

A perspective view of a server room with rows of server racks on both sides, receding into the distance. The floor is light-colored with dark grid lines, and the ceiling has recessed lighting.

The 2010 Government Virtualization Report

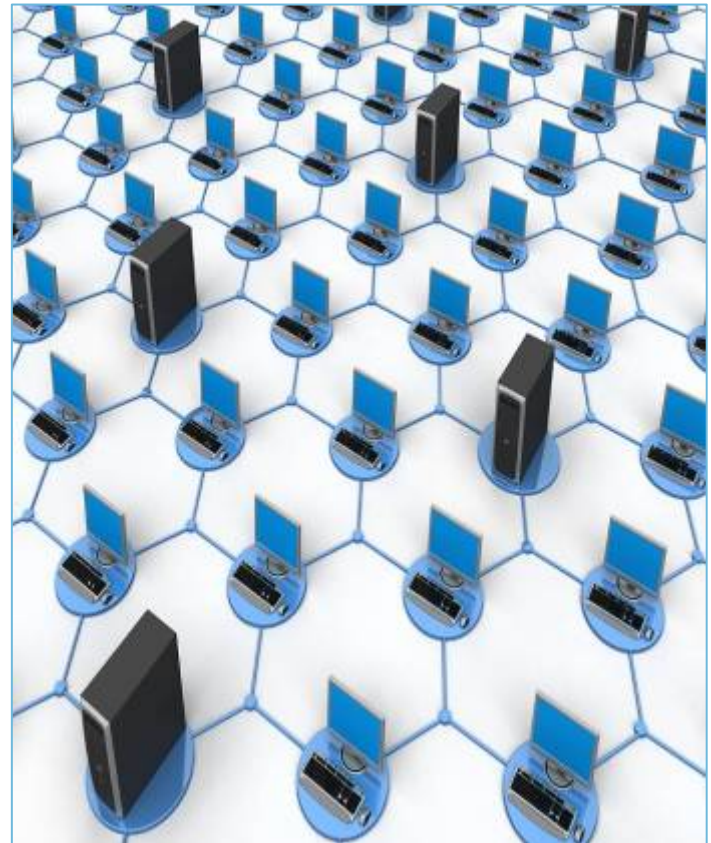
July 13, 2010

Background

Federal, state and local agencies are turning to virtualization to reduce operating expenses and energy consumption and to streamline IT operations.

To understand the state of virtualization within these agencies, CDW-G surveyed more than 600 Federal, state and local IT managers in May 2010 regarding the state of client, server and storage virtualization. The report includes year-over-year findings for Federal government; the state and local survey is new this year.

The 2010 Government Virtualization Report identifies adoption status and trends, key barriers and recommendations for successful implementation.



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“Virtualization is a proven approach to managing the data center, allowing you to streamline IT management and reduce operating costs.”

– Federal civilian agency IT director/supervisor

Key Findings

- ▶ **Federal, state and local agencies are implementing and benefiting from virtualization**
 - 77% of agencies are currently implementing some form of virtualization
 - Of those implementing or maintaining virtualization, 89% are benefiting from the technology. Top benefits include reduced operating costs, prevention of server sprawl and improved utilization of computing resources

- ▶ **Agencies with virtualization-savvy CIOs are ahead of the curve**
 - 87% of agencies that gave their CIO an A in virtualization proficiency believe their IT department is appropriately staffed and trained for a virtualized environment
 - Agencies with A-rated CIOs are three times as likely to experience a successful virtualization deployment than agencies with C-rated CIOs

- ▶ **Despite progress, nearly all agencies agree there is more work to be done**
 - 81% admit their agency has not used virtualization to its fullest extent
 - Just 33% employ a “Virtualization First” strategy in purchasing decisions

- ▶ **To meet optimistic projections, agencies need leadership, metrics and training**
 - Recommendations for success include securing CIO buy-in, establishing analysis and performance metrics up front and enhancing virtualization training

Government Virtualization Overview

- ▶ Most government IT managers report they are currently implementing and benefiting from some form of virtualization

