

CONTAINER MARKET ADOPTION SURVEY 2016



A Joint Production of:



ClusterHQ
Container Data Management

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EXECUTIVE SUMMARY

Over the course of April-May 2016 DevOps.com and ClusterHQ conducted a survey of 310 respondents regarding their container adoption and usage patterns. The survey asked about their current and near-term plans for containers, including the biggest challenges to adoption, and what platforms and vendors they are using.

This survey is a follow up to a similar survey conducted this time last year. In this report, we will compare some of the results of the 2015 and 2016 surveys to examine how market adoption patterns have evolved, as well as the current state of the container market.

New to this year's report are the first-ever industry findings demonstrating financial and human resource investments made into containers. Additionally, the survey looks at whether or not companies adopting containers are meeting or exceeding business objectives and why some companies have not yet adopted any container technologies.

The Key Findings of the Report Include:

- 79% of respondents said that their organizations run container technologies, with 76% of them in production environments. This represents a significant advance from last year where only 38% of respondents had deployed containers in production.
- The biggest drivers of container adoption are to increase developer efficiency (39%) and support microservices (36%).
- More than two thirds of respondents are realizing the expected results from their container usage.
- While containers running on Windows has received a lot of press recently, Linux remains the dominant platform for containers, with less than 2% of users reporting Windows as their primary container environment.
- Docker remains by far the dominant container engine technology with 94% of users saying they use Docker containers. Kubernetes is the leading choice for container orchestration and management.
- In terms of where containers are deployed, Amazon Web Services (AWS), unsurprisingly leads as the most used infrastructure. However, in-house data centers, while a lower percentage than last year, are a strong second location of choice.
- Of respondents who had knowledge of their company's financial investment into containers, 52% reported that their company is making a financial investment, sometimes in the millions of dollars.
- Similarly to last year, the biggest challenges to container deployment include persistent storage, networking, security and data management. However, the order of these challenges shifted in a way that runs counter to many reports. This year, persistent storage was the most oft-cited challenge and security came in third, a surprising finding based on how often security is positioned as a large concern with containers.
- On average, 72% of organizations using containers met or exceeded business and IT objectives, while only 63% of respondents not using containers achieved or exceeded both business and IT goals.
- The leading reason why some organizations have not adopted containers is that not enough is yet known about container technologies in order to justify investing any resources in them.

DEMOGRAPHICS

Of the 310 people polled, an overwhelming majority of them work for smaller organizations. This was a similar distribution to last year's survey. While that may indicate that larger organizations have different usage patterns, when filtering for larger organizations the responses do not show a material deviation.

The majority of survey takers reported working for development and DevOps teams; these groups comprised over 75% of all respondents.

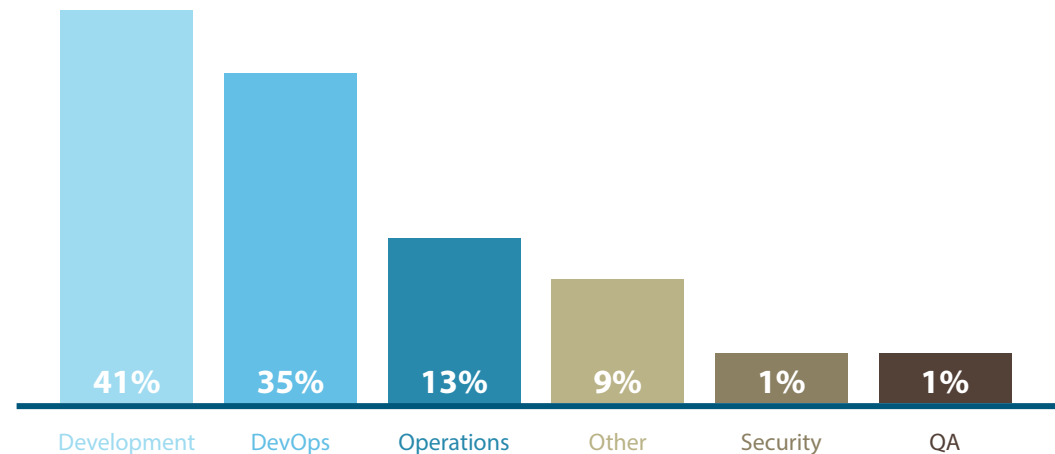
How many employees are in your organization?

ANSWERED: 308



Which of the following best describes your primary role?

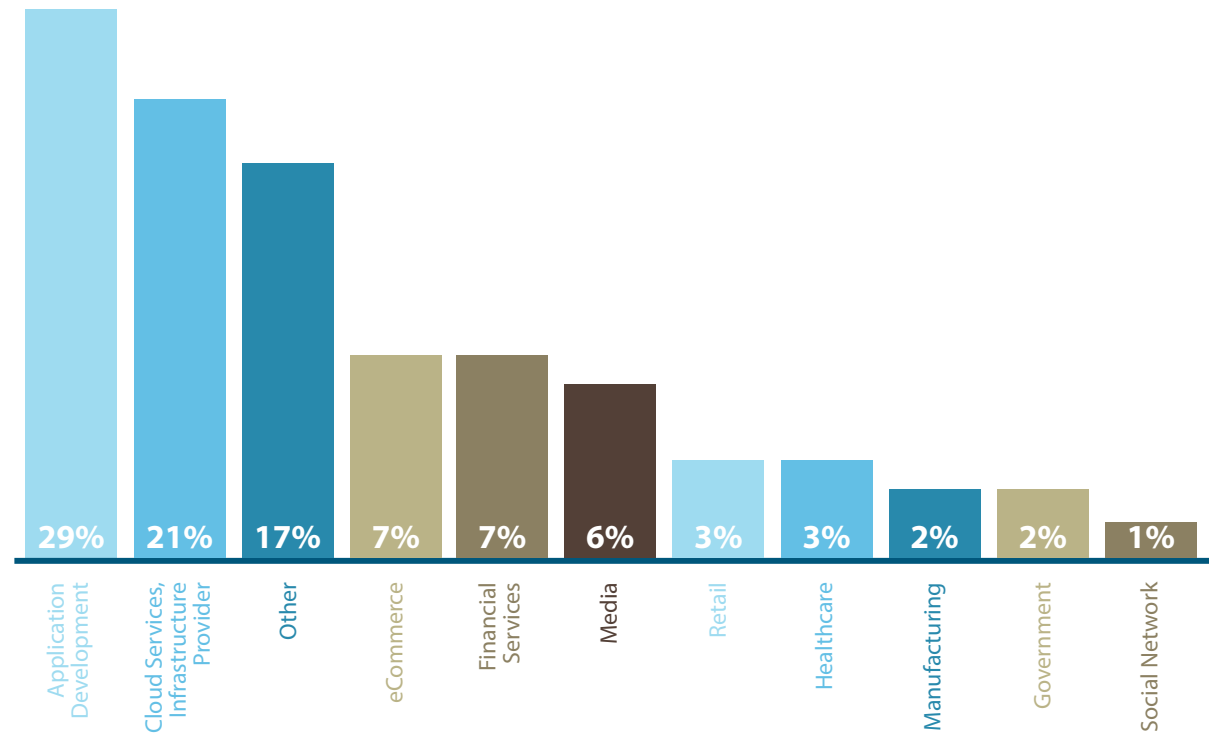
ANSWERED: 310



The survey respondents also came from a wide variety of industries, with application development making up the largest group (29%).

Which industry is your organization in?

ANSWERED: 298



CONTAINER USAGE

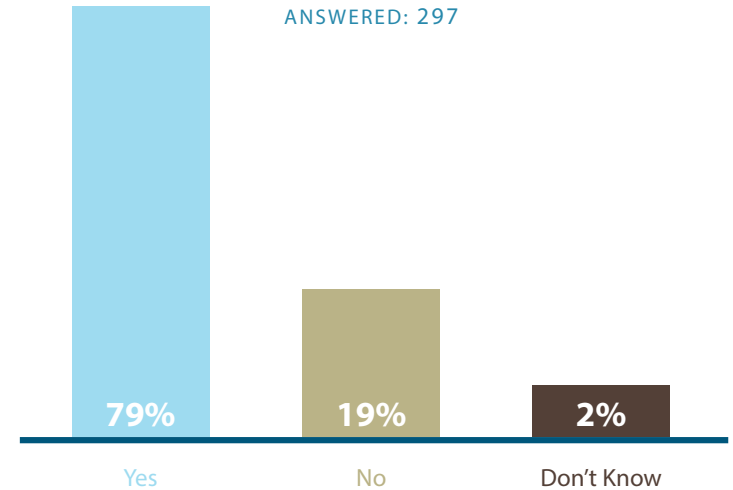
Nearly 80% of respondents reported using container technologies in their organization.

There was a sharp jump in container usage in production from last year's survey. While only 38% of respondents in 2015 said they were using containers in production, this year 76% of respondents made that claim, a doubling of production container usage in a year.

When filtered again for only large organizations of 500 employees or more, slightly less, 73%, reported using containers in production.

Does your organization run container technologies?

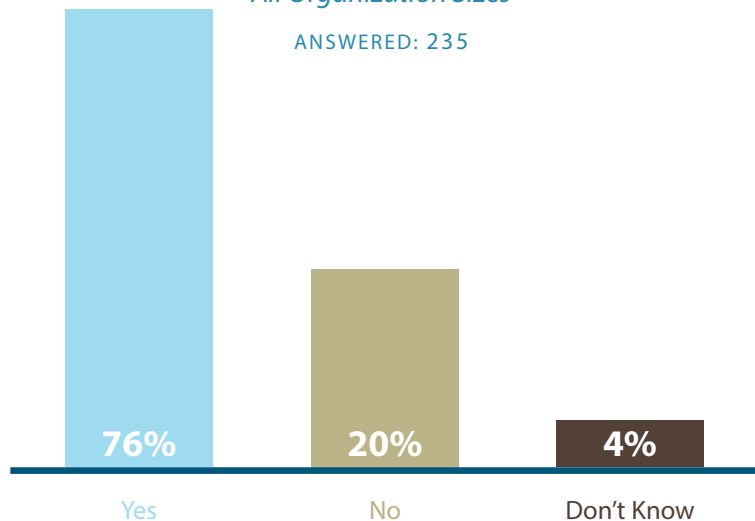
ANSWERED: 297



Is your organization running container technologies in production?

All Organization Sizes

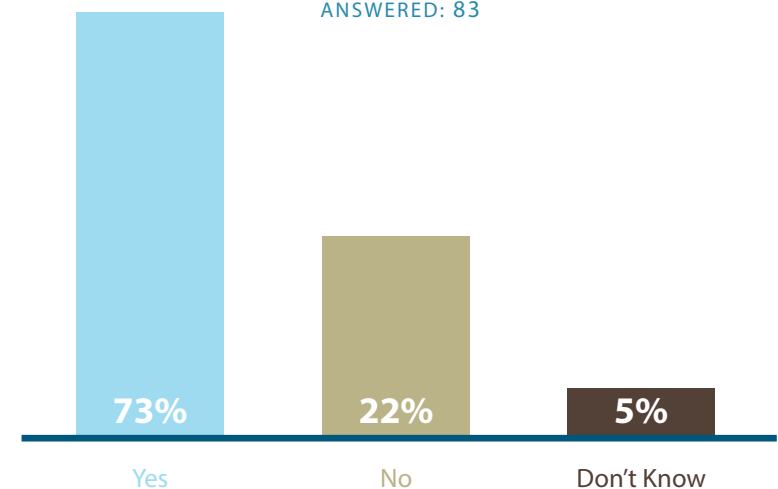
ANSWERED: 235



Is your organization running container technologies in production?

