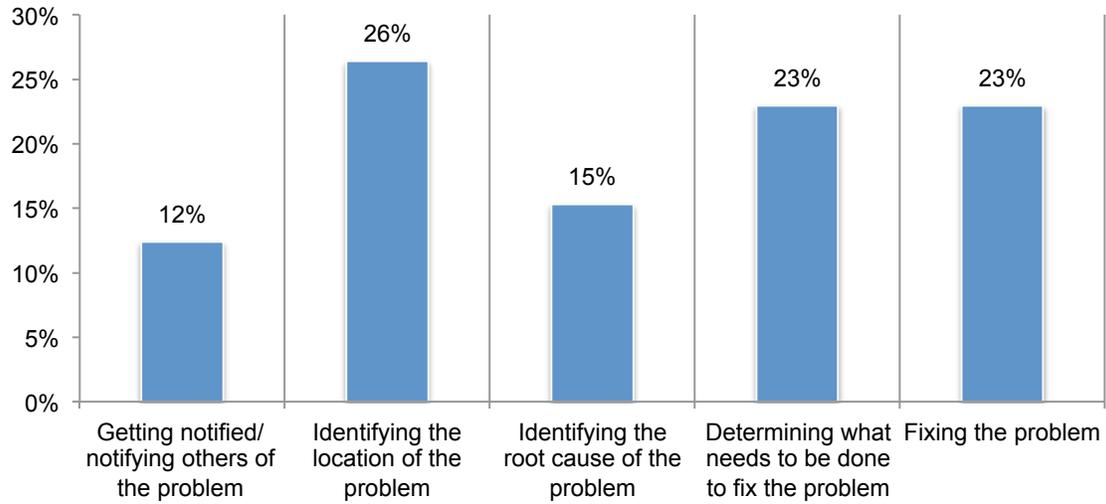
More than one response allowed



Following the loss or service or downtime, the most time is spent on identifying the location of the problem. Respondents were asked to allocate 100 percentage points to five activities that occur following the loss of service or downtime.

According to Figure 11, 26 percent of the time spent is allocated to the identification of the location of the problem in servers, applications or networks. This is followed by the need to determine what needs to be done to fix the problem and then fix the problem, both 23 percent of respondents. Only 15 percent is spent identifying the root cause of the problem and 12 percent is spent getting notified/notifying others of the problem.

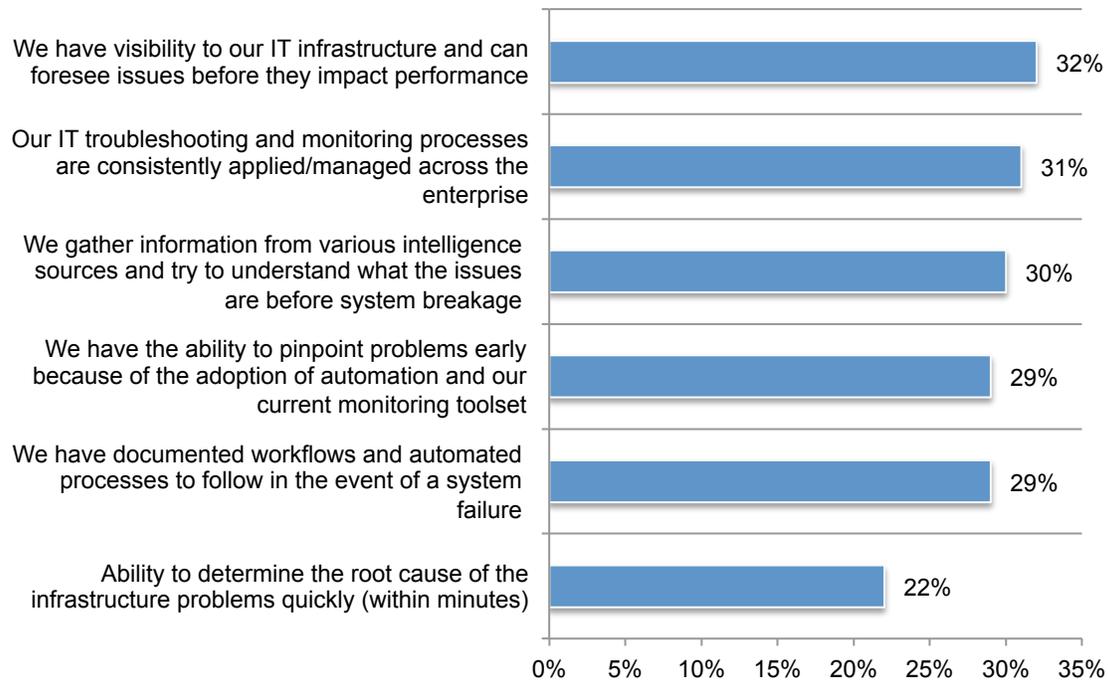
Figure 11. What is spent on each activity following the loss of service or downtime?



