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INTELLIGENCE

2019

Annual Data Center Survey Results

This report is an excerpt of a comprehensive report available to Uptime Institute Network Members. It includes the highlights of the material contained in the original. For more information about membership, See: www.UptimeInstitute.com/UI-Network

Abstract

The Uptime Institute 2019 data center survey is the largest and most comprehensive in the industry. The findings discussed in this report reveal what owners and operators around the world are thinking, doing and planning in the areas of efficiency, resiliency, workload placement, climate change, staffing, and new technology adoption.

Introduction

The Ninth Annual Uptime Institute Data Center Survey provides an overview of the shape, practices and major trends driving the mission-critical digital infrastructure of today. This survey, the most comprehensive research survey of its kind, was conducted online during March and April 2019 with nearly 1600 participants. (For more survey details, see the Appendix).

Our survey results find that the data center sector is large, diverse, complex and adapting to change in many ways. In almost every area under discussion — whether outages, resiliency, staffing, placement of workloads, use of innovation or use of cloud — there is considerable diversity in the strategies being employed. Overall, the industry is open to adopting new approaches and technologies but is doing so cautiously. Some findings stand out:

- A high proportion of organizations expressed concern at the lack of visibility into the design and operations of public cloud services on which they could be or are dependent. This has hindered adoption of the public cloud.
- There is still strong adherence to the large privately owned enterprise data center, which accounts for half of all IT workloads currently and is predicted to continue doing so in the near future. Meanwhile, a high proportion of respondents expect to own and run their own edge data centers, perhaps in conjunction with third parties.
- The number of outages reported mapped very closely onto our 2018 survey results. This is not a good thing — a third of those surveyed have suffered some form of outage or serious service degradation in the past year. A number of these had serious financial consequences.
- Meanwhile, the industry faces a staffing crisis, with most reporting difficulty recruiting or retaining staff. And while the lack of women working in data centers is well-known, the extent of the imbalance is notable: One-quarter of operators surveyed had no women at all among their design, build or operations staff.

The summary of findings of the 2019 survey are discussed in this report. Full detailed analysis of the survey data is available to members of the Uptime Institute Network, the industry's largest community of IT professionals focused on delivering digital infrastructure, See https://uptimeinstitute.com/ui-network for more information about joining.

Key Findings

- The large, privately owned enterprise data center facility still forms the bedrock of corporate IT and is expected to be running half of all workloads in 2021.

- The staffing problem affecting most of the data center sector has become a crisis. Sixty-one percent (61%) of respondents said they had difficulty retaining or recruiting staff — up from 55% a year earlier.

- Outages continue to cause significant problems for operators. Just over a third (34%) of all respondents had an outage or severe IT service degradation in the past year, while half (50%) had an outage or severe IT service degradation in the past three years.

- A lack of visibility, transparency and accountability of public cloud services is a major concern for enterprises with mission-critical applications. A fifth of operators surveyed said they would be more likely to put workloads in a public cloud if there were more visibility. Half of those using public cloud for mission-critical applications also said they do not have adequate visibility.

- Improvements in data center facility energy efficiency have flattened out and even deteriorated slightly in the past two years. The average PUE for 2019 is 1.67.

- Kilowatt (kW) rack density is rising, following a long period of flat or minor increases, causing many to rethink cooling strategies. Uptime Intelligence regards this as a medium- to long-term trend.

- Ten percent (10%) of all respondents said that their most recent significant outage cost more than $1 million (“most recent” could have been at any time in the past).

- The data center sector continues to be dominated by men. Only five percent (5%) of respondents said women represented 50% or more of staff, while a quarter had no women at all among their build, design or operations staff.

Other notable findings

- Power loss was the single biggest cause of outages, accounting for one-third, as in 2018. Networking issues were close behind, at 31%.
- Distributed resiliency using active-active data centers is becoming more common. Forty percent (40%) of those surveyed said they use availability zones for resiliency — a strategy that requires at least two active data centers replicating data to each other.
- Sixty percent (60%) of respondents said their data center’s outage could have been prevented with better management/processes or configuration.
- Most operators surveyed have a hybrid strategy. IT workloads are being spread across a range of services and data centers, with about a third of all workloads expected to be contracted to cloud, colocation, hosting and Software as a Service (SaaS) suppliers by 2021.
- Ownership and management of edge capacity will be diverse, depending on the function and the applications. But a majority of enterprises expect to mostly operate their own edge data centers or to use a mix of their own and third-party operator facilities.
- Confidence in costing best-execution venues is growing. Sixty percent (60%) of respondents said they are confident in their organization's ability to

compare the costs of provisioning workloads in the cloud or at their owned and leased colocation sites.