77%

are implementing at
least one form of
virtualization

*of
these
organizations:*

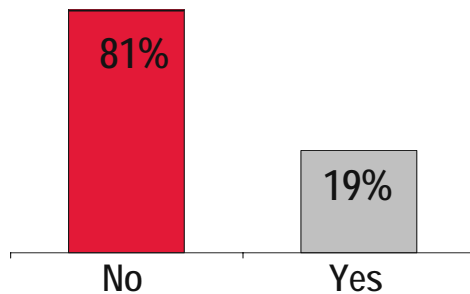
89%

are benefiting from
virtualization

Government Virtualization Overview

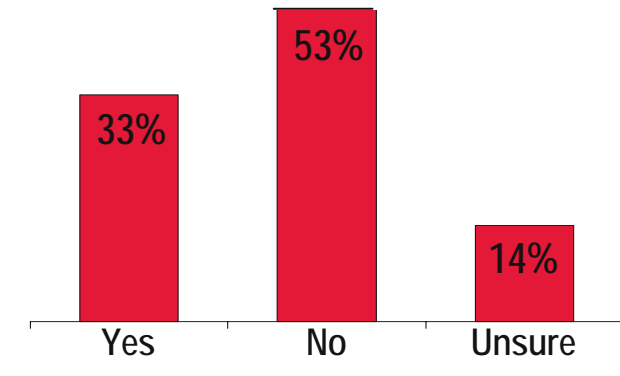
- ▶ Despite progress, the majority of Federal, state and local IT professionals admit they have not used virtualization to its fullest extent

In your opinion, has your agency used virtualization to the fullest extent?



*"[We are] just getting started."
- Deputy CIO, DoD*

Does your agency employ a "Virtualization First" strategy?



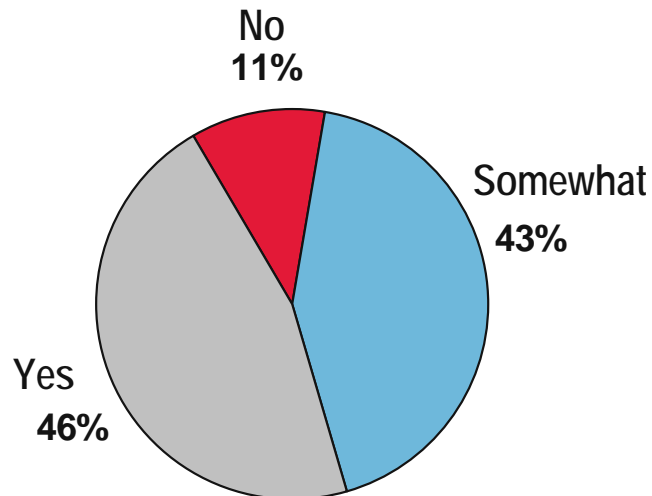
"Virtualization First" means that a requestor must prove that a new software application does not work in a virtualized environment before the agency will buy a dedicated server to support it.

Even among agencies with a "Virtualization First" strategy, 65% say they have not used virtualization to its fullest extent

Government Virtualization Overview

- ▶ Close to half of IT managers say their implementation is successful

In your opinion, has your virtualization deployment been successful?



Yes: “We cut 50 percent of our physical servers, and we have begun a disaster recovery project at a fraction of the cost of a non-virtual solution.” – County government IT director/supervisor

No: “Our systems are spread across the globe and our technical support is not able to keep up with the technology.” – Federal civilian IT manager

Somewhat: “The applications that were primed and ready for virtualization were a huge success. However, we have also “rush” moved other applications without proper planning or testing, and they have had mixed results migrating to a virtual platform.” – Federal Department of Defense (DoD) IT director/supervisor

Savvy CIOs are a Key Indicator of Success

- ▶ Agencies with virtualization-savvy CIOs are ahead of the curve

CIO Virtualization Proficiency Grade

How to read this chart: 54 percent of organizations whose CIOs received an A virtualization proficiency grade are employing a "Virtualization First" strategy