Most companies are not prepared to respond to interruptions to IT systems or loss of service. Only 29 percent of respondents say their organization has documented workflows and automated processes to follow in the event of a system failure (e.g. unplanned downtime) and has the ability to pinpoint problems early because of the adoption of automation and current monitoring toolsets. Only 30 percent of respondents say their organization gathers information from various intelligence sources and tries to understand what the issues are before system breakage, as shown in Figure 12.

Figure 12. How prepared are organizations to deal with the loss of service?

Strongly agree and Agree responses combined



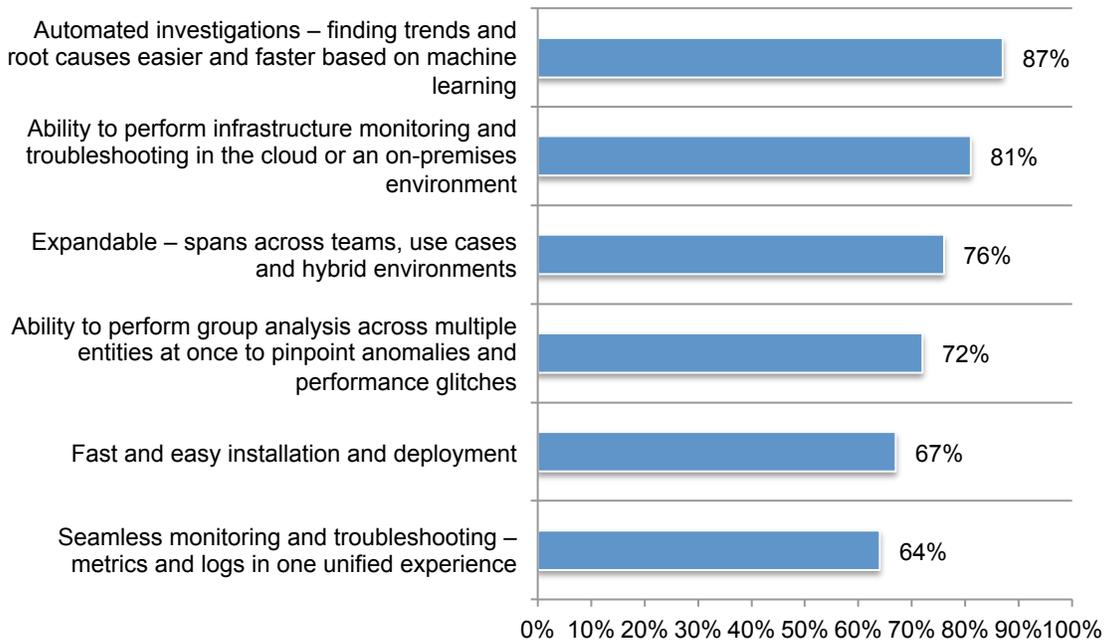
Reducing complexity through better monitoring tools

Companies want the ability to perform infrastructure monitoring and troubleshooting in the cloud or an on-premises environment. Respondents were asked to rate features that improve monitoring and troubleshooting on a scale from 1 = not important to 10 = very important. Figure 13 presents the very important responses (7+ on a scale from 1 to 10).

As shown, the most important feature, according to 87 percent of respondents, is automated investigations to find trends and root causes easier and faster based on machine learning. Seventy-three percent of respondents say it is the ability to scale automated processes from small to very large deployments.

