

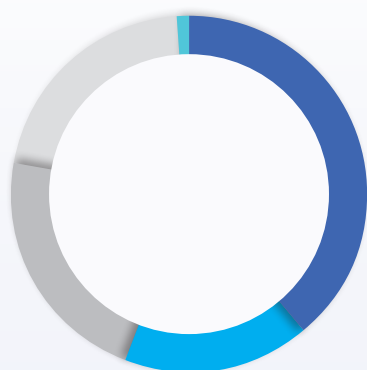
Gaining Steam:

Cloud Platform Adoption
and Emerging Technologies

As state and local governments invest in cloud platforms and infrastructure to meet their IT and business goals, they're examining how public, private, hybrid and multi-cloud models can best serve them now and in the future. The Center for Digital Government (CDG) recently surveyed 128 state and local government IT professionals on the topic of cloud computing. Areas of inquiry included the current state of cloud computing adoption, private and hybrid cloud trends, and emerging technologies such as containers and artificial intelligence (AI) that tie in closely with cloud adoption.

Respondent Demographics

CDG surveyed 128 state and local government IT professionals in November 2018. The following data shows respondent demographics by role and population size of their jurisdiction.

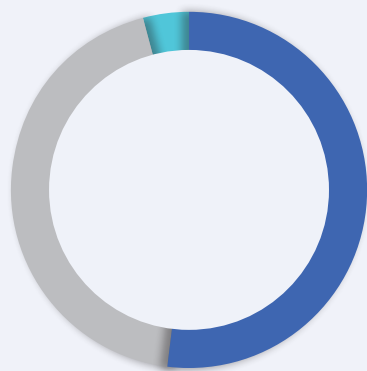
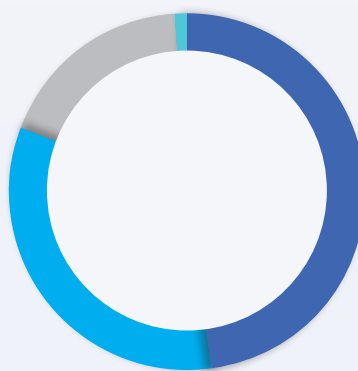


Job Role

- IT acquisition, implementation or maintenance – **39%**
- Mission, business, program or executive/senior management – **17%**
- IT executive/senior management – **22%**
- IT supervisor – **21%**
- Other – **1%**

Jurisdiction Type

- State agency or department – **48%**
- City – **33%**
- County – **18%**
- Special district or consortium – **1%**



Jurisdiction Size

- Over 500,000 residents – **52%**
- Between 25,000 and 500,000 residents – **44%**
- Under 25,000 residents – **5%**

**Total is greater than 100 due to rounding.*



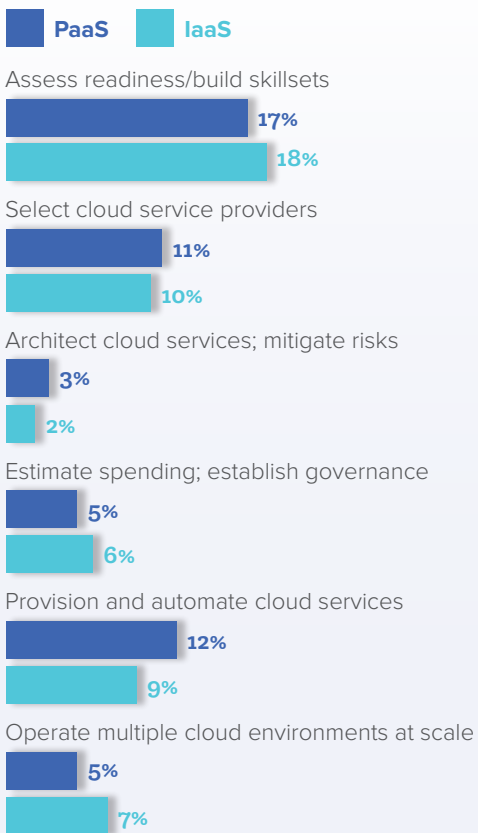
Organizations Are Still in Early Stages of Cloud Platform Deployment

Few respondents in the CDG survey are operating at advanced stages in their adoption of cloud services. When asked about their use of infrastructure as a service (IaaS) and platform as a service (PaaS), less than 20 percent of respondents said they were performing sophisticated functions such as provisioning and automating cloud services or operating multiple cloud environments at scale.