C+

Overall average CIO virtualization proficiency grade*

"Virtualization can be an incredibly useful concept, but it requires senior leadership buy-in for effective implementation." – DoD network administrator

	Policy: Agency employs a "Virtualization First" strategy	Capabilities: IT department is appropriately staffed and trained	Results: IT pros consider their deployment to be successful
CIO received an A for virtualization proficiency	54%	87%	82%
CIO received a B for virtualization proficiency	48%	73%	57%
CIO received a C for virtualization proficiency	20%	39%	25%
CIO received a D for virtualization proficiency	6%	10%	12%
CIO received an F for virtualization proficiency	14%	14%	33%

*IT managers rated their CIO's virtualization proficiency on a scale of A-F, where A was "outstanding" and F was "failing."

Staffing, Budget Challenges Impede Progress

- ▶ 46% of all respondents say their IT department is not appropriately staffed and trained to manage a virtualized environment

Top Federal Barriers:



- #1 Lack of staff knowledge to manage the technology
- #2 Limited budget for necessary hardware investments
- #3 Lack of staff and resources to make and implement a specific plan for our facilities

Top State and Local Barriers:



- #1 Limited budget for necessary hardware investments
- #2 Limited budget for necessary software investments
- #3 Lack of staff and resources to make and implement a specific plan for our facilities

Security Concerns Decline

- Federal IT professionals view security as less of a barrier than one year ago; almost half of all Federal, state and local IT professionals consider it a benefit

Which of the following are the most significant barriers to virtualization in your agency?*

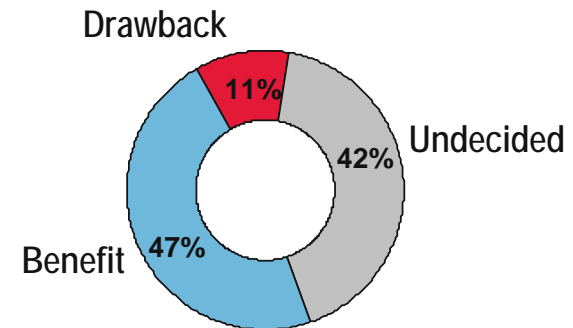
Federal IT professionals:

Year	Rank	Security is a barrier
2009	#2	35%
2010	#7	24%

State/Local IT professionals:**

2010	#8	13%
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All: Is information security a drawback or benefit of virtualization?



Security benefits: "It's a benefit because with a centralized database structure, securing and monitoring a few machines is much easier to manage than 50+." – County government IT manager