Organizations with 500+ Employees

ANSWERED: 83



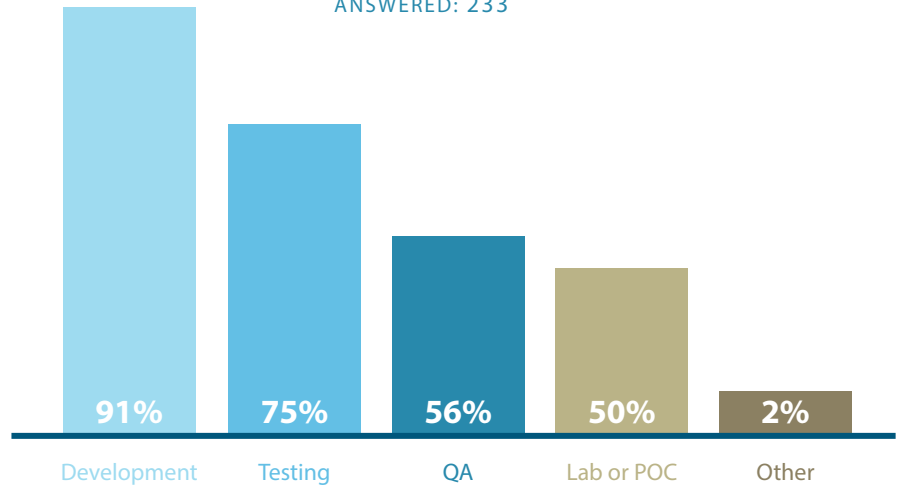
NON-PRODUCTION ENVIRONMENT USAGE

When asked what non-production environments respondents are running containers in, the answers were well distributed. However, development was chosen by more than 90% of those who responded. Testing was a somewhat distant second choice (Note, respondents could select multiple answers, which is why percentages add up to more than 100%).

When asked to select which environment respondents use containers in most frequently, development was still the leading choice, but not nearly as dominant.

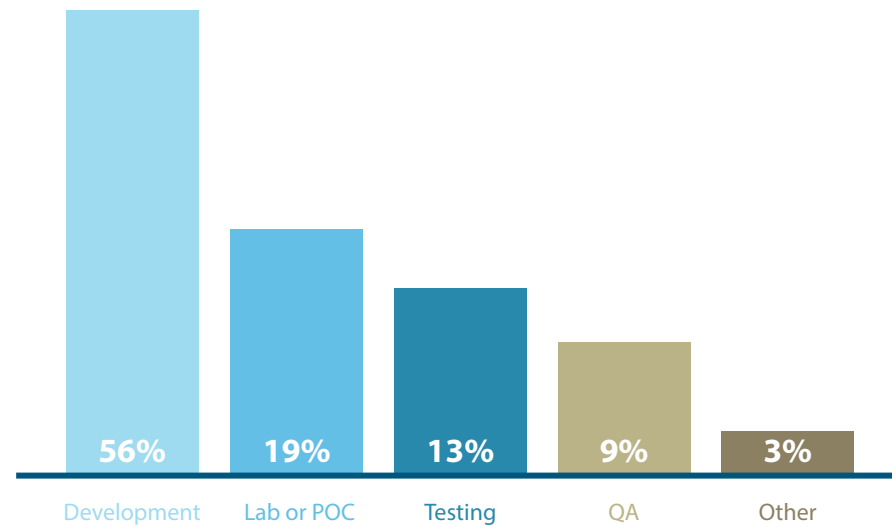
Which of these non-production environments is your organization running containers in?

ANSWERED: 233



Which of these non-production environments is your organization running containers in most frequently?

ANSWERED: 230



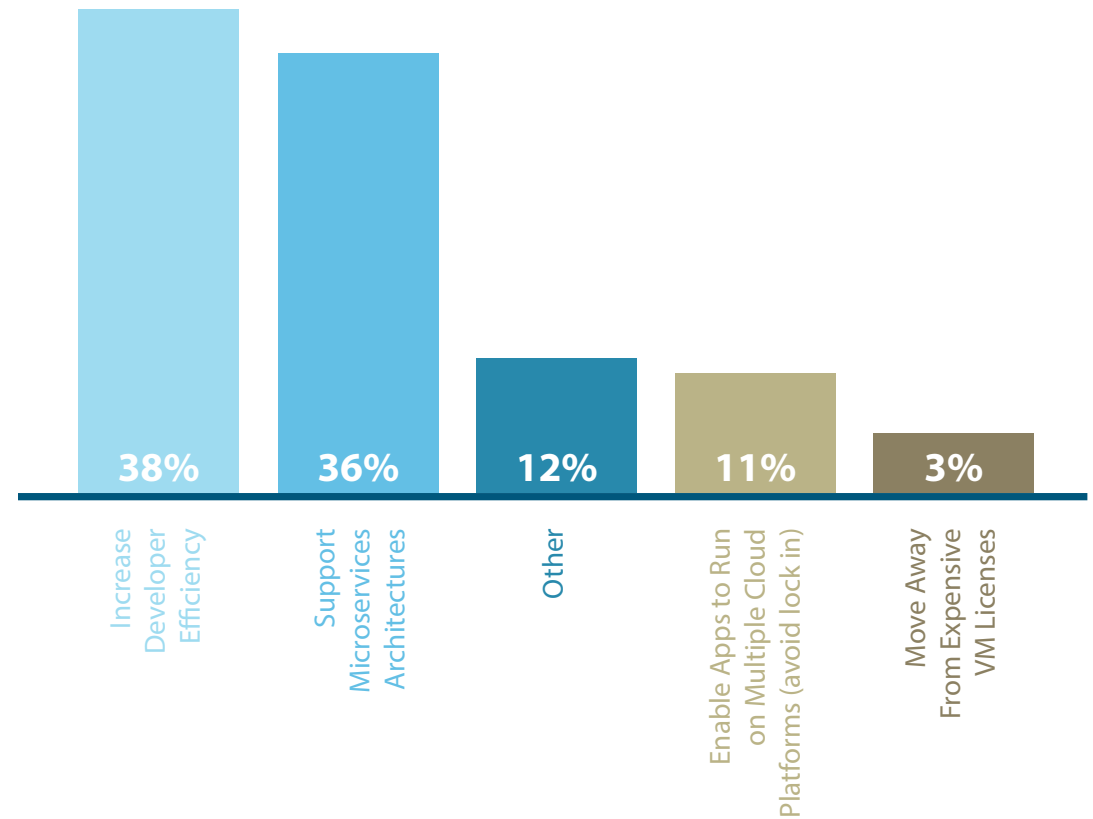
Why use containers? There are a myriad reasons; this portion of the survey asked survey takers that question.

When asked what was driving container usage in their organizations, two main drivers were selected by nearly 75% of users: increasing developer efficiency and supporting microservices.

Selectors of the option 'other' reported reasons such as: simplified packaging, a consistent deployment process, security, isolated application execution and all of the above.

What is the primary reason why your organization is running container technologies?

ANSWERED: 226

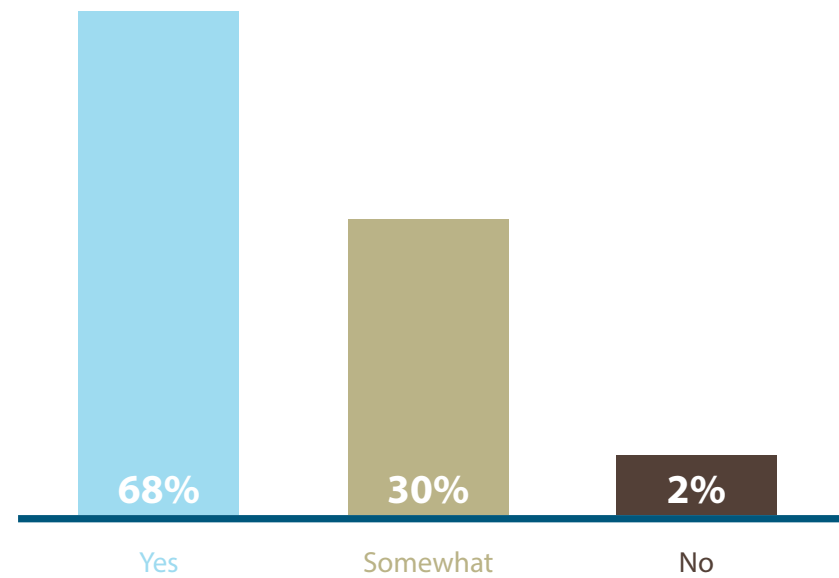


CONTAINER SATISFACTION

When asked if containers were providing their organization with the results they expected, over two thirds of respondents answered affirmatively.

Are containers providing your organization with the results it was expecting?

ANSWERED: 223



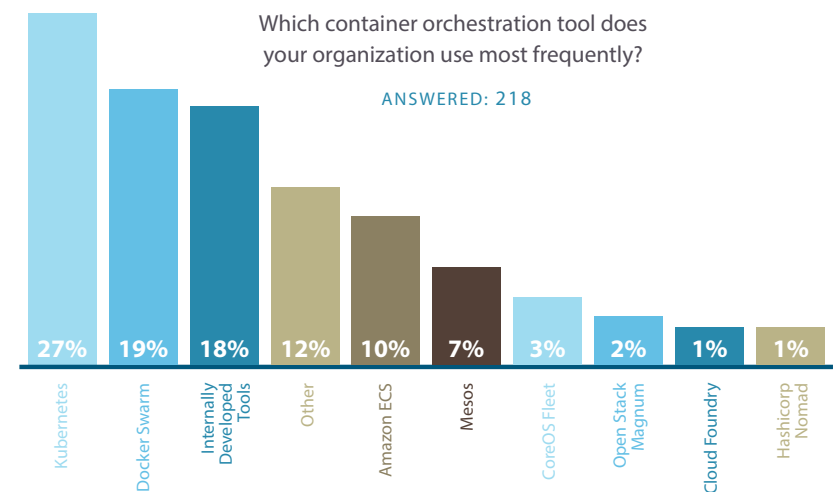
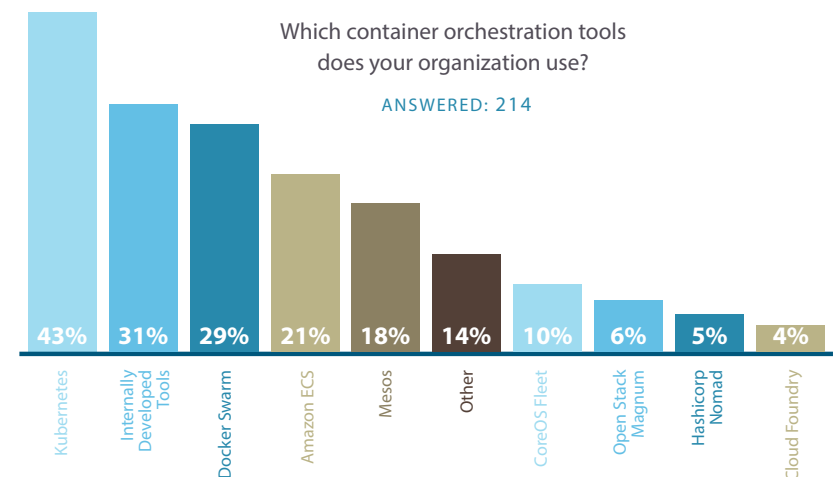
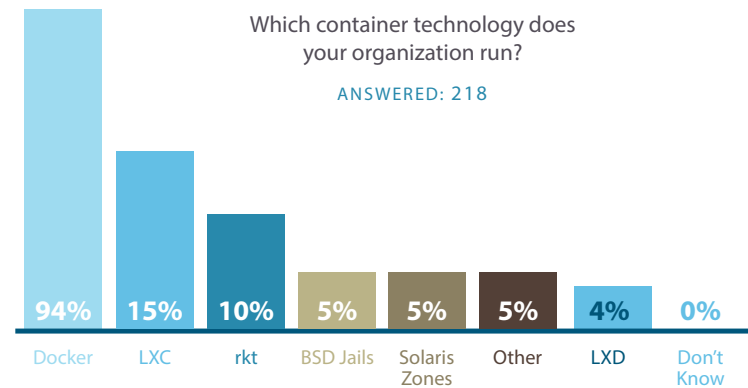
CONTAINER ORCHESTRATION TOOLS AND PLATFORMS

This series of questions asked about which container technologies are being used and where.

Docker maintains its position as the container of choice, with 94 percent of respondents saying they use the Docker container engine.

