



National Association of State Technology Directors

MAY 2020

State Government's Data Center Roadmap: Evolving Strategies & Technologies

Introduction

As technology continues to evolve, so does the management of state government data centers. For more than a decade, the strategic plan for state data centers has called for consolidation and optimization, with anticipated financial and efficiency benefits. State information technology (IT) directors have overseen and managed these efforts to realize state chief information officers' priorities.

In 2007, a National Association of State Chief Information Officers (NASCIO) survey indicated 14% of responding states had completed data center consolidation efforts.¹ By 2016, that percentage had grown to 42%.² Consolidation and optimization remain a priority, ranking at number four in the most recent list of state CIO priorities.³ As states complete the task of consolidation, it is critical they have a long-range vision of where their data center operations are headed.

While many states continue to maintain existing data centers, both state-owned and leased, there is a definite shift toward leveraging public cloud services. This aligns with the movement toward a managed services model of IT. NASCIO's 2019 State CIO Survey indicated 35% of the states want to maintain their state-owned data centers and 17% plan on expanding, but 48% say they wish to downsize their state-owned data centers.⁴ The response to the COVID-19 pandemic has further underscored the integral role of state data centers and the broad opportunities of cloud services.

Cybersecurity also remains a priority as states work to ensure their data is protected. New technologies in compute, storage and network are enabling efficient and agile solutions to be implemented, while workforce stabilization remains an ongoing challenge.

The results of the following survey show how state government IT directors are driving the evolution of the state data centers in these key areas to align with the strategic direction set by their CIOs.

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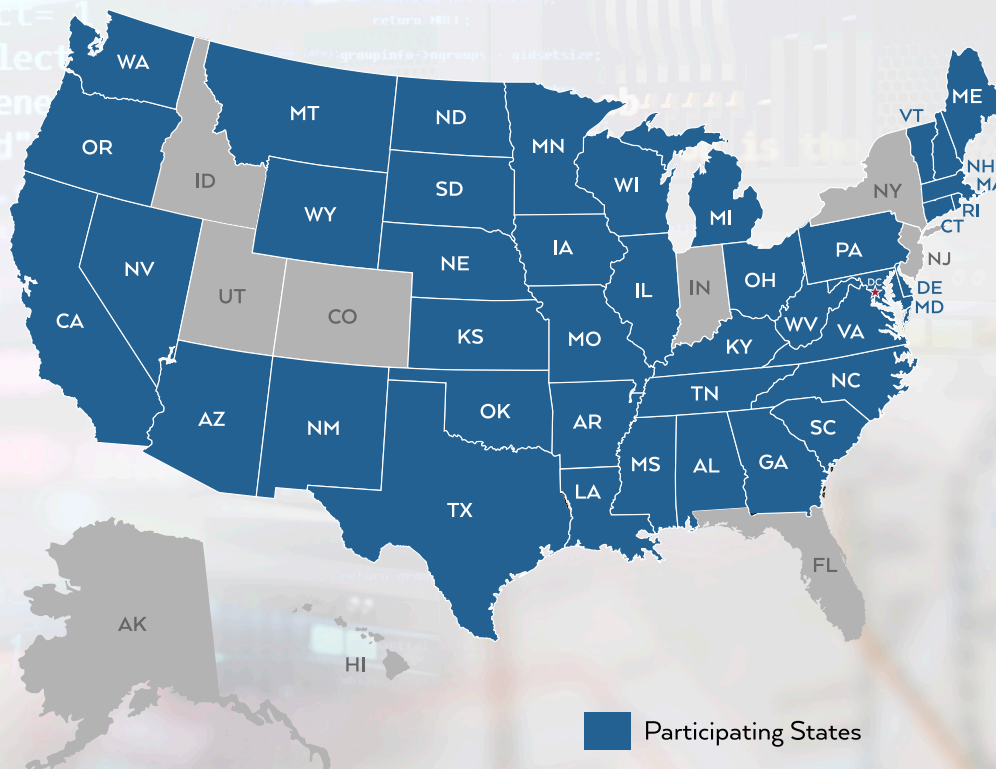
NASTD is a dynamic, member-driven association committed to advancing the effective use of information technology to achieve operational efficiency in state government.

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Methodology

The National Association of State Technology Directors (NASTD), with the assistance of NASCIO, distributed an online survey to all 50 state central IT authorities in December 2019. Forty-one (41) states submitted responses to the survey: Alabama, Arizona, Arkansas, California, Connecticut, Delaware, Georgia, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming.

