

SHRINKING STATE DATA CENTERS

A PLAYBOOK FOR
ENTERPRISE DATA CENTER
CONSOLIDATION



SHRINKING STATE DATA CENTERS: A PLAYBOOK FOR ENTERPRISE DATA CENTER CONSOLIDATION

Over the last two decades, as state Chief Information Officers have been tasked with finding cost savings, enterprise data center consolidation has been a prime target and consistent priority driven by cost savings and efficiency. Reducing the diversity and complexity of the states' information technology environment, while leveraging enterprise infrastructure, has been a common theme. Responding to a need for more information and experiences from the states, NASCIO sent out and reported on a comprehensive survey in 2007 on enterprise data center consolidation.

With 29 states responding, NASCIO found that 14% had completed enterprise data center consolidation, 38% had partial progress and 24% were in the planning phase. Another 17% had proposed consolidation while 7% said there was no activity.

Fast forward 10 years and a lot has changed. In 2017, in addition to using smart phones and Twitter handles, today's CIOs are much more likely to oversee a consolidated enterprise data center. In this brief, we will provide an update on enterprise data center consolidation on the state level, and share a data center consolidation "Playbook" for states that are early in the process or that have yet to consolidate.

BENEFITS

There are numerous benefits to enterprise data center consolidation. The most obvious benefit is cost savings, which is obtained in several ways. Savings are created by reducing diversity and complexity in the data center environment, creating economies of scale and reducing operational costs, saving on facility maintenance costs and energy costs via greater efficiency. By consolidating data centers on the enterprise level, the new centralized environment creates benefits as well.

These include:

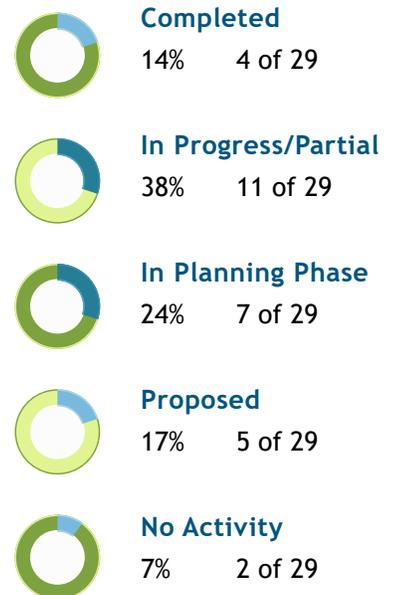
- Strengthening of IT security
- Introduction of process standards: ITIL (Information Technology Infrastructure Library) and ITSM (Information Technology Service Management)
- Promotion of enterprise integration and applications
- Improved support for legacy systems
- Centralization of infrastructure maintenance and upgrades
- Improved disaster recovery / business continuity

The federal government, one of the largest data center users in the world, is also working toward consolidation and optimization. Congress has passed several bills to mandate optimization and consolidation of data centers in recent years. Twenty-four agencies are participating in the Office of Management and Budget's Data Center Optimization Initiative. As of August 2016, the agencies had identified 9,995 data centers, closed 4,388 and plan to close a total of 5,597.¹

BARRIERS

Despite the incredible benefits of enterprise data center consolidation, it does not come without challenges and barriers. As in 2007, the top challenges continue to be workforce resistance to change and agencies' desire to remain autonomous. Additional challenges may include problems experienced in moving localized devices away from the current customer base, backlash when consolidation didn't meet specific business needs, higher than anticipated costs and problems with seeking exemptions from state and federal statutory and regulatory requirements.

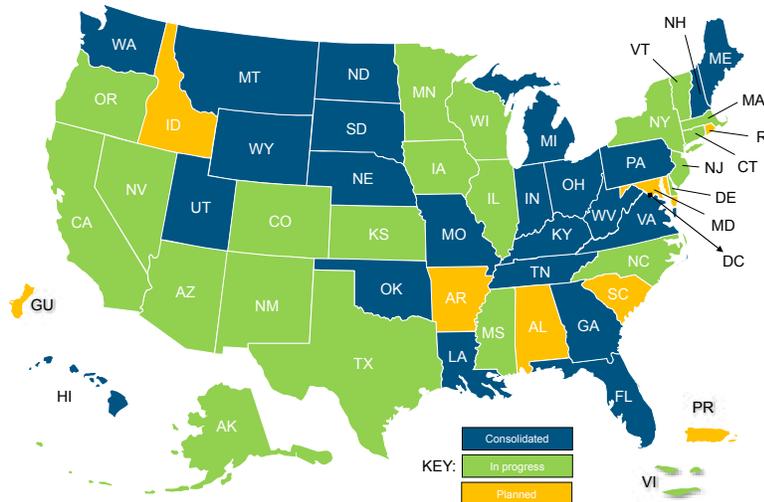
STATUS OF STATES' DATA CENTER CONSOLIDATION (2007)