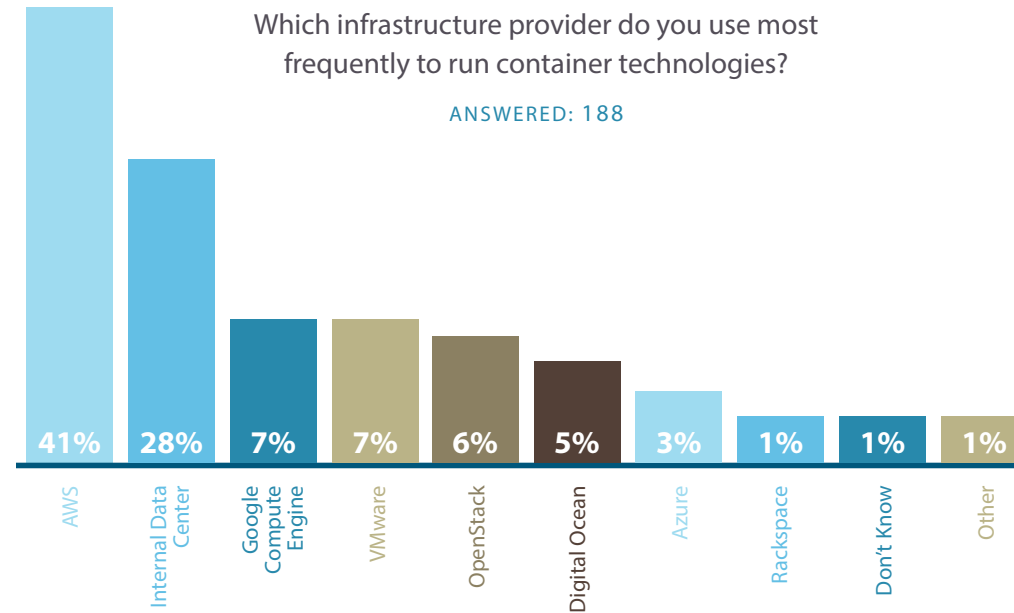
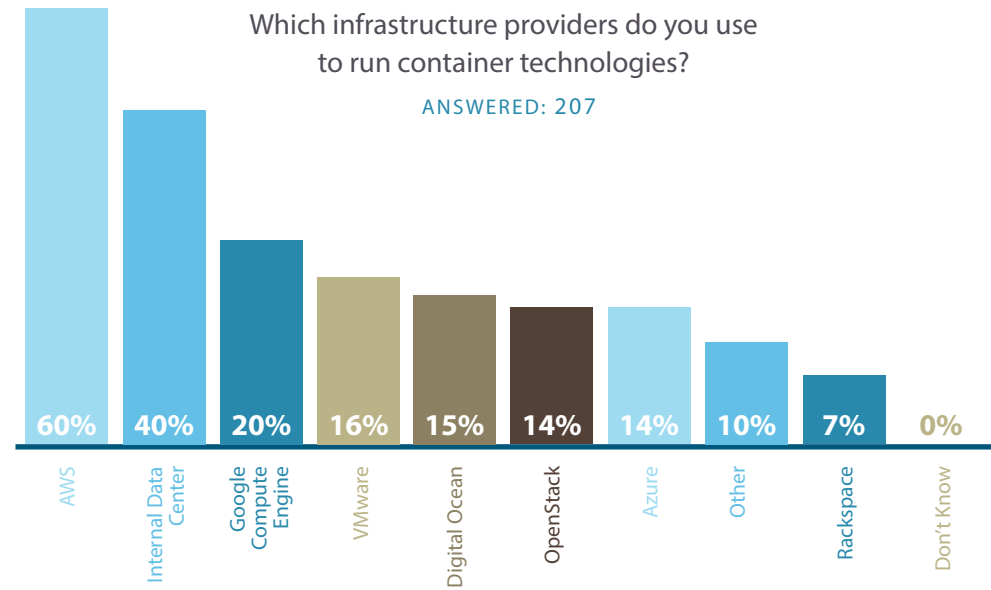
This year's survey findings demonstrate the growing popularity of Kubernetes for managing Docker containers. Last year, 50 percent of respondents selected Docker Swarm as the orchestration tool they would be most likely to consider, followed by Kubernetes (38%) and Mesos (35%). This year's results show that while Docker Swarm maintains a strong position, Kubernetes is the most widely used container orchestration tool. (Note, respondents could select multiple answers, which is why percentages add up to more than 100%).

Respondents were asked to select all the container orchestration tools they currently use. This indicates that people are still experimenting with multiple container managers to figure out which is the right tool for the job. Kubernetes was also reported as being the most frequently used tool, in comparison to the others available. The uptake in the use of Kubernetes provides market evidence that Google's investment in the industry has paid off in a short amount of time.



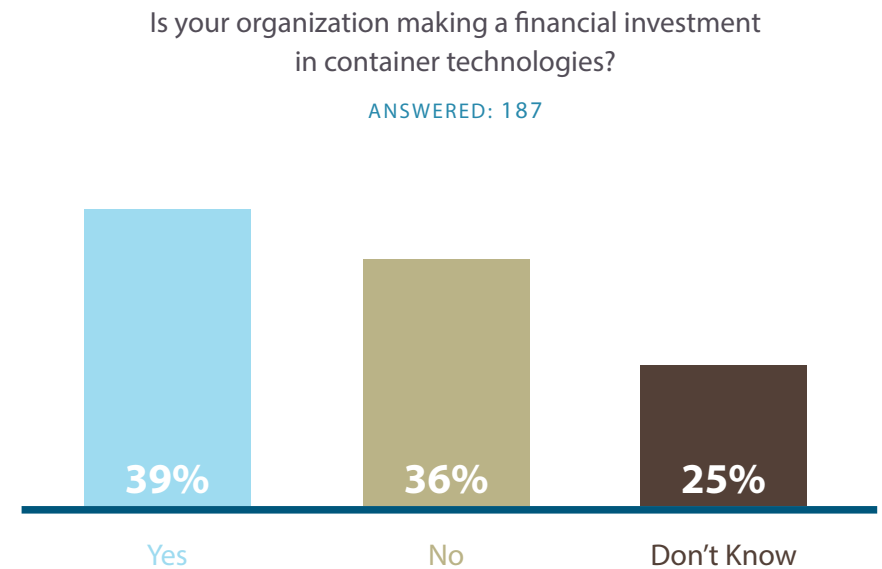
INFRASTRUCTURE OF CHOICE

A surprise in the next set of questions was that respondents host containers in private data centers (or on-prem) second only to AWS, which was cited as the most frequent and most popular infrastructure choice.



FINANCIAL INVESTMENT IN CONTAINERS

When asked if their organization was making a financial investment in containers, 39% of respondents said yes, with 36% reporting their organization has made no financial commitment to-date, and the remainder unsure.



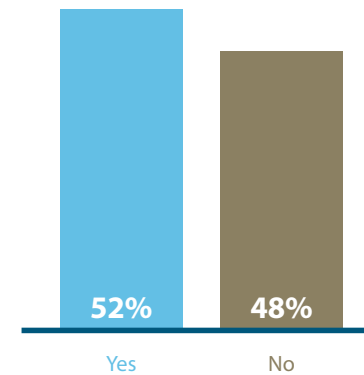
Of respondents who had knowledge of their company's financial investment into containers, 52% reported that their company is making a financial investment, sometimes in the millions of dollars.

In addition to asking about overall financial investment, the survey broke out investments in personnel, such as hiring developers, versus investments in license and user fees.

The survey asked how much of an investment companies are making. A small group stated that they are spending more than \$500,000 dollars a year on personnel (12%) or license and user fees (5%) for containers, while most reported spending less, indicating substantial room for commercial growth by container companies. As businesses continue to put containers into production, the level of investment will necessarily track other technology categories that have come before.

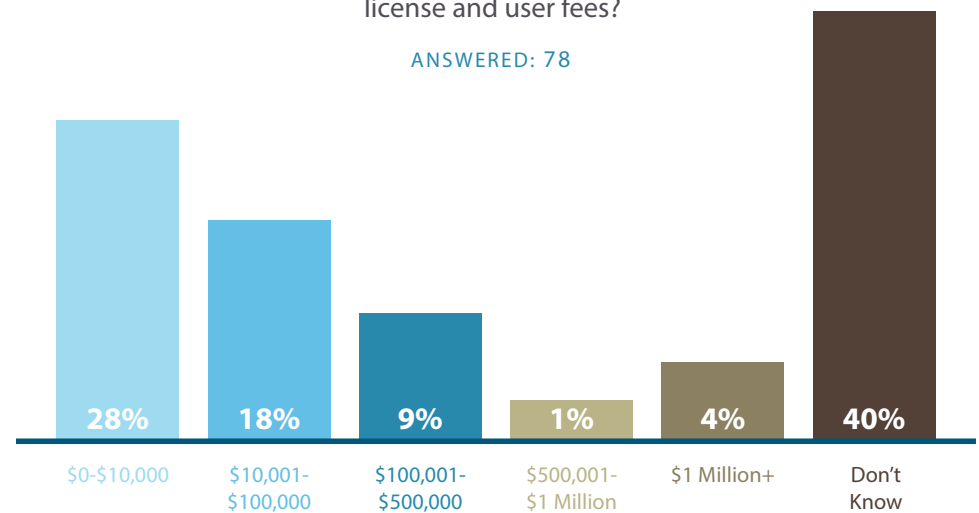
Is your organization making a financial investment in container technologies?

ANSWERED: 141



How much of an annual financial investment has your company made in container technology license and user fees?

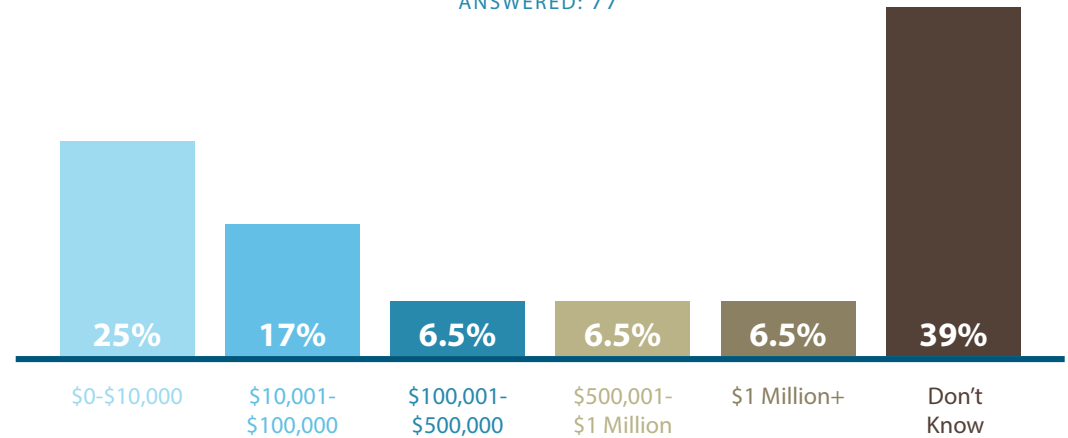
ANSWERED: 78



When respondents did report their organization had invested financially in container technologies, Docker was the overwhelming recipient of these funds, dwarfing all other options.

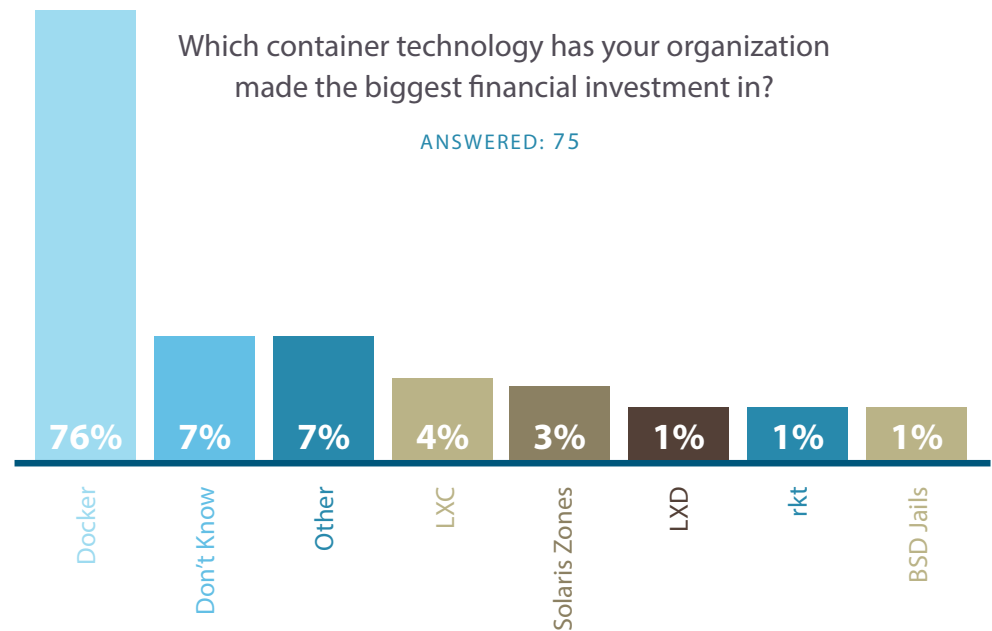
How much of an annual financial investment has your company made in personnel expenses to use container technologies?