Figure 13. Features that reduce complexity and improve scalability

1=not important to 10=very important, 7+ responses reported

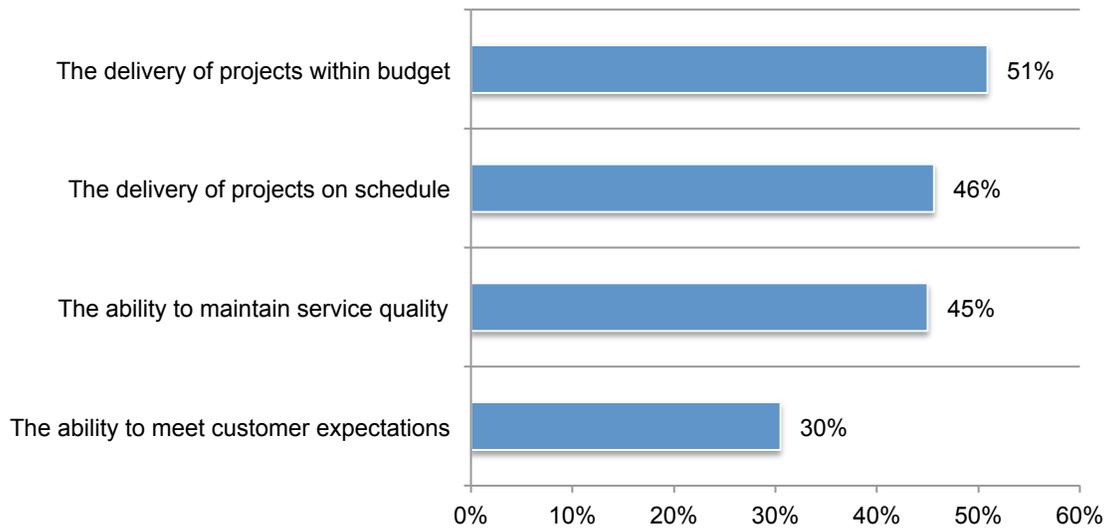


Automation and operational analytics are considered to improve the delivery of projects on schedule and within budget. Figure 14 presents the percentage of respondents who believe automation and operational analytics will improve the delivery of monitoring services.

As shown, 51 percent of respondents say implementing automation and operational analytics will improve the ability to deliver projects within budget and 46 percent of respondents say it will improve the ability to deliver projects on schedule. Forty-five percent say it improves the ability to maintain service quality. Only 30 percent of respondents say it improves their organization’s ability to meet customer expectations.

Figure 14. Will automation and operational analytics improve the ability to deliver monitoring services on time and within budget?

Improve responses reported



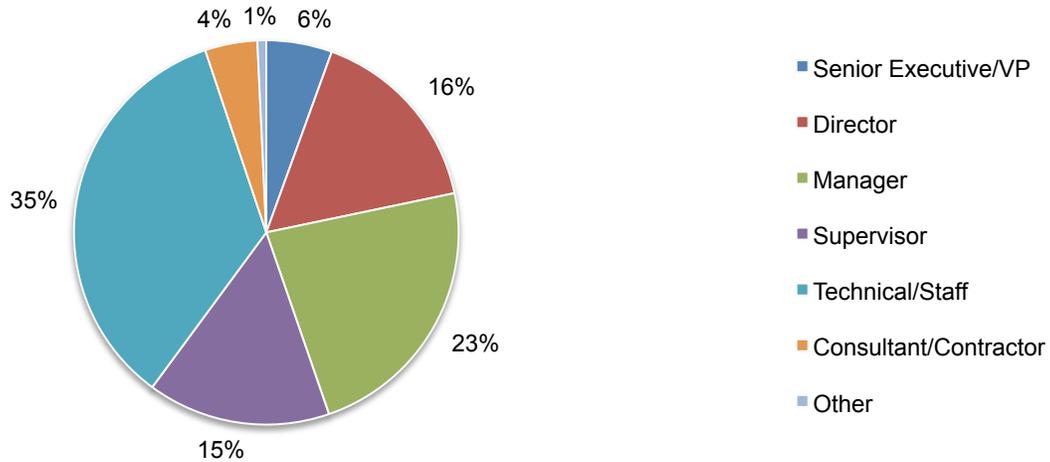
Part 3. Methods

A sampling frame of 76,002, IT and IT security practitioners located in the United States, United Kingdom, Germany, France, Australia, Singapore and Japan were selected as participants in this survey. Table 1 shows 2,780 total returns. Screening and reliability checks required the removal of 283 surveys. Our final sample consisted of 2,497 surveys or a 3.3 percent response.