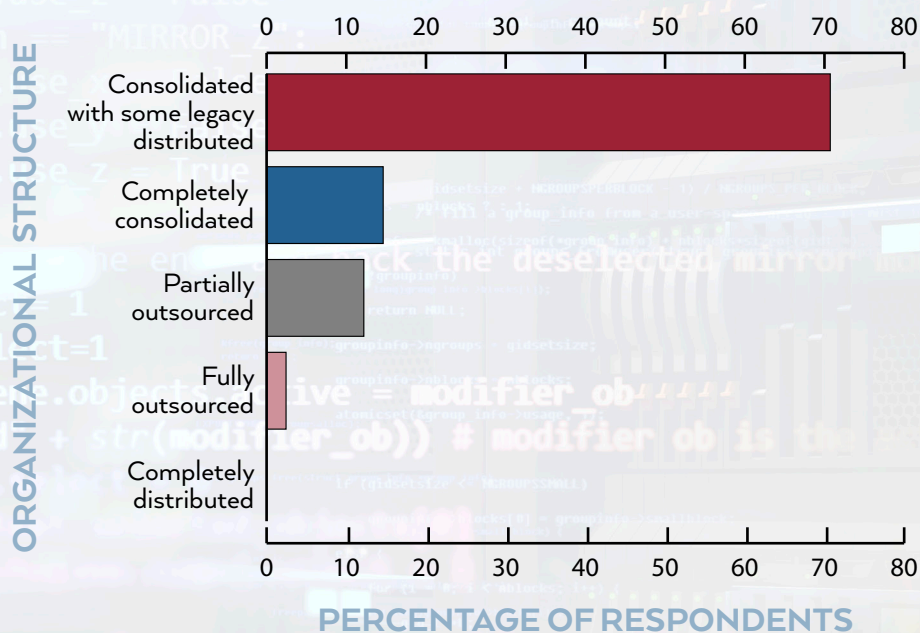


NASTD's Research Committee, comprised of state government IT members, a member representative from the private sector and association staff, developed the survey questions with additional input from the association's corporate affiliate members and NASCIO staff.

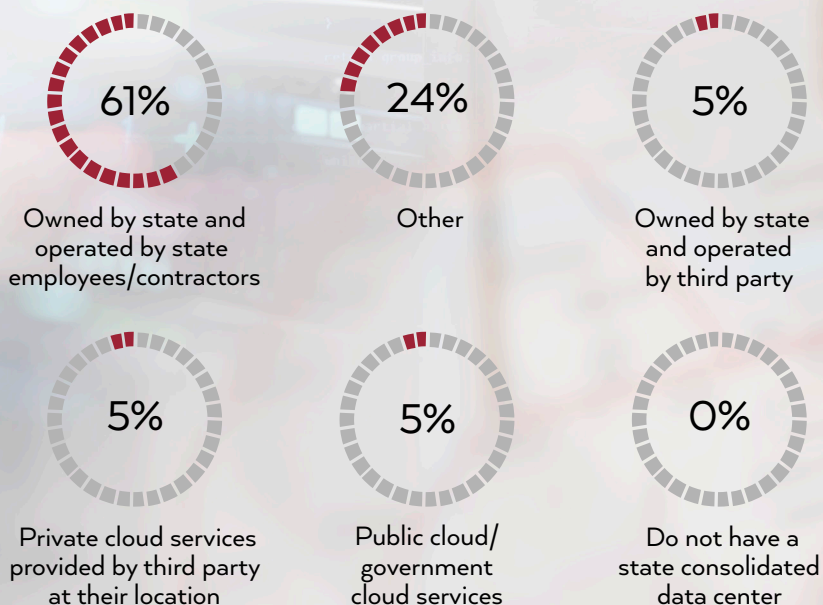
The survey questions addressed six areas of data center management: general, security, compute, storage, network and workforce. This document summarizes the findings from that survey.

Survey Results

1. What is the organizational structure of your state's data center(s)?

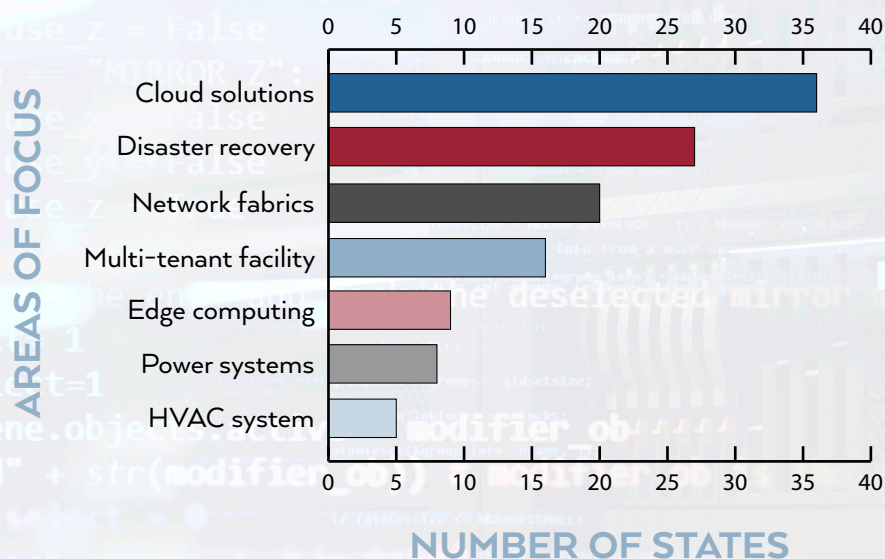


2. What is/are the operating model(s) for your state's consolidated data center?

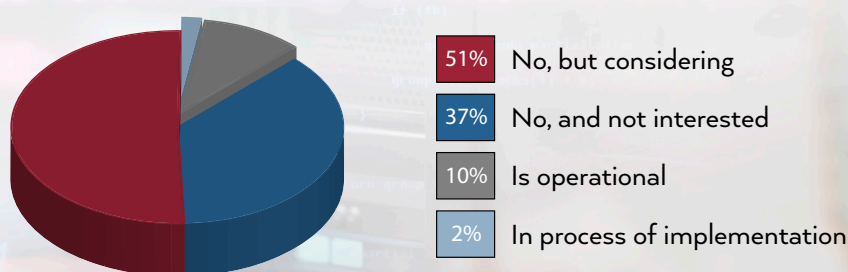


Note: Ten states responded "other", indicating mostly public/private hybrid models.

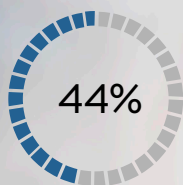
3. For those states that are maintaining or growing state-owned facilities, what areas are you focusing on? (select all that apply)



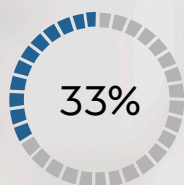
4. Does your state leverage a multisourcing services integrator (MSI)?