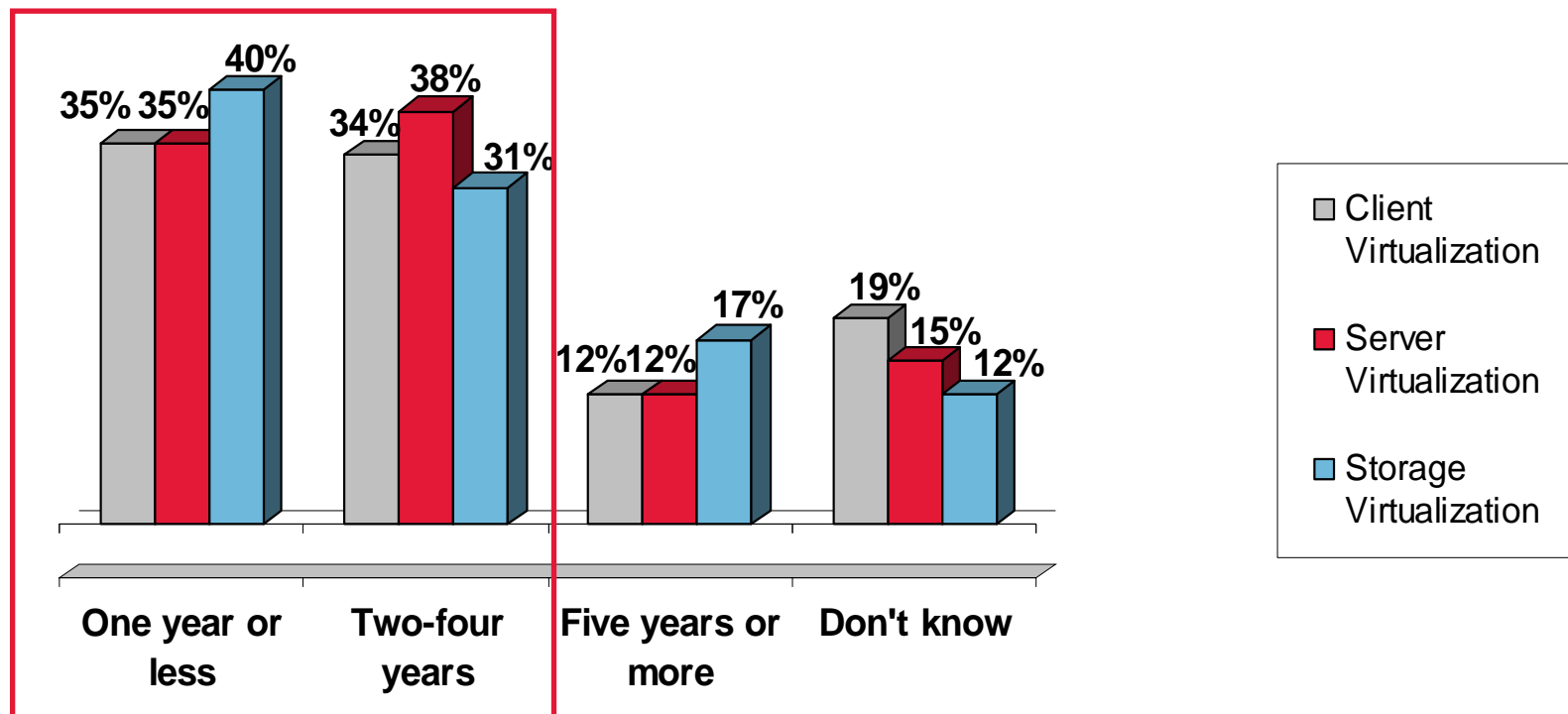
Security drawbacks: "The easier the data is to get by users, the easier it is to get to others." – Federal civilian network administrator

*Respondents asked to select their top three barriers to virtualization. **2009 data not collected for State/Local IT pros.

Agencies Predict Full Implementation Within 5 Years

- ▶ Despite concerns, most agencies say they will fully implement virtualization by 2015

Approximately how long will it take for your agency to fully adopt client/server/storage virtualization?



Client Virtualization: Where are We Now?

- ▶ 84% of all government agencies are considering or implementing client virtualization. Many, however, are still in the learning phase

Client Virtualization Adoption*

	Federal government	State/local government
Discovery	36%	44%
Planning	18%	19%
Implementing	29%	20%
Implementing with disaster recovery	8%	7%
Maintaining	9%	10%

*Of those considering or implementing client virtualization.

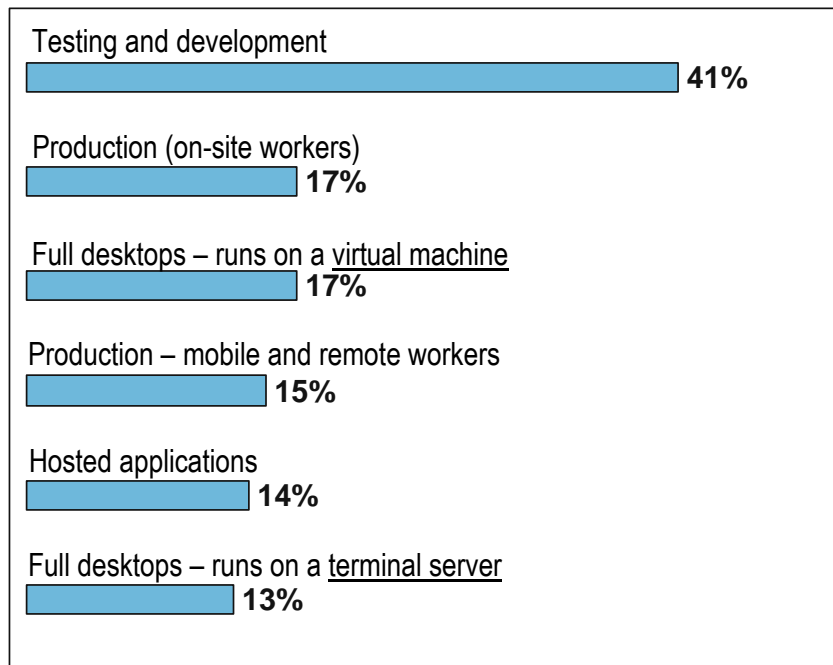
Client virtualization is a method of running multiple desktops and/or applications centrally in the data center