Table 1. Sample response	FY2017	Pct%
Sampling frame	76,002	100%
Total returns	2,780	3.7%
Rejected or screened surveys	283	.4%
Final sample	2,497	3.3%

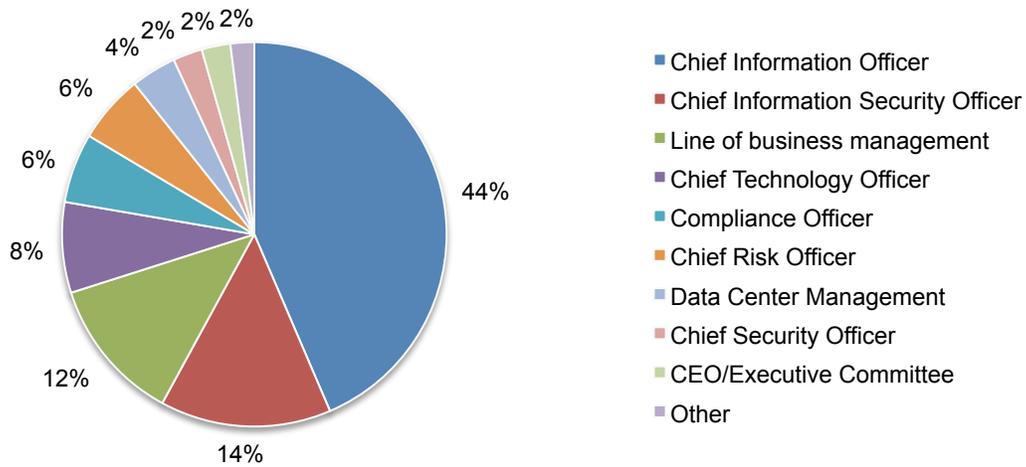
Pie Chart 1 reports the respondents' organizational levels within the participating organizations. By design, more than half of the respondents (60 percent) are at or above the supervisory levels.

Pie Chart 1. Current position within the organization



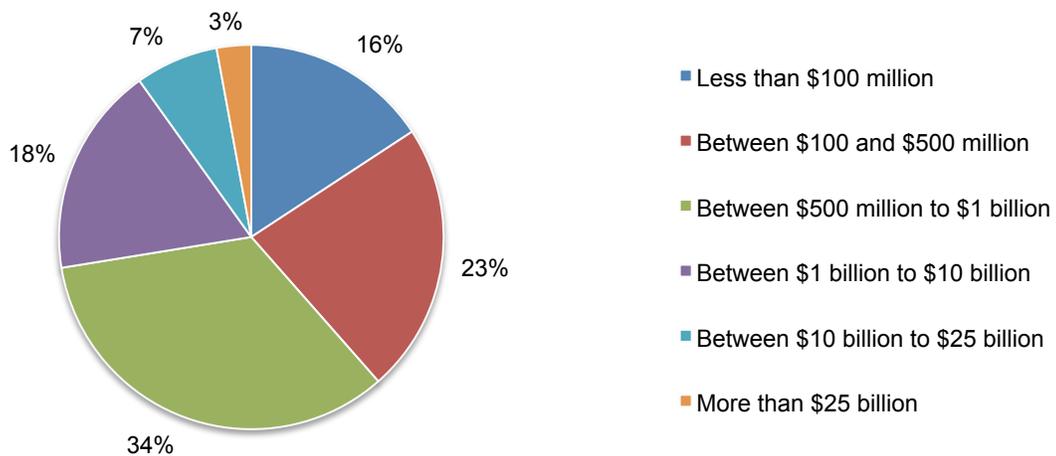
As shown in Pie Chart 2, 44 percent of respondents report to the chief information officer, 14 percent report to the chief information security officer and 12 percent indicated they report to the line of business management.