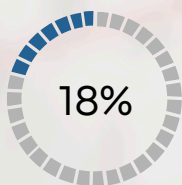
5. How does your statewide data center administration oversee out-sourced/cloud services for statewide cost allocation plans (SWCAPs)?



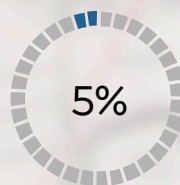
Through both billing and the approval/purchasing process



Through the approval/purchasing process



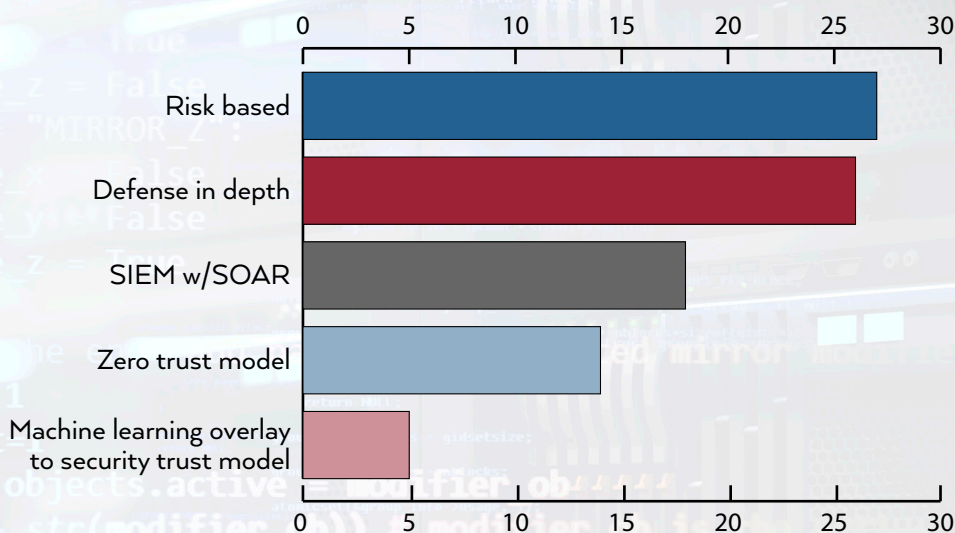
Through the billing process



What's SWCAP?

6. What is your data center's approach to security? (select all that apply)

APPROACH TO SECURITY

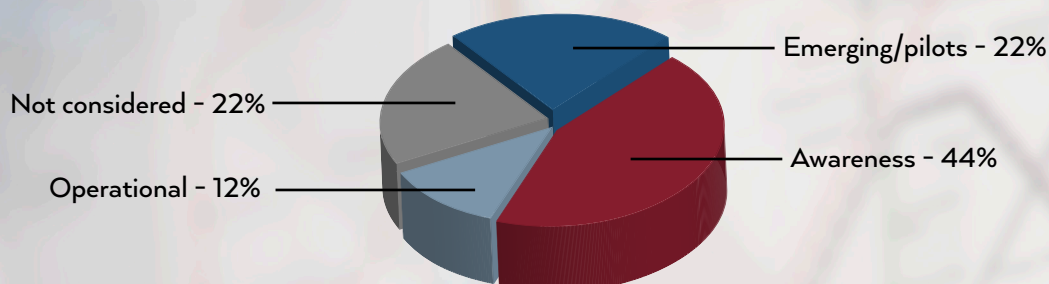


NUMBER OF STATES

7. By whom is your data center's cybersecurity monitoring performed? (select all that apply)



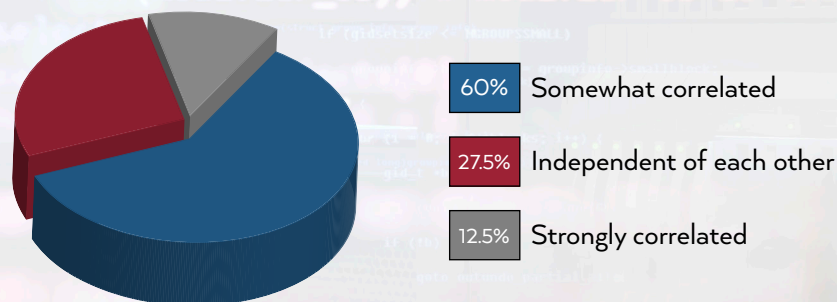
8. Does your state leverage a cloud access security broker (CASB)?



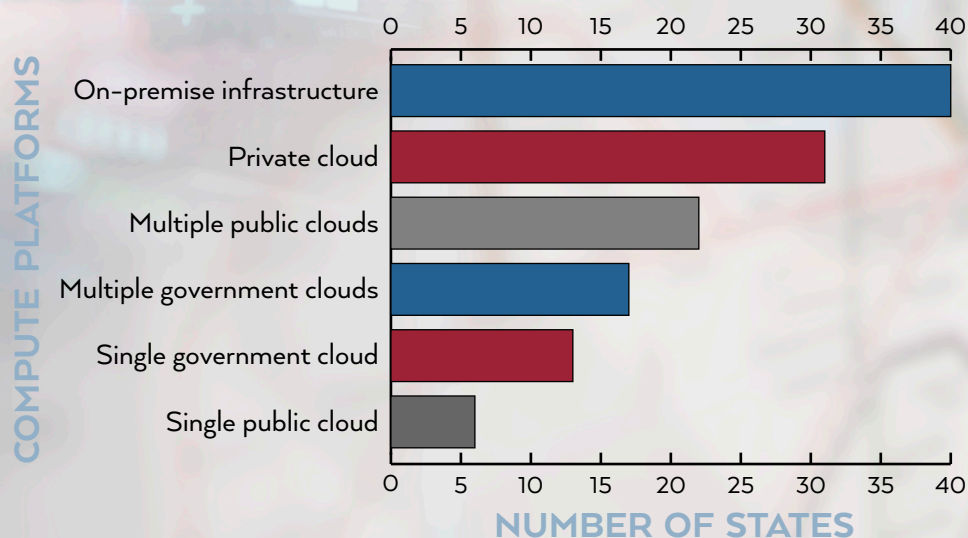
**9. By whom is your data center's cybersecurity risk assessment performed?
(select all that apply)**



