NASCIO's Survey on

ENTERPRISE DATA CENTER CONSOLIDATION IN THE *STATES*:
STRATEGIES & BUSINESS JUSTIFICATION

NASCIO
Representing Chief Information
Officers of the States

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NASCIO's Survey on Enterprise Data Center Consolidation in the States: Strategies and Business Justification

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Acknowledgements

Please direct any questions or comments about *NASCIO's Survey on Data Center Consolidation Strategies and Business Justification in the States* to Drew Leatherby at dleatherby@amrms.com or (859) 514-9178.

Background & Approach

In order to optimize infrastructure, secure physical assets and reduce costs of operation, CIOs have been charged with consolidating their Information Technology infrastructure as much as possible. States have approached this challenge utilizing various business models. Based on results from NASCIO's previous all states' survey on consolidation and shared services, ***NASCIO's Survey on IT Consolidation and Shared Services in the States: A National Assessment***, May 2006, <http://www.nascio.org/publications/>, which revealed a strong trend towards states consolidating key IT functions and an interest by NASCIO's 2007 Infrastructure and Services Committee to focus on data center consolidation, this survey was commissioned.

In 2007, NASCIO asked state CIOs to participate in a Web-based survey regarding their data center consolidation initiatives. The results of this survey serve as the baseline for this summary report and are listed in aggregate here. The online survey was completed by the state CIO or other members of the state IT function.

NASCIO does not rank states, but individual responses are available to state members so they may better assess their respective data center consolidation initiatives. Many of the states that responded requested that NASCIO keep their identities confidential, so specific state attributions to many comments have been removed. Through this report, NASCIO hopes to identify practices of effective data center consolidation initiatives strategies and business justification efforts in the states.

Survey Participants

Twenty-nine states responded to the survey through June 22, 2007, representing approximately *45.75 percent of the nation's population. Participation included a wide distribution in geography, population, and budget.

*Source: Annual Estimates of the Population for the United States and States, and for Puerto Rico: April 1, 2000 to July 1, 2004 (NST-EST2004-01) <www.**census**.gov/popest/**states**/tables/NST-EST2004-01.pdf>

The following states responded *(listed alphabetically)*:
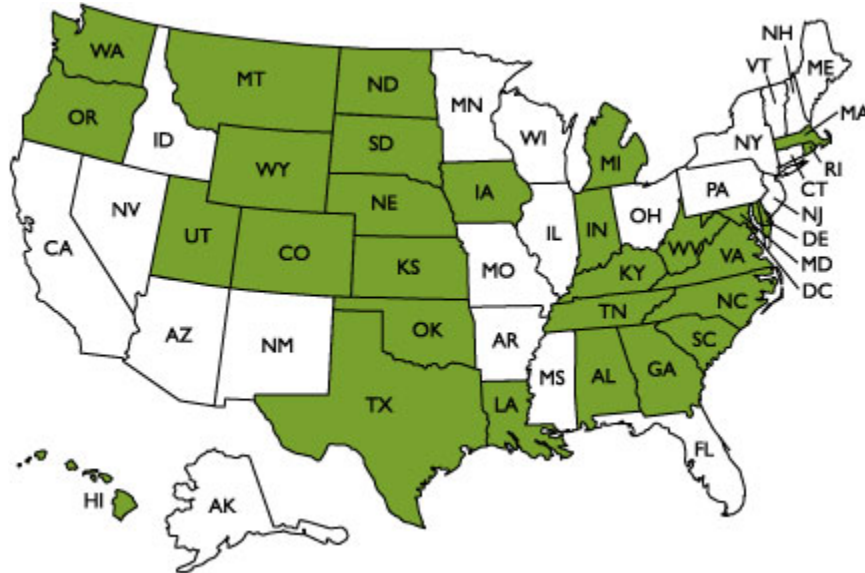
Alabama	Maryland	South Carolina
Colorado	Massachusetts	South Dakota
Delaware	Michigan	Tennessee
Georgia	Montana	Texas
Hawaii	Nebraska	Utah
Indiana	North Carolina	Virginia
Iowa	North Dakota	Washington
Kansas	Oklahoma	West Virginia
Kentucky	Oregon	Wyoming
Louisiana	Rhode Island	

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Executive Summary

Despite the remarkable transformation of the state IT enterprise over the past decade, states can be even more responsive and more capable in delivering services and protecting the states' data systems and information. That capacity rests critically on the task of reengineering business processes and eliminating redundancies wherever possible. State CIOs have seized on the potential for galvanizing the state IT enterprise to produce better results and reduce costs by engaging in consolidation of state data centers for optimization of physical infrastructure and to streamline IT functions.

Key Survey Findings

The National Association of State Chief Information Officers (NASCIO) surveyed state CIOs concerning their data center consolidation initiatives. The trends discovered in responses from 29 states in 2007 reveal a strong trend towards states consolidating their computing assets into raised floor, secured, centralized data center facilities. Many states are utilizing remote back-up data center facilities for the purpose of back-up and disaster recovery and business continuity. The survey revealed that state respondents use a variety of definitions of what constitutes an "enterprise data center," however, despite the status of states' initiatives in this area, the trend towards consolidation appears to be universal.

Current Trends in State Data Center Consolidation Initiatives

When NASCIO asked state CIOs to share their top priorities for 2007, it was their consensus view that consolidation of IT infrastructure and services was at the top of the list. It is also clear from NASCIO's recent national survey on data center consolidation in the states that there has been significant progress in centralizing computing assets, with respondents reporting they have initiatives completed or in progress consolidating their state's enterprise data centers, *see table 1 below*:

Table 1. State Data Center Consolidation Initiatives Reported as Completed, In Progress/ Partial, In Planning Phase, Proposed, or No Activity

Status of State's Data Center Consolidation Initiatives		
Initiative	**Percent**	**Count**
Completed	14%	4 of 29
In Progress/ Partial	38%	11 of 29
In Planning Phase	24%	7 of 29
Proposed	17%	5 of 29
No Activity	7%	2 of 29

Source: NASCIO's 2007 survey of state data center consolidation initiatives.

Detailed Survey Results

Survey results are presented in the same order as the survey instrument **(See Appendix V)**. This section highlights particular areas of interest from the survey results, along with selected samples of state or national trends as well as observations on those trends and their implications for state CIOs and NASCIO.

Survey Section 2. General Questions

2.1. How do you classify data centers in your state?

States respondents were asked to explain how they define or classify data centers in their respective states. As a way to level the field of responses, various examples were given as to the most common ways data centers are classified within a state IT enterprise. Such considerations include: the square footage of a facility; whether the facility has a raised floor; whether server closets and server rooms can be considered data centers; whether data centers are classified as Tier 1 (mainframes) or Tier 2 (server closets); whether tiering definitions offered by the Uptime Institute[1] are utilized, or whether states simply view mainframe and server environments as an enterprise platform and do not differentiate between the two.

Respondents offered a variety of classification systems for data centers that considered such elements as level of security, the size, configuration and use of the facility and what applications it supports, and their degree of redundancy. Several states indicated that universities, and file/print server facilities are not included in their definitions. Only one state indicated that it defines data centers using Tier 1 (mainframes) and Tier 2 (server centers). Two states indicated that they have not developed an operational definition for a data center. **Eight states** indicated that they use tiering definitions for their states' data centers provided by the Uptime Institute. **Fourteen states** indicated that they use their own definitions to classify data centers in their states. **Eight states** also indicated that they view mainframe and server environments as an enterprise platform and do not differentiate between that and a server environment. **(See Appendix I for detailed responses)**

2.2. Based on the above definition, how many data centers do you have in your state, and how many are you trying to get down to?

States were asked to explain, based on their definitions of what constitutes a data center, how many data centers they currently have, and how many are they trying to get down to through their consolidation efforts. Overall states reported their current number of data centers to run between 1 and 100, with a median of 15 and three states reporting they have never completed an assessment. Those states reporting 1 to 3 data centers currently, fall in the category of states that have completed their consolidation initiatives. Those states reporting large numbers of data centers, ranging from 40-100, are generally high due to a more loose definition of what constitutes a data center.

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[1] The **Uptime Institute** is a provider of educational and consulting services for Information Technology organizations interested in maximizing data center uptime. For more information on the Institute's tiering definitions go to: <http://www.uptimeinstitute.org/>, select: "Resources," "Whitepapers," and select "*Tier Classifications Define Site Infrastructure Performance.*"

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When reporting on the target number of data centers that their respective states are working towards, the numbers range from 1-6, with a median of 2.65, with seven states reporting that they currently have no target. Six states reported that they have already reached their target; and four states reported building one to two additional sites for disaster recovery purposes only. **(See Appendix I for detailed responses)**

2.3. Please indicate the status of your state's enterprise data center consolidation initiatives:

States were asked to indicate the status of their state's enterprise data center consolidation initiatives as either being Completed, In Progress/ Partial, In Planning Phase, Proposed, or No Activity. The majority of states indicate that they are in progress or partially completed with their state's data center consolidation initiative. If those states that indicate they are currently in the planning phase are included with that figure, then clearly over 62 percent of states are either planning for data center consolidation or are currently underway with their initiatives. The overall trend would indicate that a clear majority of states are involved in some aspect of data center consolidation whether they be completed, proposed, or somewhere in between. *See figure 1 below.* **(Also see Appendix I for detailed responses)**

Figure 1. *States' Assessment of their Progress in Data Center Consolidation*
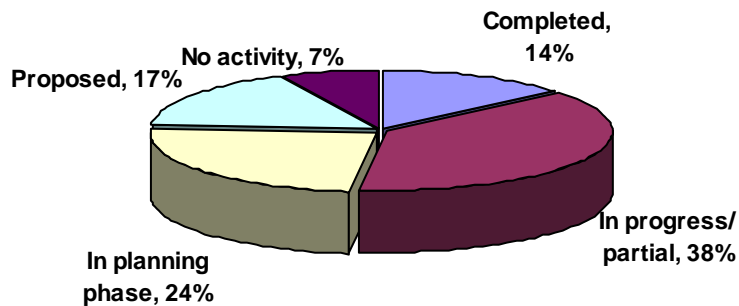
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

2.4. When developing your existing or planned state's enterprise data center consolidation initiative, what business model are you considering?

States were asked to indicate the business model(s) they are considering in developing their existing or planned state's enterprise data center consolidation initiative. An overwhelming percentage of respondents (65.5 percent) indicated that they are or will be using a "Strictly internal state operation" model. A much lower percentage (17.2 percent) indicated that they will be using a "Combination of internal and out sourced hosted operations" model. The remaining respondents indicated that they would either be using an "Internally hosted but vendor managed operation," or a strictly "Outsourced hosted operation" model for current or planned data center consolidation initiatives. *See figure 2 below.*

Figure 2. *Business Models States are Considering When Developing Data Center Consolidation Initiatives*
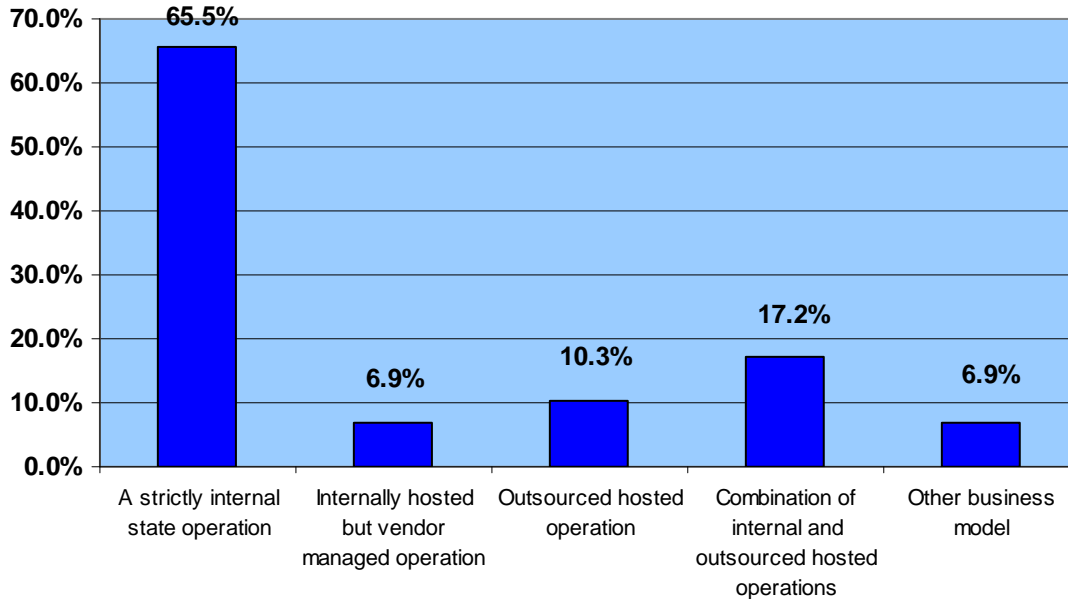
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

Other business model, comments:
Primarily internal with a smattering of vendor-managed or hosted environments.
We are considering all options.

2.5. Please indicate the different types of infrastructure or infrastructure applications currently being used or planned to be used in your state's consolidated data center platform.

States were asked to indicate which types of infrastructure or infrastructure applications currently are being used or planned to be used in their state's consolidated data center platform. The highest percentage, almost 100 percent, of respondents indicated that they used or planned to use Mainframes, Physical Security and Storage Area Networks (SAN). A high, but slightly lower percentage of respondents, ranging from 89.7 to 82.8 percent, utilized Dual power feeds, Dual internet connections, Network Management, Servers, Blade servers, Networking, Secure Network, Network Attached Storage (NAS) and Network Operation Centers in their consolidated platforms. The next group of respondents, in the 70 percentile range, utilize Redundant systems and network infrastructure with no single point of failure, and Telephony/ VoIP in their consolidated platforms. Slightly higher than half of respondents, in the 50 percentile range, also utilize Dual backup generators, and Production Output (e.g. printing, burning of CDs, video and tape) as part of their suite of infrastructure and infrastructure applications in their consolidated data center platforms.