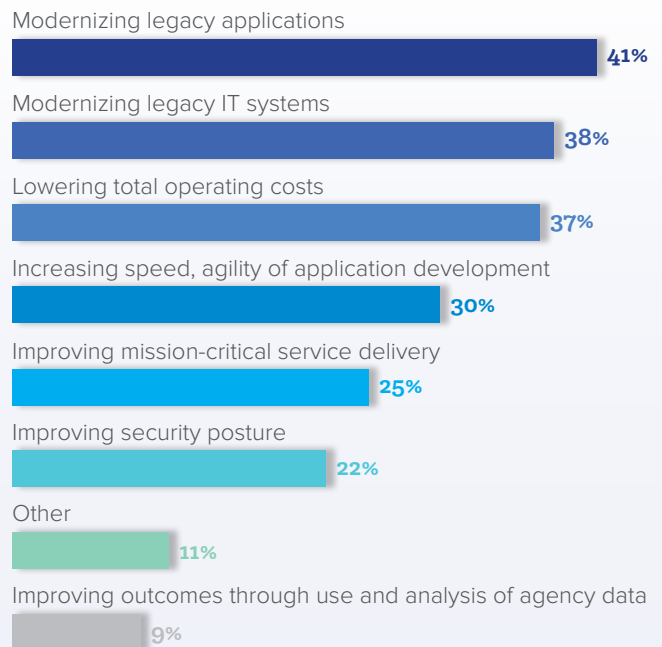
Despite being early on in adoption, respondents already are realizing the advantages of moving to the cloud, particularly around legacy modernization and associated cost savings. When asked about the benefits of cloud migration, respondents identified modernization of applications (41 percent) and legacy systems (38 percent), along with lower total operating costs (37 percent) as their top three choices.

The cloud helps organizations achieve these benefits by offloading the costs and complexity associated with developing, deploying and maintaining infrastructure, platforms and software in house. Readily available compute, storage and networking capacity allow organizations to quickly transform legacy systems and take full advantage of state-of-the-art applications and advanced functionality.

How far along is your agency in adopting the following cloud platform models?



In moving to the cloud, what has been the biggest benefit to your agency? (Select up to 3)

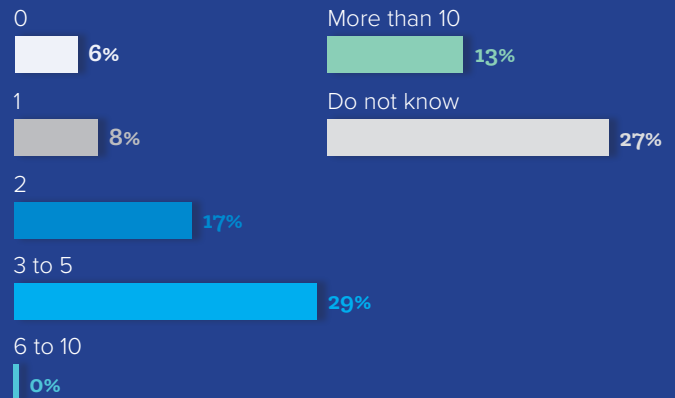


Even at These Early Stages, Multi-Cloud Environments Are the Norm

Of respondents who knew how many clouds are in use, only eight percent said their jurisdiction is operating with one cloud environment. Most jurisdictions (29 percent) are using three to five cloud environments, while 20 percent are using more than five.

As they increasingly operate in a multi-cloud universe, state and local governments will face new complexities related to data governance and compliance, cross-platform functionality, security and access control, vendor management, in-house skills sets and more. However, if they can manage these environments well, they'll accelerate and expand modernization efforts and increase cost savings.

How many cloud environments is your jurisdiction using across all departments?