Pie Chart 2. Primary person you or your leader reports to



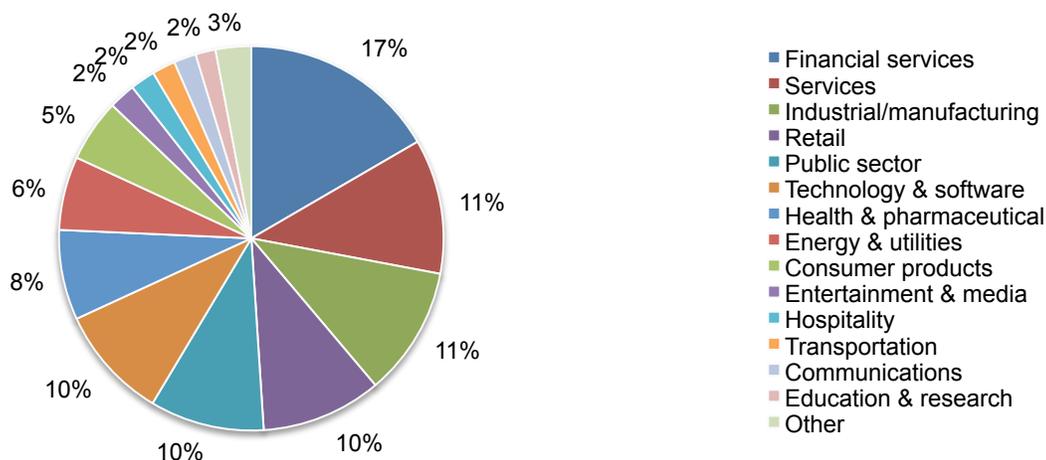
Pie Chart 3 reveals that 61 percent of respondents are from organizations with global revenue of more than \$500 million.

Pie Chart 3. Worldwide revenue of respondents' organizations



Pie Chart 4 reports the industry segments of respondents' organizations. This chart identifies financial services (17 percent of respondents) as the largest segment, followed by services (11 percent of respondents), and industrial/manufacturing (11 percent of respondents).

Pie Chart 4. Industry distribution of respondents' organizations



Part 4. Caveats to this study

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 familiar with their organization's approach to managing data risks created through outsourcing and have involvement in managing the data risks created by outsourcing. We also acknowledge that the results may be biased by external events such as media coverage. 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 accurate responses.

Appendix: Detailed Survey Results

The following tables provide the frequency or percentage frequency of responses to all survey questions contained in this study. All survey responses were captured in February 2018.

Survey response	Total
Total sampling frame	76,002
Total returns	2,780
Rejected surveys	283
Final sample	2,497
Response rate	3.3%
Sample Weights	1.00

Part 1. Screening

S1. How familiar are you with the state of IT operations within your organization?	Total
Very familiar	45%
Familiar	36%
Somewhat familiar	19%
Not familiar (stop)	0%
Total	100%

S2. What is the full-time headcount of your organization?	Total
Less than 100 (stop)	0%
100 to 500	9%
501 to 1,000	19%
1,001 to 5,000	26%
5,001 to 10,000	23%
10,001 to 25,000	12%
25,000 to 75,000	7%
More than 75,000	4%
Total	100%

S3. What best defines your job title?	Total
System administrator	5%
SRE	4%
Developer	8%
Vice president of IT	4%
Vice president of cloud operations	3%
Director or manager of IT operations	30%
Director or manager of cloud operations	20%
Director or manager of application development	10%
Program manager	6%
Analyst, technician or consultant	10%
None of the above (stop)	0%
Total	100%

Part 2. General Questions:

Q1. What best defines your organization's IT infrastructure? Please select only one choice.	Total
Mostly public cloud	32%
Mostly private cloud	8%
Mostly on-premises	36%
A combination of cloud and on-premises (hybrid)	24%
Unsure	0%
Total	100%

Q2. What happens to the IT organization when system availability and performance remains below expectations? Please select all that apply.	Total
Increase in unpatched vulnerabilities	53%
Friction between IT and lines of business	61%
Data loss	27%
Business disruption	47%
Loss of revenue	22%
Turnover of skilled personnel	36%
Increase in outsourcing expenses	26%
Other (please specify)	2%
Total	274%

Q3. On average, how many servers is each system administrator responsible for?	Total
1 to 10	7%
11 to 50	42%
51 to 100	34%
More than 100	17%
Total	100%
Extrapolated value	58.7

Q4. From one (greatest) to six (least), please rank the areas you believe are most influential in deciding your organization's approach in infrastructure troubleshooting and monitoring operations.	Total
Simplification of IT complexity through consolidation of technologies and systems	1.82
Automation of IT maintenance/management processes	1.94
Improvements in meeting current compliance and audit requirements	4.53
Server/storage/network/data center refreshes	5.02
Requirement to lower costs of running the IT infrastructure	2.43
Machine learning and other analytics approach to isolate relevant information	2.89
Average	3.20