"Other" types of infrastructure and infrastructure applications provided by respondents:
High speed printing.
Production output (Tape only).
Outbound mail and Disaster Recovery.

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Table 2 below categorizes the infrastructure and infrastructure applications into four levels of utilization based on percentage of deployment, with "**Level 1**" representing the highest degree of deployment with a sliding scale to "**Level 4,**" representing lesser degrees of deployment by CIOs in their state's consolidated data center platforms.

Table 2. Infrastructure and/or Infrastructure Applications Used or Planned to be Used in States' Consolidated Data Center Platforms

Infrastructure and/or Infrastructure Applications Used or Planned to be Used in States' Consolidated Data Center Platforms		
Level of Use	**Equipment**	**Percent**
Level 1	• Mainframes	96.6%
	• Physical Security	96.6%
	• Storage Area Network (SAN)	96.6%
Level 2	• Dual power feeds	89.7%
	• Dual internet connections	89.7%
	• Network Management	89.7%
	• Servers	89.7%
	• Dual power feeds	86.2%
	• Dual internet connections	86.2%
	• Network Management	86.2%
	• Network Attached Storage (NAS)	82.8%
	• Network Operation Center	82.8%
Level 3	• Redundant systems and network infrastructure with no single point of failure	75.9%
	• Telephony, VoIP	72.4%
Level 4	• Dual backup generators	58.6%
	• Production Output (e.g. printing, burning of CDs, video and tape)	55.2%

Source: NASCIO's 2007 survey of state data center consolidation initiatives.

2.6. Please indicate which state agencies are currently consolidated or centralized under the state's enterprise data center.

Respondents were asked to indicate which agencies are currently consolidated or centralized under the state's enterprise data center platform. The highest percentage of respondents, 86.2 percent, indicated Finance and Administration and Information Technology as the two most common agencies to be consolidated. Other high percentage responses, ranging from 72.4 to 65.5 percent indicated Personnel, Human Services/ Families and Children, and Health and Welfare as the next most commonly consolidated agencies. See **Table 3** for a complete breakdown of consolidated state agencies.

"Other" state agencies or government offices, and comments included:

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Most agencies have a dedicated server room or data center not connected to the state's primary data center.
Governor's office and Lt. Governor's office.
Justice - Mainframe only; Housing and Community Services; and Forestry/ Veteran's Affairs.
State Legislature; State Treasurer; and Secretary of State's office.
Secretary of State's office; and Treasury; **Note**: Some data center consolidation is partial/ some complete.
Licensing and Regulation; Attorney General; Library and Archives.
State retirement system.
Health Care Authority.

Table 3 below categorizes state government lines of business or agencies currently consolidated or centralized under states' enterprise data center platforms into five levels of consolidation, with "**Level 1**" representing the highest degree of consolidation, on a sliding scale to "**Level 5**" representing lesser degrees of consolidation in state's consolidated data center platforms.

Table 3. Agencies Currently Consolidated or Centralized Under the States' Enterprise Data Center Platform

Agencies Currently Consolidated or Centralized Under the States' Enterprise Data Center Platform		
Level of Consolidation	**Agency**	**Percent**
Level 1	• Finance and Administration	86.2%
	• Information technology	86.2%
	• Personnel	72.4%
	• Human Services/ Families and children	69.0%
	• Health and welfare	65.5%
Level 2	• Revenue/ Taxation	58.6%
	• Environment/ Natural resources	55.2%
	• Parks and recreation	55.2%
	• Geographic information	51.7%
	• Labor/ workforce development	51.7%
Level 3	• Economic Development	44.8%
	• Law enforcement/ Public safety	44.8%
	• Public Protection/ Regulation	44.8%
	• Transportation	37.9%
Level 4	• Agriculture	34.5%
	• Arts and Humanities	31.0%
	• Justice	31.0%
	• Tourism	31.0%
Level 5	• Homeland security	20.7%
	• Higher education	17.2%
	• K-12	17.2%

Source: NASCIO's 2007 survey of state data center consolidation initiatives.

2.7. What new technology initiatives are you using in support of data center consolidation?

States were asked to indicate new technology initiatives they are using in support of data center consolidation. A high percentage, 86.2 percent, indicated **Server virtualization** as a new technology initiative being utilized. Approximately half of respondents, 48.3 percent, indicated **Open Source** as a new technology initiative being utilized in support of their data center consolidation initiatives.

Other new services indicated by states: Storage Area Networks (SAN), and consolidated storage purchases. Service Oriented Architecture (SOA). Virtual servers provisioning and Application hosting.

2.8. What obstacles or challenges have you experienced as a result of your state's data center consolidation initiatives?

States were asked to indicate obstacles or challenges they have experienced as a result of their state's data center consolidation initiatives. Workforce resistance to change, and Agencies' desire to remain autonomous were the number one obstacles indicated with 89.7 and 86.2 percent responding respectively. The next most indicated obstacle was Problems experienced in moving localized devices away from current customer base, with 48.3 percent responding. See Table 4 below for additional responses.

Table 4. Obstacles or Challenges States Have Experienced as a Result of Data Center Consolidation Initiatives

Obstacles or Challenges Experienced as a Result of States' Data Center Consolidation Initiatives	
Perceived Challenges	**Percent**
Workforce resistance to change	89.7%
Agencies' desire to remain autonomous	86.2%
Problems experienced in moving localized devices away from current customer base	48.3%
Backlash when consolidation didn't meet specific business needs	20.7%
Higher than anticipated costs	17.2%
Seeking exemptions from state statutory and regulatory requirements	17.2%
Seeking exemptions from federal statutory and regulatory requirements	17.2%
Failure to identify and adhere to service levels	3.4%

Source: NASCIO's 2007 survey of state data center consolidation initiatives.

<u>"Other" obstacles or challenges indicated by states</u>:

Numerous platforms.

Conditions associated with funding sources; loss of direct control by user agencies.

Perception that consolidation is not the ideal business model for some agencies; lack of funding.

Moving from individually funded data center to a simple usage-based rate model for services.

Reaching cost neutrality among all participants.

Some concerns about moving localized devices away from customer base.

Resistance from different branches of government.

Implementation costs.

2.9. Please describe any strategies or tactics your state has employed to overcome the obstacles or challenges indicated in question 2.8.

Respondents were asked to describe strategies or tactics their state has employed to overcome the obstacles or challenges they indicated in question 2.8. General themes that emerged from states' commentary included executive leadership, focus on business processes instead of technical processes, and communication and awareness programs for agencies on the benefits of consolidation. **(See Appendix I for detailed responses; also see Appendix IV for Michigan's response)**

2.10. Which human resources barriers has your state experienced as a result of its data center consolidation initiatives?

States were asked to indicate which human resources barriers their state has experienced as a result of its data center consolidation initiatives. The overwhelming response was Pervasive culture/ resistance to change, with 62.10 percent responding, which correlates to a similar question from **NASCIO's Survey on IT Consolidation and Shared Services in the States: A National Assessment**, May 2006, <http://www.nascio.org/publications/>, where 80 percent of state respondents indicated that Workforce resistance to change was the leading obstacle to state-wide consolidation initiatives. *See figure 3 below.*

Figure 3. *Human Resources Barriers States Experienced as a Result of Data Center Consolidation Initiatives*
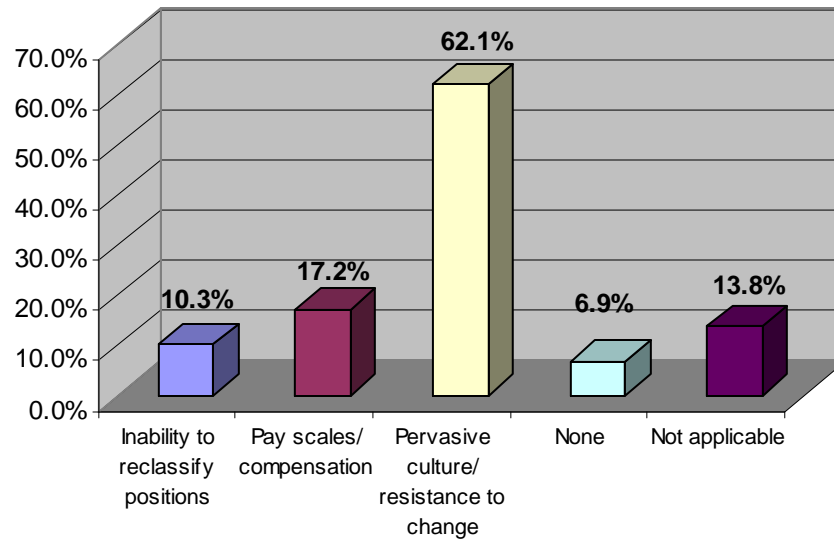
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

Other barriers, indicated:

IT skills in agencies are broad, but not deep.

Recruiting skilled IT employees.

Many state employees did not accept positions with the outsourced vendor because they wanted to stay in the state retirement system.

2.11. If your state's enterprise data center consolidation initiatives include other branches of state government, and elected officials (constitutional offices), how has your state dealt with the disparate governance structures for these entities; or do you feel the non-executive branches and elected officials (constitutional offices) are out of scope of your state's data center consolidation efforts?

States were asked to indicate if their state's enterprise data center consolidation initiatives include other branches of state government, and elected officials (constitutional offices), and if so, how

their state has dealt with the disparate governance structures for these entities. Respondents were also asked if they feel the non-executive branches and elected officials (constitutional offices) are out of scope of their state's data center consolidation efforts. Eight states indicated that they do not include other branches of government. Several states indicated that the legislative and judicial branches have chosen to consolidate under the state's enterprise to varying degrees, while consolidating other state-wide elected offices was a rare occurrence. **(See Appendix I for detailed responses)**

Survey Section 3. Data Center Location

3.1. If you already have new or existing primary and back-up data centers in place, are they located inside or outside the state capital geographic boundary?

States were asked if they already have new or existing primary and back-up data centers in place, and if so whether they are located inside or outside the state capital geographic boundary. The split was almost 50/50 for those states responding. The rationale cited by respondents for data centers located **inside the state capital** centered primarily on logistics (proximity to support, state agencies and other infrastructure); also, original site design and the cost of moving existing facilities were cited. The rationale cited by respondents for data centers located **outside the state capital** was based mostly on facilities utilized for back-up, resiliency and disaster recovery, and geographic dispersal of critical assets (indicated mostly as secondary sites); one respondent indicating the state used a requirements-driven approach, and another citing economic development reasons for their site location. *See figure 4 below.*

Figure 4. *Data Centers Located Inside or Outside the State Capital Geographic Boundary*

Outside the state capital, 48.3%

Inside the state capital, 55.2%
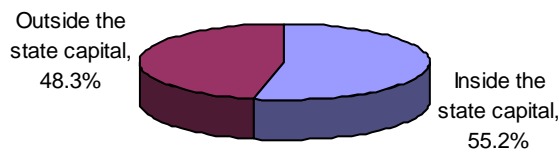
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

3.2. If you are in the planning phase of new or existing primary and back-up data center construction, are you planning on locating the facility outside of the state capital geographic boundary?

States were asked, if they are in the planning phase of new or existing primary and back-up data center construction, are they planning on locating the facility outside of the state capital geographic boundary. The majority of respondents indicated they are planning their new data

center **outside the state capital geographic boundaries**. The most cited rationale by respondents was for back-up and disaster recovery; (specific responses included, "Planning for wide-spread disaster," "Moving facilities away from hurricane zones," and "Ability to use the National Guard if needed.") Other responses included "Availability of high speed lines;" and "Job creation." The rationale cited by those respondents planning facilities **within the capital geographic boundaries** mostly involved proximity to support; (specific responses included, "Some agencies feel the risk of widespread disaster is low and accept that risk for certain applications," and "We would like to take advantage of the fiber network already in place in our state capital." *See figure 5 below.*

Figure 5. *Data Centers Planned Inside or Outside the State Capital Geographic Boundary*
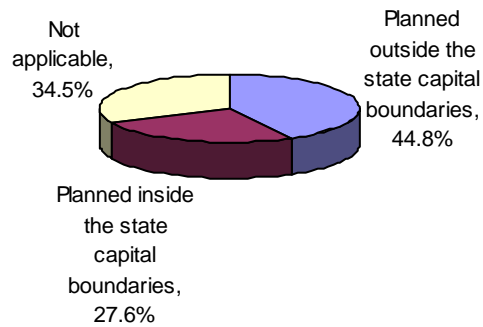
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

3.3. If you are in the construction phase of a new primary or back-up data center, is it being constructed outside of the state capital geographic boundary?

States were asked, if they are in the construction phase of a new primary or back-up data center, is it being constructed outside of the state capital geographic boundary. The percentage of responses for those states currently constructing data centers was low; however a slight majority of respondents indicated they are constructing their new data center **outside the state capital geographic boundaries**. Reasons for this trend were similar to those indicated by states in the planning phase and primarily involved back-up and disaster recovery. For those states constructing data centers within the state's capital boundaries, responses again included proximity to state agencies, and one state indicated that since they already had a primary facility outside the capital area, it made sense to construct the back-up center in the state's capital. *See figure 6 below.*

Figure 6. *Data Centers Under Construction Outside the State Capital Geographic Boundary*
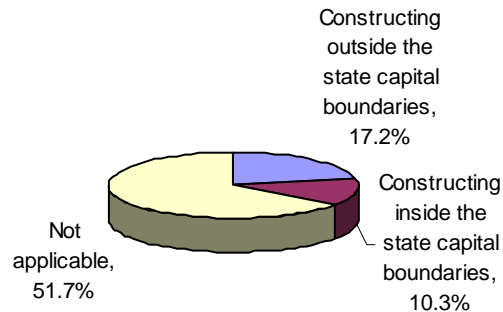
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

3.4. If you are planning or are in the process of moving an existing primary or back-up data center, what complications are you experiencing?