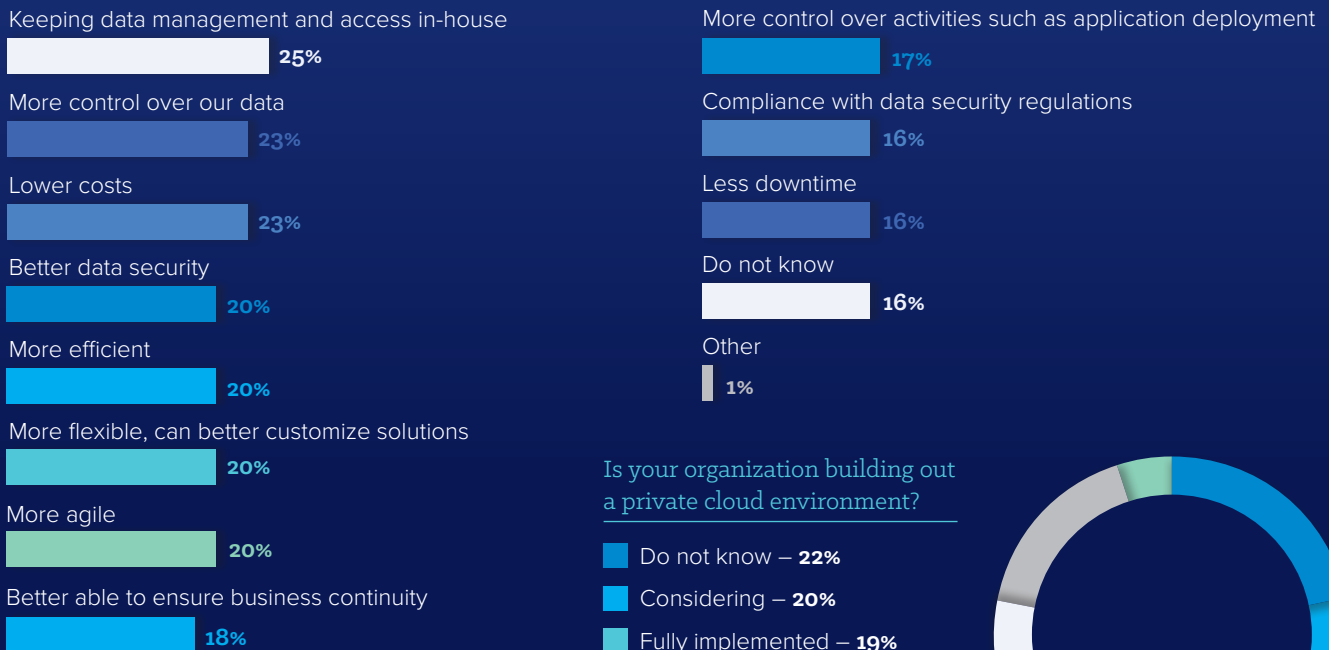


Private Clouds Are a Priority

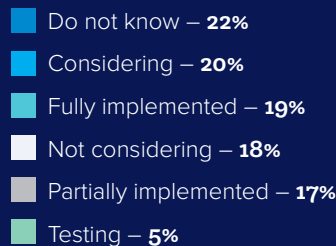
Thirty-six percent of respondents have a partially or fully implemented private cloud environment, and 20 percent are considering adoption. Respondents had many reasons for adopting a private cloud, with the top three being keeping data management in-house (25 percent), maintaining more control over data (23 percent) and lowering costs (23 percent).

Although private clouds offer important benefits to the appropriate workloads, they should be part of an overall cloud strategy which integrates private cloud with the scale, functionality, cost savings and agility of public and hybrid environments. Open source technology, automation, containers, software-defined networking and other emerging technologies are vital to make private cloud environments part of a modern hybrid multi-cloud infrastructure.

What do you perceive to be benefits of using private cloud environments? (Select up to 3)



Is your organization building out a private cloud environment?



*Total is greater than 100 due to rounding.

Respondents Recognize the Value of Hybrid Clouds, But More Education Is Needed

Respondents identified increased flexibility, less downtime/better business continuity and lower costs as the top benefits of hybrid clouds. Interestingly, 24 percent of respondents were not aware of the benefits of hybrid environments; this result suggests they may not be embracing hybrid clouds and the opportunities they offer.

Interoperability issues, data security, difficulty working with multiple vendors and lack of expertise to manage multiple environments were the most cited obstacles to building a hybrid environment. However, agencies may be able to overcome these challenges more easily than they think. For example, mature commercial cloud environments have built-in security mechanisms that earlier environments did not (making them more secure than many on-premises environments), and vendors have recently introduced security solutions — such as cloud access security brokers (CASBs) — that focus on protecting data across cloud environments. In addition, emerging technologies such as containers inherently improve security by creating an isolation boundary at the level of individual applications.

What are the main benefits of adopting a hybrid approach? (Select up to 3)



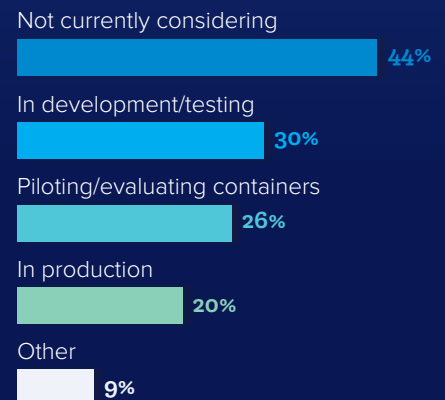
Organizations Are Taking Steps to Manage Hybrid Cloud Complexity

More than half (56 percent) of jurisdictions are in some phase of adopting container technology. Of those jurisdictions, 30 percent are developing and testing containers, 26 percent are piloting or evaluating containers, and 20 percent are using them in a production environment. When asked how they use containers, 40 percent of respondents identified new applications, 19 percent identified existing or legacy applications, and 40 percent were not sure.

Containers package pieces of code in a standardized way so they can be plugged easily into any environment. In essence, they enable the unbundling of applications to run as micro services, while minimizing resource usage, enhancing portability and enabling the combination of multiple application components. They help address some key cloud modernization challenges, including interoperability, vendor lock-in and security.

Open source technology is another important strategy to help manage the complexity of hybrid environments, providing portability and easy access to both internal and external sources of data, a large library of add-on tools and a common language that developers are already familiar with.