- Climate change is not causing the data center industry a lot of concern. As in 2018, half of operators said they are not currently preparing for climate change, with more than half of that cohort stating that their existing plans are sufficient (30% of total respondents). There were small increases in the number re-evaluating flood risk, site selection and their ability to deal with rising temperatures, compared with last year.
- While most think the industry would benefit from more women, they also think that it is easy for women to pursue a data center career — at least in their organization — and that the lack of women presents no threat to the industry.
- Automation and artificial intelligence (AI) will not reduce data center staffing requirements in the next five years, according to the majority of respondents. After that, however, most think automation will reduce staff requirements.
- Awareness and adoption of both the Open Compute Project (OCP) and Open19 as lower-cost architectures for racks and power distribution is still low, years after their introduction, as is evaluation and deployment. Among data center staff, senior IT management are the most likely to be aware of these initiatives. Nearly half of the data centers represented in our survey now have some lithium-ion (Li-ion) batteries in use or contracted to be installed.

Conclusions and Recommendations

Based on our survey findings, Uptime Institute Intelligence recommends that managers/operators consider the following:

- Public cloud and other third-party data center services are not immune to outages or service degradations. The vetting process for third-party services should go beyond a simple review of the service level agreement and include visibility, resiliency, accountability and true costs.
- The biggest infrastructure efficiency gains happened five to six years ago, according to our analysis of the industry average PUE. Further improvements will require significant investment and effort, with increasingly diminishing returns. While managers and operators should remain vigilant and seek to maintain high facility efficiency levels, higher gains may be found by focusing on IT efficiency.
- Outages continue to be commonplace and costly, and incidents increasingly span multiple data centers. Uptime Institute recommends comprehensive and ongoing resiliency reviews of digital infrastructure that include company-owned data centers and third-party service providers, and that also take into account the effects of climate change (at a regional level).
- Data center skill shortages will intensify: In this aging and overwhelmingly male sector, most operators are struggling with staffing issues. While most do not believe a lack of diversity in their ranks is an issue to be concerned about, Uptime believes actively recruiting women and other underrepresented populations into data centers will help to alleviate the staffing crisis.

Appendix

The Uptime Institute Annual Survey, now in its ninth year, is conducted online and by email. The 2019 survey was conducted in March and April 2019 and had a participation of nearly 1600 people. Respondents are separated into two groups: owner/operators of data centers; and suppliers, designers and advisors. This report focuses on the findings from the owner/operator survey — people responsible for managing infrastructure at the world's largest IT organizations. Job titles include senior executive, IT management, critical facilities management and design engineer.

As Figure A1 shows, the participants represent a wide range of industries in multiple countries, with just over half coming from North America and Europe. Almost half of the respondents work for professional IT/data center service providers (i.e., staff with operational or executive responsibilities for a third-party data center, such as those offering colocation, wholesale, software or cloud computing services). This is closely aligned with the percentage of data center build-out (by MW) attributed to this sector.

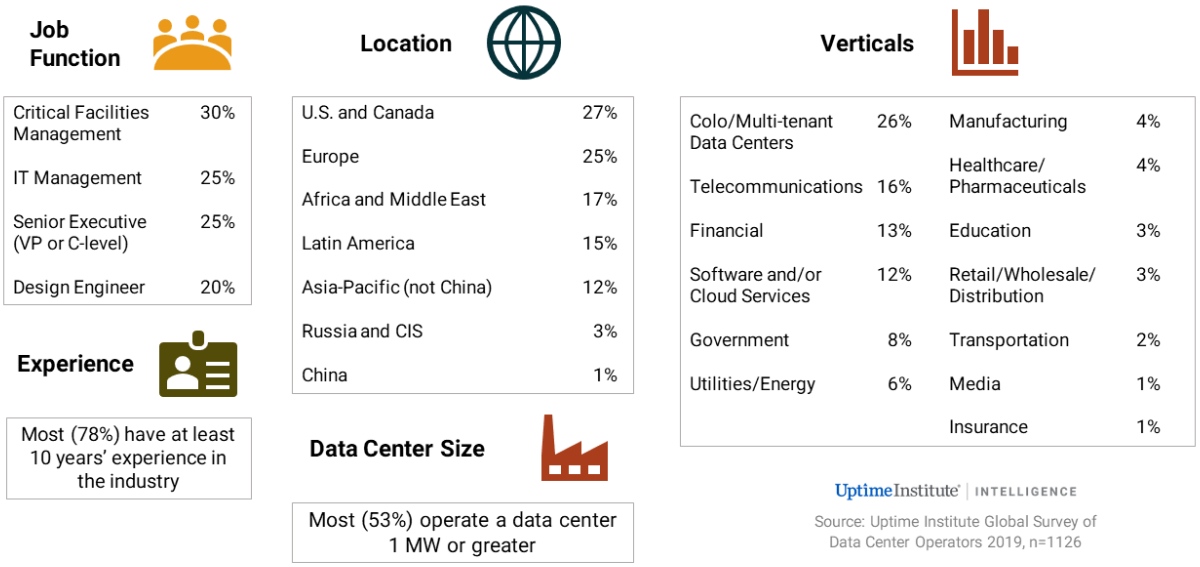

Figure A1. **Respondent demographics, Uptime Institute Global Survey of Data Center Operators, 2019**

For More Information

For more information on our surveys or Uptime Intelligence, contact Rhonda Ascierto, Vice President of Research (rascierto@uptimeinstitute.com) or Brenda South, Vice President Communications (bsouth@uptimeinstitute.com).