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Uptime Institute Global Data Center Survey 2023

1575 respondents (850 end users)
16 verticals
13th annual industry survey
10 key findings

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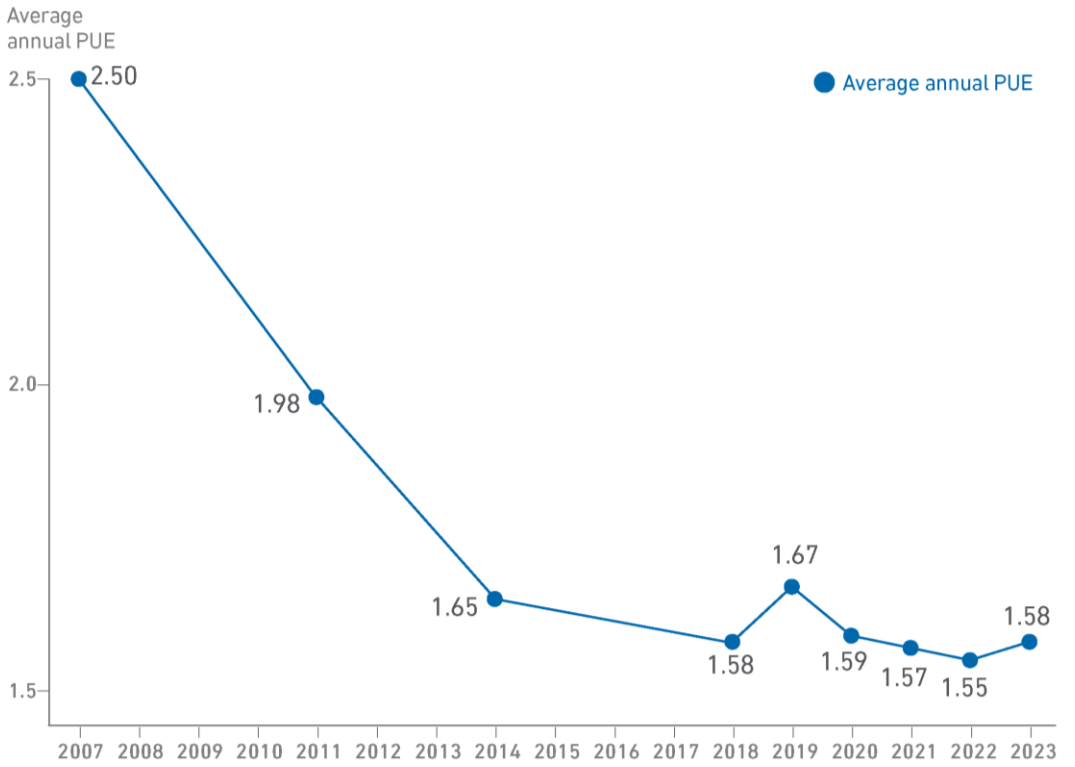
1. Industry-wide PUE improvement slows, then stops

What is the average annual PUE for your data center? (n=567)



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16% report PUEs under 1.3, with most of these in Europe and North America

Further gains in the near-term rely on new investments and retiring legacy facilities

Higher costs and regulatory requirements push the business case for higher energy performance

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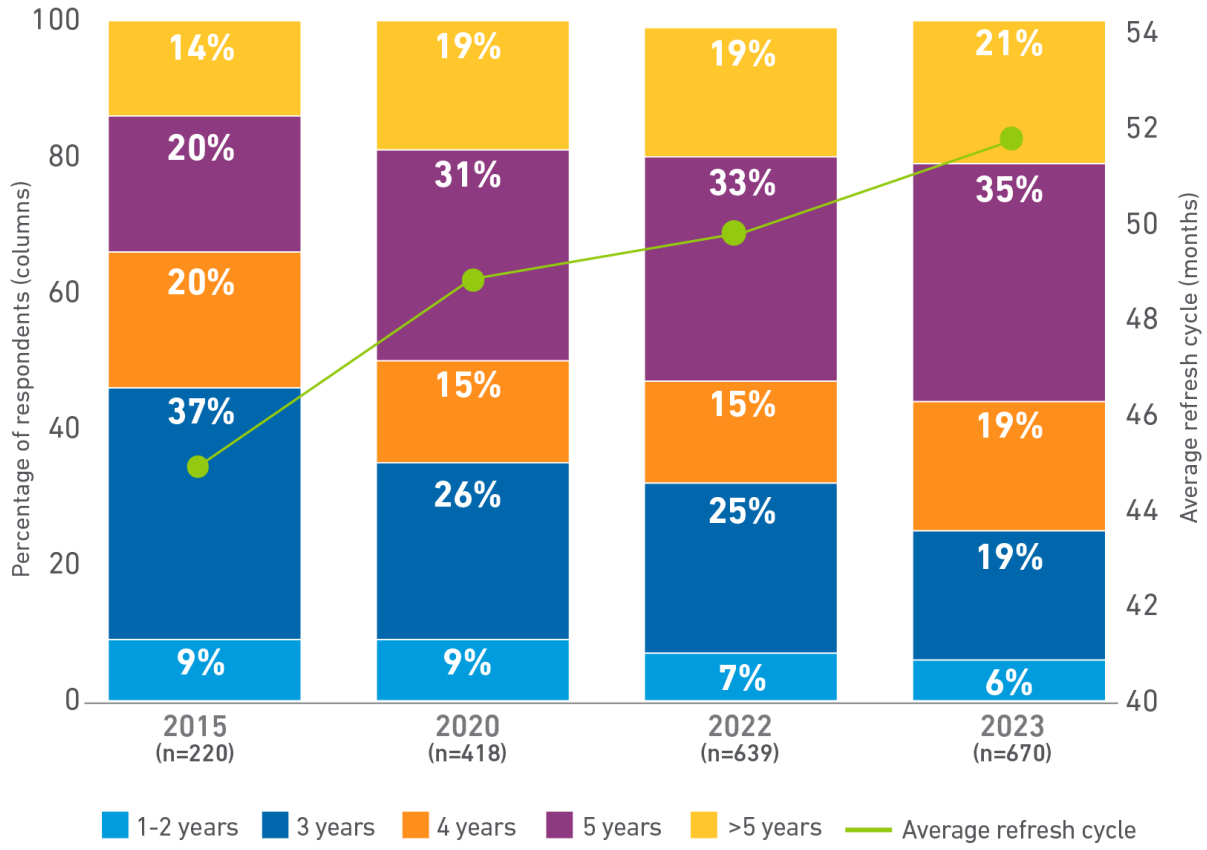
2. Server refresh cycles continue to slow