*Of all agencies implementing or maintaining client virtualization, an average of **29%** of their total client infrastructure currently consists of virtualized (guest) applications*

Client Virtualization: Top Uses and Benefits

- ▶ Agencies are not taking full advantage of client virtualization

Top Uses*



Top Benefits**

Reduced operating costs	36%
Improved Continuity of Operations (COOP)	28%
Improved network security	28%

Reduced operating costs is the No. 1 benefit for Federal and State and Local agencies

*Of those implementing client virtualization. Respondents asked to select all that apply. **Respondents asked to select top three benefits.

Server Virtualization: Where Are We Now?

- ▶ Agencies are adopting server virtualization more aggressively than client or storage virtualization – 91% are considering or implementing the technology

Server Virtualization Adoption*

	Federal government	State/local government
Discovery	18%	24%
Planning	19%	8%
Implementing	37%	30%
Implementing with disaster recovery	13%	20%
Maintaining	13%	18%

*Of those considering or implementing server virtualization.

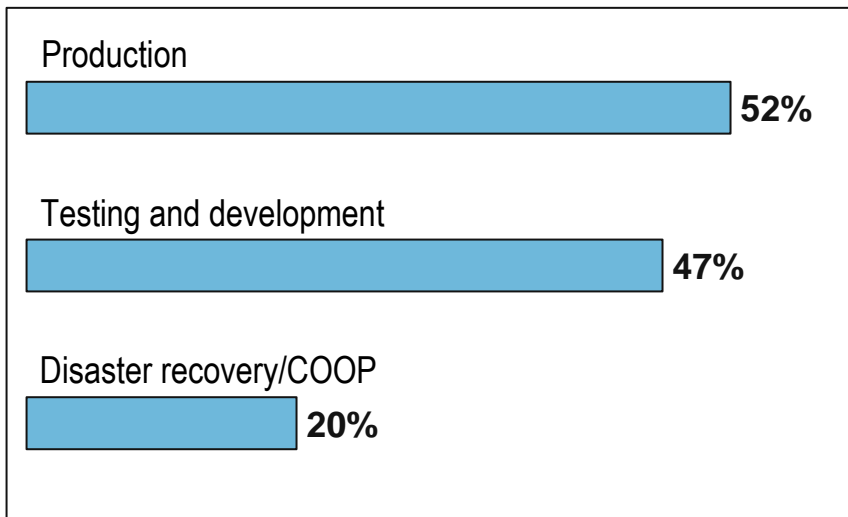
Server virtualization is a method of running multiple independent server operating systems on a single physical server

*Of all agencies implementing or maintaining server virtualization, an average of **40%** of their total server infrastructure currently consists of virtualized (guest) servers*

Server Virtualization: Top Uses and Benefits

- ▶ Server virtualization is helping agencies make the most of their infrastructure

Top Uses*



Top Benefits*

Improved utilization and capacity management of computing resources	46%
Reduced operating costs	43%
Eliminated/prevented server sprawl	42%

Federal agencies are more likely to utilize server virtualization for testing and development; state and local agencies are more likely to utilize it for production purposes

*Of those implementing client virtualization. Respondents asked to select all that apply. **Respondents asked to select top three benefits.