States were asked to indicate complications they are experiencing if they are planning or are in the process of moving an existing primary or back-up data center. Not surprisingly, the general theme indicated by respondents revolved around funding issues and charge-back methods. Other states indicated problems with increased bandwidth costs and connectivity to secondary data centers that are a great distance from the state's primary data center. Individual state comments included concerns over agencies that continue to operate their own centers/ server rooms even though some of their operations are hosted in the state's primary data center. Complications with moving legacy system hardware, especially those with hard coded IP addresses were cited. Also, reflective of agencies' resistance to change, one state commented, "**Agencies don't want to see the hardware move from their location; they like to see the blinking lights.**"

Survey Section 4. Strategies and Business Rationale

4.1. If your state has a defined, documented strategy or business plan that sets the direction for the state's enterprise data center consolidation initiative, please describe below.

States were asked to describe strategies or business plans that set the direction for the state's enterprise data center consolidation initiative. **Six states** indicated that their data center consolidation initiatives were part of a larger Information Technology master plan or strategy. **Two states** indicated that their data center consolidation initiatives were legislatively mandated. Other strategies included: Locating critical systems in Tier III plus data centers for redundancy and reliability; Utilizing an IT roadmap and scorecard for all IT services; Consolidating like services which can be classified as "utilities;" Utilizing a Strategic Management Team (SMT) that collaborates with technical and client staff to determine the most effective means to move systems with minimum risk and minimum cost; and Creating a plan for enterprise server systems with a vendor's assistance. **Six states** indicated that they have no formal strategies in place at this time, or that they are currently under development. **(See Appendix II for detailed responses; also see Appendix IV for Michigan's response)**

4.2. What factors are driving your state's strategy to consolidate data centers?

States were asked to indicate factors that are driving their state's strategy to consolidate data centers. Disaster recovery and Replication, redundancy and fault tolerance were the two driving factors most indicated by respondents. Cost savings and Security and data classification were also listed as significant factors in states' decisions to consolidate data centers. "Other" comments indicated included "Existing site is experiencing space constraints;" and "Optimization and economies of scale." (See Table 5. for a complete list of responses)

Table 5. Factors Driving States' Strategies to Consolidate Data Centers

Factors Driving States' Strategies to Consolidate Data Centers	
Driving factors	**Percent**
Disaster recovery	82.8%
Replication, redundancy and fault tolerance	75.9%
Cost savings	65.5%
Security and data classification	62.1%
Better access to new technologies for all agencies	55.2%
Aging state facilities	51.7%
Improved information sharing/ data integration	51.7%
Energy conservation/ Environmental concerns	41.4%
Size	37.9%
Business applications	24.1%

Source: NASCIO's 2007 survey of state data center consolidation initiatives.

4.3. What method(s) is your state utilizing to project cost savings for its data center consolidation initiatives?

States were asked to indicate what method(s) were utilized to project cost savings for their data center consolidation initiatives. A majority of states indicated that they are not using a method to project cost savings. States that are projecting cost savings indicated that they are utilizing private consultants, ROI calculators, and funding models for this function. "Other" responses included, "Common sense," "Hosting center rate reductions" and "Cost benefit analysis/ Cumulative payback assessment." *See figure 7 below.*

Figure 7. *Methods States are Utilizing to Project Cost Savings for their Data Center Consolidation Initiatives*
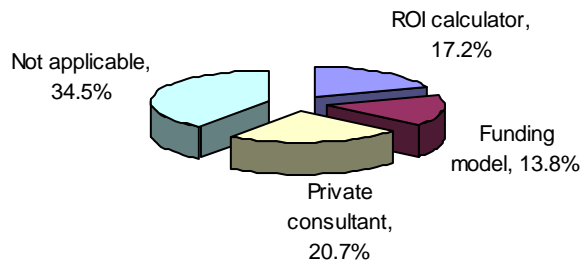
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

4.4. What types of reporting tools are being utilized by your state to report on the status of projected cost savings for your data center consolidation initiatives?

States were asked to indicate reporting tools being utilized to report on the status of projected cost savings for their data center consolidation initiatives. Fifteen states indicated that they had no such reporting tools at this time, and one state indicated that its reporting tool was currently in development. For those states that indicated utilization of a reporting tool, responses ranged from utilizing scorecards, project portfolio management processes and tracking tools, cost avoidance, and initiatives that require agencies to regularly measure and report the effectiveness of the services they provide. **(See Appendix II for detailed responses)**

4.5. What metrics is your state using to measure success in achieving enterprise-wide data center consolidation?

States were asked to indicate metrics they are using to measure success in achieving enterprise-wide data center consolidation. Uptime, response time, reliability and availability was the most common metrics indicated. Number of servers and Percent of participation were also indicated as measures of success. *See figure 8 below.* "Other" state comments included use of Scorecards, Rate reductions, Cost savings, Annual customer satisfaction surveys, and Industry benchmarking.

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Figure 8. *Metrics States are Using to Measure Success in Achieving Enterprise-wide Data Center Consolidation*
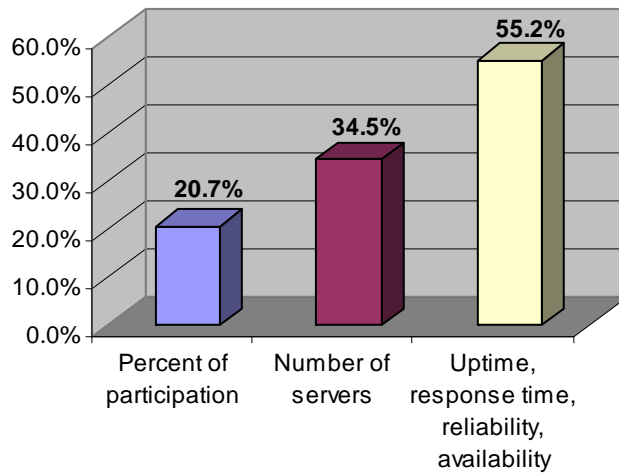
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

4.6. If internal relationship management strategies are being employed by your state technology office to promote data center consolidation efforts, please describe below.

States were asked to describe any internal relationship management strategies being employed by their state technology office to promote data center consolidation efforts. The overall theme that emerged from states' responses indicates a growing awareness of the effectiveness of internal relationship management strategies to promote agency buy-in for consolidation efforts. **(See Appendix II for detailed responses)**

This trend was noted in two issue briefs released by NASCIO in 2006, ***Relationships Matter: Customer Service Strategies to Promote Enterprise Services***, and ***Staying Connected to Your Customers: Strategies and Tactics to Grow Enterprise IT Services***, which examine the utilization of strategies and tactics to sustain and grow relationships with agencies using proven customer service management techniques; available at: <http://www.nascio.org/publications/>.

4.7. If your state has initiated an enterprise-wide data center consolidation project, how much calendar time is being allocated by your office for its completion?

States were asked to indicate how much calendar time is being allocated for completion of their state's enterprise-wide data center consolidation project, if one has been initiated. For those states that had initiatives underway, responses ranged from six months to four years with the majority of respondents indicating two years for completion.

4.8. Who in your state initiated the data center consolidation process (what is your mandate for consolidation)?

States were asked to indicate which governing body in their state initiated and/ or mandated the data center consolidation process. A majority of respondents indicated that the state CIO's office issued the directive to consolidate data centers in their respective states. Empowering state legislation was the next most indicated response. *See figure 9 below* for detailed responses.

Figure 9. *Governing Body That Initiated or Mandated the States' Data Center Consolidation Process*
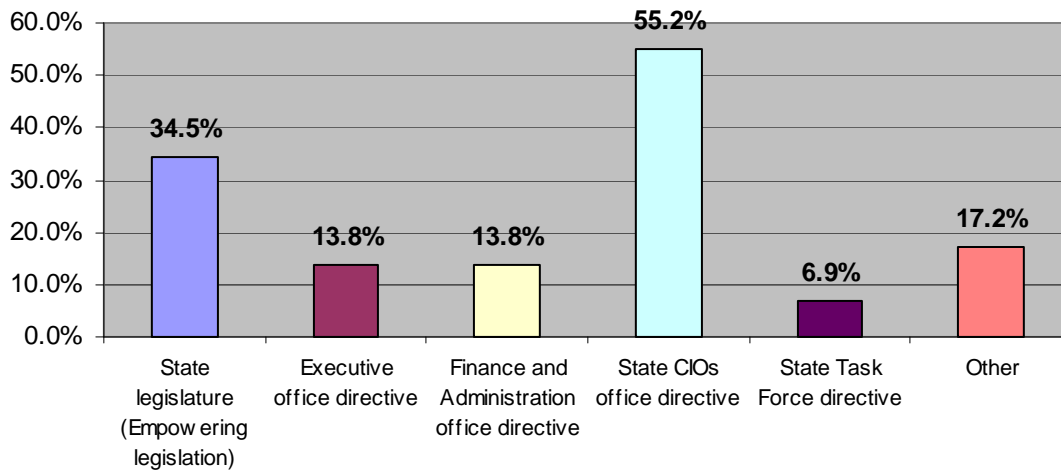
Source: NASCIO's 2007 survey of state data center consolidation initiatives.

Survey Section 5. Enterprise Architecture and Standards

5.1. If your state has a formalized enterprise architecture and standards creation and approval process for data center consolidation, please describe below. Also indicate whether this process includes technology managers from all the agencies targeted for consolidation?

Respondents were asked to indicate if their state has a formalized enterprise architecture and standards creation and approval process for data center consolidation, and also whether this process includes technology managers from all the agencies targeted for consolidation. Twelve states indicated they had no EA standards or process. Five states indicated that they are in the process of developing such standards. However, a general theme emerged from state responses that EA standards are being utilized by several states as part of overall consolidation and centralization plans, which also include data center consolidation initiatives, and in most cases also involve participation by agency IT managers. **(See Appendix II for detailed responses)**

5.2. If your state has an information architecture standard in place that employs data classification policy, please describe below, including levels of data classification utilized?

States were asked to describe their information architecture standards that employ data classification policy, including levels of data classification utilized. Sixteen states indicated they have no such standards in place. Two states indicated that they are in the process of developing such standards. For those states that have information architecture standards in place, responses included:

We are working on a data classification system but are currently focusing on level 3 data security needs system by system.

All data is required to be classified in one of four categories: Public, Private, Secret, and Top-Secret.

We use a slightly modified version of the FIPS-199 framework, which uses a "low," "medium" and "high" rating system.

There is a specifically different set of SAN memory and state policies that govern the administration of sensitive to protected data. Other than the HIPPA and Personal Sensitive Information, data is handled the same as far as storage and processing.

A policy requiring data classification by all agencies is being promulgated now by the state's Enterprise Security Office. Implementation of the policy is being undertaken by a Community of Practice comprised of state agency business leaders and experts, and supported by staff reporting to the state CIO. **Data classification levels** defined in the policy are: **Level 1**, "Published": Low-sensitive information, Information that is not protected from disclosure that if disclosed will not jeopardize the privacy or security of agency employees, clients, and partners. **Level 2**, "Limited": Sensitive information that may not be protected from public disclosure, but if made easily and readily available, may jeopardize the privacy or security of agency employees, clients, partners. **Level 3**, "Restricted": Sensitive information intended for limited business use that may be exempt from public disclosure because, among other reasons, such disclosure WILL jeopardize the privacy or security of agency employees, clients, partners, or individuals who otherwise qualify for an exemption. **Level 4**, "Critical": Information that is deemed extremely sensitive and is intended for use by named individual(s) only. This information is typically exempt from public disclosure because, among other reasons, such disclosure, WOULD POTENTIALLY CAUSE MAJOR DAMAGE OR INJURY, up to and including death, to the named individual(s), agency employees, clients, partners, or cause major harm to the agency.

We are in the process of an RFP for data classification and also working on an enterprise security assessment which has components of this classification effort.

The state's information architecture is in the early stages of development, in a collaborative effort with several other states via NASCIO. The only detailed data classification thus far has been "sensitive" data for security purposes. Overall, classification will be based on the state's Enterprise Business Model.

Through the Enterprise Architecture Committee (EAC) our state has established data standards for integration of data exchanges between agencies. The EAC has also been working on the following initiatives: Identity Management Initiative, Networking Standards Initiative and Voice over IP Initiative.

Survey Section 6. Privacy and Security Requirements

6.1. HIPAA requirements, Department of Justice requirements, restrictions on access to juvenile data, and other federal and state laws and regulations can impose barriers to consolidation of data centers, especially those that affect access to data. Please describe strategies your state has developed to address these issues as part of its data center consolidation initiative.

Respondents were asked to describe strategies their state has developed to address issues related to federal and state laws and regulations that impose barriers to consolidation of data centers. Three states indicated they perceived no such barriers and one state expounded on this by stating, "We disagree, the state's MMIS, SACWIS, and eligibility systems have been housed in our centralized data center for many years without issue." The overall theme for most respondents indicated that barriers do exist and states are employing a variety of security strategies to overcome these barriers and phase federally funded programs into the states' data center consolidation initiatives. **(See Appendix II for detailed responses)**

Survey Section 7. CIO Questions

7.1. Please describe your experience with data center consolidation initiatives that could benefit other state CIOs. For example, keys to success, challenges, roadblocks experienced, and what was involved in developing your state's strategy.

CIOs were asked to provide keys to success, challenges, roadblocks experienced, and what was involved in developing their state's strategy. General themes included Governor's office support and empowerment of the state CIO by reporting directly to the Governor; legislative support and aligning timing to coincide with the legislative funding process; partnerships with the state controller and state personnel office; teaming with the state's budget office; agency CIOs championing the cause; marketing communication, and collaborative relationships with agency directors regarding better quality of service and savings and establishing a customer advisory board that includes agency directors; setting very specific performance targets; and a well developed strategic plan. **(See Appendix II for detailed responses)**

Survey Section 8. Additional Resources

8.1. Please provide any links to governance models, funding models, consolidation plans, or other resources that you feel would benefit other CIOs in their data center consolidation initiatives.