Operators are extending refresh cycles

How often does your organization typically refresh its servers?



Cycles have increased by 7 months on average compared to 2015

10% of respondents refresh every 7 years or longer (not shown in chart)

Extensions can reduce Scope 3 emissions, but primary drivers are costs and supply chain issues

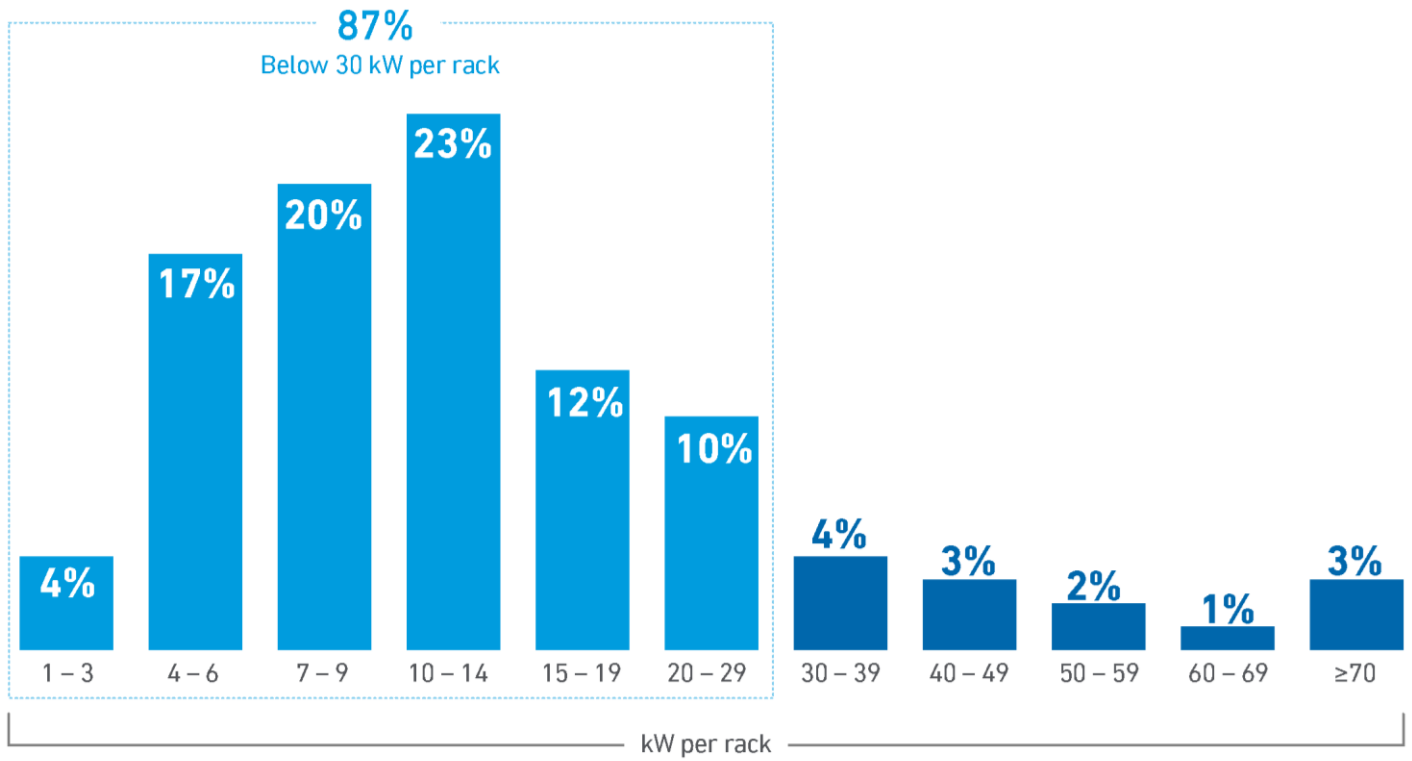
3. Long, slow climb in rack density

Servers designed for compute-intense applications are becoming more common

Optimized, larger facilities are more likely to house the highest-density racks

Most racks less than 30 kW, but extreme densities are emerging

What is the highest server rack density deployed in your site? (n=687)