Q5. If you had to choose ONE, which of the following would you say is the most effective way to strengthen your organization's IT infrastructure and monitoring operations?	Total
Analytics to quickly process and summarize information	20%
Better automation of IT management/maintenance	24%
Machine learning capabilities	18%
Better infrastructure performance across entire organization	24%
Better enforcement of current policies and regulations	7%
Better employee training to improve IT management/deployment	5%
Total	100%

Q6. How has your confidence changed in the following areas of IT infrastructure over the last 12 months?	
Q6a. Handling the scale and complexity of IT infrastructure you are managing	Total
Significantly better	6%
Somewhat better	18%
About the same	40%
Somewhat worse	23%
Significantly worse	12%
Total	100%

Q6b. Skills Gap – people have the right skills to “get the job done”	Total
Significantly better	8%
Somewhat better	19%
About the same	39%
Somewhat worse	28%
Significantly worse	6%
Total	100%

Q6c. Ability to ensure performance and availability of systems with current toolset	Total
Significantly better	7%
Somewhat better	26%
About the same	34%
Somewhat worse	28%
Significantly worse	4%
Total	100%

Q6d. Ability to quickly pinpoint root-cause and source of failure with current toolset	Total
Significantly better	9%
Somewhat better	22%
About the same	42%
Somewhat worse	17%
Significantly worse	10%
Total	100%

Q6e. Efficiency (people and effort) to perform IT operations	Total
Significantly better	10%
Somewhat better	21%
About the same	42%
Somewhat worse	22%
Significantly worse	5%
Total	100%

Q6f. Ability to migrate workloads and applications to the cloud	Total
Significantly better	7%
Somewhat better	25%
About the same	41%
Somewhat worse	22%
Significantly worse	5%
Total	100%

Q6g. Ability to easily deploy and maintain server monitoring technologies	Total
Significantly better	5%
Somewhat better	24%
About the same	38%
Somewhat worse	27%
Significantly worse	6%
Total	100%

Q7. What are the greatest difficulties or challenges in managing IT infrastructure (e.g., troubleshooting, monitoring, cloud migration) at your organization? Please select your top 4 choices.	Total
Complexity and diversity (heterogeneity) of IT systems and technology	47%
Skills gap among existing resources	44%
Insufficient resources and inability to hire them	33%
Several 'blind spots' that hinder required visibility into issues	41%
Lack of visibility into cloud-based services	42%
Lack of insights to quickly pinpoint issues and identify root cause	50%
Silos of IT systems and technologies and lack of ability to integrate them	31%
Purchasing policies and guidelines	10%
Compliance and audit requirements	32%
Changing priorities of senior management	17%
Rolling out new software releases	11%
Data center upgrades/updates and consolidation initiatives	18%
Changes in IT environment due to migration to cloud	24%
Other (please specify)	1%
Total	400%

Q8. Do you expect your organization's operating budget for IT (on-premises) infrastructure to increase, decrease or stay the same over the next 12 months?	Total
Significant increase	4%
Some increase	17%
Stay the same	41%
Some decrease	30%
Significant decrease	8%
Total	100%

Q9. Do you expect your organization's operating budget for cloud operations to increase, decrease or stay the same over the next 12 months?	Total
Significant increase	8%
Some increase	33%
Stay the same	39%
Some decrease	16%
Significant decrease	2%
Total	100%

Q10. Which of the following do you think are the biggest risks to your organization in managing IT infrastructure (e.g., troubleshooting, monitoring and cloud migration)? Please select your top 4 choices.	Total
Lack of a consistent and formal IT outage response process	34%
Lag time between outages and being aware of them	39%
Increased complexity of applications running on infrastructure	55%
Lack of tools that help identify the cause of IT performance and availability problems	21%
Insufficient budget and personnel to provide enough "coverage" to monitor and troubleshoot problems	27%
Inability to forecast applications and infrastructure workload demands	32%
Lack of tools due to budget constraints and/or time required to deploy and maintain	12%
Migration to cloud	25%
Lack of coordination and collaboration between IT personnel in different departments	35%
Lack of skills and expertise	44%
Influx of new technologies and devices (IoT, mobile)	24%
Continued maintenance of legacy systems	11%
Negligent or malicious insiders/employees/contractors	41%
Total	400%

Q11. If an interruption to IT systems or loss of service occurred, would you agree or disagree with the following statements? Please use the agreement scale below each statement.	
Q11a. We have the ability to determine the root cause of the infrastructure problems quickly (within minutes).	Total
Strongly agree	6%
Agree	16%
Unsure	29%
Disagree	33%
Strongly disagree	16%
Total	100%