States were asked to provide any links to governance models, funding models, consolidation plans, or other resources that they felt would benefit other CIOs in their data center consolidation initiatives. **(See Appendix III for detailed responses)**

Appendix I – Additional State Comments from Survey Section 2. General Questions

Reference survey question (2.1.) How do you classify data centers in your state?

States Using the Uptime Institute to Define Their Data Centers – <u>Comments included</u>:

Most CIOs have some kind of "Data Center" ranging from raised floor to closets. We have both a mainframe and approximately 400 servers in our data center so we do not differentiate between a mainframe and server environment.

Many agencies have dedicated computing space utilizing raised or non-raised floors. The floor spaces range from 14 square feet to 17,700 square feet. Our main Information Technology Data Center is rated Tier-2 relative to the Uptime Institute. We are targeting a new second co-processing Data Center for Tier-3(N+1) level.

We have three enterprise Hosting Centers (Data Centers) with a total of over 30,000 square feet of raised floor space. These hosting centers contain mainframes and servers. We also have several smaller legacy data centers/ server rooms with anywhere from 100 to 2,500 square feet of space, some raised floor, some not. The Legacy data centers/server rooms are being closed as a part of our Data Center Consolidation Project. Our three hosting centers are classified as Tier 3 using the Uptime Institute tiering structure. Our data centers/ server rooms can be considered Tier 1-2. The legacy rooms contain application and Office Automation Servers/storage. We have enterprise platforms (Shared by all agencies or several state agencies), and these enterprise platforms are mainframes, storage and servers. We also host agency specific platforms, some mainframe and servers.

For planning purposes we have considered any facility greater than 100 square feet a "data center" to filter out file/print server facilities and the like. We don't differentiate between mainframe and mid-tier servers. We are using Uptime definitions for Tier 3 and 4 in planning for new data centers.

We have one State Data Center - a Tier III facility as classified by the Uptime Institute. Other agency IT facilities across the agencies would not be considered "data centers."

We classify state enterprise data centers as all raised floor facilities managed by the Department of Information Services (DIS). These managed data centers have redundant power, generator, HVAC and house mainframe, server, network, storage, backup and production output technology and applications. The state enterprise data center is built for redundancy and failover capabilities. We classify our data center using the criteria established by the Uptime Institute. Our current data center is at Tier 3. We are in the process of developing a Tier-3+ data center. We consider sites located in other agencies as machine rooms.

States Utilizing Their Own Definitions – <u>State specific definitions included</u>:

Any secure facility that provides enterprise and critical application support for state agencies.

A facility, which may be a room in a building or an entire building, that is specifically configured to support and house hardware. This typically has controlled access to the area and backup power supplies. Also, facilities used to house organizational applications are considered data centers

A single, large state data center with all environmental facility requirements met including emergency generator, raised floor, tightly controlled physical access, and Storage Area Network (SAN) attached disaster recovery.

We only have one building classified as a data center; however, we do classify anything housing more than one server as a "server room."

We define them by application and the type of hardware being used for the most part. If it is a statewide application running on IBM like hardware at a central site, we consider it a mainframe.

Minimum 1,000 square feet raised floor with backup power generation and UPS. We do not differentiate between mainframe, minicomputer and server environments -- all are accommodated in the data center.

We run two raised floor data centers on the capitol grounds and one remote data center six miles away from the capitol campus. Server closets and some rooms are not considered data centers. We define our mainframe and iSeries systems by redundancy and recovery times. We consider the mainframe an enterprise platform and treat it as any other server, however with service level objectives uniquely defined to the hardware itself. Applications on the other servers comprise their own service level objectives.

Data centers have raised floors and contain mainframes and servers. We do not differentiate between servers and mainframes.

Any facility with a raised floor servicing the entire state government; we do not consider locations with servers as data centers. We also consider the mainframe as an enterprise platform, and we do differentiate between mainframe and server environments.

Raised floor, highly survivable sites are considered data centers.

Data centers host key applications for a particular agency. We view the mainframe as a hosting platform and though rates for this system are different, we treat it as a hosting system.

At the beginning of our IT Infrastructure Transformation effort, we inventoried "data centers" as any room of 100 square feet or more housing one or more servers used by executive branch agencies (higher education excluded in all cases), regardless of other characteristics (raised floor, environmental controls, etc.). By traditional definitions, our "enterprise platforms" consist of large IBM and Unisys mainframes and a large UNIX system. As our transformation partner consolidates servers in our new data center we agree that differentiating between those traditional platforms and servers in terms of "enterprise" business support is losing any significance.

We define data centers using the following tiering classifications: Tier 1 - Fully redundant, raised floor, highly secured area. This is where the mainframe resides along with other enterprise servers and critical infrastructure. Tier 2 - Agency specific server rooms with usually less than 50 servers. Tier 3 - Glorified closets with 5 or fewer servers.

States Defining Their Data Centers as Enterprise Platforms – <u>Comments included</u>:

The mainframe supported by the Department of Administration is considered an enterprise platform as it serves the needs of several state agencies.

We have an enterprise-wide data center in the state's capitol. A second enterprise-wide data center is being constructed in the Western part of the state. We provide multiple enterprise-wide service offerings which include mainframe and open systems (servers) as well as other IT infrastructure services.

We run two raised floor data centers on the capitol grounds and one remote data center six miles away from the capitol campus. Server closets and some rooms are not considered data centers. We define our tiers for storage, mainframe and iSeries systems by redundancy and recovery times. I consider the mainframe an enterprise platform and treat it as any other server, however with service level objectives uniquely defined to the hardware itself. Applications on the other servers comprise their own service level objectives.

Any facility with raised floor, servicing the entire state government, we consider a data center. We do not consider locations with servers as data centers. Our data center is a combination Tier 1 and 2. We also consider the mainframe as an enterprise platform, and do differentiate between mainframe and server environments.

We consider a data center to have a raised floor, full UPS, fire suppression capabilities, and security. We are a Tier 3 Data Center with mainframes and servers sharing the same environment. Our mainframes and servers are considered Enterprise Platforms.

We consider our mainframe an enterprise environment but also possess shared enterprise server environments such as our VM farms, enterprise SAN storage, shared database environments, etc.

Data centers host key applications for a particular agency. We view the mainframe as a hosting platform and though rates for this system are different, we treat it as a hosting system.

We consider Data Centers to include all facilities designed to house computer systems with specialized environments providing conditioned power, physical security, CRAC and fire suppression. We also consider our sole mainframe to be an enterprise platform and do provide separate operating environments from other servers.

Reference survey question (2.2.) Based on the above definition, how many data centers do you have in your state, and how many are you trying to get down to?

State comments included:

Based on the definition in question 2.1, we estimate something around 30 data centers in the capitol area. Under our consolidation vision we see one large data center, probably 40,000 sq ft or so, plus our disaster recovery data center, 6,500 sq ft.

Prior to our consolidation initiative there were ten state agencies that had server rooms that could be considered data centers. All other agencies had server rooms from mid-size to small. All servers were consolidated and centralized at the state data center. The result is a reduction of nearly 30 percent of the servers statewide.

Within the executive branch, data centers reside in at least four locations, with one of those spanning more than one floor in a building. State agencies are dispersed over a wide area and the logistics of support have dictated the current number. There is no formal target number of data centers because we recognize that business needs change over time (for example, we are considering expanding into a new geographic area of the state for disaster recovery/ redundancy); however we do not envision additional significant numbers in the next ten years.

We currently have one data center and are in the process of looking for an alternative site to replicate data and for disaster recovery.

The state has three Hosting Centers as our "Target" data center environment. We have consolidated 21 data centers/server rooms with our Data Center Consolidation Project since 2004, and all of these have been consolidated into the 3 hosting centers. There are 15 additional data centers/server rooms targeted for closure in 2007. All remaining data center/server rooms will be targeted for consolidation and closure in 2008.

We have four data center locations that function as a redundant mesh spread across our capital city.

We currently have three data centers, a larger number of server rooms, closets, as well servers located under desks and hallways throughout the state. We are consolidating to two centrally operated Tier III+ Data Centers.

By our definition, we have 31 data centers, with six of those having a mainframe. We have 1,154 remote sites that house servers. Our target number of data centers is two.

Based on our 100 square foot definition, we have over 100 data centers throughout the executive branch. Our three-year IT Infrastructure Transformation Plan (FYs 2007-09) includes a Tier III primary data center (coming on-line beginning July 2007) and a Tier II+ backup center (coming on-line beginning November 2007), both built, owned, and operated by our corporate partner, which has already begun consolidating our inherited inventory of 3,000 servers. Our goal is ending up with the equivalent of no more that 1,000 physical servers, the vast majority of which will be in our new data centers. Where most practical from engineering and cost standpoints, some consolidated servers will remain in the field, in rooms with appropriate security and environmental controls.

Based on our definition we have provisions for three state enterprise data centers. One enterprise data center on the capital campus and two redundant data centers in the eastern part of the state for fail over.

Currently we have one Tier 1 data center with plans of going to two. We have approximately 25 Tier 2 data centers with plans of going to two. We also have approximately 50 Tier 3 data centers with plans of going to zero.

Reference survey question (2.3.) Please indicate the status of your state's enterprise data center consolidation initiatives.

Comments for those states indicating they have **completed** initiatives, include:

For the executive branch of government all e-mail, storage, and server hosting is completed. The judicial and legislative branches choose to use the consolidated servers at their discretion and have only partially opted to do so.

Selecting only one does not describe our situation. Our central state data center is 20 years old and provides enterprise shared services; and our initial server consolidation initiative is completed. However we are now expanding to the next level.

Comments for those states indicating they have initiatives **in progress or partially completed**, include:

We are consolidating three server-based open systems data centers into an enterprise data center. Our mainframe disaster recovery data center is also almost complete.

The mainframe and many servers are located in the data center. Other servers will be relocated or moved to data center hardware.

Eleven of the initial twelve state agencies scheduled for migration have been migrated using a "lift and drop" methodology. Planning for consolidation of platforms is now underway.

The outsource vendor took over providing services in place in April 2007. Consolidation will occur over the next two years.

Our new primary data center comes on-line beginning July 2007. Our new backup center comes on-line beginning November 2007. Both centers will take about six months to install new equipment and transition functions and equipment from our existing data center. Server consolidation will continue over the remainder of the three-year transformation effort, through fiscal 2009.

Completion of a new facility in our Capital Complex is scheduled this year and will receive equipment from a variety of disparate locations.

Comments for those states indicating they have initiatives **in the planning phase**, include:

Our disaster recovery data center is in the planning phase and will house open systems and voice\ data core routers.

We assessed the need for one new data center and will soon be releasing an RFP to design one. We just received funding for a new data center earlier this month during a special session.

We have two new Tier III data centers for self recovery in the planning phase; final budget approval is expected; properties already secured.

A new Tier 1 center currently under construction. Tier 3s are being eliminated as we do routine age and condition projects.

Comments for those states indicating they have initiatives **proposed**, include:

There is an awareness of the benefits of consolidation, and most agencies support this strategy; however, no formal plans exist for further consolidation.

We have requested funding to build a new third shared data center for the state.

Recent legislation has given us the authority to pursue construction of a new state data center.

Comments for those states indicating they have **no activity**, include:

We currently have no initiatives planned; however, in the past year the state's workforce department's mainframe services have come on the state's enterprise data center mainframe.

We currently have four data centers, and although we plan on eventually consolidating down to one, we currently have no initiatives in place.

Reference survey question (2.9.) Please describe any strategies or tactics your state has employed to overcome the obstacles or challenges indicated in question (2.8.)

State responses varied and included:

Our best strategy was to provide a superior data center than what the agencies currently were using.

Our new administration is beginning to consolidate the state CIO's office and expand it beyond policy to include IT operations.

We have included the customer base in the selection and design process for the new data center.

We are trying to be as transparent as possible during the planning and decision making phases.

Establishment of an IT governance committee structure at both the policy and technical levels.

The empowerment of our central IT department and the state CIO - Became responsible for all IT hardware, operating systems, centralized services (e-mail, home directories, active directory, etc.), and all IT services in the following service areas: 1. Network services; 2. System administration/ engineering services; 3. Distributed services (desktops, printers, remote servers); 4. Customer services (help desk).

Efforts to make agencies aware of the potential cost savings.

Creating a business case to offer better and cost effective services.

This has to be first and foremost a "business" decision rather than a technical one. We're soliciting Governor's Office and Cabinet support to set the direction in agencies.

Close coordination at the executive level.

(1) Frequent and timely communication to the agencies; (2) Agency Department Head support of the IT Consolidation Program; (3) Continuous education on the value of IT Consolidation; (4) Development of Operational Excellence program, including ITIL best practices, to provide performance measures, to improve IT processes and to improve service delivery to customers.

We are in the process of creating service level objectives for our consolidated systems. These indicators will flow up to a service level agreement with agencies. These agreements will gauge our performance based on our ability to perform to our stated service level objectives. We feel that this level of published accountability will help prove our ability to deliver in a demanding environment.

We are in the planning stages. Strategies are being developed.

1) Working with the state's department of Education and the Federal FERPA Compliance Office to allow the department to be included in the state data center; 2) Strong leadership (Governor, Legislature) regarding customer expectations; 3) Working to change attitudes of the new state data center staff (formerly agency staff) to do business in a new way; 4) Major re-base lining of projected operational cost structure and staffing levels in April 2006.

Currently in the planning stages.

(1) Offering SLA's; (2) Lower Cost of Total Ownership; (3) Better Service

The state has a comprehensive Enterprise IT Planning process which is being used to promote server consolidation. The state's central IT agency has also been granted authority to approve all

agency IT purchases. This allows central IT to direct agencies to data center services and dis-allow agency server purchases as appropriate.