ANSWERED: 77



Which container technology has your organization made the biggest financial investment in?

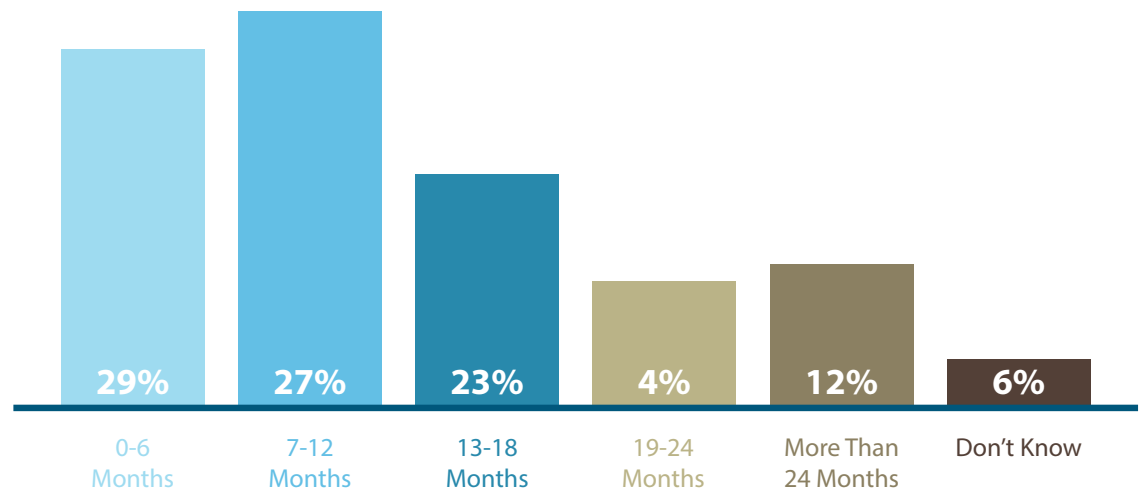
ANSWERED: 75



Also, over half of respondents (56%) say their organizations have been making these investments for less than one year.

How long has your organization been making a financial investment in container technologies?

ANSWERED: 83



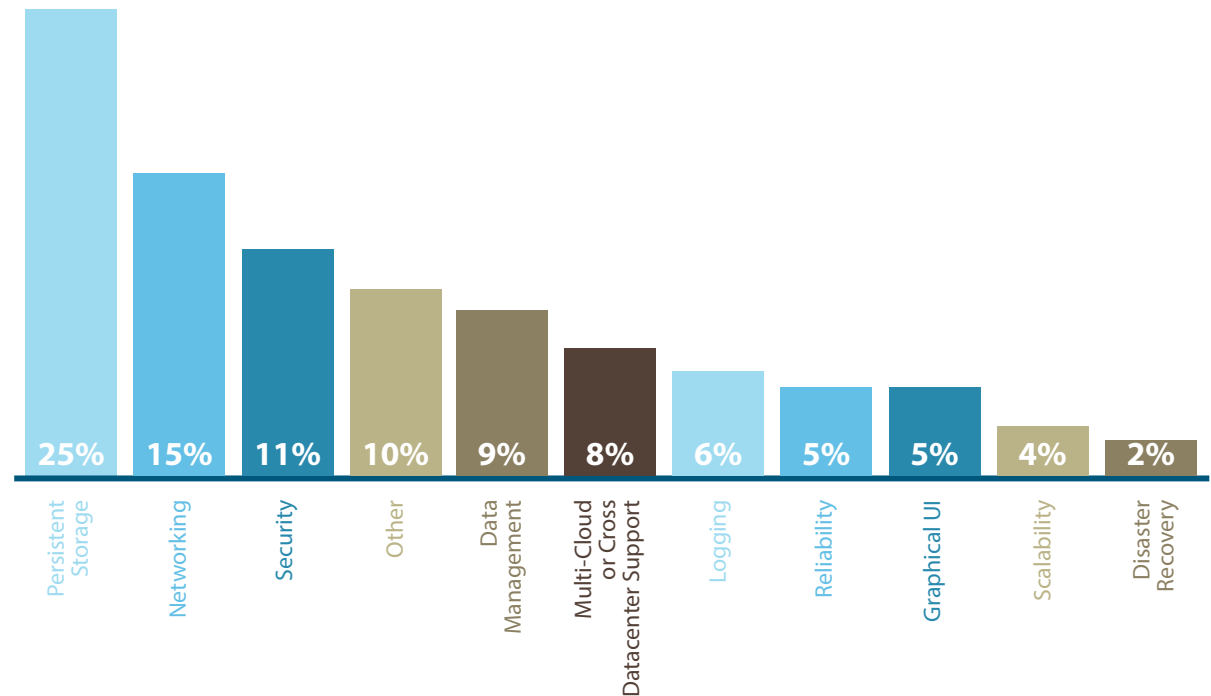
BARRIERS TO CONTAINER ADOPTION

What is the biggest challenge to overcome when adopting containers?

Last year, security was reported as the largest barrier to container adoption followed by data management, networking and persistent storage. This year's findings show that security fell to third place, with persistent storage jumping to number one.

In order to deploy containers, which challenge has been the most difficult to overcome?

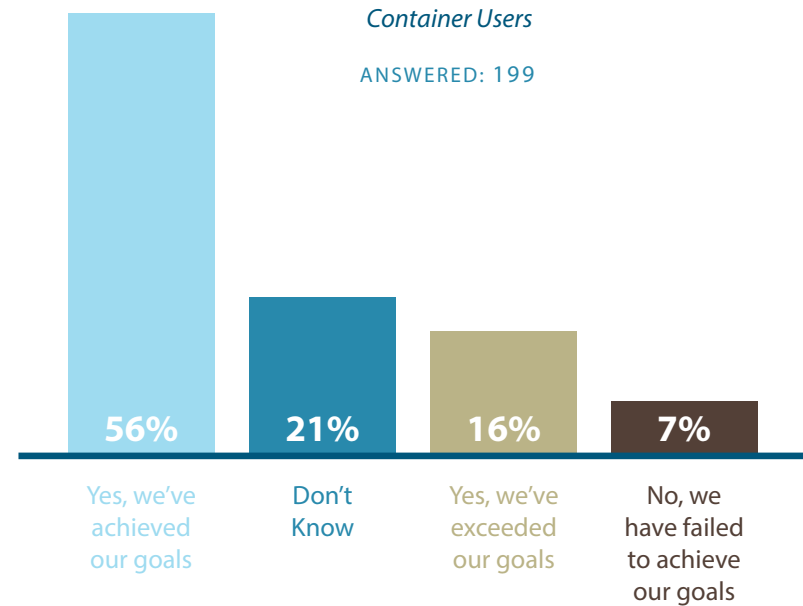
ANSWERED: 205



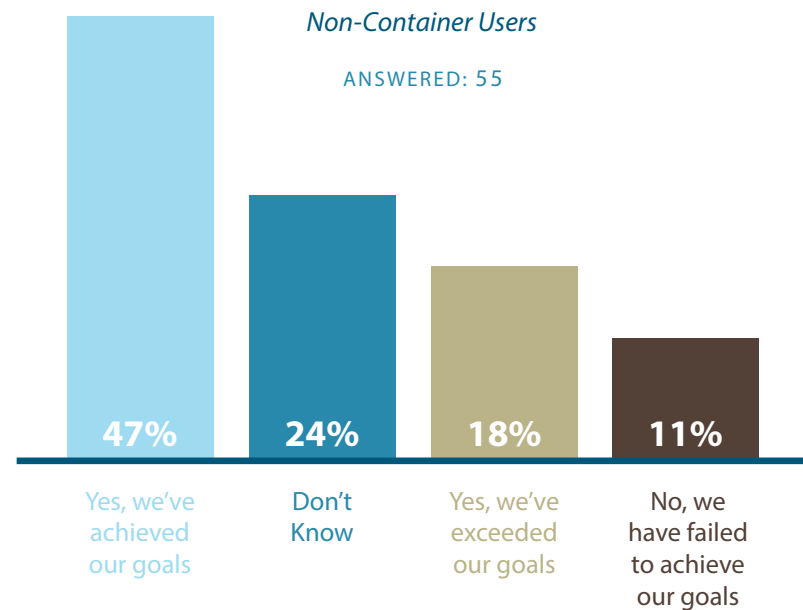
BUSINESS AND IT OBJECTIVES

On average, 72% of organizations using containers have met or exceeded business and IT objectives.

In the past 12 months, has your organization achieved its business goals as outlined by its top leaders, e.g CEO, Board of Directors?



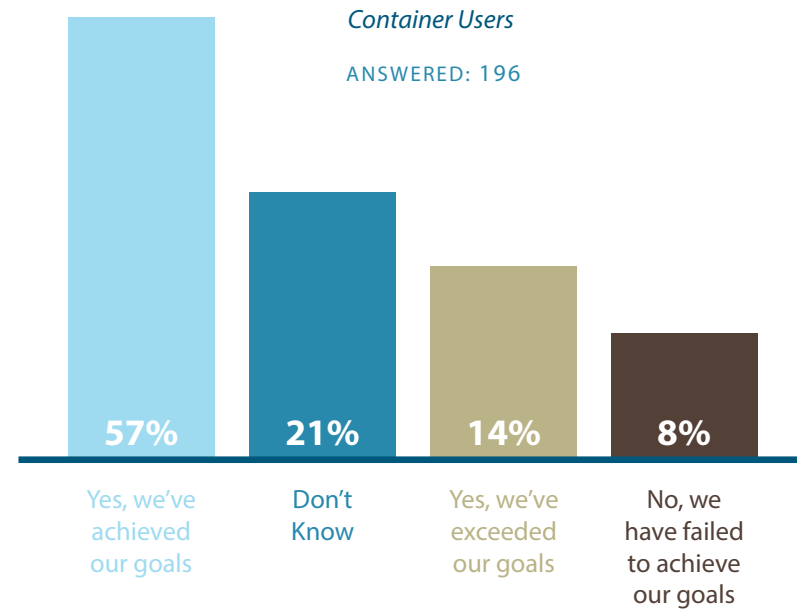
In the past 12 months, has your organization achieved its business goals as outlined by its top leaders, e.g CEO, Board of Directors?



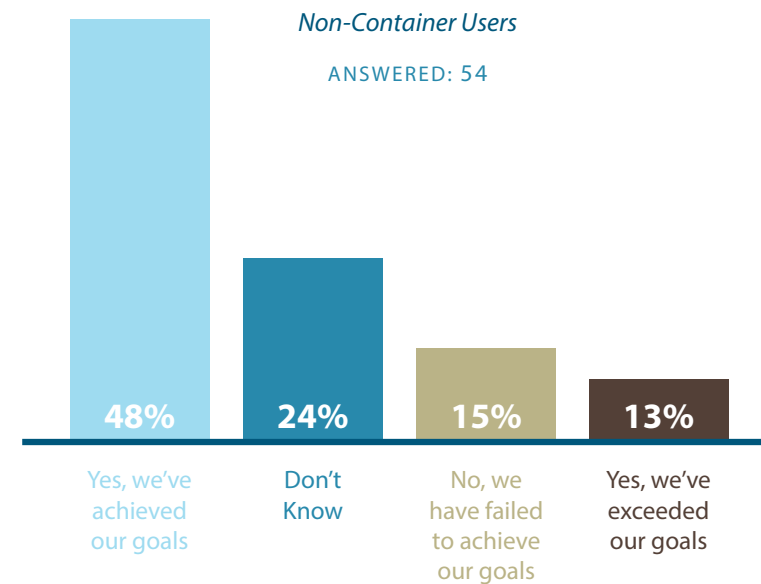
Of respondents who reported not using containers, on average only 63% said they have met or exceeded both business and IT goals in the last twelve months.

While the 9% difference may not appear significant, it is in fact a large enough gap to show that not only are containers working as intended, but they are helping achieve better results for those organizations using them.

In the past 12 months, has your IT team met their goals as outlined by its top IT leaders, e.g. CIO?



In the past 12 months, has your IT team met their goals as outlined by its top IT leaders, e.g. CIO?