1. GAO Data Center Optimization Report, May 18, 2017
<https://www.gao.gov/products/GAO-17-388>

Enterprise Data Center Consolidation

Source: NASCIO 2016 State CIO Survey with 2017 Updates



ENTERPRISE CONSOLIDATION OF DATA CENTERS TODAY

NASCIO considers a state to have completed enterprise data center consolidation if they have met the following criteria: a state has completed a plan to significantly reduce executive agency data centers into one or more data center/s and has met the targets laid out in the enterprise consolidation plan while recognizing that in some cases there may be approved exemptions for some executive agencies.

In [NASCIO's 2016 State CIO Survey](#) (the most recent year the question was asked), we again asked State CIOs about the status of their enterprise data center consolidation efforts. This time 42% had completed consolidation, 47% said it was ongoing, and 11% said it was planned. Clearly states have made much headway in the last decade.

In the [2017 State CIO Survey](#), we asked the question: "How does your state CIO organization plan to deliver or obtain IT services over the next three years?" Fifty-eight percent (58%) said they plan to downsize state-owned-and-operated data center/s. The other respondents had already consolidated.

Each year NASCIO asks CIOs what their [top priorities](#) will be for the following year and ranks them based on the number of responses. For the last 10 years, consolidation/optimization has been in the top three. For 2017, the second highest response was consolidation/optimization. Security came in first as it has for many years. Security is often a motivator for enterprise consolidation as well.

What follows is a playbook with ten top plays for enterprise data center consolidation based on a decade of feedback from state CIOs as well as other government and private sector experts on consolidation and similar processes.

STATE CIO TOP PRIORITIES FOR 2017

ONE

Security and Risk Management

TWO

Consolidation/Optimization

THREE

Cloud Services

FOUR

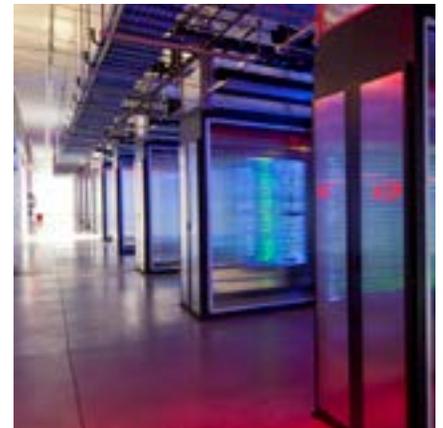
Budget/Cost Control/Fiscal Management

FIVE

Legacy Modernization

Source: State CIO Top Ten Policy and Technology Priorities for 2017

PLAYBOOK FOR ENTERPRISE DATA CENTER CONSOLIDATION



PLAYBOOK FOR ENTERPRISE DATA CENTER CONSOLIDATION

PLAY 1

UNDERSTAND WHAT IS NEEDED

Before getting started, it's critical to understand the needs of each agency that will be using the data center. This is done by engaging stakeholders early (something we will stress repeatedly), and designing the outcome to fit needs, instead of requiring agencies to find ways to work within (or despite) new government regulations or directives.

Part of this should include a gap analysis to understand and communicate the benefits of consolidation versus current capabilities.

The team should assess agencies' requirements for data processing, storage and back-up, continuity of operations, and future needs or expansion. A state should understand needs, requirements and potential issues before setting a target date or launching any initiatives.²

PLAY 2

ENGAGE AGENCY STAKEHOLDERS EARLY AND CONTINUOUSLY (BUT EXPECT RESISTANCE)

In our discussions, CIOs with consolidated data centers repeatedly stressed the importance of relationships. The biggest challenge and resistance to consolidation will inevitably come from agency CIOs who will likely be hesitant to give over control of their data center.