Hired 3rd party consultant to help write request for offer (RFO) and master services agreement. Created data center advisory council and engaged the agency IT Directors early in the process.

We are working closely with business executives and taking a managed and measured approach.

(1) The state has established a governance structure led by the Information Services Board (ISB); (2) The ISB has established an Enterprise Architecture Committee to identify technology standards for common services; (3) The legislature has established an Information Technology pool comprised of 70 agency projects and central IT is responsible for the oversight and management of the technology pool; (4) The state has implemented government management, accountability and performance (GMAP) to meet the Governor's approach to accountability which requires agencies to regularly measure and report the effectiveness of the services they provide, so that problems can be identified and fixed. These strategies are being leveraged to help agencies get common IT services from the state enterprise provider.

The development of very detailed MOUs and SLAs.

Demonstration of performance and security improvements, and economy of scale resulting in ROI.

Reference survey question (2.11.) If your state's enterprise data center consolidation initiatives include other branches of state government, and elected officials (constitutional offices), how has your state dealt with the disparate governance structures for these entities; or do you feel the non-executive branches and elected officials (constitutional offices) are out of scope of your state's data center consolidation efforts?

State responses varied and included:

Participation outside the executive branch is voluntary. Both judicial and the legislature joined the state wide area network (WAN) but higher education opted out. The state's disaster recovery data center was actually instituted by the secretary of state's office and is open to all state government entities.

Consolidation, centralization and standardization have been completed for the executive branch of state government. After assessing our success, other agencies of state government outside of the executive branch have requested consolidation.

Same as for the executive branch agencies, primarily autonomy.

While we have openly shared the data center consolidation projects with elected officials and other branches of state government, we have not discussed migrating their data centers into the project.

The primary challenge is some staff in organizations not under executive control wrap themselves in the constitution to preserve the status quo. Others see the value and economy of scale and cooperate willingly.

No, but some have located servers in the data center.

Only executive branch involved in IT infrastructure consolidation. Constitutional offices and other branches of government are expected to use the second data center now under construction.

Yes. Our non-executive branch agencies have the option to use the central IT services based on their own business cases. Central IT is in the executive branch of government, headed by the state CIO who reports directly to the Governor. When the judicial and legislative branches choose our services it is typically based on our reputation and history for delivering the service they are choosing, for example, e-mail services. Thus, buy-in typically has happened by the time they come looking for us to host their systems.

The state has not had problems getting buy-in from other branches. They have been supportive and in some cases have led the initiative. The Department of Education has posed a challenge.

We are a service bureau data center for the state. We service all branches of state government.

We have voluntary participation from the majority of non-executive branch agencies but to varying degrees.

Yes, it included elected officials. Consolidation was state mandated and required by statute.

The current state data center has historically served agencies outside the executive branch as a "vendor of choice." Customers include the only other statewide elected officials: the Lieutenant Governor and Attorney General. One of the aspects of the partnership is to proactively market our consolidated 21st Century infrastructure as a cost-effective platform for additional non-executive branch customers at both the state and local levels.

The Executive Branch of government follows the standards established by the Information Services Board (ISB). The Legislative and Judicial branches of government acknowledge the ISB standard and have a member of the ISB; however these branches of government are not governed by the ISB standards. The Judicial and Legislative branches also have participants on the state Enterprise Architecture Committee (EAC).

Our consolidation includes all executive branch agencies except for Higher Education and K-12 and the elected officials: Auditors Office, Secretary of State, the Attorney General and the Treasurer.

Elected officials and Judicial Branch are offered the option to opt-in.

Appendix II – Additional State Comments from Survey Sections 3 through 7.

Reference survey question (4.1.) If your state has a defined, documented strategy or business plan that sets the direction for the state's enterprise data center consolidation initiative, please describe below.

State responses included:

Our state has an IT Consolidation, Centralization, and Standardization Roadmap for all IT services, including a consolidation plan and scorecard. The consolidation process has been extensively documented and followed, which includes dealing with the state personnel office, the Office of Management and Budget (OMB), and several other state agencies with each agency consolidation.

We have a documented plan and have communicated that with all agencies. Our focus has been to consolidate like services which can be classified as "utilities." Services such as desktop, LAN/WAN, storage, operations, telephony, data management, and security

It is one of our strategic initiatives in the state's Information Technology Master Plan.

We have the state's Information Technology Act which suggests consolidation to meet efficiency objectives; however, it's by inference rather than explicit reference.

(1) Legislation; (2) An established and staffed IT Consolidation Program; (3) An established budget with funding; and (4) A phased approach.

The original consolidation requirement was a legislative mandate. **Business Case** The purpose of the IT Functional Consolidation Project is to meet legislative intent. **Section 10** requires that 24 full-time equivalent positions relating to information technology services, including e-mail, file and print server administration, database administration, storage, application server, and hosting services, be reduced and transferred from 15 various agencies to the Information Technology Department (ITD), unless exempted by the state's Chief Information Officer. Each affected agency shall purchase these services from ITD. **Section 11** required the Office of Management and Budget (OMB) to achieve efficiencies during the 2003-05 biennium, relating to the required consolidation of information technology functions. OMB and ITD are to achieve accumulated net savings totaling $1.4 million dollars, but may exercise full discretion in any necessary modifications. **Section 16** requires that each state agency and institution, excluding the legislative and judicial branches, the institutions under the control of the state board of higher education, the Public Employees Retirement System (PERS), the Retirement and Investment Office (RIO), the Attorney General's Office, and any entity exempted by OMB and ITD, shall obtain e-mail, file and print server administration, database administration, storage, application server, and hosting services through a delivery system established by ITD and OMB. **Additional info** can be found at: <http://www.nd.gov/itd/consolidation/>

Our state's 2005 Enterprise Information Resource Management Strategy – Objective 2.3 (Page 23) URL:
<http://www.oregon.gov/DAS/EISPD/ITIP/docs/strategic_plan/2005_to_2009/full_plan.pdf>

We have a mainframe Disaster Recovery Plan in place with a major Disaster Recovery vendor. We are currently creating our plan for Enterprise Server systems with the vendor's assistance.

Our state's Enterprise Shared Services Program – In a nutshell: All servers not currently located in State Data Center will be consolidated as existing servers reach end of life. Applications will be moved to shared services (VM farms, shared databases, etc.) as appropriate. If agency systems are not deemed appropriate for shared resources, systems will be housed in a dedicated environment. Central IT owns and operates all equipment housed in the Data Center and supports though the OS layer. Additional services for DBA and mid-tier support are provided upon request. Agencies are responsible for business application support. Central IT provides enterprise

services for core infrastructure systems such as e-mail, Blackberry, Anti-virus, Anti-spam, Internet content filtering, Video conferencing, Video Streaming, Centralized Fax, File Services, ECM, Reporting, Business intelligence, etc.
See Texas' DIR Strategic Plan at: <http://www.dir.state.tx.us/irsp/index.htm>

We are determined to provide a high level of customer service. We are working with agency or department business leaders and IT staff assigned to those business units. The plan is to protect the data, provide a high level of availability, meet our customers' needs, and avoid costs where possible. The reduction of data centers to a certain number is not part of our goal, although a reduction will take place.

Documents exist at several levels to describe the Commonwealth's IT infrastructure transformation, including data center consolidation. For a summary, see:
<http://www.vita.virginia.gov/docs/docs/VITAValueITTransformationBringing21stCentury.pdf>.

For further details, see:
<http://www.vita.virginia.gov/itpartnership/index.cfm>

We have an Agency Strategic Plan and a State Strategic IT Plan that are focused on provisioning common shared services out of the state data center.

Reference survey question (4.4.) What types of reporting tools are being utilized by your state to report on the status of projected cost savings for its data center consolidation initiatives?

Reporting tools utilized by states included:

An annual department IT plan is conducted by the state CIO's office.

Consolidation (including data center consolidation) is reported and tracked using a scorecard. This effort has provided a net state savings of $13.8 million per year. In addition, central IT has reduced the amount of statewide servers by nearly 30 percent which is not included in the state savings.

We utilize status reports and project plans.

Our state utilizes the project portfolio management process and tracking tools; Business case costs and benefits are tracked by Office of State Budget and Management

Post consolidation, or rather, ongoing measurements, are not conducted beyond the initial ROI savings measured at the completion of the consolidation project. It is strongly believed that decentralization is inefficient and thus there is no ongoing ROI measurement.

We are using internal processes to identify cost savings resulting from software consolidations or elimination of hardware.

We do not project cost savings, only cost avoidance for implementing best practices, increased fault tolerance, increased security and positioning the State for Enterprise Disaster Recovery.

A private consultant helped central IT to create an enterprise business case evaluating all in-scope cost factors. This business case represents our current costs. This is compared to future costs bid by the selected vendor and the retained or new costs created by the consolidation initiative. Savings are calculated by taking the total business case cost minus the vendor costs minus our retained/new costs.

We are feeding performance and financial information into a balanced scorecard effort.

The state's IT Transformation is a self-funded model. As such savings are built into the model, as follows: our contractor is completely transforming the executive branch's IT infrastructure (desktops, servers, networks, mainframes, data centers, etc.) and will continue to operate same under a ten-year, $1.9 billion contract. That consolidation and modernization effort will involve a $272 million up-front capital investment by our contractor. For these services, the state will pay annual fees not to exceed the executive branch's fiscal 2005 costs for that year's equivalent level of infrastructure services, or $225 million. Via these fees and savings from the transformed

environment, our contractor will recoup its cost of capital, operating costs, and return on its investment. In evaluating this model, the state also looked at the "do-nothing" option—continuing to maintain the existing infrastructure. Our analysis indicated that option would add an estimated $200 million in ongoing operating costs over a ten-year period. Additional analyses indicated that after the initial ten-year implementation and payback period, the state's ongoing costs of the transformed environment would be 10-15 percent less than the do-nothing alternative.

The state has implemented Government Management, Accountability and Performance (GMAP). The Governor's approach to accountability requires agencies to regularly measure and report the effectiveness of the services they provide, so that problems can be identified and fixed.

Reference survey question (4.6.) If internal relationship management strategies are being employed by your state technology office to promote data center consolidation efforts, please describe below.

State responses included:

Our new administration is conducting a fairly assertive "get to know" program but has only been in office for five months.

We have included the agencies in the development effort including selecting architects and preparing requirements.

Engaging early with customers and making the decision making process transparent.

Since business applications and their support remain the responsibility of the agencies, there have been continuous meetings with agency IT directors and central IT executive staff. Since central IT hosts these systems and supports the hardware and operating systems, there is a very close working relationship between central IT and the agencies' IT application development and support staffs.

We have been working with the agency CIO consortia, Information Technology Advisory Council (ITAC), to get cross agency support for a consolidated center.

We're seeking to close business continuity gaps with agency customers as a means to provide added or improved availability of systems.

The Business Relationship Management team acts as a liaison between the central IT organization and a consolidated agency. This role provides a single customer contact, performs service level reviews, manages issues and acts as an advocate to the agency.

As we continue to strive for excellence, we have started to deploy "IT business consultants" who will be responsible for a portfolio of agencies and will be tasked with making sure their needs are met. The concept is similar to that of sales rep with a vendor. Today, these consultants act on behalf of the communications department and will likely be expanding into the entire suite of service offerings for the other divisions within central IT. The "sales reps" will offer service to more than just the consolidated services.

We created an executive advisory panel comprised of seven agency heads covering a representation of different agency types (small, medium, large, federally funded, state funded, etc). We kept the panel apprised throughout procurement phase, and created an IT director advisory council that meets bi-weekly to discuss and guide the data center project.

Each state agency is assigned an IT Director who is responsible for all IT functions within that agency. They are the single point of contact for all IT Services and Processes. The IT directors are also the customer advocate and IT relations manager for their agencies.

Internally, we have set up a 20-person Service Management Organization (SMO) consistent with Gartner's best practices model to oversee our contractor's performance of IT infrastructure services. From the customer agencies' view, we have been structured to emphasize a customer-centric focus. A staff of six Customer Account Managers is assigned to specific agencies on a cabinet secretariat basis to address business needs at a strategic level. Within the SMO, Agency Performance Managers are similarly aligned by the secretariat to address day-to-day operational

issues. That assignment by secretariat model even extends to central IT units responsible for statewide IT governance (IT plan and project approvals, major project oversight, and architecture and standards). Together, those subject matter specialists assigned by secretariats, working as Customer Account Teams, meet regularly with their respective customers. Central IT has also initiated Customer Councils as advisory groups to each of the six directorates within our organizational structure. Our governing body, the IT Investment Board, also has its own customer council comprised of agency heads representing a cross-section of our customer base, state and local.

We have a Customer Advisory Board (CAB) comprised of agency directors who make decisions on common services to meet business needs across the state enterprise. We have also established an account rep program where the Department of Information Services assistant directors meet with customer agency CIOs on a monthly basis.

We have relationship managers meet with agency heads on a quarterly basis to do a detailed review of service level agreements (SLAs) and performance expectations.

We are pre-planning with agencies to ensure capacity and funding availability for rated services associated with the state's data center.

Reference survey question (5.1.) If your state has a formalized enterprise architecture and standards creation and approval process for data center consolidation, please describe below. Also indicate whether this process includes technology managers from all the agencies targeted for consolidation?

State responses included:

The data center centralization plan is a portion of the overall state IT consolidation, centralization, and standardization plan established by central IT strategic objectives. The objectives drove initiatives which in turn required an established plan which was developed by central IT.

Yes, we have a committee that reports to the CIO their recommendations. Currently we allow all agencies to participate.

We have an enterprise architecture initiative, but it is currently stalled due to difficulty in recruiting the appropriate skill set.

The state has a formalized enterprise architecture process in place for agencies. This process DOES include the input for agency IT managers from other agencies targeted for consolidation. The EA process also includes the agency IT managers not targeted for consolidation.