Q11b. We have visibility to our IT infrastructure and can foresee issues before they impact performance.	Total
Strongly agree	10%
Agree	22%
Unsure	24%
Disagree	29%
Strongly disagree	15%
Total	100%

Q11c. We have documented workflows and automated processes to follow in the event of a system failure (e.g., unplanned downtime).	Total
Strongly agree	12%
Agree	17%
Unsure	35%
Disagree	29%
Strongly disagree	7%
Total	100%

Q11d. We have the ability to pinpoint problems early because of the adoption of automation and our current monitoring toolset.	Total
Strongly agree	12%
Agree	17%
Unsure	34%
Disagree	30%
Strongly disagree	8%
Total	100%

Q11e. We gather information from various intelligence sources and try to understand what the issues are before system breakage (e.g., unplanned downtime).	Total
Strongly agree	14%
Agree	16%
Unsure	31%
Disagree	29%
Strongly disagree	9%
Total	100%

Q11f. Our IT troubleshooting and monitoring processes are consistently applied/managed across the enterprise.	Total
Strongly agree	14%
Agree	17%
Unsure	30%
Disagree	23%
Strongly disagree	16%
Total	100%

Q12. The table below lists 5 activities that occur after the loss of service or downtime. Please allocate 100 percentage points based on what is spent on each activity listed in the table below. Use all 100 points in the table to allocate your response.	Total
Getting notified/notifying others of the problem	12
Identifying the location of the problem (servers, applications, networks, etc.)	26
Identifying the root cause of the problem	15
Determining what needs to be done to fix the problem	23
Fixing the problem	23
Total points = 100	100

Q13. What challenges do you face or anticipate as you move to automate the troubleshooting and monitoring of IT infrastructure? Please select all that apply.	Total
No challenges	19%
Contractor limitations and constraints	40%
Difficulty managing multiple environments	45%
Legacy systems	63%
Application complexity	58%
Budget constraints	49%
Lack of resources and/or skills	54%
Organizational and/or cultural resistance	49%
Other (please specify)	1%
Total	378%

Q14. How will implementing automation and operational analytics impact your organization's ability to deliver IT troubleshooting and monitoring services on time and on budget?	
Q14a The delivery of projects on schedule	Total
Improves	46%
Diminishes	15%
No change	40%
Total	100%

Q14b. The delivery of projects within budget	Total
Improves	51%
Diminishes	15%
No change	34%
Total	100%

Q14c. The ability to maintain service quality	Total
Improves	45%
Diminishes	17%
No change	38%
Total	100%

Q14d. The ability to meet customer expectations	Total
Improves	30%
Diminishes	28%
No change	42%
Total	100%

Part 3. Waitomo-specific questions

<p>Following are infrastructure performance monitoring use cases or features relating to Project Waitomo and other enterprise Splunk solutions. Please use the 10-point scale to rate each case with respect to its importance to your organization's troubleshooting and monitoring process. 1=not important to 10=very important.</p>	
Q15a. Server-level performance monitoring and troubleshooting	Total
1 or 2	1%
3 or 4	8%
5 or 6	17%
7 or 8	35%
9 or 10	39%
Total	100%
Extrapolated value	7.53
Q15b. Ability to perform infrastructure monitoring and troubleshooting in the cloud or an on-premises environment	Total
1 or 2	1%
3 or 4	6%
5 or 6	13%
7 or 8	32%
9 or 10	49%
Total	100%
Extrapolated value	7.95
Q15c. Ability to perform monitoring and troubleshooting of specific containers	Total
1 or 2	5%
3 or 4	5%
5 or 6	19%
7 or 8	30%
9 or 10	41%
Total	100%
Extrapolated value	7.44
Q15d. Ability to connect the results of infrastructure monitoring and troubleshooting to service-level intelligence	Total
1 or 2	2%
3 or 4	7%
5 or 6	15%
7 or 8	38%
9 or 10	39%
Total	100%
Extrapolated value	7.61

Q15e. Provides an analytics-driven IT infrastructure tool that unifies metrics and logs	Total
1 or 2	5%
3 or 4	9%
5 or 6	19%
7 or 8	32%
9 or 10	35%
Total	100%
Extrapolated value	7.15