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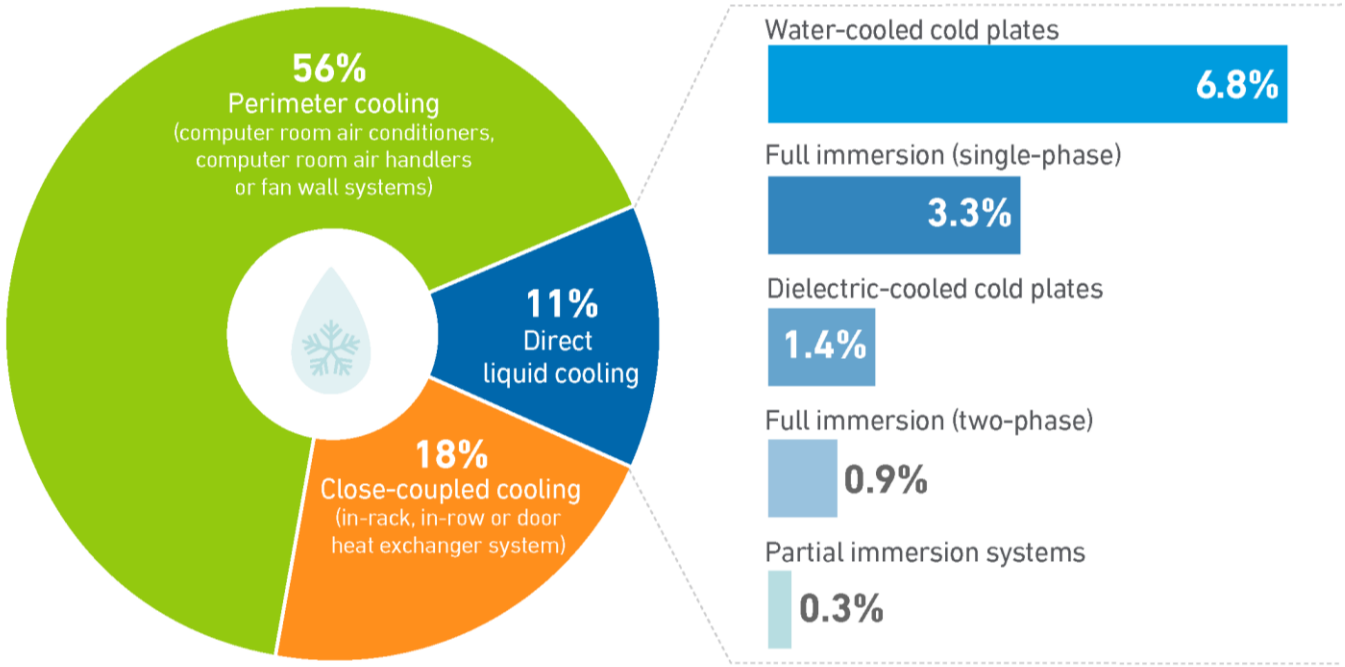
Long, slow climb in rack density

Even on the densest racks, perimeter cooling dominates

How do you currently cool your highest density cabinets? (n=572)



(All figures rounded.)

Air and liquid cooling are evenly split for racks above 40 kW

Future increases in densification and silicon power will drive further use of DLC and close-coupled air

4. Most corporate IT is running off-premises

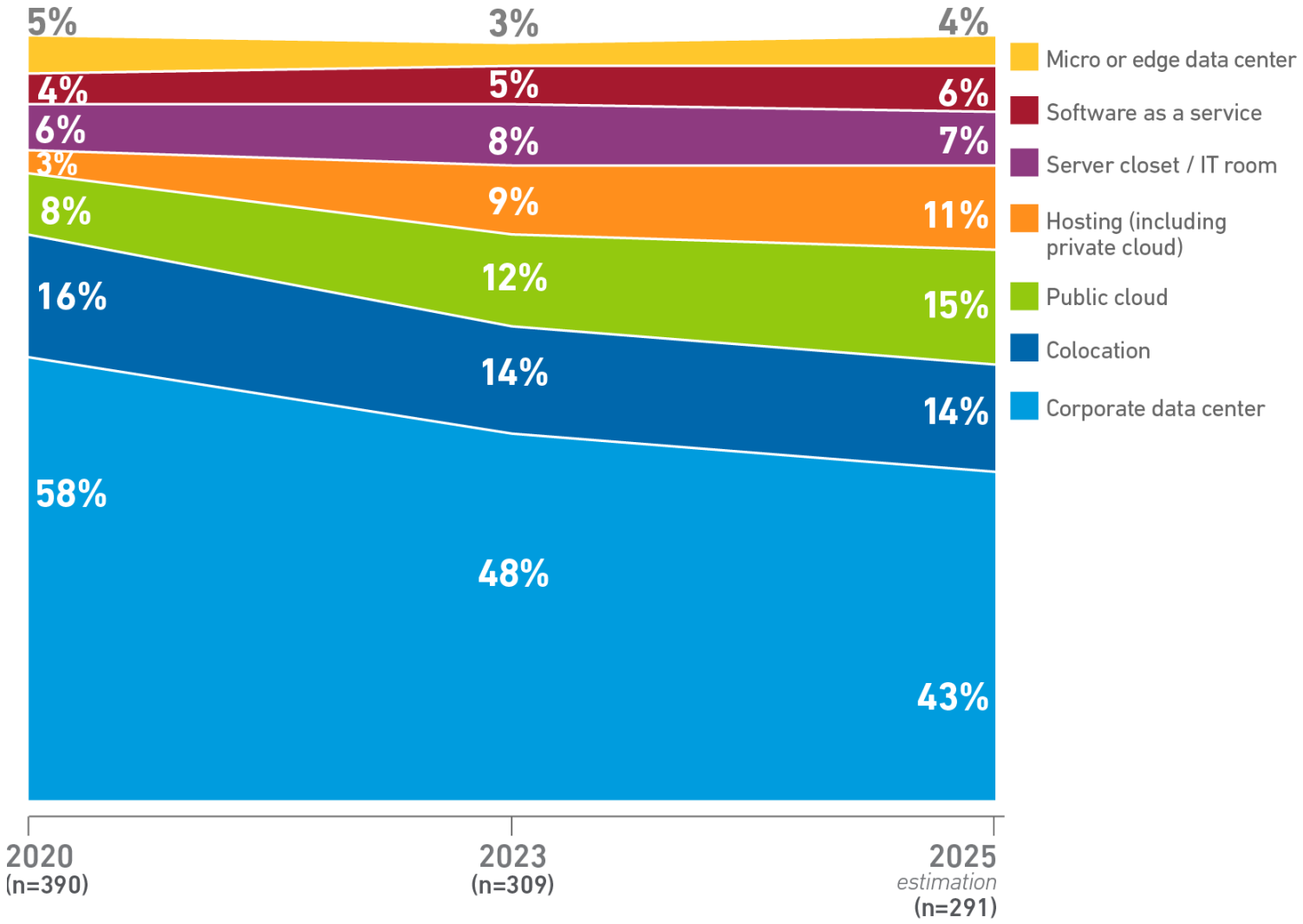
Organizations are taking a more hybrid approach to IT