State data center consolidation was architected using input from a wide spectrum of decision-makers and stakeholders. Planning was done under the watchful eye of two governance groups: one comprised of the heads of agencies impacted by the effort; and another comprised of the CIO from each of the impacted agencies. The state's formal enterprise architecture program was initiated after the state data center planning and construction efforts were well under way. So early state data center planning was not synched with the broader state government-wide architecture. From this point forward the state data center's technical architecture will be harmonized with the state's business and technical architecture.

We created the Architecture Oversight Committee (AOC). It's comprised of IT Directors and CIOs from all state agencies. This is the platform for creating Enterprise Standards across all state agencies.

The state has possessed a formalized planning, EA and Standards creation process for some time. These are not directly related to our data center consolidation program although they do support it.

We are formulating the EA effort and setting standards in conjunction with this consolidation effort.

Central IT has formalized enterprise architecture standards. The process for creating the EA is the same for creation of other statewide IT policies, standards, and guidelines, under the auspices of the IT Investment Board and state's CIO. Typically, workgroups staffed by central IT with participation from a representative cross-section of affected agencies research, develop, and propose standards for approval by the CIO and Board. Central IT technical architecture, including elements impacting the new data centers, was completed in early 2006.

The state has an Enterprise Architecture Committee (EAC) responsible for developing enterprise standards for common services. Data center consolidation has not been formally documented by the committee however this effort is supported through the GMAP reporting process for agency participation using shared common services. The state data center is considered a shared common service.

We formed an Enterprise Infrastructure Architecture committee made up of employees from all major agencies. They are developing standards, slowly but surely.

Reference survey question (6.1.) HIPAA requirements, Department of Justice requirements, restrictions on access to juvenile data, and other federal and state laws and regulations can impose barriers to consolidation of data centers, especially those that affect access to data. Please describe strategies your state has developed to address these issues as part of its data center consolidation initiative.

Strategies reported included:

In our existing state data center we are segregating HIPAA, SSN and other similar applications through data classification and encryption in transport and at rest. Many of these applications run on the mainframe and it would be cost prohibitive to duplicate somewhere else. Public Safety has its own data center.

Our VRF initiative to isolate agency networks will address this issue.

We (the state technology office) are already subject to all of these requirements. Consequently, we don't expect a significant challenge in using a third party.

Statewide IT Security Policies and directives have been developed and are easier to implement under consolidated IT services and a single centralized data center. Central IT operations works closely with the IT Security group headed by the state Chief Security Office, a central IT executive. All security policies are part of a state security plan which addresses all security requirements. Central IT has additionally standardized on the 3 tier model for Web-based systems that have a Web server on our extranet.

We have encouraged much stronger security measures in the consolidated hosting centers than what was in place in any of our legacy data centers. This has been a very positive incentive for those agencies concerned about HIPAA, and sensitivity and security of data.

We are asking those agencies to define specific business requirements for security and privacy so that we can design to meet them.

The state of ITD is subject to operational audit reviews in the health, medical, government and financial areas. ITD uses these audits as the basis for ensuring agencies that we meet the need of confidentiality for their data. Typically, the agency conducts the SAS70, HIPAA, IRS, SSA, etc. The agencies in question sign-off as ITD being the keepers of their IT systems and look at us to partner with them and hold us accountable to pass their audits. Likewise, we have had agencies perform individual, specific audits of ITD from their providers.

We implemented state data center consolidation with these restrictions in mind. We inherited and later improved on the security and sensitivity necessary to support these types of agencies.

Our data center vendor will apply the criminal justice security regulations and HIPAA compliance to the entire data center. Agencies that were at a lower security or confidentiality standard are

being raised to meet these requirements. All data center infrastructure staff must pass criminal justice and juvenile data access background checks. For IRS data, we will cordon off the systems that contain federal tax information data and it will be secured within a fenced area with additional background and training requirements for staff assigned to those systems.

Enterprise Security Assessment will address these as we move forward in the planning phase of the consolidation effort.

An essential part of surveying every customer's business needs in planning for the consolidation was a definition of all privacy and security requirements. These were then consolidated into the overall requirements that NG is contractually required to meet.

The state data center is the facility that meets federal and state regulations for privacy and security. We have established physical and data security guidelines to meet IRS, HIPAA, FBI and other defined requirements. Requirements and standards currently governed by the Information Services Board are being developed to advance the standards.

All IT employees are undergoing background checks. We have each employee sign a confidentiality statement. The room has been secured, plus we restrict access to a need-to-have basis.

We provide discreet, secured racks for each entity placing server equipment in the consolidated data center. This provides a unique security zone for each department's servers array.

Reference survey question (7.1.) Please describe your experience with data center consolidation initiatives that could benefit other state CIOs. For example, keys to success, challenges, roadblocks experienced, and what was involved in developing your state's strategy.

State experiences cited, included:

Alabama – The mainframe data centers were pretty much under control in Alabama, but the open systems data centers were not easily managed by the centralized IT department (Information Services Division - ISD). Our new data center offers the agencies better quality at a technology savings. "The build and they will come," philosophy.

Georgia – Let everyone know what is going on, otherwise they will just make up what they "think" might be happening; and make sure the deal fits the marketplace.

Indiana – Indiana's CIO reports directly to the Governor and is a member of the Governor's cabinet. This coupled with the legislation giving IOT, headed by the CIO, responsibility for statewide services results in an empowerment of IOT. This empowerment is not the only key to success but is the single most effective key to success. It is also the main reason (not the only reason) for the on-time completion of the state's consolidation, centralization, and standardization effort.

Kansas – It requires an initial investment to consolidate dispersed technology resources, and there must be a conscious effort on the part of agency CIOs to champion the cause.

Kentucky – The best approach is to produce the business value from the project, communicate early and often with key agency officials and General Assembly, and use Governor Executive Order as a last resort. Won't stand the test of time.

Montana – Don't underestimate the resistance and the innovative ways it will show itself. Lobbyists and opposition party will use Fear, Uncertainty and Doubt (FUD).

Nebraska – The Governor's support has been of great value as have been collaborative relationships with agency directors.

North Carolina – Important to have the Governor's Office support as well as a partnership with the Office of State Budget and Management, State Controller and State Personnel.

North Dakota – I would suggest that the findings found in our post-consolidation recommendations would be of value. See <http://www.nd.gov/itd/consolidation/doc/final-recommend-report.pdf>

Oregon –
Oregon's unique experience in planning and deploying a state data center is well-documented and available to other states at:
<http://www.oregon.gov/DAS/SDC/cnic/welcome.shtml>
Oregon's Secretary of State Audit Division performed a risk assessment in September 2006. That audit and the Dept. of Administrative Services response further explain challenges associated with the creation of a state data center.
Summary - <http://www.sos.state.or.us/audits/reports/summaries/2006/33.html>
Full Report - <http://www.sos.state.or.us/audits/reports/full/2006/2006-33.pdf>

South Carolina – Sharing of operating systems and supported software was a huge challenge. However, once completed the cost savings were tremendous. Our biggest hurdle was convincing IT Directors to release control. The largest key to success was a well-developed Strategic Plan.

South Dakota – By cutting the money and people before doing the actual consolidation, the process went quickly out of necessity.

Texas –
- Legislative support
- Define success criteria at the beginning of the project.
- Align timing to coincide with legislative funding process. Texas crossed two biennial funding periods and had to request supplemental funding for the FY06-FY07 biennium. Preference would be to start services at the beginning of biennium.
- Use a 3rd party team to collect technical data to ensure measurement consistency across all participating agencies
- Use a 3rd party financial team to collect current costs within agencies
- Define scope documents at a very detailed level very early in the process
- Ensure that properly sized governance staff is funded to support ongoing consolidation management
- Benchmark outsource vendor bid at the resource unit level

Utah – Understand the requirements and the issues before you set a target or launch initiatives.

Virginia –
Keys to success:
--Maintained strong executive buy-in and support from the start
--Used a sound, self-funded business model, proven in the private sector
--Learned from others in public and private sectors
--Retained excellent, experienced advisors
--Focused on affected employees; gave them good career options; kept them informed
--Kept all key stakeholder groups consistently informed
--Leveraged Virginia's public-private partnership legislation to allow proposers to be creative in their proposals
--Kept competition in the partner selection process to the very end (negotiated complete contracts simultaneously with the two finalists)
--Involved a representative group of customers in the partner selection process

Challenges:
--The early perception of IT transformation was that it was all about "savings". We quickly found that the more appropriate emphasis is on improved services/ security at no additional cost, as cost-takeouts are needed to repay the up-front capital investment.
--Organizational change management issues require substantial upfront as well as ongoing attention and resources. Culture shock was and is pervasive.

--In addition to operational efficiencies, centralization of support services is intended to allow business units to focus more on their core competencies. As the consolidation becomes a reality, helping agencies understand how to take advantage of this 21st Century platform is the latest challenge.

Washington – Teaming with the State's Budget Office is essential to promoting a common shared service strategy. Establishing a governance model to develop and approve standards has been successful. Establishing a Customer Advisory Board (CAB) that includes agency directors has provided an opportunity to discuss the benefits to the state for supporting shared common services. Agency directors are responsible for submitting an IT Portfolio and Strategic Plan on an annual basis. This process establishes the agency spending authority.

West Virginia – Market and communicate to your customers. Set very specific performance targets and have routine meetings with your customers to review SLA results. And most importantly, if you screw up, say so. Don't try to hide anything.

Appendix III – Additional Resources

Reference survey question (8.1.) Please provide any links to governance models, funding models, consolidation plans, or other resources that you feel would benefit other CIOs in their data center consolidation initiatives.

Colorado – You can find our state's strategic plan, enterprise architecture standards and other information on our state IT office home page: <http://www.colorado.gov/oit>.

Indiana – All information provided here can be found at the iot.in.gov Website, which includes our cost allocation-based bill back pricing for services. IOT funding is supported by prices that reflect actual IOT cost to provide the services.

North Carolina – North Carolina's IT Consolidation Website: <http://www.itc.scio.nc.gov/>

North Dakota – Our main IT Functional Consolidation Project information can be found at: <http://www.nd.gov/itd/consolidation/index.html>

Oregon – CNIC Website: <http://www.oregon.gov/DAS/SDC/cnic/welcome.shtml>

Texas –
Texas Data Center Governance Model:
<http://www.dir.state.tx.us/datacenter/docs/Contract/ex06-governanceModel.pdf>
Texas Data Center Governance Diagram:
<http://www.dir.state.tx.us/datacenter/docs/Contract/ex06-att6-A.pdf>
Texas Data Center Strategy:
<http://www.dir.state.tx.us/pubs/datacenter/2006status/index.htm>
Texas Data Center Services Webpage:
<http://www.dir.state.tx.us/datacenter/index.htm>

Virginia – An extensive library of materials on all aspects of Virginia's IT infrastructure consolidation, including solicitations, proposals, and contracts, is available at:
<http://www.vita.virginia.gov/itpartnership/index.cfm>.

Washington –
ISB Governance Structure <http://isb.wa.gov/siteinfo/aboutISB.aspx>
Investment Policy <http://isb.wa.gov/policies/investment.aspx>
Portfolio Management <http://isb.wa.gov/policies.aspx>
Enterprise Architecture <http://isb.wa.gov/policies/eaprogram.aspx>
Project Management <http://isb.wa.gov/policies/management.aspx>

Appendix IV – Michigan's Strategy to Overcome Challenges to Their Data Center Consolidation Initiative and Michigan's Data Center Consolidation Strategy

Reference survey question (2.9.) Please describe any strategies or tactics your state has employed to overcome the obstacles or challenges indicated in question (2.8.)

State of Michigan Strategy to Overcome Challenges to Data Center Consolidation

Phase I: June 2004-Dec. 2004
Conduct Risk Assessment: Know the facts.

In June 2004 MDIT contracted for an independent risk assessment on 29 of the legacy data center/server rooms and the three target Hosting Centers in the Lansing area. The study determined that legacy computer/server rooms lacked the stability found in the three target hosting centers. Physical visits to each server room provided new reasons why the servers should be moved: centers were located in areas that flooded each spring, oscillating fans were substituting for cooling systems, critical servers plugged directly into wall outlets, fire suppression systems that triggered accidentally, non-existent wiring standards, and room temperatures commonly over 85 degrees. The study turned up other "interesting" findings (among our favorites are a mouse trap used to protect network cables from rodents and a termite infestation that was being tracked as a "science project.") Limitations in the three target Hosting Centers were identified as well. Additional enterprise storage, power, network bandwidth, physical security, floor space and backup power solutions would be needed to address the demands a large-scale consolidation would require. All these improvements would need to be planned and implemented to meet consolidation demands, but scarce capital meant that investments would have to be made with a small percentage of savings delivered from the migrations themselves.

Phase II: Dec. 2004-Oct. 2005
Develop Support Strategy and Prepare: You only get one chance to make a first impression.

Consolidation requires that the facilities, infrastructure and support staff be up to the challenge. Applications targeted for migration included the state's revenue collection, law enforcement support, emergency management systems, health facilities, human services eligibility and prisoner tracking systems to name a few. The criticality of these functions left no room for error or degradation of performance once migrated.

Upon completion of the risk assessment, work began immediately to bring the three target enterprise hosting centers to a Tier 3 level. Given limited capital, MDIT staff looked at every alternative to move improvements forward. A homeland security grant was used to purchase and install backup diesel generators. Savings were garnered from any possible source, vendor contracts were renegotiated and the project was planned specifically to realize savings throughout implementation to cover additional capital improvements.

More importantly, this phase of the project included the implementation of an ITIL based organization. Incident Management, Problem Management, Change Management, Release Management and Configuration Management practices were developed and implemented. Existing state employees were trained and reorganized into new Technical and Data Center Services groups based around ITIL components:
• Service Management Center: Responsible for enterprise monitoring of hosting center solutions.
• Configuration Management: Responsible for comprehensive CMDB and hosting best practices.

• Facilities Management: Oversees the data center facilities.
• Solutions Engineering: Ensures that new and migrated solutions meet the Tier 3 standard.
• Storage Management: Oversees centralized enterprise storage and backup infrastructure.