Ohio approached this challenge with care and planning and was honored with a NASCIO State IT Recognition Award for their project in 2015. Ohio formed a Multi-Agency CIO Advisory Council (MAC) around the same time they started commissioning studies on consolidation. The MAC was made up of agency CIOs and their discussions lead to the decision that Ohio needed to consolidate its IT infrastructure. Ohio CIO Stu Davis started convening the MAC once every six weeks (from twice per year). These meetings conveyed a sense of urgency to the group about consolidation. This was important as the Department of Administrative Services had no authority over the agencies to require consolidation. It was actually a group of agency officials (18 out of the 26) that came up with the plan for consolidating data centers.

To ease resistance to the consolidation, Ohio emphasized that agencies would just be moving servers, not giving up control of them. They also worked to ensure that existing staff would not lose their jobs by explaining that personnel savings would come from attrition. They recruited staff from participating agencies to work in the data center so agency heads knew someone would be in the data center who understood their specific needs. By having agency input and buy-in so early in the process, the project was successful.^{3,4}

2 A Comprehensive Strategy for Successful Data Center Consolidation; CGI: <https://www.cgi.com/sites/default/files/white-papers/cgi-state-and-local-data-center-consolidation-white-paper.pdf>

3 NASCA Case Study: The Transformation of the State of Ohio Computing Center: <http://das.ohio.gov/Portals/0/DASDivisions/InformationTechnology/IS/Optimization/2016%20NASCA%20Ohio%20Case%20Study.pdf>

4 NASCIO State IT Recognition Award 2015: <https://www.nascio.org/portals/0/awards/nominations2015/2015/2015OH4-NASCIO%20awards%20OH%20IT%20Optimization%20Enterprise%20IT%20Management%20FINAL.pdf>

CREATE A ROADMAP WITH REASONABLE MILESTONES SET IN WAVES

Simply put, more planning and organization results in a smoother consolidation process. The complexity of data center consolidation is often underestimated. Your team must develop a detailed plan and process.

The team will need to identify facilities, technologies, organizations, services, people and processes that will be impacted by the consolidation. During the planning process, the team will need to understand the interdependencies between multiple applications as well as infrastructure to ensure minimal disruption and outages.²

When Montana developed their consolidation plan, it was holistic—an overarching plan for the state, with sub-plans for each individual agency. Montana reported that while some agencies requested to wait until the last minute, the CIO’s office stressed the importance and necessity of sticking to a schedule.

When Oklahoma⁵ collapsed the Department of Human Services into the state data center, the required space went from an 8300 square-foot facility (almost the size of the entire state data center) to six racks taking up only 100 square feet. After a year of planning they were set to begin over Memorial Day weekend, 2016. They had prepared a detailed schedule, down to the minute. They carefully followed the detailed plan and had 53 systems moved over with no outages or hitches. Oklahoma CIO Bo Reese’s advice to other states is to “Plan, plan, plan.”

DOCUMENT THE BASELINE OF ASSETS

The more detailed a state can be in documenting assets, the better the information will be on outcomes post-consolidation. Existing technologies and systems that are working and can be reused should be identified. During the consolidation of Montana’s data centers, the Department of Administrative services bought equipment from many of the agencies through asset transfer. The agencies no longer owned the equipment but the state could reuse it.

Advantages and disadvantages of different hosting environments should be discussed (cloud, internal and hybrid) and decisions should be made based on the needs of the stakeholders.

Decisions should be made about how to fill technology and systems gaps where new investments need to be made. To fill the gaps, Montana purchased new equipment with better security and disaster recovery capabilities.

When Missouri was consolidating their data centers, they used the motto “check every closet.” More than once, after shutting down servers in an agency, their tools would continue to pick up servers doing work for that agency. There would be machines hiding in other closets that people didn’t think were part of the consolidation. They also found items purchased for future growth, that were plugged in and using resources but not actually doing any work. They learned to be thorough.

5.

6.

7.

8.

9.

10.

⁵ Oklahoma Progress on Consolidation Reports: https://www.ok.gov/cio/Policy_and_Standards/Progress_on_Consolidation_Reports.html

CONDUCT A SPEND ANALYSIS

Whether the state decides to conduct a spend analysis or outsource it to the private sector, it's important to know where all money is spent. It is especially useful to know all the costs to agencies of maintaining and staffing their own data centers. Once the data centers are consolidated, it is likely that the agencies will be charged a new fee. It is helpful to be able to show agencies what they are saving by no longer having to maintain a data center despite the new fee associated with participating in the state data center.