No indication of shrinking usage or expenditure for on-premises facilities

Workload placements based on cost, regulatory compliance and technical requirements

Cloud and hosting grows at the expense of corporate data centers

Approximately what percentage of your organization's total IT would you describe as running in the following environments today versus in two years?



(All figures rounded.)

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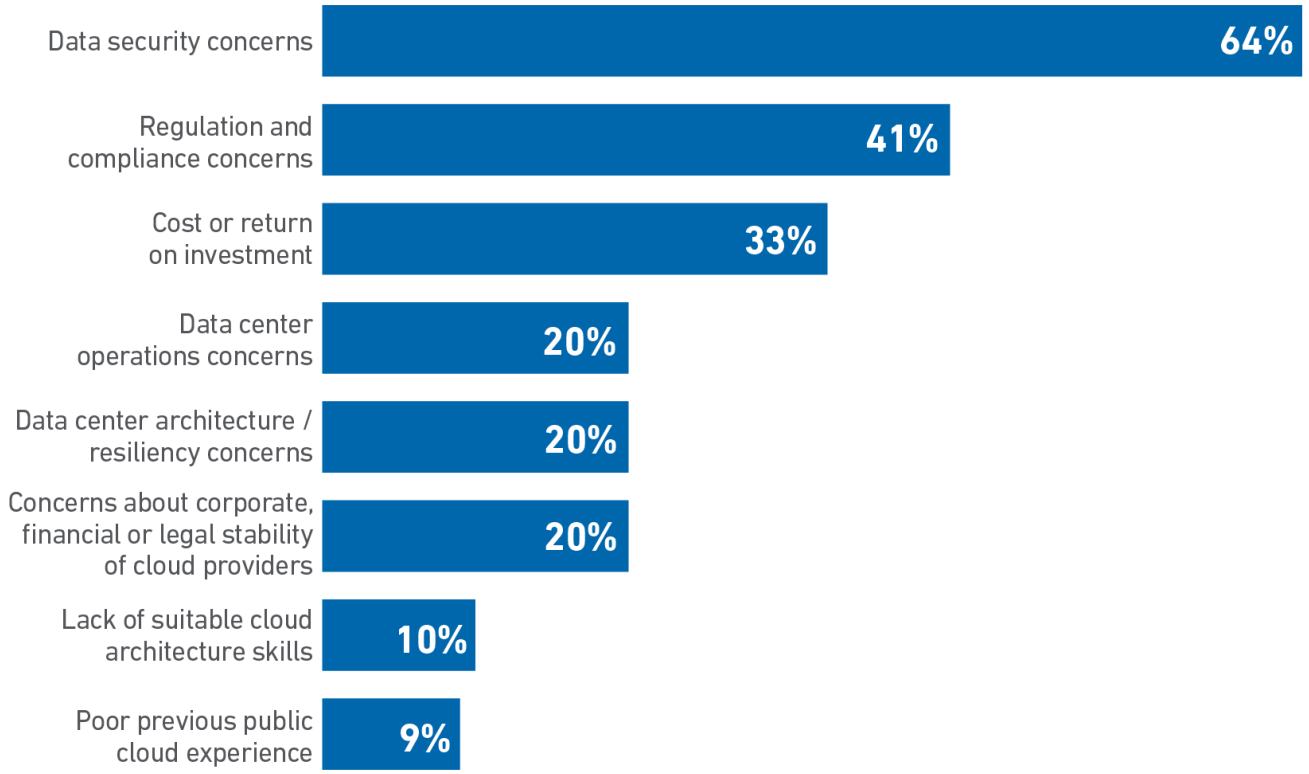
5. Data security, not infrastructure, blocks cloud adoption

Data security and compliance concerns impede adoption

What are the main reasons you do not place mission-critical workloads into public clouds? Choose no more than three. (n=240)



Nearly 2/3 do not host mission-critical applications in public cloud (n=659)