The effect of these changes was dramatic. Even before consolidations began, statewide processes started to take hold as the Data Center staff became the champions for change management. A daily conference call was initiated in 2004 that created a forum to communicate and review all open incidents, problems, and changes. The "Day Start" call is attended daily by hundreds of technical staff supporting all of Michigan's 19 agencies.

A dedicated PMO (made up of 2 FTE's) was assigned to create and maintain detailed project planning templates and a common migration approach for each consolidation. Strategies for taking "lesson-learned" and process improvements were integrated into the consolidation approach to ensure that every subsequent data center migration built upon the experience of the last.

Phase III: Feb. 2005 – Oct. 2005
Communicate and Create Momentum: Open dialogue and common sense can go a long way.

Once MDIT's support teams were ready to take on a challenge of this magnitude, the job of making agency collaboration a reality loomed. Two factors were key to MDIT's success:
1) MDIT's executives reasoned that if a picture is worth a thousand words, an actual visit combined with pictures could be many times more valuable. So the department bused clients and state officials to the new hosting center facilities and gave them VIP tours where they were educated on the benefits of centralizing processing. Visitors were treated to photos and risk assessments of their current centers; most clients had no idea how vulnerable their data centers and their data had become.
2) After careful financial analysis, MDIT made a commitment to charge agencies no more for their data processing than they were paying, and promised an eventual, if not immediate, reduction in data center costs.

Phase IV: July 2005-Present
Consolidate: Implement with care.

In July of 2005, plans and procedures were put to the test when MDIT staff consolidated their first data center in an emergency session. The Child Support data center's cooling systems had failed and their UPS batteries had melted. HASMAT teams were deployed to clean up the mess and MDIT project teams effected a flawless migration over a two day period. Quality and executive commitment from MDIT management have been paramount to the project's success. Every migration (regardless of size) goes through the same core project process:
1. Assign core team of agency, application, network and systems administration resources.
2. Perform discovery and inventory of current server room.
3. Develop initial move scenario and establish target move date (include engineering diagram and cost estimate).
4. Prepare target data center and develop detailed "Move Day Plan" (including application verification plan, and next day support team).
5. Execute move of equipment to the target hosting centers.
6. Prepare legacy data center space for reuse as office space.

To date, we have successfully consolidated 21 computer/server rooms without a single hour of downtime. Michigan has 16 additional rooms scheduled for 2007, with all remaining rooms to be closed by the end of 2008. Some 273 servers have been migrated into the enterprise Hosting Center environment, and 310 legacy servers have been salvaged. **(Michigan)**

NASCIO's Survey on Enterprise Data Center Consolidation in the States: Strategies and Business Justification

Reference survey question (4.1.) If your state has a defined documented strategy or business plan that sets the direction for the state's enterprise data center consolidation initiative, please describe below.

State of Michigan Consolidation Strategy, Executive Summary:

Centralization and consolidation are hardly new topics to State Government. What is new and interesting is the scope of consolidation that is now possible and the significant savings and government transformation that are being realized. The critical ingredient to this level of success—at least in the Michigan example—has been collaboration.

In the past three years Michigan's Department of Information Technology (MDIT) has closed 21 separate hosting centers, saving millions of dollars while improving our overall quality of service. Specific benefits of Michigan's Data Center Consolidation are well documented:

• $9.5 Million saved to date (with an estimated 5-year ROI of $19.1 million)
• Eliminating over $375,000 a year from facilities environmentals and leased space cost.
• Savings of $403,000 per year in hardware maintenance cost.
• Avoided $7,313,245 in capital costs to upgrade legacy data centers/computer rooms.
• Regain 29,062 sq foot of floor space.

But the ROI is only half the story.

Michigan's successful efforts of the past—mainframe consolidation, telecommunication consolidation and the print center consolidation projects—were all accomplished with clear, imperative and visible executive mandate (in the form of an Executive Order from the Governor). But what happens when the mandate cools, when the urgency fades and agencies begin to tally the costs? Consolidations of this magnitude are measured in terms of years, not months.

With the data center consolidation, the MDIT executive team set out to build a strategy that would stand the test of time and changing political priorities. In the midst of the most challenging economic climate in decades, Michigan needed a project that delivered ROI, but not at the political and financial expense that a "forced death-march" would impose.

MDIT took a dramatically different approach to the Data Center Consolidation Project. From the onset of planning, the Data Center Consolidation team collaborated with technical and client staff to determine the most effective means to move their systems with the minimum risk at the minimum cost. The MDIT Strategic Management Team (SMT) worked directly with our agency partners to find both creative fiscal solutions and to educate clients on the risk their current environments posed.

In the end, the collaborative approach is what has seemed to matter the most. A commitment to collaboration has given Michigan a technology climate where agencies now openly request to get their remote locations closed (the project team now has a "waiting list" of locations targeted for closure). Our approach has helped cement a reputation for quality, built trust with our clients and set the stage for more fundamental initiatives that reach across government boundaries (IE Virtualization, SOA, Shared Services).

Project Description: Michigan's Data Center Consolidation project consists of the migration of hardware and application systems from thirty-seven Lansing area computer/server rooms into three target hosting centers also in the Lansing area. The project started in early 2004 and is ongoing today with nineteen computer/server rooms closed to date.

Problem area that the project addresses:

NASCIO's Survey on Enterprise Data Center Consolidation in the States: Strategies and Business Justification

Prior to MDIT, server rooms had been individually maintained by Michigan's nineteen different executive branch agencies. The level of technical support varied widely from department to department, but even the best of the individually managed facilities struggled to achieve even a "Tier II" status as defined by the Uptime Institute. Michigan's economy was slowing and the state's financial situation had begun to take its toll. Upgrades to facilities infrastructure and regular maintenance went undone. In late 2003 the Lansing area data centers began to show the strain, four separate data centers experienced site-level outages in just six months. Failures were commonplace and "emergency investment" was being forced into locations that could no longer support critical processing. Costs were on the rise and as privacy concerns began to surface throughout the public sector, Michigan found itself with critical data spread geographically across the State, on thousands of storage devices with inconsistent legacy backup solutions. MDIT developed a comprehensive four phase approach to the Data Center Consolidation Project.

Phase I: June 2004-Dec. 2004
Conduct Risk Assessment: Know the facts.

In June 2004 MDIT contracted for an independent risk assessment on 29 of the legacy data center/server rooms and the three target Hosting Centers in the Lansing area. The study determined that legacy computer/server rooms lacked the stability found in the three target hosting centers. Physical visits to each server room provided new reasons why the servers should be moved: centers were located in areas that flooded each spring, oscillating fans were substituting for cooling systems, critical servers plugged directly into wall outlets, fire suppression systems that triggered accidentally, non-existent wiring standards, and room temperatures commonly over 85 degrees. The study turned up other "interesting" findings (among our favorites are a mouse trap used to protect network cables from rodents and a termite infestation that was being tracked as a "science project.") Limitations in the three target Hosting Centers were identified as well. Additional enterprise storage, power, network bandwidth, physical security, floor space and backup power solutions would be needed to address the demands a large-scale consolidation would require. All these improvements would need to be planned and implemented to meet consolidation demands, but scarce capital meant that investments would have to be made with a small percentage of savings delivered from the migrations themselves.

Phase II: Dec. 2004-Oct. 2005
Develop Support Strategy and Prepare: You only get one chance to make a first impression.

Consolidation requires that the facilities, infrastructure and support staff be up to the challenge. Applications targeted for migration included the state's revenue collection, law enforcement support, emergency management systems, health facilities, human services eligibility and prisoner tracking systems to name a few. The criticality of these functions left no room for error or degradation of performance once migrated.

Upon completion of the risk assessment, work began immediately to bring the three target enterprise hosting centers to a Tier 3 level. Given limited capital, MDIT staff looked at every alternative to move improvements forward. A homeland security grant was used to purchase and install backup diesel generators. Savings were garnered from any possible source, vendor contracts were renegotiated and the project was planned specifically to realize savings throughout implementation to cover additional capital improvements.

More importantly, this phase of the project included the implementation of an ITIL based organization. Incident Management, Problem Management, Change Management, Release Management and Configuration Management practices were developed and implemented. Existing state employees were trained and reorganized into new Technical and Data Center Services groups based around ITIL components:

• Service Management Center: Responsible for enterprise monitoring of hosting center solutions.
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NASCIO's Survey on Enterprise Data Center Consolidation in the States: Strategies and Business Justification

• Facilities Management: Oversees the data center facilities.
• Solutions Engineering: Ensures that new and migrated solutions meet the Tier 3 standard.
• Storage Management: Oversees centralized enterprise storage and backup infrastructure.

The effect of these changes was dramatic. Even before consolidations began, statewide processes started to take hold as the Data Center staff became the champions for change management. A daily conference call was initiated in 2004 that created a forum to communicate and review all open incidents, problems, and changes. The "Day Start" call is attended daily by hundreds of technical staff supporting all of Michigan's 19 agencies.

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Phase III: Feb. 2005-Oct. 2005
Communicate and Create Momentum: Open dialogue and common sense can go a long way.

Once MDIT's support teams were ready to take on a challenge of this magnitude, the job of making agency collaboration a reality loomed. Two factors were key to MDIT's success:

1) MDIT's executives reasoned that if a picture is worth a thousand words, an actual visit combined with pictures could be many times more valuable. So the department bused clients and state officials to the new hosting center facilities and gave them VIP tours where they were educated on the benefits of centralizing processing. Visitors were treated to photos and risk assessments of their current centers; most clients had no idea how vulnerable their data centers and their data had become.
2) After careful financial analysis, MDIT made a commitment to charge agencies no more for their data processing than they were paying, and promised an eventual, if not immediate, reduction in data center costs.

Phase IV: July 2005-Present
Consolidate: Implement with care.

In July of 2005, plans and procedures were put to the test when MDIT staff consolidated their first data center in an emergency session. The Child Support data center's cooling systems had failed and their UPS batteries had melted. HASMAT teams were deployed to clean up the mess and MDIT project teams effected a flawless migration over a two day period. Quality and executive commitment from MDIT management have been paramount to the project's success. Every migration (regardless of size) goes through the same core project process:

1. Assign core team of agency, application, network and systems administration resources.
2. Perform discovery and inventory of current server room.
3. Develop initial move scenario and establish target move date (include engineering diagram and cost estimate).
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NASCIO's Survey on Enterprise Data Center Consolidation in the States: Strategies and Business Justification

Significance to the operations of government: The Data Center Consolidation project has had a profound affect on Michigan's government operations. Benefits from the project have been beyond the expectations of the project team. Initial rationale centered primarily on cost savings, but the collaborative approach that was taken has delivered benefits on a scale that was unexpected.

Critical Systems Support: The list of critical business functions positively impacted by the project covers nearly every area of state government. Systems for the departments of Agriculture, Civil Rights, Labor and Economic Growth, Michigan State Police, Transportation, Education, Natural Resources, Treasury, Environmental Quality, Military and Veterans Affairs, Human Services and Community Health have benefited from the consolidation. Specific benefits have varied based on the particular situation but have included: proactive systems monitoring, physical security, 24x7 support, ongoing equipment upgrade planning and disaster recovery implementation to name a few.

Communication: Imagine the power of your most seasoned technical staff throughout the state working, collaborating and communicating each and every business day. Implementation of ITIL practices has made this a reality in our state. ITIL has allowed us to react quickly during emergencies, communicate effectively statewide, it makes projects easier to implement, leveraging technology a reality, and true "cross boundary" transformation an legitimate possibility.

Repeatability: Data Center Migration project processes are well documented and fully repeatable for other local and state governments. The MDIT Data Center Operations Team has developed an outreach program sharing best practices with many of our local governments and private sector companies (most notably the City of Detroit, Ford Motor Company and Polk enterprises). Michigan's business case and marketing approach has been shared among the States (through NASCIO).

Improved Privacy: Enterprise storage solutions have allowed MDIT centralize and consolidate critical data from all over the State into our hosting centers. Today, we have over one Petabyte of data on the centralized storage devices. This data is now stored on current technology, secured behind firewalls, intrusion detection systems and is backed up regularly.

Improved Security and Disaster Recovery: Security solutions and disaster recovery response within the Tier 3 hosting centers is at now at optimum levels. In 2007, Michigan experienced 2 separate "zero-day" virus attacks that caused statewide outages. All servers contained within the hosting centers were patched within 1-2 hours of the initial outbreak. All application systems in the target hosting centers were quickly restored to service and no data was compromised. Remediation efforts for remote servers continued for nearly two full business days.

Alignment to State Priorities: The project offered MDIT the opportunity to meet gubernatorial goals to save money, retool for disaster preparedness and is part of a major "shared services" initiative underway in the State. Also, the 2006 MDIT strategic plan commits to either retire or consolidate 1,000 servers this fiscal year. This initiative brought the department 310 servers closer to that goal.

Reuse Adding Efficiency: MDIT salvaged un-needed or older technology, combining workloads on enterprise servers. More than 50% of the servers inventoried (310 in total) have been eliminated reducing costs by $403,000 per year and allowing support staff to focus on higher priority systems instead of facilities or aging infrastructure.

Improved Trust and Credibility: The true test of any technology effort is voluntary compliance or adoption rates. When the costs and quality are not in debate, customers should follow. While credibility is a tough measure to quantify, MDIT's Data Center Consolidation project has matured to the point where agencies are now openly requesting consolidation of their systems and hardware. Agency requests are eagerly acknowledged and are put on the "waiting list" for 2008.