WHY AREN'T ORGANIZATIONS USING CONTAINERS?

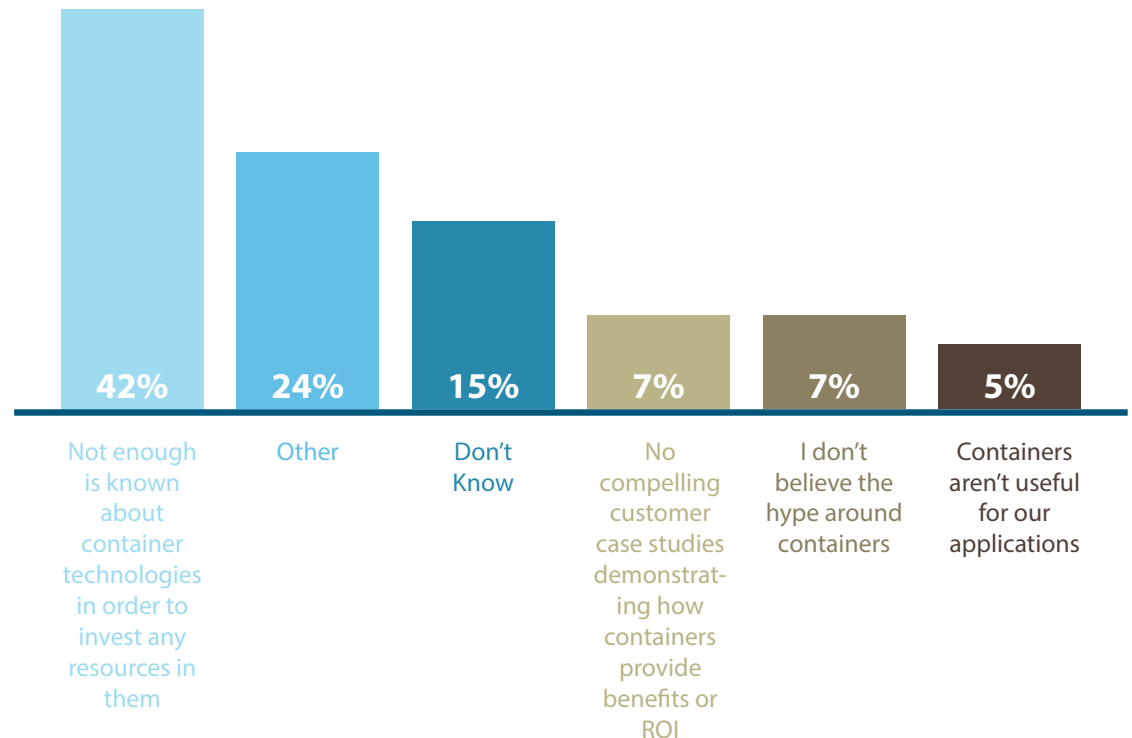
For respondents who answered that their organization is not currently using containers, they were asked to report why this was the case. Most commonly, respondents selected that there is still not enough information available about the technology. This would indicate that the container industry as a whole, still has a lot of educating to do.

CONCLUSION

Once again this year's survey justifies why containers are one of the hottest areas in IT. Usage of container technologies is growing and use of containers in production environments has skyrocketed. It is poised to become a dominant architecture for application development and deployment in the near future.

What is the primary reason why your organization isn't using container technologies today?

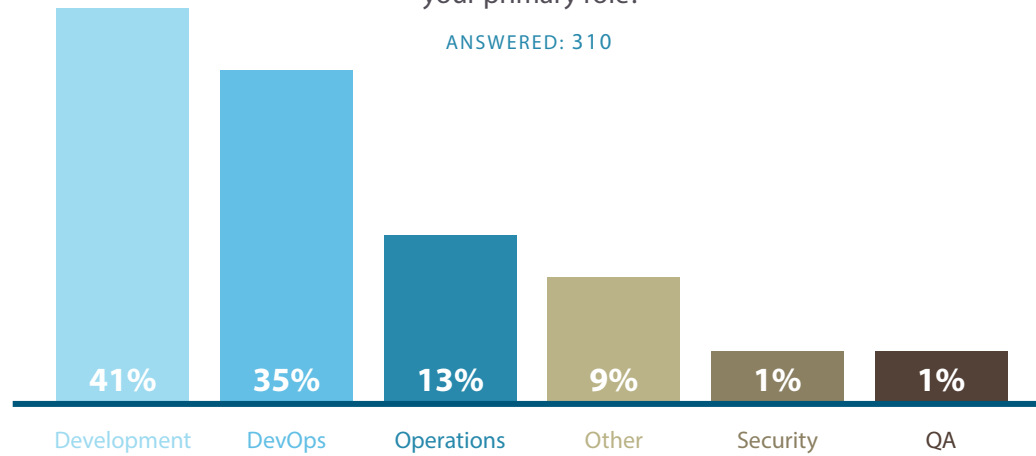
ANSWERED: 59



APPENDIX

Q1: Which of the following best describes your primary role?

ANSWERED: 310



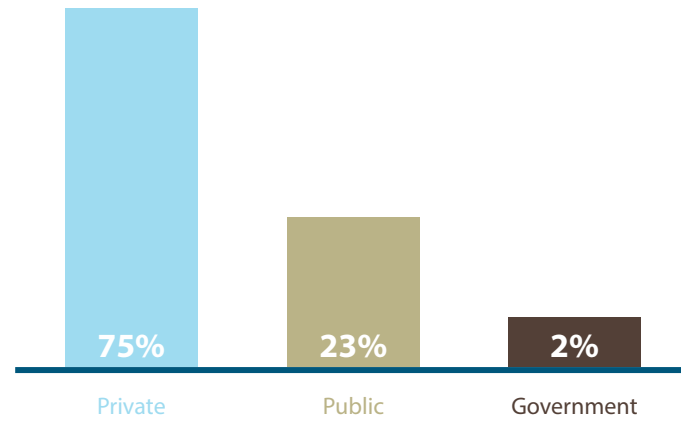
Q2: How many employees are in your organization?

ANSWERED: 308



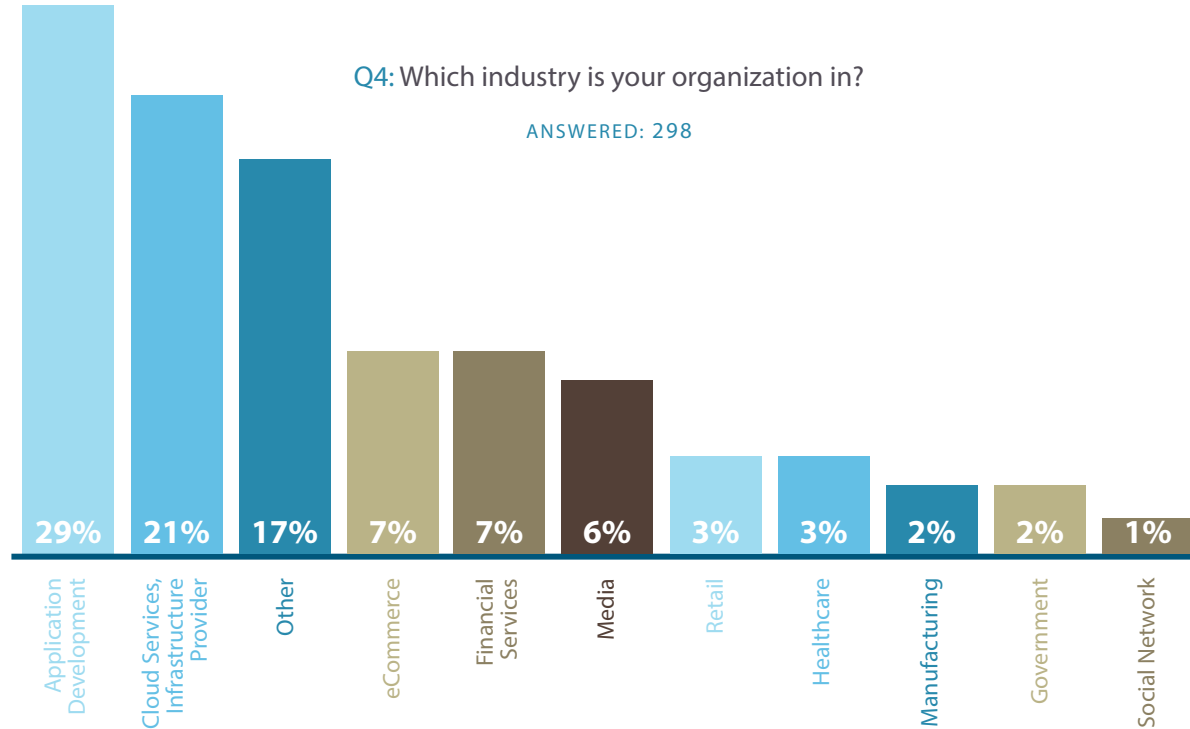
Q3: Which best describes the type of organization you work for?

ANSWERED: 306

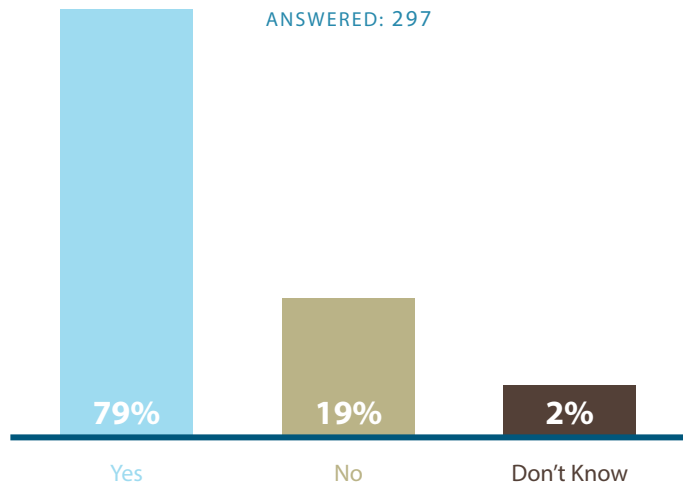


Q4: Which industry is your organization in?

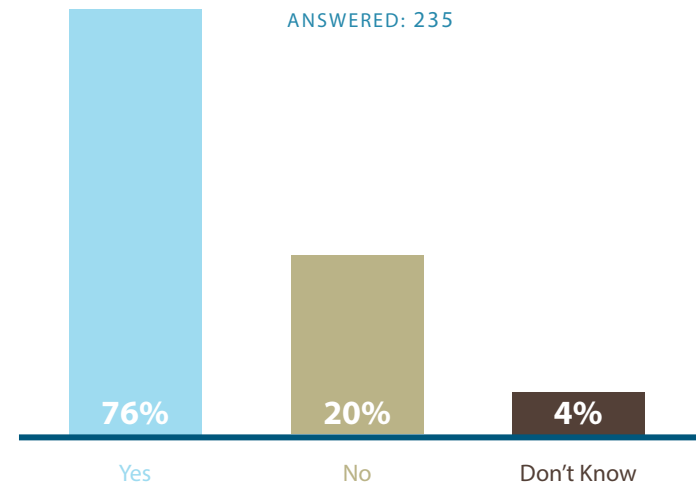
ANSWERED: 298



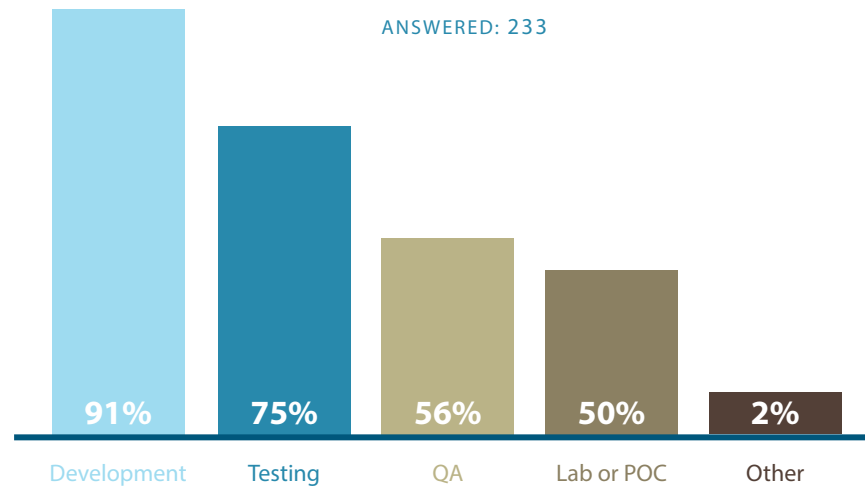
Q5: Does your organization run container technologies?