10. Security assessment results and data center budget requests and allocations are _____.

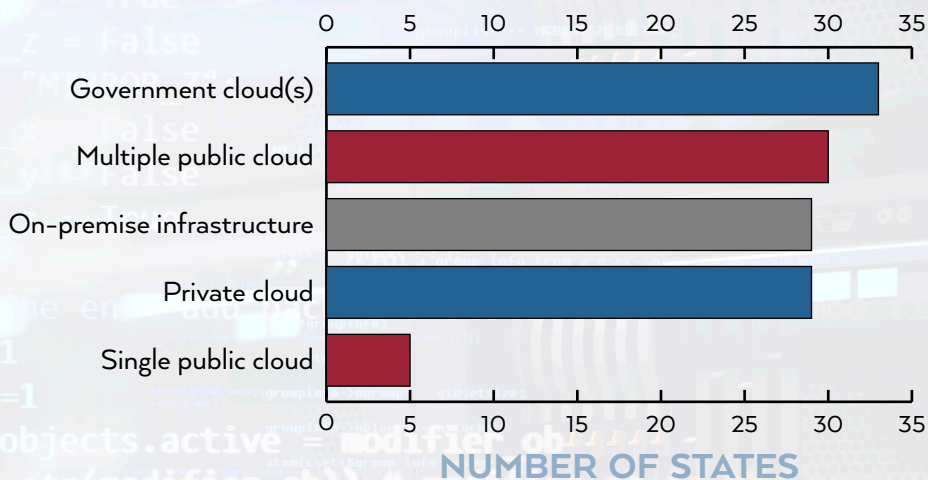


11. Which compute platforms does your data center provide? (select all that apply)



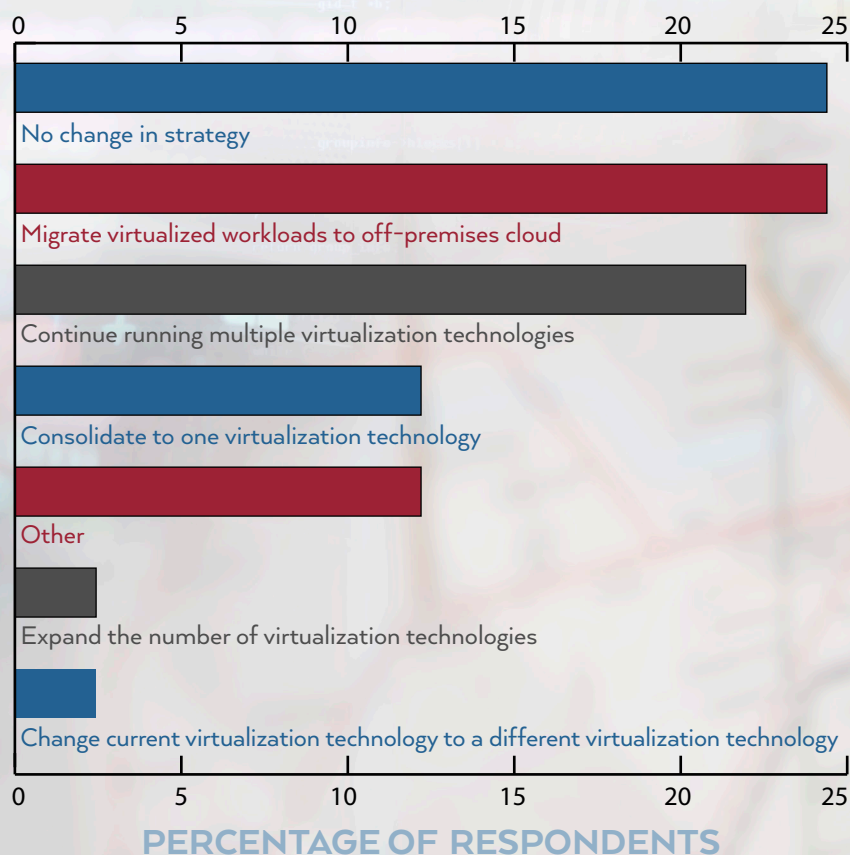
12. In which compute platforms do you plan on investing for the next 3-5 years? (select all that apply)