Storage Virtualization: Where Are We Now?

- ▶ 57% of all government agencies have implemented storage virtualization

Storage Virtualization Adoption*

	Federal government	State/local government
Discovery	21%	34%
Planning	20%	12%
Implementing	37%	27%
Implementing with disaster recovery	7%	10%
Maintaining	15%	17%

*Of those considering or implementing storage virtualization.

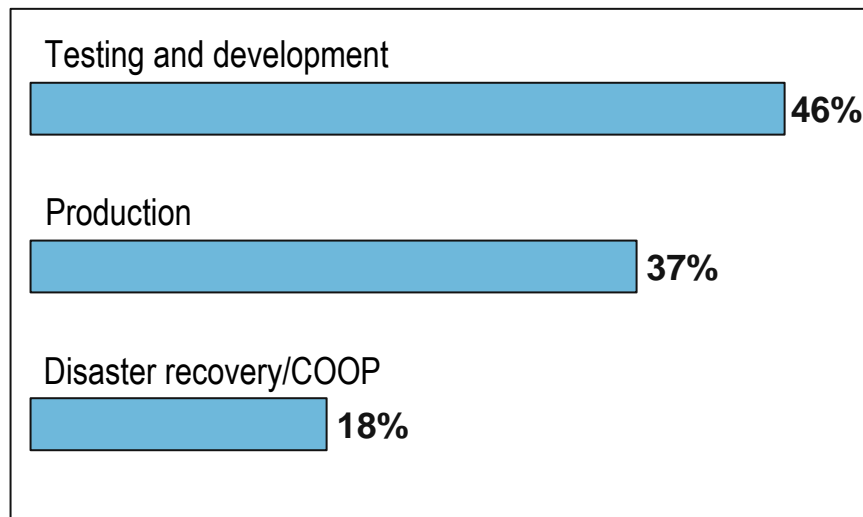
Storage virtualization is a method of taking many different physical storage networks and devices, and making them appear as one "virtual" entity for purposes of management and administration

*Of all agencies implementing or maintaining storage virtualization, an average of **41%** of their total storage is currently held in a virtualized environment*

Storage Virtualization: Top Uses and Benefits

- ▶ Storage virtualization may offer a cost-effective path to improved disaster recovery/COOP preparedness, but few agencies harness this capability today

Top Uses*



Top Benefits*

Reduced operating costs	47%
Eliminated/prevented server sprawl	36%
Reduced capital costs	34%

*Of those implementing client virtualization. Respondents asked to select all that apply. **Respondents asked to select top three benefits.

IT Professionals Advise Weighing the Pros and Cons

- ▶ Virtualization is not a one-size-fits-all solution

50%

believe some applications should not run on virtualized clients

“Some applications need direct hardware access. I am not aware of virtualization platforms that can provide this.”

46%

believe some applications should not run on virtualized servers

“Some applications require such intensive resources, the cost benefit is outweighed. Further, some apps are sensitive to data transactions and do not perform well for file-backed VMs.”

43%

believe some applications should not be stored in a virtualized environment

“Enterprise databases are an example of data storage that does not make sense for us to virtualize.”

Agencies are Validating Virtualization Investments

- ▶ Nearly all (85%) are measuring the results of their virtualization efforts. To track success, IT managers look to IT productivity and cost and space savings

Top Federal Measurement Methods:

#1	Improved IT productivity
#2	Server utilization
#3	Hardware cost savings <i>tied with</i> Server count reduction

Top State/Local Measurement Methods:

#1	Hardware cost savings
#2	Server count reduction
#3	Improved IT productivity

Implementers Offer Advice to Their Peers

- ▶ What advice would you give to another agency considering virtualization?