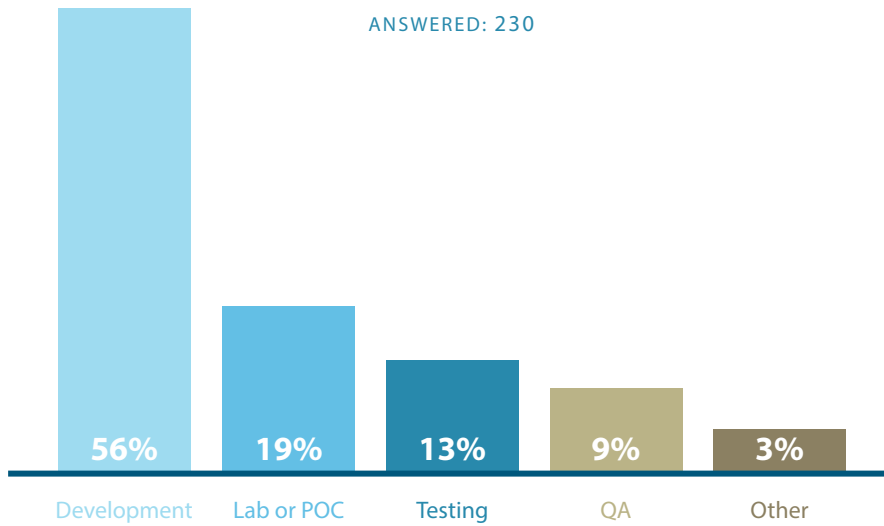
Q6: Is your organization running container technologies in production?



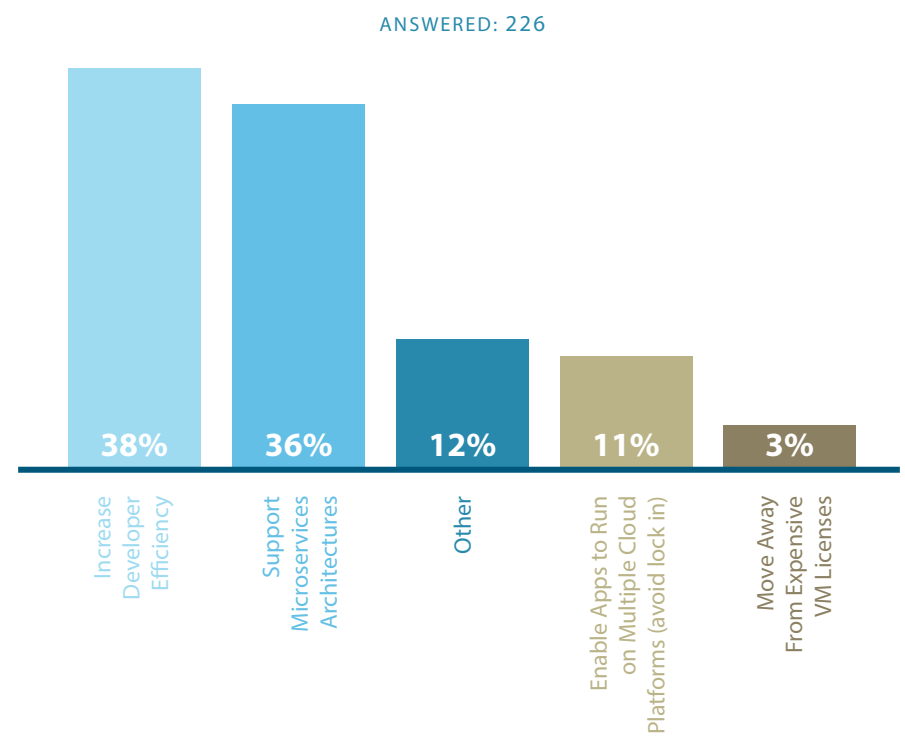
Q7: Which of these non-production environments is your organization running containers in?



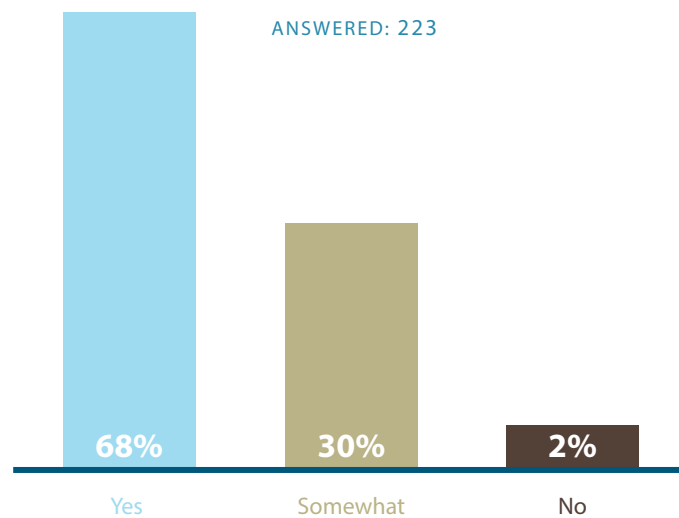
Q8: Which of these non-production environments is your organization running containers in most frequently?



Q9: What is the primary reason why your organization is running container technologies?

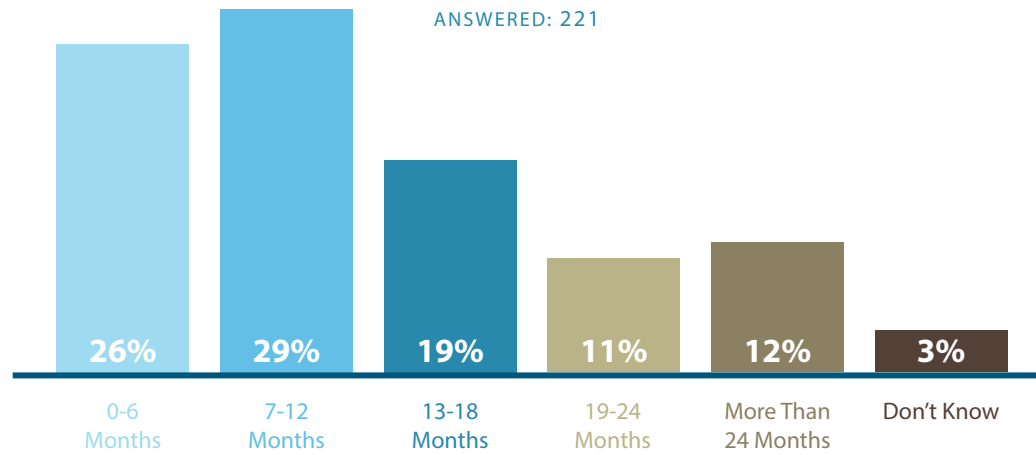


Q10: Are containers providing your organization with the results it was expecting?



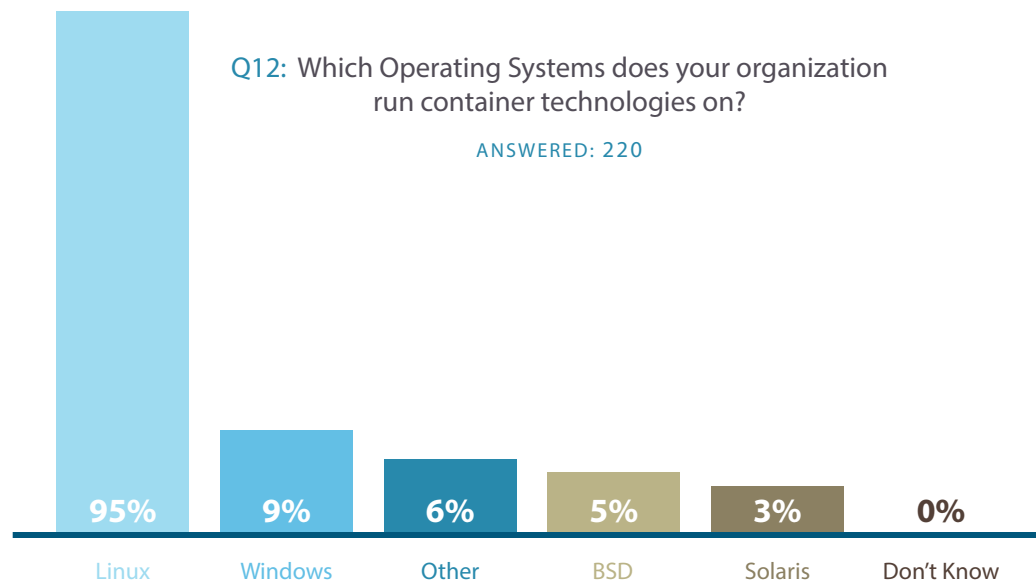
Q11: How long has your organization been running container technologies?

ANSWERED: 221



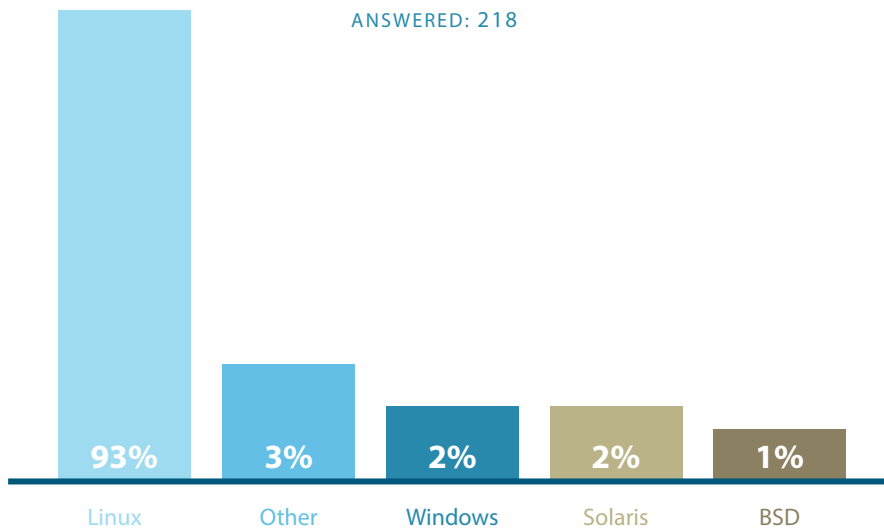
Q12: Which Operating Systems does your organization run container technologies on?

ANSWERED: 220



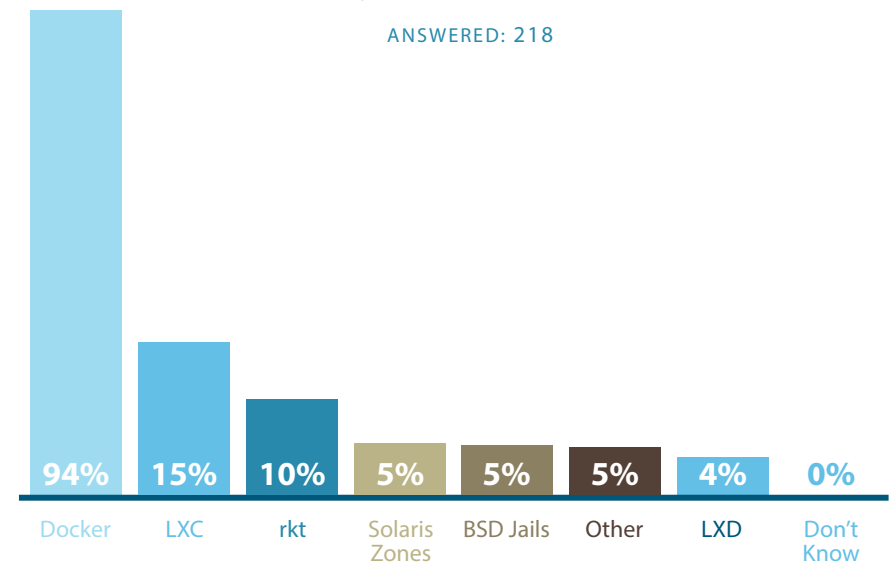
Q13: Which Operating System does your organization run container technologies on most frequently?