Missouri hired a third party to do a front-end cost assessment and found that outsourcing these types of assessments is vital. Using a third party, while they may not always find new information, lends credibility to the findings, which is essential.

ADDRESS COST ALLOCATION AND FUNDING ISSUES

It is likely that a slew of issues will need to be addressed when it comes to funding. The CIO may need the support of the legislature for appropriating funds. If federal funds are used the state will need to address the impact of the Super Circular (previously known as A-87). Existing contracts with outside vendors may need to be renegotiated to fit the new model of consolidation.

IMPLEMENT STANDARDS WHERE THEY EXIST (ITIL & ITSM)

In NASCIO's 2017 State CIO Survey we asked states, "For which ITSM processes have you implemented a defined process and supporting toolset?" Change and Incident Management had the highest response rates with formal processes established in approximately 85% of states. Service Catalogue Management and Request Fulfillment followed closely behind with 70% of states reporting a defined process.⁶

Where applicable, states should implement ITSM standards and any appropriate frameworks, especially ITIL.

A consolidated environment provides the perfect opportunity for a state to pursue ITSM either as an on premises software, or in the cloud. ITSM streamlines the delivery of IT services to agencies and provides improved service. At the same time, the state may decide to implement or refresh their use of ITIL practices. Implementing ITSM and ITIL can reduce costs, improve efficiency and increase security.⁷

6 NASCIO State CIO Survey 2017: <https://www.nascio.org/Publications/ArtMID/485/ArticleID/561/2017-State-CIO-Survey>

7 The Promise of ITSM: <https://fcw.com/Articles/2013/05/27/exectech-it-service-management.aspx?Page=1>

IMPLEMENT STANDARDS WHERE THEY EXIST (ITIL & ITSM)

For which ITSM processes have you implemented a defined process and supporting toolset?

70%	59%	85%	49%	37%	89%	63%	73%	39%
Service catalog mgmt	Service level mgmt	Change mgmt	Configuration mgmt	Knowledge mgmt	Incident mgmt	Problem mgmt	Request fulfillment	Adoption of framework

Source: NASCIO's 2017 state CIO survey

Missouri used both ITSM and ITIL when they consolidated their data centers. They found it to be extremely useful to identify a standard supported across the enterprise. They found that not only could they tell the customer they would save money, but they would also get current technology, technological flexibility and readily available, highly qualified support.

MANAGE EXPECTATIONS AND EXPECT SURPRISES

Communication can go a long way in putting everyone on the same page. Agencies will need to stick to schedules and timelines. New fees will need to be explained. New processes will need to be implemented. Managing expectations with planning and communication will prevent cultural resistance in the near and long term.

However, no matter how much you have communicated, managed and planned, surprises happen. When Michigan was consolidating their Child Support Data Center in 2005, it ended up being an emergency consolidation when the data center's cooling systems failed and their uninterruptible power supply batteries melted. HAZMAT teams were deployed to clean up the mess and MDIT project teams effected a flawless migration over a two-day period.

Even after consolidation you must be prepared for the worst. An enterprise data center can go down as it did after a fire in the Iowa data center. When a consolidated data center goes down, the impact is felt over the entire government. In Iowa, they had all the systems back up and running by the next morning and some just six hours later. They learned that you should always have plans in place for such disasters and practice for these types of emergencies. As Iowa's CIO will tell you, scheduling a review of electrical systems is a good idea as well.⁸

⁸ Fire in Your Data Center: No Power, No Access. Now What? By Robert Von Wolfradt, CIO, Iowa: <http://www.govtech.com/state/Fire-in-your-Data-Center-No-Power-No-Access-Now-What.html>

MAKE IT SUSTAINABLE

PLAY 9

After going through the work and expense of building a new consolidated data center, you want to ensure that it's a lasting endeavor.

Politically, having buy-in from agencies and other customers because of a voluntary commitment (in the case of Ohio) or because of an executive order (in the case of Maine and Montana) is important. But more importantly, customers/agencies must feel as if they are getting better service and security at the same or less cost. Only then will they want to continue if voluntary, and only then will a new administration want to keep moving forward under a previous executive order.

In addition, some states have found ways to fund the data center or reduce costs by selling excess space. For example, Montana leases space to Oregon to store racks for disaster recovery—a mutually beneficial agreement that resulted in a NASCIO State IT Recognition Award in 2015.⁹ Montana is also considering renting space to private entities to offset costs and make the data center more sustainable.