COMPUTE PLATFORMS

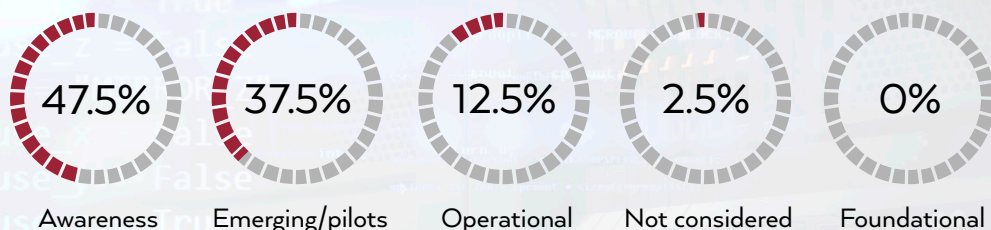


13. For those utilizing virtualization technologies, what are your plans for the next 3-5 years?

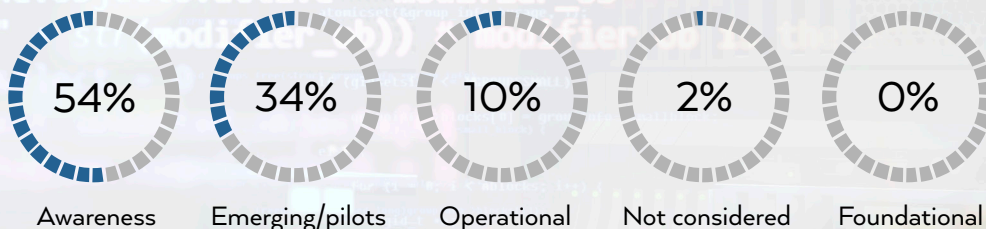
VIRTUALIZATION TECHNOLOGY PLANS



14. What is your program's current maturity toward software-defined data center (SDDC) or software-defined infrastructure (SDI)?