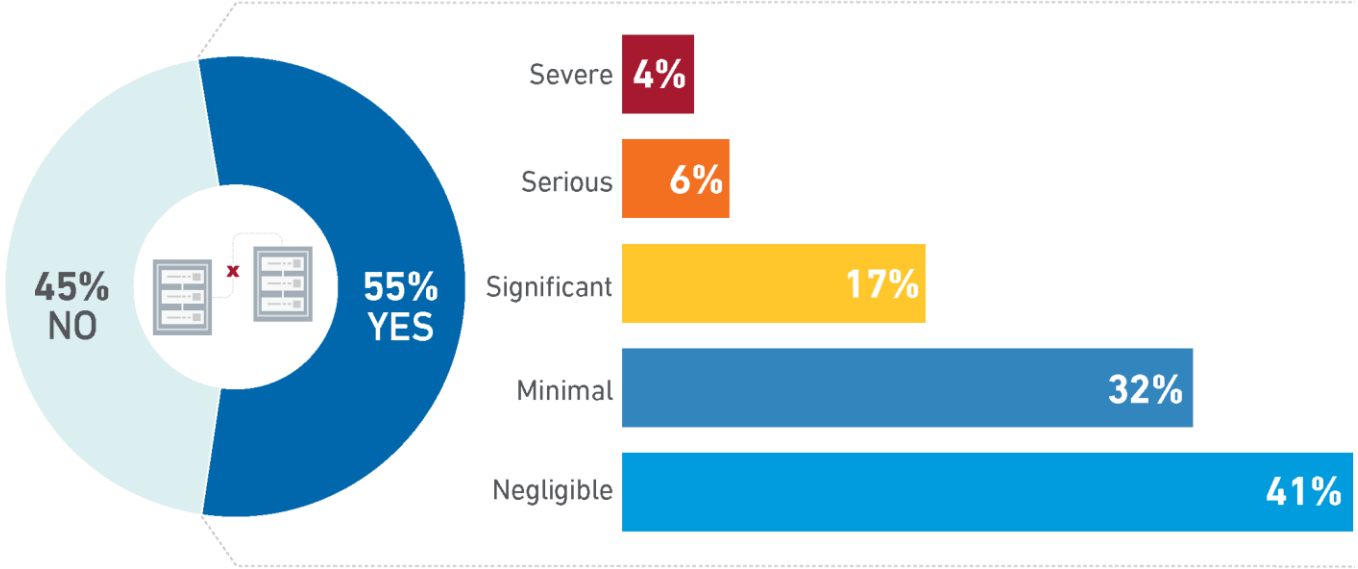
Formerly seen as the result of inadequate visibility into cloud operations

Concentration risk is a major concern for regulators, but less so for operators

6. Operators report fewer disruptive outages

Most operators had no or negligible outages in the past 3 years

On a scale of 1 (neglibible) to 5 (severe) how would you classify your organization's most impactful outage in the past three years, either in your own facility or because of a third-party service provider? (n=781)



(Responses for "Don't know" are not included.)

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Outages down from 60% in 2022, 69% in 2021 and 78% in 2020

Changes in Uptime statistical methodology in 2023 likely to have had minor effect

COVID-19 played a major role in previous years' data – but is difficult to quantify

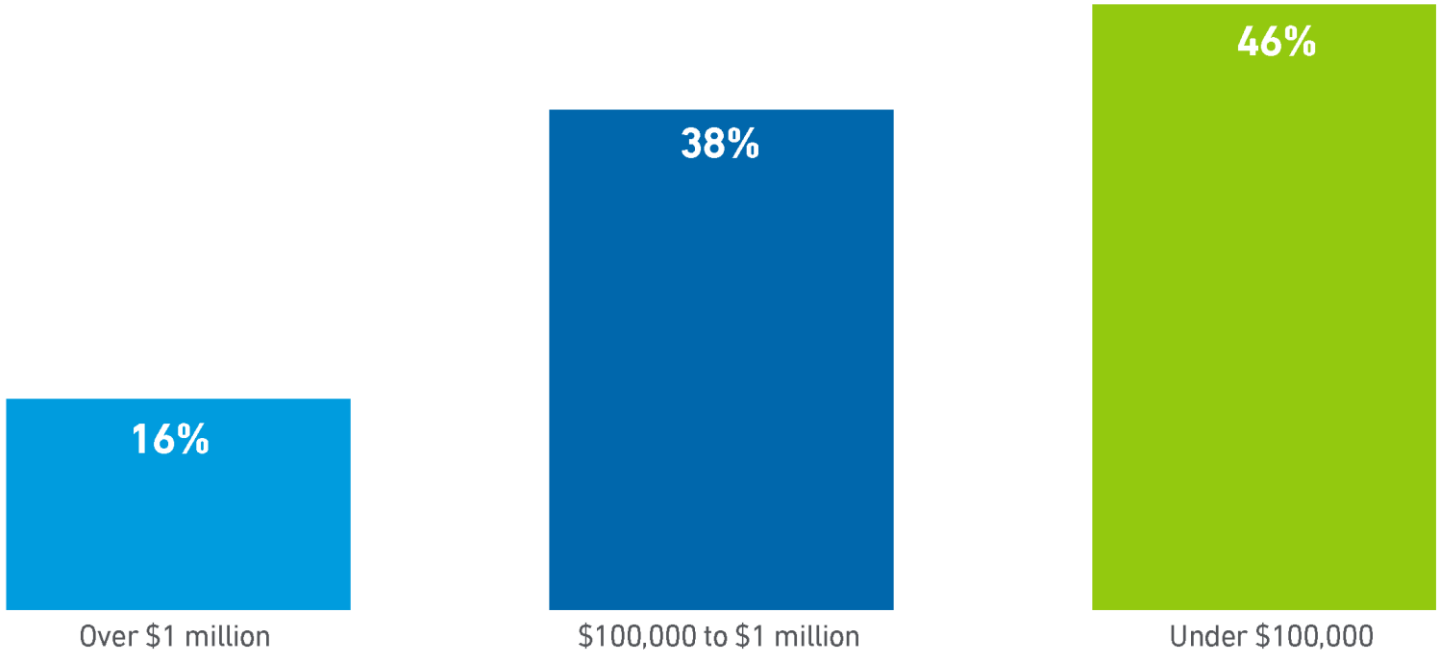
Cost of outages remains high

Lower frequency of serious and severe outages, but those that occur are often expensive

Inflationary and legal factors likely to maintain high outage costs

Half of impactful outages cost over $100k

Please estimate the total cost of this downtime incident (from outage to full recovery) for your organization, including direct, opportunity and reputation costs using the following options. (n=94)