How are you using or planning to use containers? (Choose all that apply)



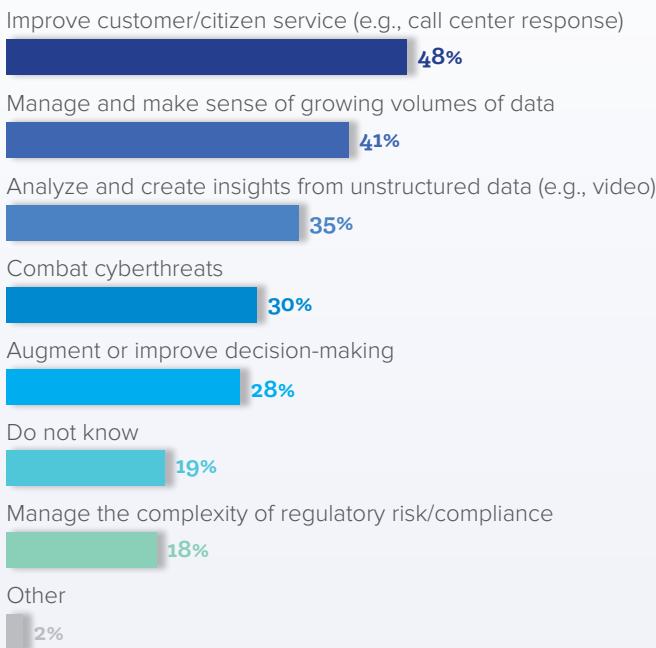
Organizations Recognize the Potential of Artificial Intelligence (AI)

Thirty-one percent of respondents said their agency is using or considering AI (e.g., machine learning and deep learning) to support its initiatives. When asked which applications of AI have the most potential, the top three choices were to improve customer/citizen service (48 percent), manage and make sense of growing volumes of data (41 percent), and analyze and create insights from unstructured data (35 percent).

The top three program areas most likely to see increased AI usage in the next two to five years were law enforcement/public safety (36 percent), health and human services (36 percent) and call centers (35 percent).

The cloud will be vital in fully leveraging data and maximizing AI's potential in state and local government. It enables access to the multiple data sets that AI draws upon, and it provides the scalable compute capacity required for data-intensive services.

Which AI applications hold the greatest potential to support or add value to your agency's mission or initiatives? (Select up to three)

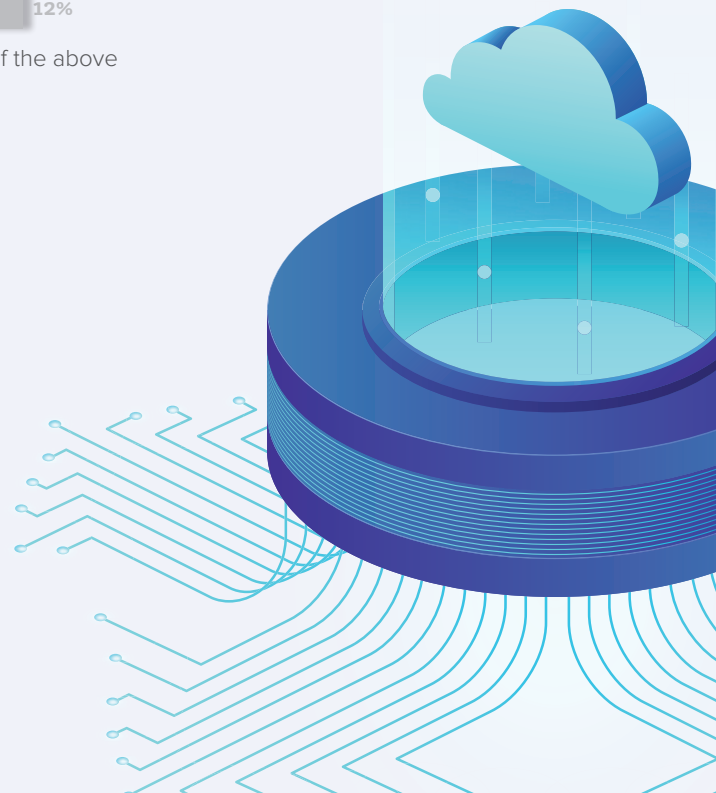


What business areas in your jurisdiction are likely see more use of AI in the next two to five years? (Select up to 3)



The Sky Is the Limit

Cloud platform adoption is expanding and evolving as state and local governments gain more experience, new technologies emerge to support cloud environments, and AI and other transformative technologies demand the scale and interoperability that well-crafted cloud solutions can provide. To take full advantage of cloud opportunities, organizations should seek an experienced vendor that supports the full range of cloud models, understands the unique public sector requirements and offers a clear path forward for cloud implementations.



Produced by:



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