15. What is your program's current maturity toward containers and microservices?

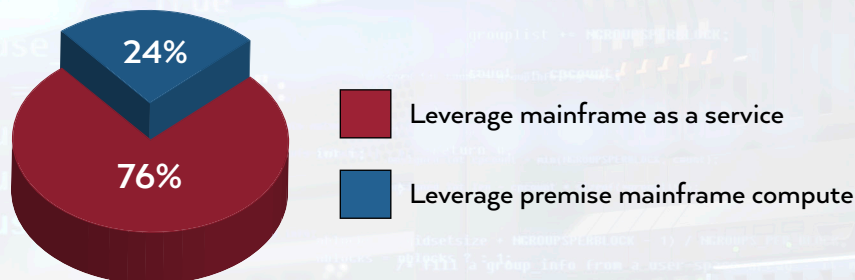


16. What is your program's configuration management database (CMDB) used as? (select all that apply)

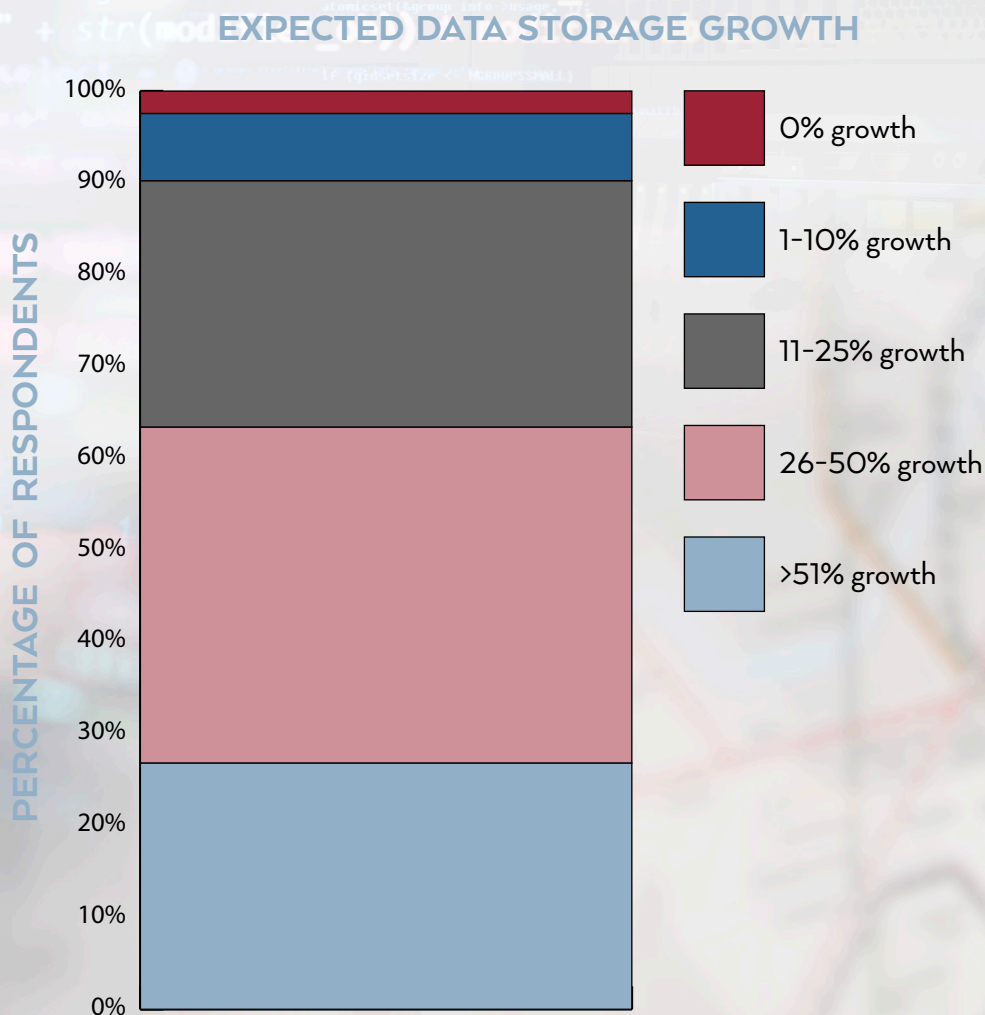


USES FOR CMDB

17. What is your state's intent with mainframe compute in the next 3-5 years?

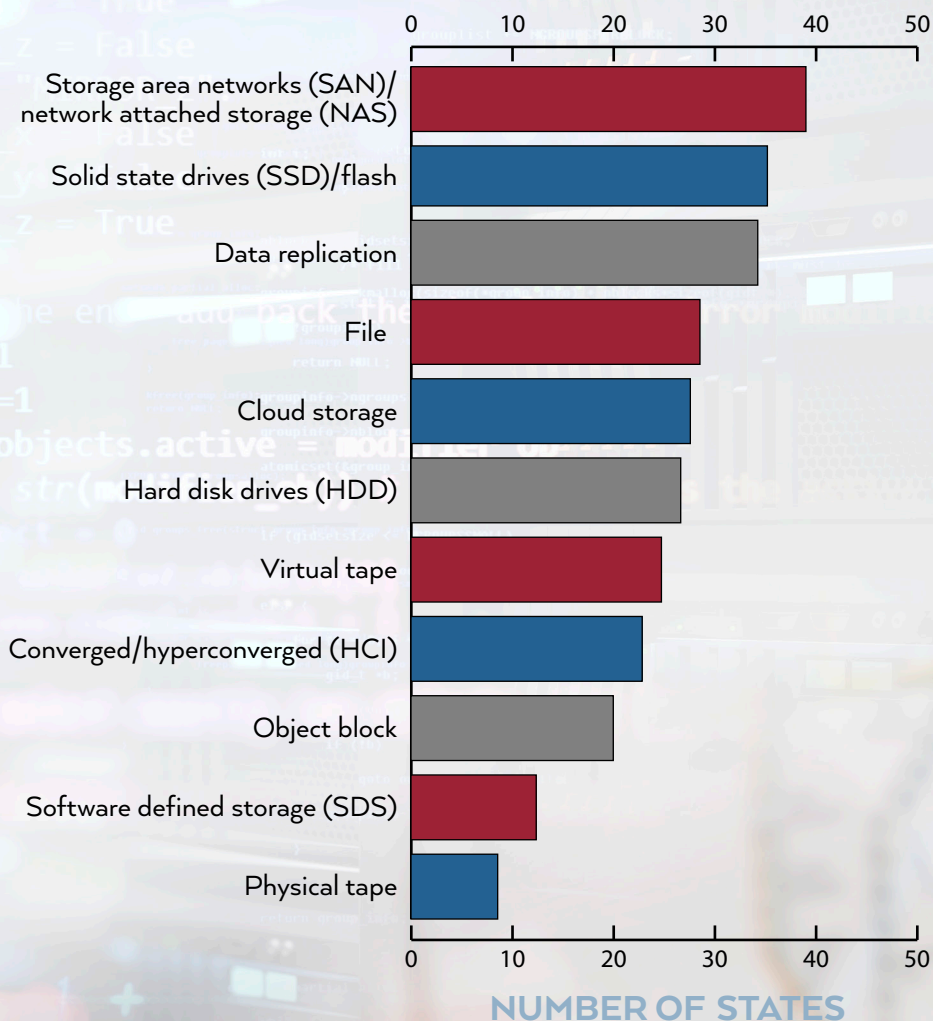


18. What is your expected data storage growth in the next 3-5 years?

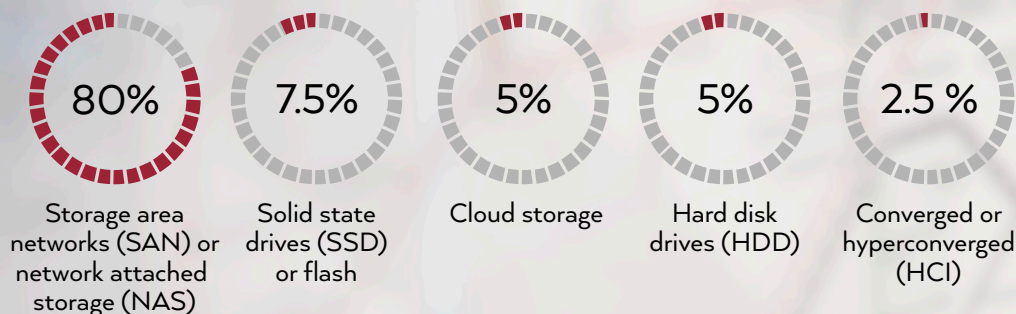


19. What technologies are included in your current storage infrastructure? (select all that apply)

STORAGE TECHNOLOGIES

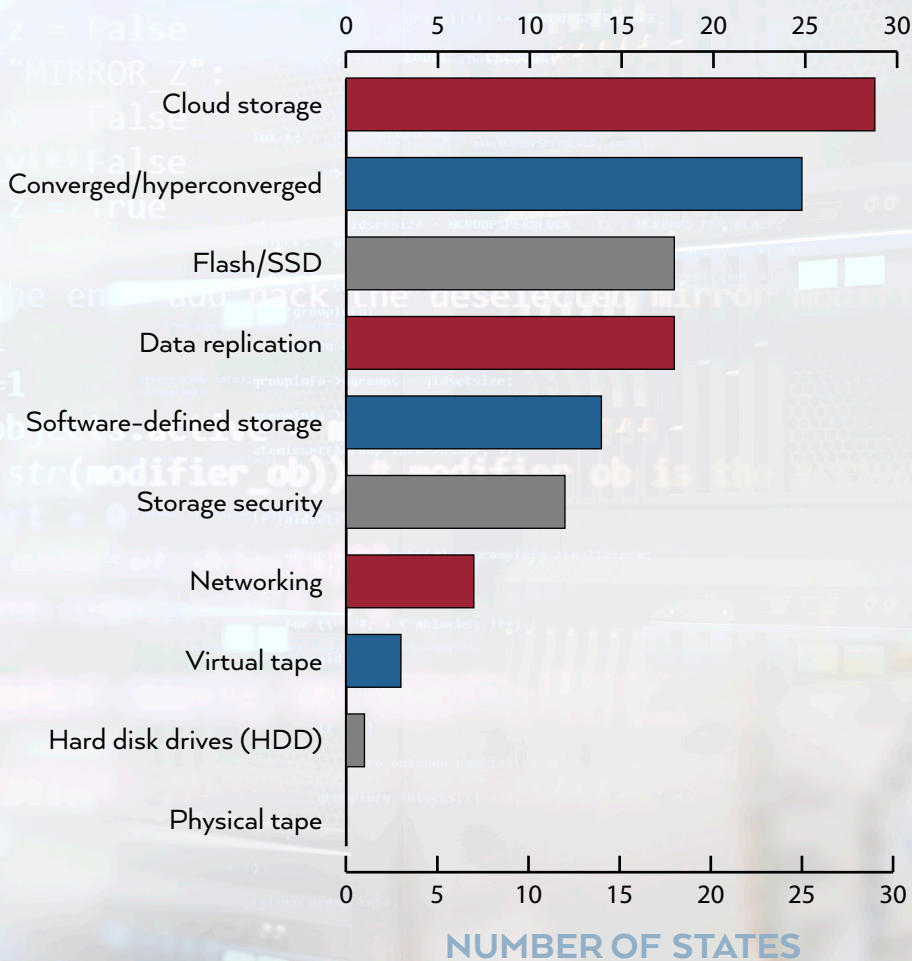


20. What format currently holds most of your primary storage?

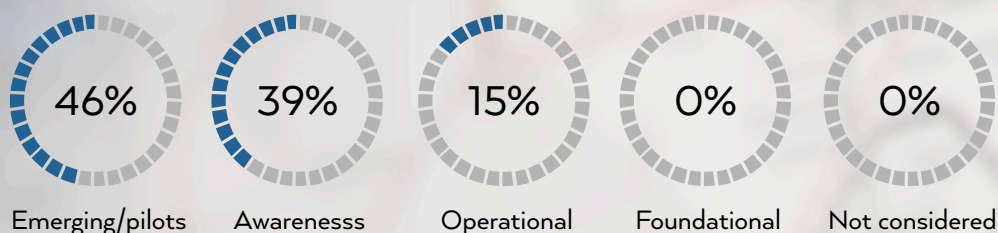


21. In what storage technology do you plan on investing the greatest amount of budget in the next 3-5 years? (select all that apply)

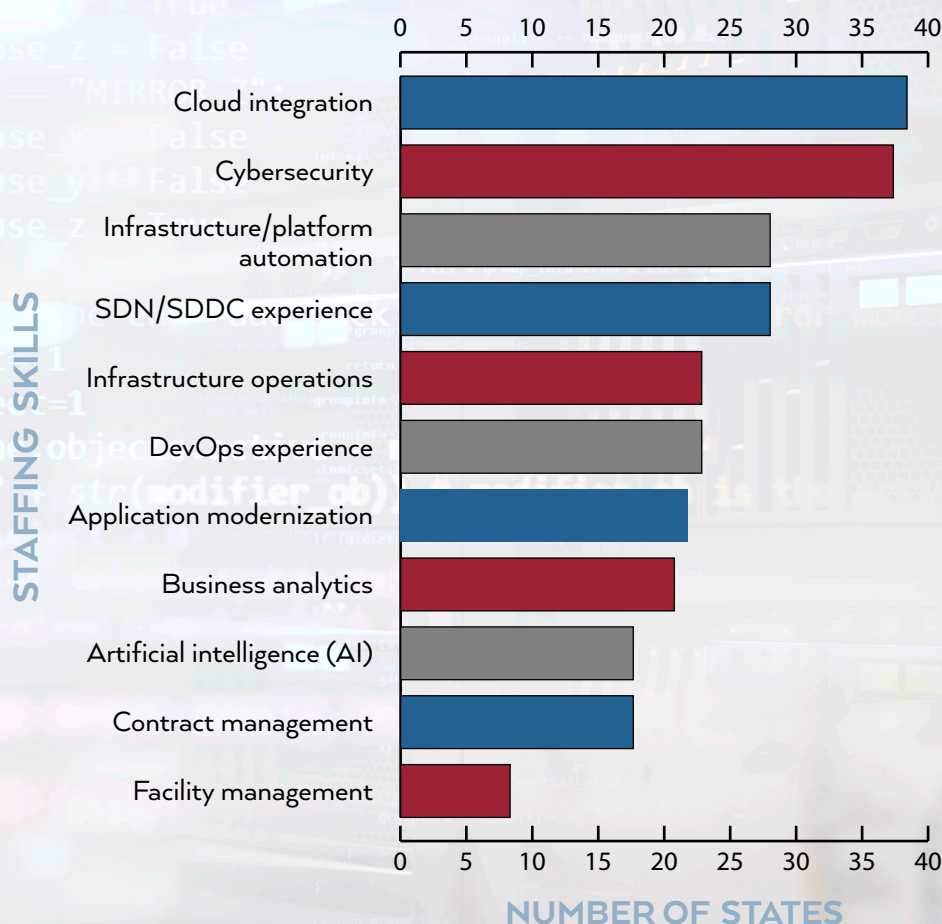
STORAGE TECHNOLOGIES



22. What is your program's current maturity toward software-defined networking (SDN)?



23. Which staffing skill sets do you consider critical to your data center evolution in the next 3-5 years? (select all that apply)



24. Do you have any comments that sum up your state's current and future data center strategy?

- We are looking heavily at cloud, and with the sunset of one of two data centers, will be looking to leverage cloud to provide disaster recovery for our remaining site. To sum it up, we're looking to leverage the cloud wherever it makes business sense.
- Data center consolidation continues but new IT investments target cloud-based services for application modernization and digital government transformation.
- Move away from state-owned on-prem data centers to a "cloud smart" approach.
- Data center strategy focuses on leveraging cloud capabilities and automation to improve the quality of services being provided.