ANSWERED: 218



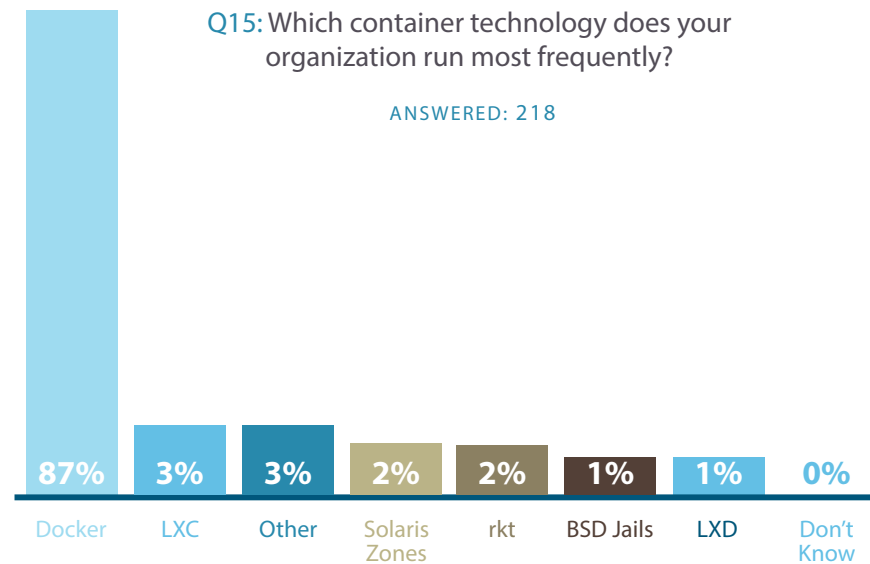
Q14: Which container technologies does your organization run?

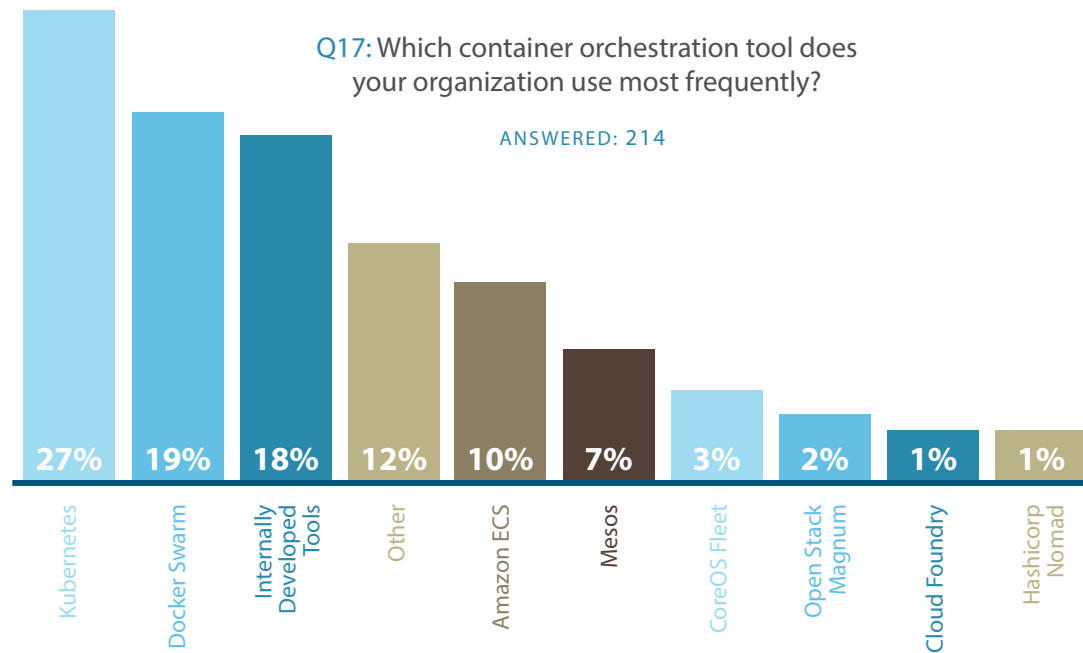
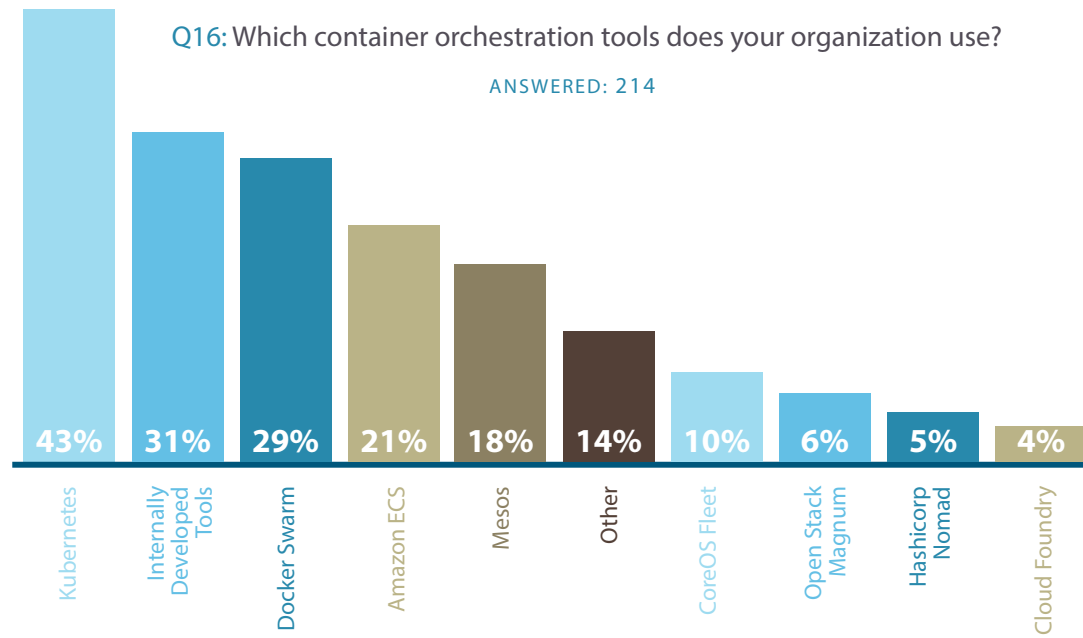
ANSWERED: 218

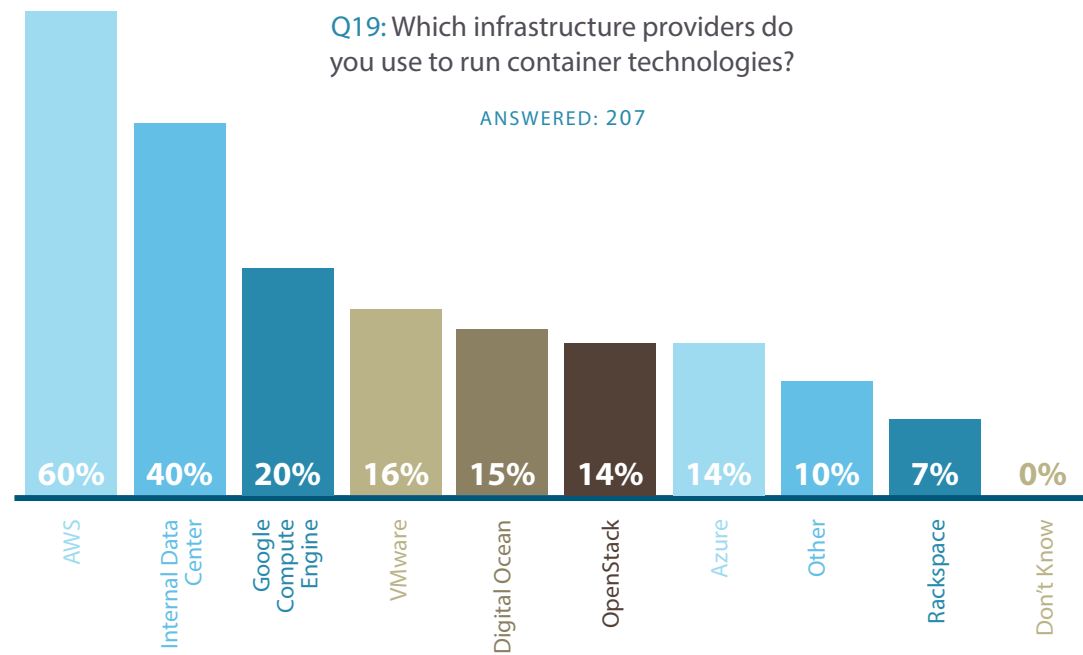
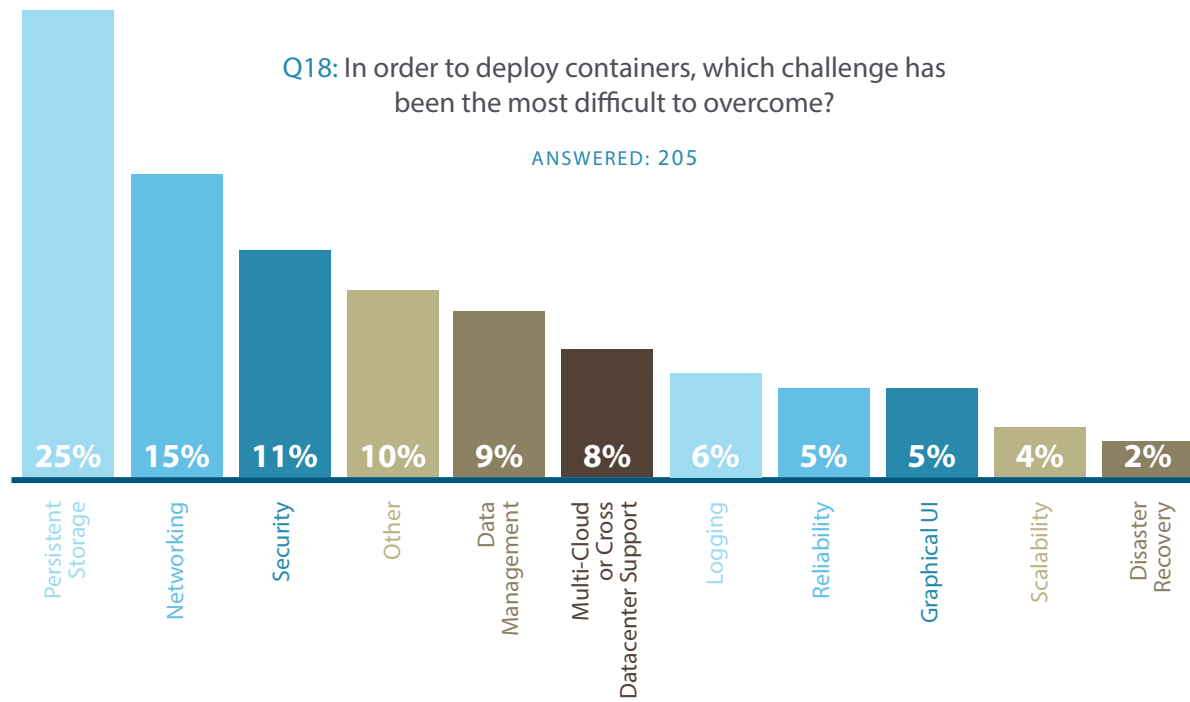


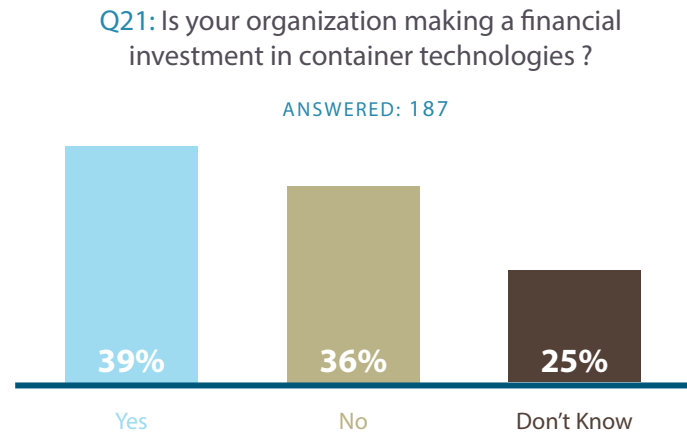
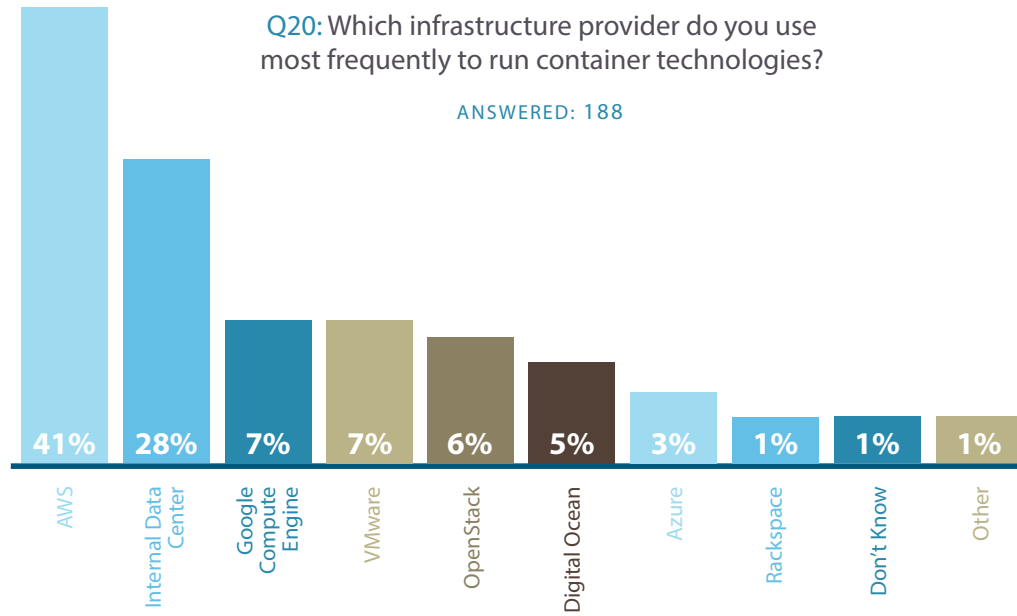
Q15: Which container technology does your organization run most frequently?