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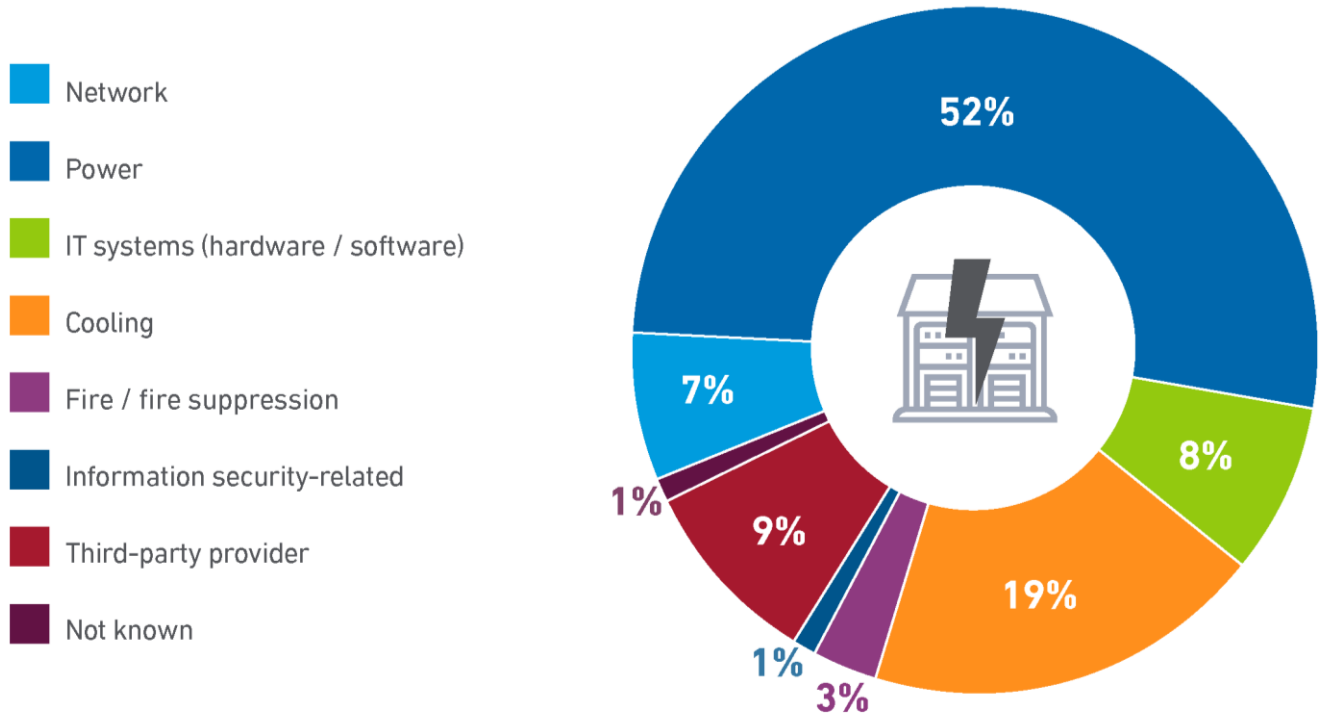
7. Power issues are the top cause of disruption

Power remains the number one root cause to tackle

What was the primary cause of your organization's most recent impactful incident or outage? (n=108)



Marginal increase in share of power-related outages compared to previous years

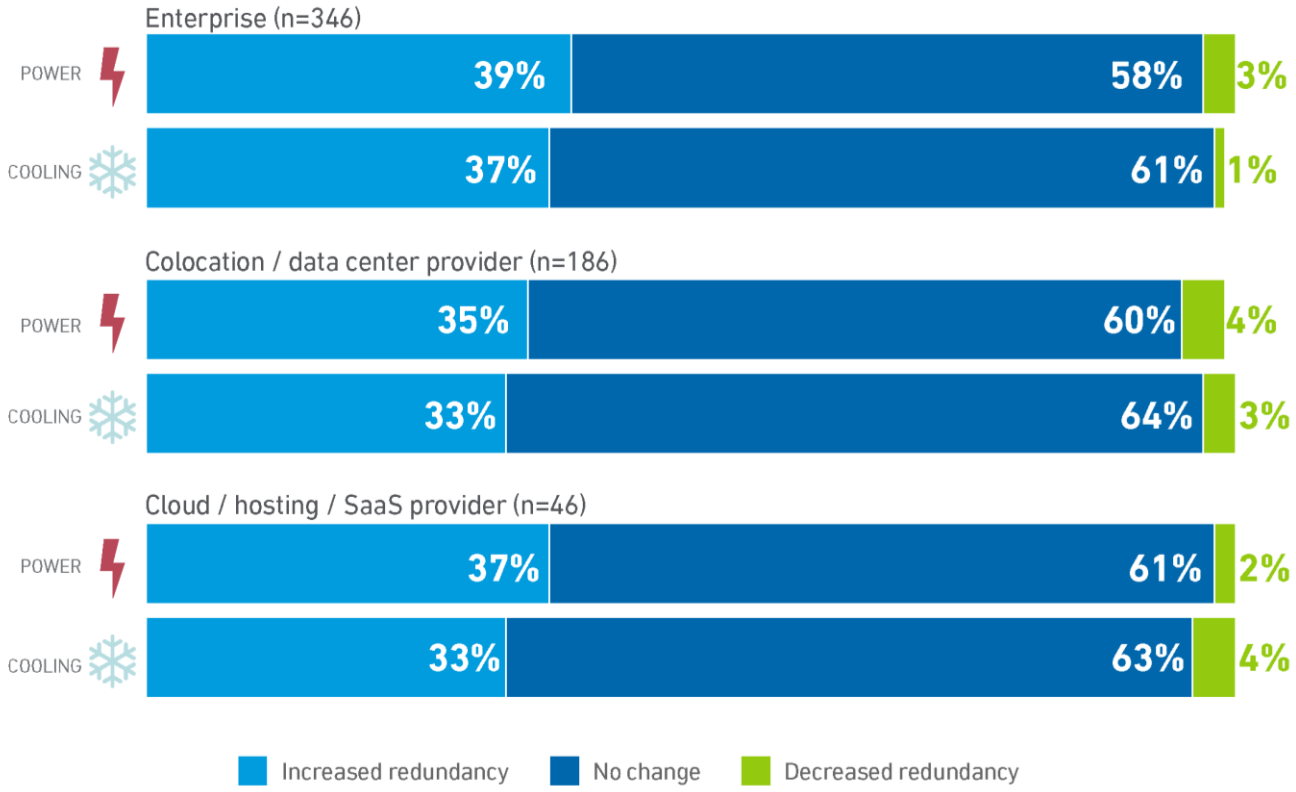
Other Uptime research indicates UPS issues are most common cause of IT outages