NASCIO's Survey on Enterprise Data Center Consolidation in the States: Strategies and Business Justification

Public Value of Project:

The first measure of fiscal success is in reductions of the rates for technology services. MDIT's Infrastructure Services Group uses a charge back model that defines rates for the series of technology services that are provided. Rates typically include the total cost of supporting an enterprise function, including staffing, license, equipment and maintenance costs. Each year, since beginning the Data Center Consolidation, MDIT has lowered rates for most of its enterprise services. A rate schedule and demand summary for some of our most widely used services has been included below for your consideration:

Monthly Hosting Rate 2003 Charge 2006 Charge Reduction % Changes in Demand (2003-2006)

Level 1 Storage
(Per GB) $15 $8 47%
rate reduction 224% Increase in enterprise storage
Data Warehouse Storage
(Per GB) $250 $40 84%
rate reduction 199.25% Increase in warehouse storage

Facilities & Monitoring
(Per Server) $400 $200 50%
rate reduction 377% Increase in servers monitored

Data 100MB Port
(Per port/month) $75 $50 33%
rate reduction 456% Increase the number of data ports
Table 1: Sample Hosting Rate Reductions with Demand Trends

Rate Reductions don't necessarily guarantee costs have been reduced. But when MDIT coupled rate reductions with an efficient investment strategy, the combination has resulted in dramatic and quantifiable savings for Michigan agencies every year since the project's inception. A table containing the total annual savings realized for all data center services billed by MDIT is included below. The savings reflected are annual totals and have increased year over year as the consolidations were implemented.

2003 2004 2005 2006
Data Center Services Annual Cost Reduction $0 $270,282 4.43 Million 4.8 Million
Table 2: Data Center Cost Reductions to Agencies

Total 3 Year Savings: $9.5 Million
Projected 5 Year Return: $19.1 Million

In addition to the ROI detailed above the Data Center Consolidation Project has included the following benefits:

• Eliminating over $375,000 a year from the facilities environmentals and leased space cost.
• $7,313,245 Cost Avoidance - Projected capital costs to upgrade 29 legacy data centers/computer rooms to Tier II data centers. Note: Risk assessment provided estimates for only 29 of the 37 sites now included in the consolidation project.
• 25,570 sq foot of floor space regained for other use (so far).
• Decreased travel expenses for support staff that had to travel to the 37 sites to support and maintain the equipment.
• All savings and rate reductions were realized during a time of unprecedented increase in demand for enterprise technology services.

• Capital investments in the three target hosting centers were also accomplished during this time frame; costs of improvements have been deducted from the savings.

The Public Value of the Data Center Consolidation does not stop with dollars. The Michigan State Police have struggled under a severe budget crisis throughout our state's economic downturn. A lack of funding left many local police posts with unsupported and failing technology. Servers decommissioned throughout the migration process were redeployed to posts throughout the state, helping keep our troopers on the road and productive. It's difficult to quantify the value of a citizen that gets their tax return in on time because the call center is available during a power outage, or a child support check that is not delayed due to another "computer problem?" Whether the costs we cut help save a program in rough budget waters or facilities improvements keep the servers running in an emergency, the Data Center Consolidation project team has been proud of its role in improving the quality of service for nearly every taxpayer in our state. **(Michigan)**

Appendix V – Survey Instrument

A National Survey on Enterprise Data Center Consolidation Strategies and Business Justification In the States

National Association of State Chief Information Officers (NASCIO) Lexington, Kentucky

Background

This national survey of state CIOs is being conducted by NASCIO's Infrastructure and Services Committee to assess the current environment of enterprise data center consolidation strategies and business justification initiatives in the states.

Committee co-chairs **Kyle Schafer**, Chief Technology Officer for the state of West Virginia and **Mike Mittleman**, Chief Information Officer for the state of New York invite you to complete this survey. National assessments of this type have proven to be very valuable to NASCIO state members and others as they examine ways to cut cost and improve efficiencies across the state's IT enterprise.

Many states have embarked on enterprise data center consolidation initiatives to promote cost savings, secure infrastructure, increase disaster recovery and business continuity capabilities, provide better access to new technologies for all agencies, and improve information sharing and data integration. The survey is designed to capture the current status of each state's data center consolidation initiatives and provide insight into their strategies for making the business case.

Results

The aggregated results of this survey will be available to NASCIO members as a tool to help gauge their own data center consolidation efforts. Additionally, a summary of the data will be featured in a forthcoming NASCIO research brief that will examine enterprise data center consolidation strategies and business justification efforts in the states. Those states that grant NASCIO permission to share their experiences will be featured in mini state case studies within the brief. All other state identities and attributions will be kept confidential. There will be no grading or ranking of states based on survey results.

Completion Time

NASCIO estimates that it will take between 20-30 minutes to complete the survey.

Instructions
Below are a series of questions relating to data center consolidation efforts in the states. Please complete your online response by no later than **Friday, May 25, 2007**. For easy reference, click on the following link to download a hard copy of this survey https://www.nascio.org/committees/infrastructure/DataCenterSurvey.pdf.

Need Help?
If you have any questions or concerns about this survey, please feel free to contact **Drew Leatherby**, NASCIO Issues Coordinator, by phone at **859-514-9187** or by e-mail at **dleatherby@AMRms.com**.

Section 1. Contact Information

1.1. Please provide your contact information.
[For survey administration purposes only]

Your Name:

Title:

Organization:

State:

Phone:

Email:

Section 2. General

2.1. How do you classify data centers in your state? [Examples - Any facility with raised floor and a minimum of 600 square feet. Do you consider anyplace you have application servers or server closets and server rooms to be data centers; raised floor or non-raised floor? Do you classify your states' data centers as Tier 1 (mainframes) or Tier 2 (server centers)? Do you define tiers using the Uptime Institute? Is a data center tier defined by the amount of redundancy? Do you think of a mainframe as an enterprise platform, and not differentiate between that and a server environment?]

2.2. Based on your state's definition above, how many data centers do you have in state

government? Based on your state's consolidation initiative, what is your target number of data centers?

2.3. **Please indicate the status of your state's enterprise data center consolidation initiatives:**
Please choose only one. A comment box is provided if you require room to qualify your answer.
Please note that checked responses cannot be deselected once entered.

	Data Center Status	Comments
Completed	○	
In Progress/ Partial	○	
In Planning Phase	○	
Proposed	○	
No Activity	○	

2.4. **When developing your existing or planned state's enterprise data center consolidation initiative, what business model are you considering?**
(Please check all that apply)
☐ A strictly internal state operation
☐ Internally hosted but vendor managed operation
☐ Outsourced hosted operation
☐ Combination of internal and outsourced hosted operations
☐ Other business model, please specify
☐ Not applicable

2.5. **Please indicate the different types of infrastructure or infrastructure applications currently being used or planned to be used in your state's consolidated data center platform.**
(Please check all that apply)
☐ Blade servers

- ☐ Dual power feeds
- ☐ Dual backup generators
- ☐ Dual internet connections
- ☐ Mainframes
- ☐ Networking
- ☐ Network Attached Storage (NAS)
- ☐ Network Management
- ☐ Network Operation Center
- ☐ Physical Security
- ☐ Production Output (e.g. printing, burning of CDs, video and tape)
- ☐ Redundant systems and network infrastructure with no single point of failure
- ☐ Secure Network
- ☐ Servers
- ☐ Storage Area Network (SAN)
- ☐ Telephony, VoIP
- ☐ Other, please specify _____

2.6. Please indicate which state agencies are currently consolidated or centralized under the state's enterprise data center.

(Please check all that apply)

- ☐ Agriculture
- ☐ Arts and Humanities
- ☐ Economic Development
- ☐ Environment/ Natural resources
- ☐ Finance and Administration
- ☐ Geographic information
- ☐ Health and welfare
- ☐ Higher education
- ☐ K-12 education
- ☐ Homeland security
- ☐ Human Services/ Families and children
- ☐ Information technology
- ☐ Justice
- ☐ Labor/ workforce development
- ☐ Law enforcement/ Public safety
- ☐ Parks and recreation
- ☐ Personnel
- ☐ Public Protection/ Regulation
- ☐ Revenue/ Taxation
- ☐ Tourism

☐ Transportation
☐ Other, please specify _____
☐ Other, please specify _____
☐ Other, please specify _____

2.7. What new technology initiatives are you using in support of data center consolidation?
(Please check all that apply)
☐ Server virtualization
☐ Open Source
☐ Other, new services (please describe) _____

2.8. What obstacles or challenges have you experienced as a result of your state's data center consolidation initiatives?
(Please check all that apply)
☐ Agency's desire to remain autonomous
☐ Backlash when consolidation didn't meet specific business needs
☐ Failure to identify and adhere to service levels
☐ Higher than anticipated costs
☐ Problems experienced in moving localized devices away from current customer base
☐ Seeking exemptions from state statutory and regulatory requirements
☐ Seeking exemptions from federal statutory and regulatory requirements
☐ Workforce resistance to change
☐ Not applicable
☐ Other, please specify _____

2.9. Please describe any strategies or tactics your state has employed to overcome the obstacles or challenges indicated in question 2.8.

2.10. Which, if any, human resources barriers has your state experienced as a result of its data center consolidation initiatives?
(Please chack all that apply)
☐ Inability to reclassify positions
☐ Pay scales/ compensation
☐ Pervasive culture/ resistance to change
☐ Other, please specify _____

☐ None
☐ Not applicable

2.11. Does your state's enterprise data center consolidation initiative include other branches of state government, and state elected officials (constitutional offices)? If YES, please describe challenges you faced gaining buy-in from the non-executive branches and state elected officials.

Section 3. Data Center Site Location

3.1. If you already have new or existing primary and back-up data centers in place, are they located inside or outside the state capital geographic boundary?
(Please provide the rationale for your state's location decision in the adjacent text box.)

☐ Inside the state capital

☐ Outside the state capital

3.2. If you are in the planning phase of new or existing primary and back-up data center construction, are you planning on locating the facility outside of the state capital geographic boundary?
(Please provide the rationale for your state's location decision in the adjacent text box.)

☐ Yes

☐ No

☐ Not applicable

3.3. If you are in the construction phase of a new primary or back-up data center, is it being constructed outside of the state capital geographic boundary?
(Please provide the rationale for your state's location decision in the adjacent text box.)

☐ Yes

☐ No

☐ Not applicable

3.4. If you are planning or are in the process of moving an existing primary or back-up data center, what complications are you experiencing?

Section 4. Strategies and Business Rationale

4.1. If your state has a defined documented strategy or business plan that sets the direction for the state's enterprise data center consolidation initiative, please describe below.

4.2. What factors are driving your state's strategy to consolidate data centers?
(Please check all that apply)
- ☐ Aging state facilities
- ☐ Better access to new technologies for all agencies
- ☐ Business applications
- ☐ Cost savings
- ☐ Disaster recovery
- ☐ Energy conservation/ Environmental concerns
- ☐ Improved information sharing/ data integration
- ☐ Replication, redundancy and fault tolerance
- ☐ Size
- ☐ Security and data classification
- ☐ Other, please specify _____
- ☐ Not applicable

4.3. What method did your state utilize to estimate potential cost savings for the state in its data center consolidation initiatives?
(Please check all that apply)
- ☐ ROI calculator
- ☐ Funding model
- ☐ Private consultant
- ☐ Other, please specify _____
- ☐ Not applicable

4.4. **What types of reporting tools are being utilized by your state to report on the status of projected cost savings for its data center consolidation initiatives?**
(Please describe)

4.5. **What metrics is your state using to measure success in achieving enterprise-wide data center consolidation?**
(Please check all that apply)
- ☐ Percent of participation
- ☐ Number of servers
- ☐ Uptime, response time, reliability, availability
- ☐ Other, please specify
- ☐ Not applicable

4.6. **If internal relationship management strategies are being employed by your state technology office to promote data center consolidation efforts with state agencies, please describe below.**

4.7. **If your state has initiated an enterprise-wide data center consolidation project, how much calendar time is being allocated by your office for its completion?**

4.8. **Who in your state initiated the data center consolidation process (what is your mandate for consolidation)?**
(Please check all that apply, and provide links to associated documents)
- ☐ State legislature (Empowering legislation)
- ☐ Governor's executive order

☐ Finance and Administration office directive

☐ State CIOs office directive

☐ State Task Force directive

☐ Other, please specify

☐ Not applicable

Section 5. Enterprise Architecture and Standards

5.1. If your state has a formalized enterprise architecture and standards creation and approval process for data center consolidation, please describe below. Also indicate whether this process includes technology managers from all the agencies targeted for consolidation.

5.2. If your state has an information architecture standard in place that employs data classification policy, please describe below, including levels of data classification utilized.

Section 6. Privacy and Security Requirements

6.1. HIPAA requirements, Department of Justice requirements, restrictions on access to juvenile data, and other federal and state laws and regulations can impose barriers to consolidation of data centers, especially those that affect access to data. Please describe strategies your state has developed to address these issues as part of its data center consolidation initiative.

Section 7. CIO Questions

7.1. Please describe your experience with data center consolidation initiatives that could benefit other state CIOs. For example, keys to success, challenges, roadblocks experienced, and what was involved in developing your state's strategy.

7.2. Please describe any questions or concerns that you would like addressed in the committee's deliverables related to state data center consolidation efforts.

Section 8. Additional Resources

8.1. Please provide any links to governance models, funding models, consolidation plans, or other resources that you feel would benefit other CIOs in their data center consolidation initiatives.

Section 9. Use of Information

9.1. Please indicate if you would be willing to have your state's experience summarized in NASCIO's forthcoming publication on data center consolidation strategies and business justification.

☐ Yes, you may profile our states experience

☐ No, please keep our states identity confidential

NOTICE TO RESPONDENTS

This survey is hosted at NASCIO headquarters. Your response will be logged into a database that is accessible only to NASCIO staff. No permanent Internet-based record of your response will be kept. Your data will be downloaded into a spreadsheet for compilation. The survey instrument will be deleted once the survey is completed.

If you have any questions or concerns, please contact Drew Leatherby, NASCIO Issues Coordinator by phone at (859) 514-9187 or by e-mail at dleatherby@AMRms.com.

| Submit Survey to NASCIO | Erase Form and Start Over |

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