ANSWERED: 218



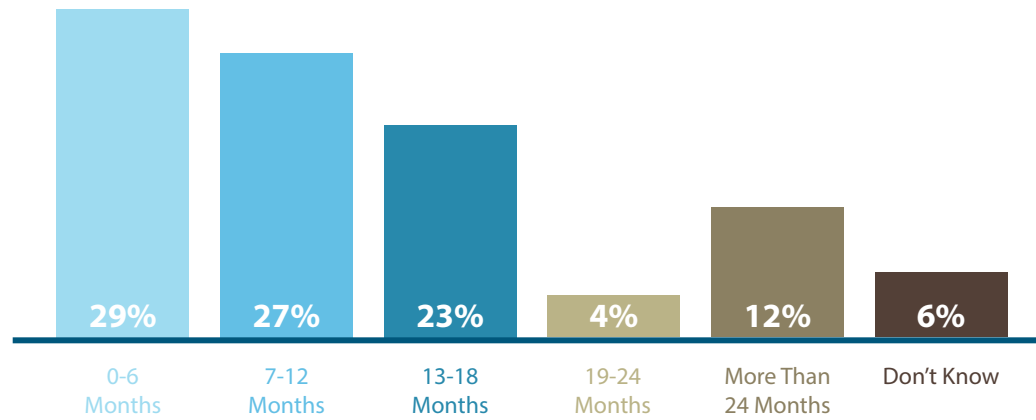






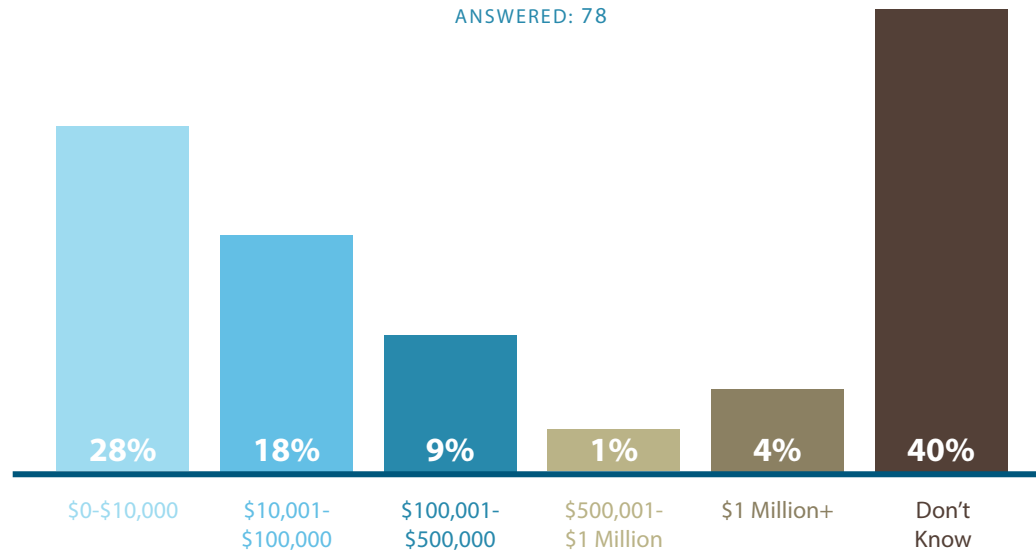
Q22: How long has your organization been making a financial investment in container technologies?

ANSWERED: 83



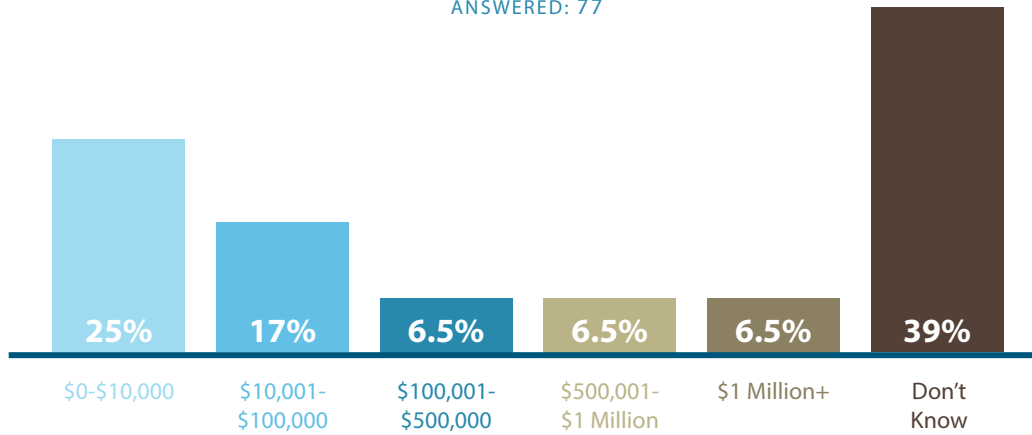
Q23: How much of an annual financial investment has your company made in container technology license and user fees?

ANSWERED: 78



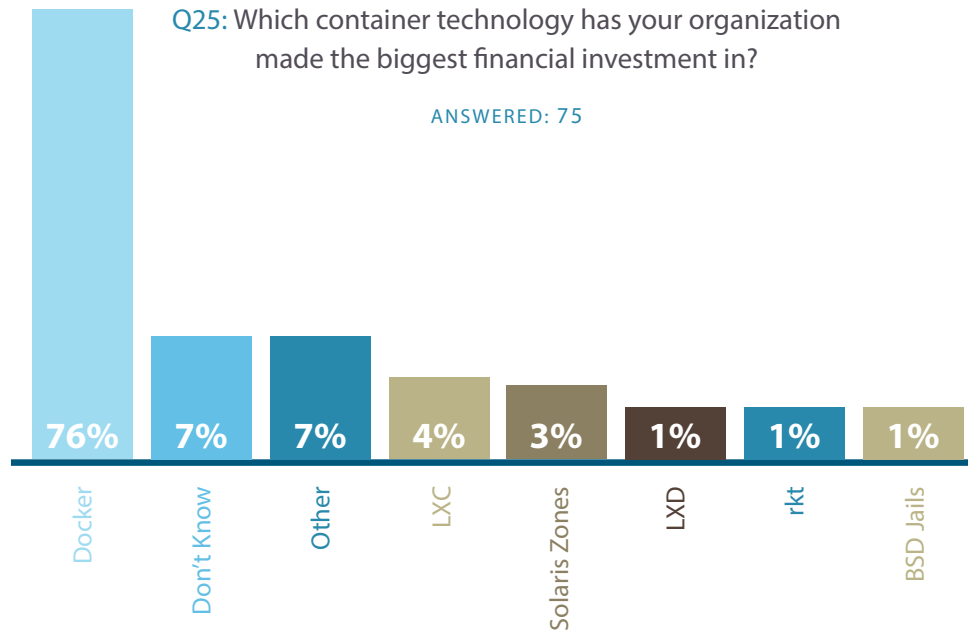
Q24: How much of an annual financial investment has your company made in personnel expenses to use container technologies?

ANSWERED: 77

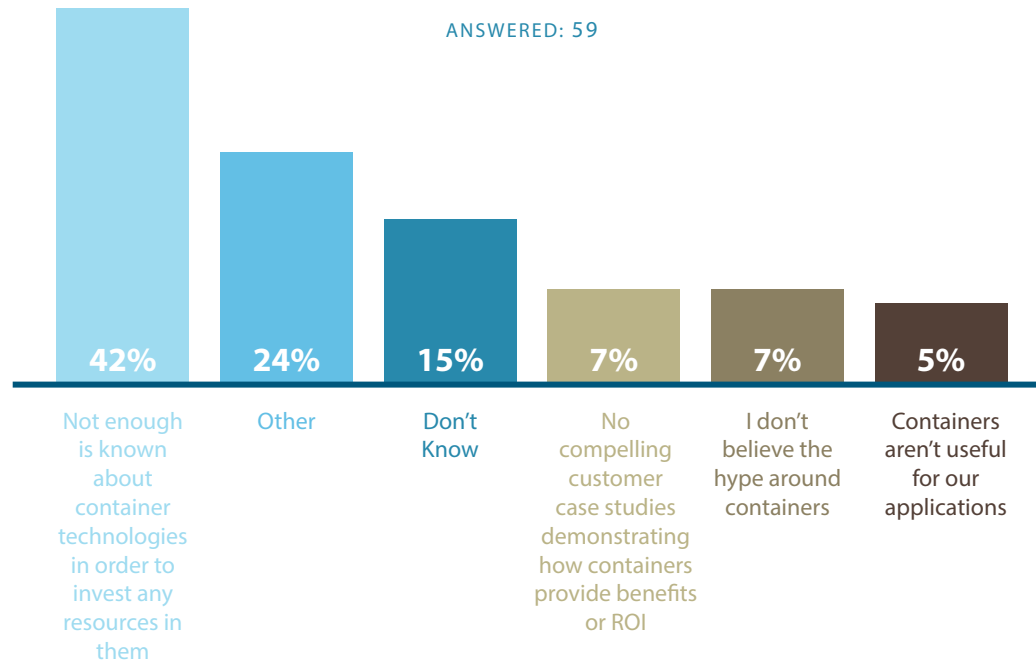


Q25: Which container technology has your organization made the biggest financial investment in?

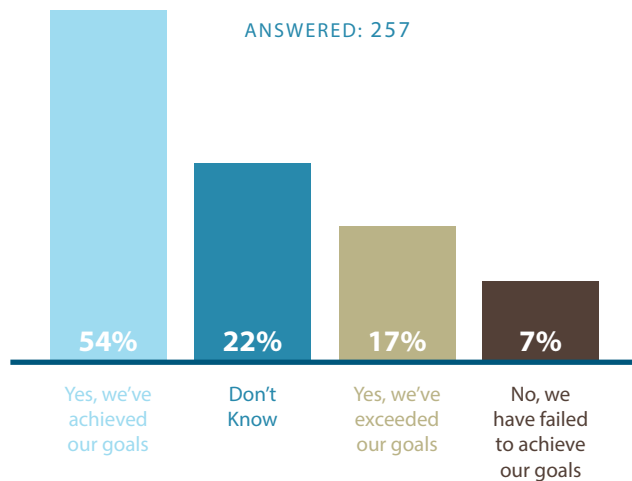
ANSWERED: 75



Q26: What is the primary reason why your organization isn't using container technologies today?



Q27: In the past 12 months, has your organization achieved its business goals as outlined by its top leaders, e.g. CEO, Board of Directors?



Q28: In the past 12 months, has your IT team met their goals as outlined by its top IT leaders, e.g. CIO?