Slight uptick in 3rd party outages reflect greater use of cloud / hosting / SaaS

Investing to increase resiliency

Physical site redundancy still climbing

How have redundancy levels changed in the past three to five years in your data center?



(All figures rounded.)

Operators continue to invest in site-level infrastructure redundancy

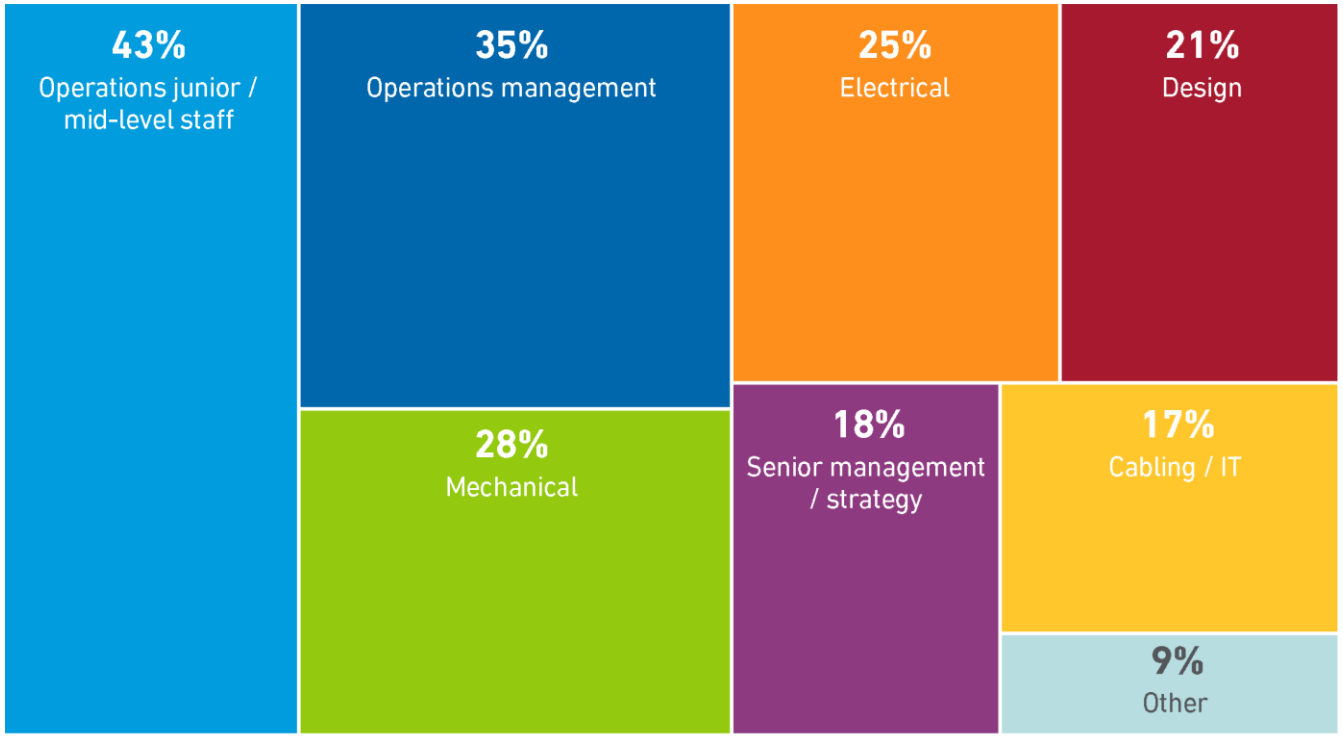
Likely driven by grid instability, climate-related risks, and growing adoption of fault-tolerant designs

Availability of replacement systems or components may have reinforced this trend

8. Staff pipelines are dry, poaching is high

Operations, mechanical, and electrical staff face skill gaps

In which of the following areas is your organization experiencing significant gaps in skills? Choose all that apply. (n=723)



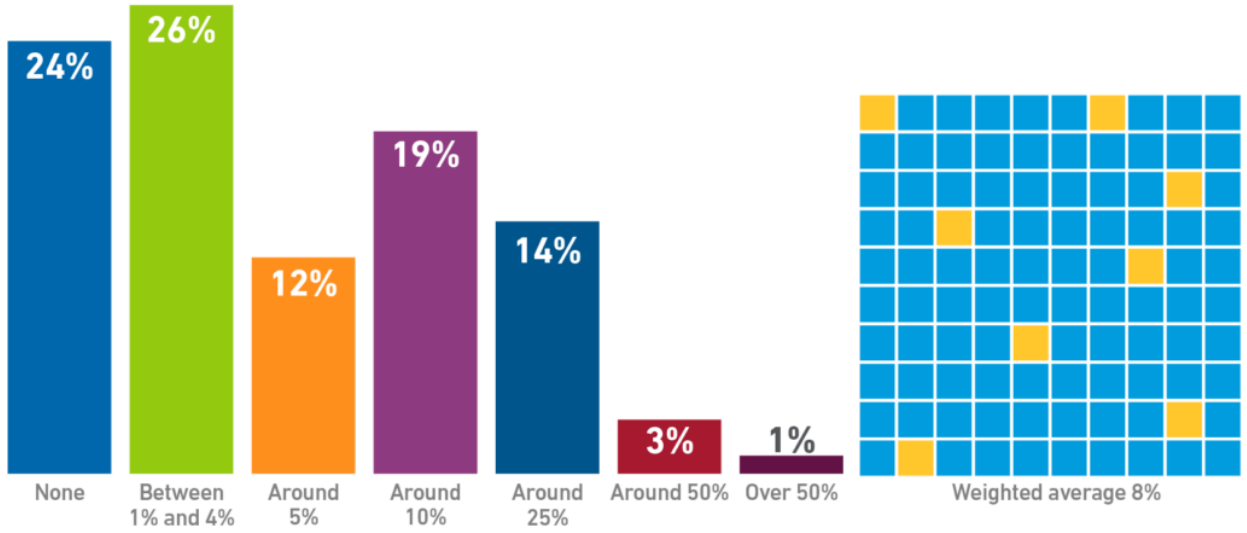
Filling skill gaps will require immediate investment – but returns will take time