Q15f. Ability to scale automated processes from small to very large deployments	Total
1 or 2	1%
3 or 4	9%
5 or 6	17%
7 or 8	33%
9 or 10	40%
Total	100%
Extrapolated value	7.54

Q15g. Fast and easy installation and deployment	Total
1 or 2	9%
3 or 4	10%
5 or 6	14%
7 or 8	30%
9 or 10	37%
Total	100%
Extrapolated value	7.00

Q15h. Ability to perform group analysis across multiple entities at once to pinpoint anomalies and performance glitches	Total
1 or 2	5%
3 or 4	6%
5 or 6	18%
7 or 8	33%
9 or 10	39%
Total	100%
Extrapolated value	7.42

Q15i. Seamless monitoring and troubleshooting – metrics and logs in one unified experience	Total
1 or 2	7%
3 or 4	6%
5 or 6	21%
7 or 8	29%
9 or 10	35%
Total	100%
Extrapolated value	7.07

Q15j. Automated investigations – finding trends and root causes easier and faster based on machine learning	Total
1 or 2	1%
3 or 4	4%
5 or 6	8%
7 or 8	43%
9 or 10	44%
Total	100%
Extrapolated value	7.99

Q15k. Expandable – spans across teams, use cases and hybrid environments	Total
1 or 2	1%
3 or 4	9%
5 or 6	15%
7 or 8	34%
9 or 10	42%
Total	100%
Extrapolated value	7.63

Q16. In your opinion, do new automation and machine learning technologies make IT infrastructure monitoring simpler or more complex?	Total
It makes my function more complex	33%
It makes my function simpler	61%
Unsure	6%
Total	100%

Q17. As your organization migrates to cloud platforms/solutions, what are your biggest concerns? Please select your top 4 choices.	Total
Data security/privacy	47%
Application performance and availability	68%
Inability to monitor and troubleshoot applications	51%
Lack of visibility across workloads	50%
Inability to correlate data and events across on-premises and Cloud	36%
Limited customization to suit our needs	23%
Compliance/regulations	39%
Cost	51%
Cloud vendors' inability to provide SLA monitoring in near real-time	18%
Contract limitations	15%
Other (please specify)	2%
Total	400%

Part 4. Monitoring and visibility across silos

Q18. We have siloed monitoring solutions across our IT infrastructure.	Total
Strongly agree	32%
Agree	31%
Unsure	17%
Disagree	14%
Strongly disagree	5%
Total	100%

Q19. When using data to diagnose IT issues and determine root cause, what problems have you experienced? Please select all that apply.	Total
Not sure what data is relevant for problems that arise	56%
Not enough context or fidelity to understand the full picture	50%
Data is in different formats and types (difficult to normalize)	63%
No capability to ingest real-time data	59%
Data ingestion and normalization is cumbersome and tedious	70%
Mostly analysis of historical data and so difficult to troubleshoot in real-time	60%
Reluctance or Lack of collaboration and data sharing among various teams	54%
Total	412%

Part 5. Your role and organization

D1. What organizational level best describes your current position?	Total
Senior Executive/VP	6%
Director	16%
Manager	23%
Supervisor	15%
Technical/Staff	35%
Consultant/Contractor	4%
Other	1%
Total	100%

D2. Check the Primary Person you or your supervisor reports to within the organization.	Total
CEO/Executive Committee	2%
General Counsel	1%
Chief Information Officer	44%
Chief Technology Officer	8%
Chief Information Security Officer	14%
Compliance Officer	6%
Line of business (LOB) management	12%
Chief Security Officer	2%
Data Center Management	4%
Chief Risk Officer	6%
Other	1%
Total	100%

D3. What range best defines the worldwide revenue of your organization?	Total
Less than \$100 million	16%
Between \$100 and \$500 million	23%
Between \$500 million to \$1 billion	34%
Between \$1 billion to \$10 billion	18%
Between \$10 billion to \$25 billion	7%
More than \$25 billion	3%
Total	100%

D4. What best describes your organization's primary industry classification?	Total
Agriculture & food services	1%
Communications	2%
Consumer products	5%
Defense & aerospace	1%
Education & research	2%
Energy & utilities	6%
Entertainment & media	2%
Financial services	17%
Health & pharmaceutical	8%
Hospitality	2%
Industrial/manufacturing	11%
Public sector	10%
Retail	10%
Services	11%
Technology & software	10%
Transportation	2%
Other (please specify)	1%
Total	100%

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

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