- Move private cloud to hyperconverged, develop self-service portal for agencies, hybrid cloud strategy.
- Modernizing on-premise end of service life infrastructure as a transition to full hybrid cloud implementation.
- Moving to a cloud ecosystem that encompasses the integration of both public cloud and an on-premise managed solution that resides within the state's data centers.
- The state's strategy is to continue to look for opportunities to deliver high quality services, value and cost transparency.
- Every available IT option is being investigated. The IT industry is now turning over every five months with new innovations, not eighteen months as in the past.

Summary

General

The push for consolidation and optimization has resulted in 86% of state respondents indicating their state data center's organizational structure is completely consolidated (15%) or consolidated with some legacy distributed (71%). Sixty-one percent (61%) of state respondents still own their data centers and operate them with state employees, contractors or a combination of both.

States that are maintaining or growing state-owned facilities are focusing their attention on cloud solutions (90%), disaster recovery (67%) and WAN and data center-based network fabrics (50%). While only 12% of responding states are using or implementing a multisource services integrator (MSI), 51% are considering using one.

Security

Security remains the top priority for state government IT. Survey respondents are emphasizing two approaches to data center security: a risk-based approach (69%) and a defense-in-depth approach (67%). States are monitoring their data center's cybersecurity with a combination of state employees (93%) and third parties not responsible for data center operations (49%).

New services are taking off as state respondents are either using (12%), piloting (22%) or considering (44%) a cloud access security broker (CASB). As with security monitoring practices, states are performing data center cybersecurity risk assessments with a combination of state employees (85%) and third parties not responsible for operations (66%).

Maintaining a high security profile with limited funding is an ongoing issue. Sixty percent (60%) of the states identified the results of security assessments and data center budget requests as somewhat correlated, with only 12% seeing a strong correlation.

Compute

State data center computing is evolving. More than half of the states are providing on-premise infrastructure (98%), private cloud offerings (76%) and multiple public cloud offerings (54%). Looking ahead three to five years, states anticipate investing in government clouds (80%), multiple public clouds (73%), on-premise infrastructure (71%) and private cloud (71%) with few focusing on a single public cloud offering (12%).

Most states anticipate very little change in the data center virtualization technology solutions they will be using in the next three to five years, but some do indicate a consolidation of technologies and/or migration to the cloud.

In other areas, 85% of the states are either considering or piloting software-defined data centers or software-defined infrastructure. Eighty-eight percent (88%) are considering or piloting containers and microservices. States utilizing a configuration management database are mostly using it as an operationally integrated tool (67%) and billing resource (61%).

Finally, 76% of state respondents say they will leverage mainframe as a service as their mainframe computing strategy for the next three to five years.

Storage

All but one of the states responding to the survey anticipate some data storage growth in the next three to five years, with the biggest percentage (37%) projecting growth in the range of 26-50%. Twenty-seven percent (27%) of the states anticipate more than 51% growth.

Eighty percent (80%) of the states have most of their primary storage allocated to storage area networks and network-attached storage. States identified cloud storage (73%), converged/hyperconverged storage (63%), data replication and flash/SSD (45%) as the four biggest areas of investment in the next three to five years.

Network

Eighty-five percent (85%) of state respondents are considering or piloting software-defined networking for their data centers, with 14% already operational.

Workforce

Attracting and retaining qualified staff continues to be of concern for state government IT. The survey respondents deemed a wide range of skill sets as critical to their data center's staff in the next three to five years. Of the 11 areas listed in the survey,



National Association of State Technology Directors

more than half of the states identified the following skills as critical: cloud integration (90%), cybersecurity (88%), infrastructure/platform automation and SDN/SDDC experience (66%), infrastructure operations and DevOps experience (54%) and application modernization skills (51%).

Outlook

The results of the survey reveal many changes in the road ahead, with states shifting direction toward hybrid approaches and emerging technologies to operate their data centers. Cloud solutions will include both government and private offerings with new and innovative features. The challenge of securing and governing the data will remain a key focus. With states projecting growth in data storage requirements, efficiency and cost savings will also remain a priority and will likely drive converged/hyperconverged storage solutions. Managing these data centers will require a workforce with diverse skills, whether the state is using its own employees or solution services.

¹Enterprise Data Center Consolidation in the States: Strategies & Business Justification, NASCIO:
<https://www.nascio.org/wp-content/uploads/2019/11/NASCIO-EnterpriseDataCenterConsolidation.pdf>

²The 2016 State CIO Survey: The Adaptable State CIO, NASCIO:
https://www.nascio.org/wp-content/uploads/2019/11/NASCIO_2016_State_CIO_Survey.pdf

³State CIO Top Ten Policy and Technology Priorities for 2020, NASCIO:
https://www.nascio.org/wp-content/uploads/2020/01/NASCIO_CIO_TopTenPriorities.pdf

⁴The Responsive State CIO: Connecting to the Customer, NASCIO:
<https://www.nascio.org/wp-content/uploads/2019/11/2019StateCIOSurvey.pdf>

Acknowledgements

Along with the NASTD and NASCIO members who submitted responses to the survey, NASTD thanks the following for their contributions:

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