Organizations may seek career changers with transferrable skills in the meantime

9. Data centers are still a boy's club

Data center teams lack gender diversity

What portion of your organization's data center design, build or operations staff is women? (n=749)



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Women and other marginalized groups may be deterred from careers in data centers due to a lack of representation

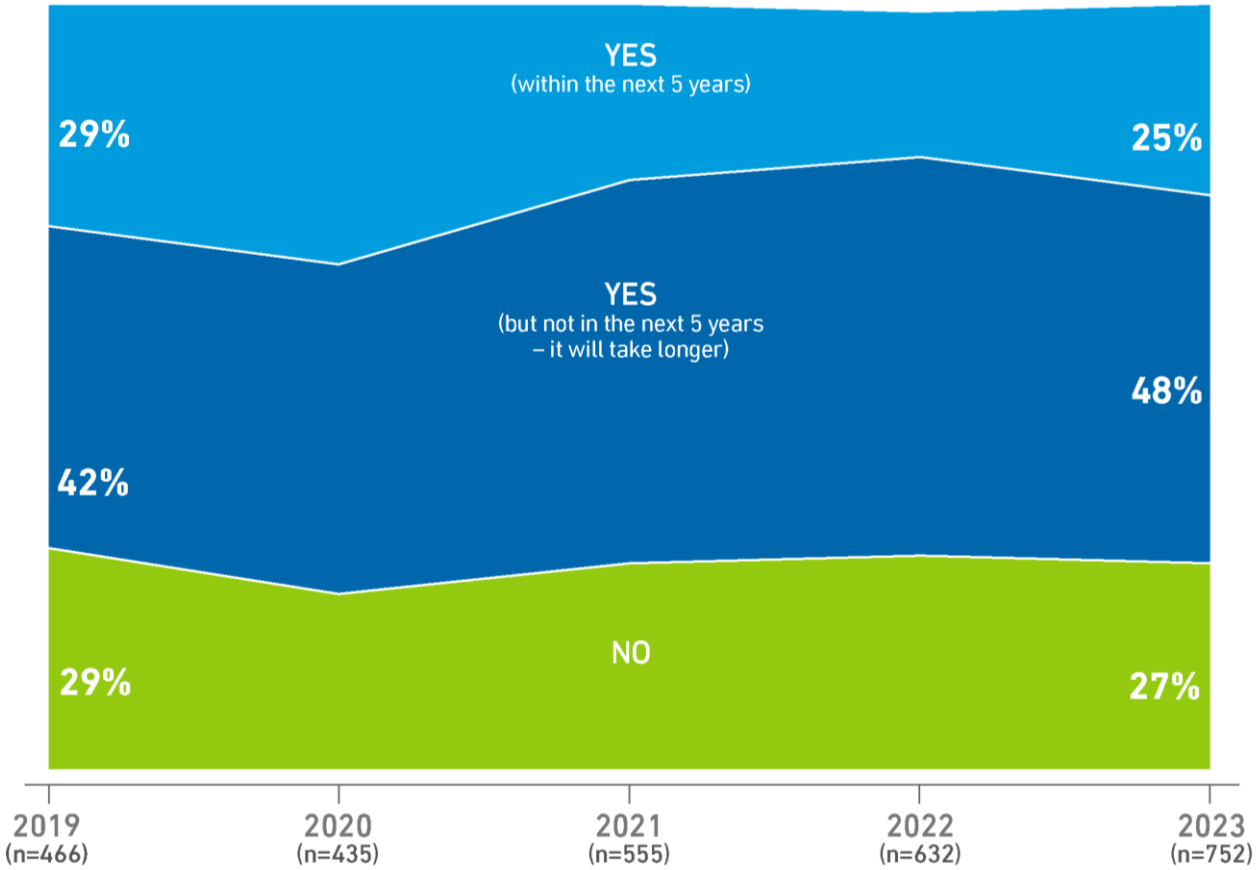
This can result in further reducing the stream of incoming talent

Gender imbalance (8% weighted average) is worse than in other (male dominated) sectors, including construction and mining

10. Perception of AI's looming influence does not reflect reality

Fewer expect AI to reduce staffing in the near term

Do you believe artificial intelligence will reduce your data center operations staffing levels in the next five years?



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AI in data centers has been mostly limited to optimization, detection and predictive maintenance

Expectation of short-term impacts on staffing increased in 2023

Growing media coverage of AI (ChatGPT, Stable Diffusion, etc.) likely a contributing factor

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Uptime Institute is the Global Digital Infrastructure Authority.
Uptime Institute is headquartered in New York, NY, with offices in Seattle, London, Sao Paulo, Dubai, Singapore, and Taipei.

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