Lead

“Work closely to ensure that non-IT leadership is aligned and supportive and provide adequate resources to educate end users.” – Federal civilian IT director/supervisor

Analyze

“Do an extensive cost-benefit analysis as well as a thorough performance analysis; then set appropriate benchmarks.” – State government IT manager

Plan

“Evaluate your current environment and identify servers that could immediately benefit; for example, those close to replacement. Start with a limited rollout and ensure that you have a rollback plan.” – State government IT director/supervisor

Implement

“Just get started with virtualization. Learn about the technology and start using it, either in test mode or on a small scale. Every agency should at least have some servers running in a virtualization environment.” – Municipal government IT director/supervisor

Methodology and Demographics

- ▶ CDW-G hired O’Keeffe & Company to survey more than **600 government IT managers** online in May 2010. The sample size equates to a margin of error of +/- 3.9% at 95% confidence for the group
 - Federal government sample: N = 309, MOE = +/- 5.5% at 95%
 - State/local government sample: N = 301, MOE = +/- 5.6% at 95%
- ▶ 100% of respondents are familiar with the term virtualization

Title	
2%	CIO/CTO
5%	Deputy CIO/CTO
14%	IT Director/Supervisor
20%	IT Manager
24%	Network Administrator
8%	Data Center Manager
27%	Other IT management

Federal Government Breakdown	
51%	Federal Civilian
44%	Department of Defense
5%	Intelligence

State/Local Government Breakdown	
54%	State government
24%	County government
22%	Municipal government

Appendix I: Federal Government Snapshot



Implemented some form of virtualization

76%

Of the group who implemented, say deployment is successful*

Yes: 42%

Somewhat: 47%

0% 20% 40% 60% 80% 100%

80%

Say they have not
employed virtualization to
its fullest extent

55%

Say they are staffed and
trained to migrate to and
manage in a virtualized
environment

33%

Employ a “Virtualization
First” strategy

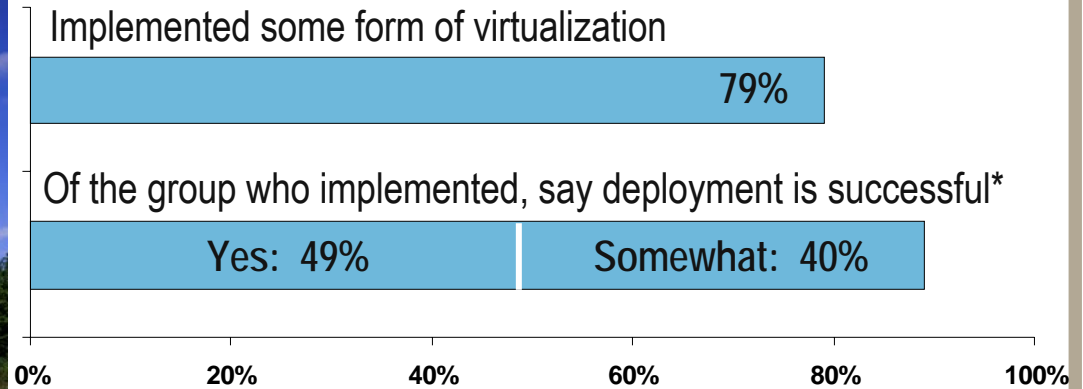
*an additional 47% responded “somewhat.”

Appendix I: DoD vs. Civilian Government

	DoD	Civilian Agencies
Say their virtualization deployment has been successful	38%	47%
Believe there are applications that should not run on virtualized servers	58%	39%
Measure success based on productivity	42%	33%
Experience network security challenges during virtualization implementation*	41%	28%
Experience training challenges during virtualization implementation	36%	22%

*Respondents asked to select their top three challenges.

Appendix II: State and Local Government Snapshot



82%

Say they have not employed virtualization to its fullest extent

52%

Say they are staffed and trained to migrate to and manage in a virtualized environment

33%

Employ a “Virtualization First” strategy

*an additional 40% responded “somewhat.”

Appendix II: State vs. County/Municipal Government

	State	County/ Municipal
Give their CIO an A or B for virtualization proficiency	54%	36%
Measure the success of their virtualization implementation	89%	78%
Experience budget limitations	42%	52%
More interested in case studies of other government agencies with virtualized environments*	19%	28%

*Respondents asked to select their top three improvements.