Ohio not only houses agencies in their data center, but city and county governments, and multiple major universities including The Ohio State University and the University of Cincinnati. This high level of participation allows the data center to achieve the highest level of cost savings.

Utah is currently considering adding solar panels to their main data center. Utah's CIO explained that not only would this decrease energy costs and improve the environmental impact of the consolidated data center but it's something that would be much less feasible if the data centers were small and spread across the state.

CAPTURE AND REPORT COST SAVINGS

For all states, the main motivation for consolidation is the significant cost savings. Consolidated states have a lot to be proud of. They are working in new state of the art data centers, reporting greater efficiencies, stronger security and millions of dollars in savings.

Here are some examples:

Utah is saving \$4 million each year on their annual budget. That savings goes directly back to the agencies. A staff reduction from 1000 to 704 via attrition has saved \$136 million alone since 2007.

Indiana is saving over \$13 million a year after consolidation.

Oklahoma has saved \$98 million since budget year 2012.

Ohio has saved over \$100 million since 2016.

Louisiana reported a savings of \$75 million in their first year of consolidation.

18 of the 24 federal agencies participating in a Federal Data Center Optimization Initiative reported saving \$2.3 billion collectively from 2012-2016.

Missouri saw another benefit in hiring third parties to do assessments. The third party could identify the milestones the state should be hitting and on which they should report. While the staff already knew about these milestones, it was important to be given a plan for communicating their wins back to the Governor's office.

⁹ NASCIO Award Submission: Oregon-Montana Disaster Recovery Phase 1 & 2: <https://www.nascio.org/portals/0/awards/nominations2015/2015/2015OR12-Oregon%20-%20DAS-ETS%20-%20OR%20DR%20-%20phase%201%20&%202.pdf>

PLAY 10

THE FUTURE OF ENTERPRISE DATA CENTER CONSOLIDATION

While a lot has changed in the IT landscape in the last ten years, we can already start to see some of the changes that the next ten will bring to state CIOs. An ongoing trend in our annual state CIO surveys is that CIOs are moving more and more to the role of “broker of services” and less so a “provider of services.”

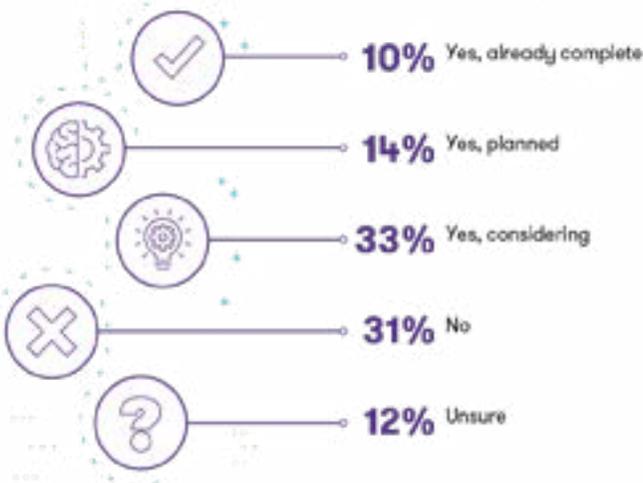
Some states are finding that the space they need for their data centers is shrinking as they move more storage to the cloud. While some private companies are already using the cloud for 100% of their applications, at some point there will be a state that reaches that milestone as well.

A couple of states have avoided investing in a building that may end up outdated or underutilized by leasing a data center and outsourcing the management of it. The State of Georgia has been leasing data center space since 2005. When it came time to move servers out of an old parking garage that had been converted to a data center, leasing the space made the most financial sense for them. Georgia’s Chief Technology Officer Steve Nichols explained that they don’t have to be concerned about the upkeep or heating and cooling of unused data center space. They also avoid investing in a data center that is not equipped to handle the power densities or air conditioning needs of future servers—which could make it impossible to sell without major renovations.

For Georgia, when it came time to consolidate IT services, additional agencies joined the data center. It made sense financially to outsource not only the space but also the management of IT services to a private company. Georgia’s IT services and data center management has been outsourced since 2008 with 21 agencies (70%) in the North Atlanta Data Center.