Appendix III: Virtualization Case Studies



State and Local Success

- ▶ Heat produced by the City of Chesapeake, Va.'s, data center was reducing the lifespan of the equipment it housed. Rather than expand the data center and replace underutilized servers, the city chose to deploy 84 virtual servers – significantly reducing server sprawl and increasing the longevity of its hardware
- ▶ By the project's end in August 2010, the city expects:
 - Energy cost savings of \$3,000 a month (50%)
 - Annual hardware cost savings of \$200,000
 - Reduced physical server count from 135 to 20
 - Implementation cost savings of at least \$120,000 by training in-house staff instead of hiring consultants
- ▶ The savings realized allows Chesapeake to work on projects that would be otherwise underfunded. Next on the city's list is a storage virtualization project, slated to begin in July 2010, which will include off-site data backup and disaster recovery capability



“One piece of advice I can give Federal and state and local agencies is to capture your current costs and compare them to the end result. Proving a reduction in total cost of ownership is the only way to truly show the value of IT in today's economic climate.”

– Peter Wallace, CIO, Chesapeake, Va.

State and Local Success

- ▶ The City of McKinney, Texas, one of the top 10 fastest growing cities in the United States,* had outgrown its data center. To continue operations in the same physical space, the city embarked upon a three-year virtualization initiative completed in December 2009 with 120 of its 158 servers (76%) virtualized
- ▶ With server virtualization, the city:
 - Cut server deployment time from several days to a few hours
 - Significantly improved IT staff productivity, freeing time for other critical IT initiatives
- ▶ The cost and time savings enabled by server virtualization led to a desktop virtualization pilot project, now in development, which will:
 - Double desktop hardware longevity
 - Enable IT staff to deploy new applications and updates centrally, improving the end-user experience and further improving IT productivity



“Reducing our carbon footprint was a major driver in our decision to virtualize, but the service we provide to our end users was equally – if not more – important to us. Our users now benefit from higher-quality service without experiencing disruption when infrastructure changes are made.”

– Don Grammar, IT director,
McKinney, Texas

*Forbes.com

State and Local Success

- ▶ Before virtualization, Stanly County, N.C., did not have a backup solution for its 9-1-1 center, which is in the basement of its courthouse. Any disaster could have interrupted emergency communications. This possibility, as well as lack of space for more physical servers and power and cooling challenges, drove the county's decision to virtualize
- ▶ With virtualization, Stanly County:
 - Created a fully redundant data center
 - Improved availability of 9-1-1 services for citizens
 - Condensed seven physical servers to three
- ▶ Based on its initial success, the county is expanding its virtualization initiative to its general network
- ▶ To enable disaster recovery, Chad Coble, IT director for Stanly County, recommends that agencies couple virtual servers with an enterprise-level storage area network



“Our production site is in the basement of our courthouse. Bursting pipes, fires and floods used to be real concerns for us. Virtualization allows us to provide the protection our citizens deserve by ensuring our 9-1-1 operations are up and running during all emergencies.”

– Chad Coble, IT director, Stanly County

State and Local Success

- ▶ After a major storm flooded part of the Village of Skokie, Ill., Bryan Gilley, the village's management information systems director, knew his team would have faced days of work to restore the environment had the village's data center flooded. During a planned refresh cycle, he turned to server and storage virtualization to prepare for future business interruptions
- ▶ Via virtualization, Skokie benefited from:
 - Reduced power consumption and heat generation by replacing 12 servers with four energy efficient servers and four SAN nodes
 - Improved service to employees and citizens with improved disaster recovery and storage management
 - Significant IT time and cost savings
 - Alignment with the village's green initiative
- ▶ Next, construction of the village's new police station which includes a new data center will enable two-way data replication between sites



“We are in a much better situation because of virtualization. Before, if a server crashed, it would take us one to two days to get a new server configured and to transfer all the data from the old server to the new one. With the new infrastructure and disaster recovery plan in place, we can be up and running within an hour.”

– Bryan Gilley, management information systems director, Skokie, Ill.

Thank you.

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