Another trend that states are moving toward is off-premise Mainframe-as-a-Service. While these solutions have been available for several years, NASCIO asked about this for the first time in the 2017 State CIO Survey. NASCIO asked if states are planning to move to an off-premise Mainframe-as-a-Service solution in the next 2-3 years. Over 50 percent of CIOs responded that they had either completed such a move or were considering it.

Are you planning to move to an off-premise Mainframe-as-a-Service solution in the next 2-3 years?



Source: 2017 NASCIO State CIO Survey

ADVICE FROM THE TRENCHES



CIOs and deputies who discussed enterprise data center consolidation with NASCIO were enthusiastic in their recommendation for consolidating data centers. Many had sound advice for CIOs who are early in the process of consolidation or who may be considering it.

“It’s about relationships. Your customers are your partners.”

Bo Reese, CIO, Oklahoma

“It’s really a no-brainer in terms of deliverables. Why spend money on distributed data centers when you can use that money to improve services.”

Mike Hussey, CIO, Utah

“So much of the project is about money, so it is important for the CIO and budget director to be best friends.”

Ron Baldwin, CIO, Montana

“The most important thing is communication. There is no overcommunicating.”

Steve Siegler, Deputy Chief Information Officer for Operations, Missouri

“Be flexible for the future. Don’t feel like you have to solve all problems with one solution.”

Steve Nichols, Chief Technology Officer, State of Georgia

“Go forth and consolidate!”

Jim Smith, CIO, Maine

CONTRIBUTORS

Doug Robinson, Executive Director, NASCIO

Steve Nichols, Chief Technology Officer, Georgia

Jim Smith, State Chief Information Officer, Maine

Victor Chakravarty, Associate Chief Information Officer of Infrastructure
Office of Information Technology, Maine

Rich Kliethermes, Chief Information Officer, Missouri

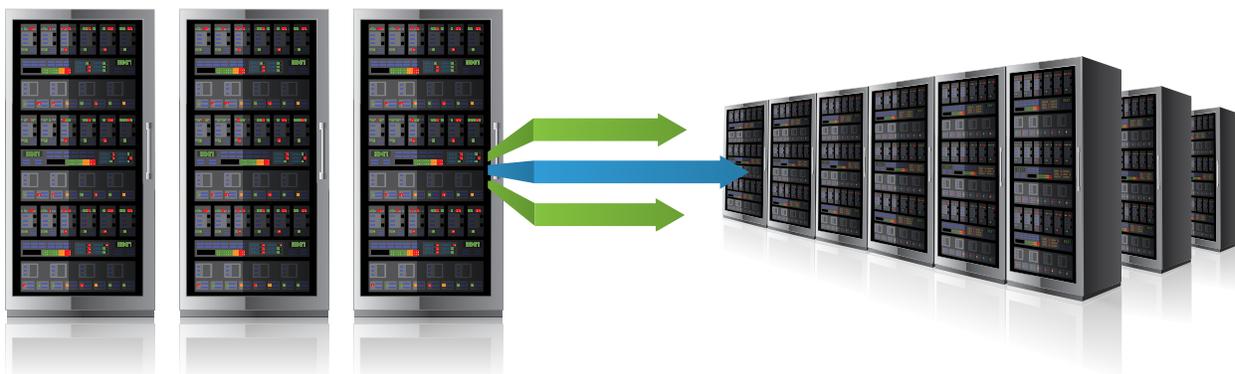
Steve Siegler, Deputy Chief Information Officer, Missouri

Ron Baldwin, Chief Information Officer, Montana

Bo Reese, State Chief Information Officer, Oklahoma

Mike Hussey, State Chief Information Officer, Utah

Dave Fletcher, State Chief Technology Officer, Utah



NASCIO Staff Contact:
Amy Hille Glasscock
Senior Policy Analyst
aglasscock@NASCIO.org

Founded in 1969, the National Association of State Chief Information Officers (NASCIO) represents state chief information officers (CIOs) and information technology (IT) executives and managers from the states, territories and District of Columbia. NASCIO's mission is to foster government excellence through quality business practices, information management and technology policy. NASCIO provides state CIOs and state members with products and services designed to support the challenging role of the state CIO, stimulate the exchange of information and promote the adoption of IT best practices and innovations. From national conferences to peer networking, research and publications, briefings and government affairs, NASCIO is the premier network and resource for state CIOs. For more information, visit www.NASCIO.org.

