

**IT AUTOMATION
IN GOVERNMENT
BREAKING DOWN
WHAT YOU NEED
TO KNOW**

**GOVLOOP
POCKET GUIDE
2017**

**AUTOMATION HELPS
IT ORGANIZATIONS**

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FOREWORD FROM RED HAT

The way government manages and supports its IT efforts hasn't changed in nearly three decades. Many agencies and IT departments struggle mightily with legacy technology and tight budgets, innovation in terms of managing networks is hard to come by. This can negatively affect government in a variety of ways - it makes it difficult to modernize, transform digitally, and offer citizens the services they need.

One solution that can help governments at all levels with their network management

and digital transformations is IT automation. At its core, IT automation can replace manual labor currently carried out by IT administrators and other personnel. Automation technology can improve current processes, migrate applications for better optimization and provide a single language for DevOps practices across your organization.

Networks are integral parts of IT enterprises, yet true automation of the network stack is nearly nonexistent in government. When organizations are

automating networks, they're using proprietary vendor-specific tooling that requires significant training to use. Long, detailed and complex Methods of Procedure (MOPs) have to be manually managed, and often result in delays and reduced organizational agility.

But it doesn't have to be this way, and that's why Red Hat has partnered with GovLoop to create this pocket guide to IT automation in the public sector. To truly unleash government innovation, the public sector must turn to automation. When repetitive labor and processes are solved by deploying automation technologies, then and only then will IT managers truly have the needed freedom to spend more time exploring and adopting new technologies, rather than spending their time keeping the lights on. Integrating automation practices will help balance the scales and provide agencies with a more solid platform for future growth.

At Red Hat, we see the potential for innovation in government every single day with the customers that we work with. We truly believe that with the right software and processes in place – like automation – we can help your team collaborate to build new solutions for tomorrow's needs. Plus, our open source solutions are interoperable across a wide range of technologies, letting you take advantage of existing investments while giving you more options as you grow.

We believe that IT automation can provide the foundation for secure, cost-effective operations and continuous innovation across the government IT landscape. You just need to get started. We hope this guide will help put you on the path there.

— **Steven Carter**,
Chief Cloud Architect
for Red Hat's Public Sector

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and the way people work

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and the way people work
together.



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EXECUTIVE SUMMARY

Think back to over a hundred years ago, when America was just starting to feel the advent of the automobile and its impact on technology and society. It was an exciting time, and one of the most thrilling players in the game was a man named Henry Ford. Ford is one of the names most associated with the invention of the car, but the reality is that he did not invent the vehicle. Who exactly invented the automobile is a matter of opinion, but it wasn't Ford.

What Ford did do was to invent the assembly line, which accelerated the manufacturing and wide-spread adoption of the car. Think about it: This scalable innovation reduced the time it took to build a car from more than 12 hours to two hours and 30 minutes. Ford is so associated with the concept of the car not because he invented it, but because he was able to scale its creation to much larger and faster levels, so that more and more people could easily buy and drive one. It worked: Today there are 253 million cars and trucks on U.S. roads.

There's an analogy in this story for government. Today, government at all levels is dealing with the need to digitize and modernize its IT. It's a difficult reality, but one government is getting better at. But it's not doing it fast enough. It still deals with the struggles of legacy infrastructure, figuring out how to move workloads to the cloud and understanding staffing and operational capabilities of employees, some of whom are retiring in record numbers.

That's where the concept of automation comes in. Automation is to IT modernization what the manufacturing assembly line was to the automobile. It's an approach that links disparate and disconnected IT systems in such a way that formerly manual tasks become self-acting and simplified.

And today, as governments face immense resource constraints, automation matters more than ever. To provide citizen services, improve efficiencies, reduce the complexities of legacy IT and allow agencies to scale up into the cloud and beyond, automation must be a part of the story.

Once automation is truly part of the story in government IT, digitization and modernization of tech – much like the assembly line did for the car – will transform the way government operates and the services citizens can receive at a massive scale.

To better understand the effects of this new age in government IT, we've created this pocket guide on IT automation in government. This new piece from GovLoop will give you the overview of IT automation in the public sector, why it matters, how we can be better at it, as well as a case study and how-tos that will help you get to where you need to be today.

WHAT IT AUTOMATION IN GOVERNMENT MEANS TODAY

In this section, we'll define what we mean by automation in government, as well as explore the drivers of automation today and how the government is approaching it.

In a complex IT environment, even small tasks can take forever. Sprawling and legacy systems are hard to develop, deploy and maintain. Citizen demands only increase the complexity, and IT teams struggle with management, availability and cost.

That's where automation comes in for government IT. Software automation can replace manual labor currently carried out by IT administrators and other personnel, and automation technology can improve current processes, migrate applications for better optimization and provide a single language for DevOps practices across your organization.

IT automation is a large and complex category that refers to anything from very simple automatic routing of forms to something more difficult, such as the automated provisioning of backup and recovery systems without manual or human involvement.

Sounds great, right? So why is it important now more than ever that government start to adopt this approach and technology?

Much as we discussed how improvements in manufacturing heralded the age of the automobile, automation improves the efficiency of the varied applications that operate in a complex, diverse and distributed information technology environment.

This is because government IT environments are growing bigger in scale and increasingly more complex. But simultaneously, demands for more efficient and cost-effective delivery of services and the secure exchange of data and information with citizens have never been higher.

For a government IT department, these real-time demands mean that IT must coordinate complex tasks and business processes more often. Agencies need orchestration across different technologies and solutions, as well as management of the dozens of products that need to interact and communicate among their workflows.

The centralization of government data centers through IT automation is key to achieving these more comprehensive objectives. Automation improves operating efficiency and reduces costs, while simultaneously meeting escalating demands on the IT department and the government organization as a whole.

Maximizing an organization's automation helps prepare agencies to modernize and increase its workloads, and helps IT organizations addressing the increasing demand for speed and simplicity coming from the lines of business across a wide range of key initiatives.

Think about it this way: IT departments are the modern factories powering today's digital government. And just as today's factories can't compete without automation, automation will soon become imperative for IT organizations in government.

In short, if we want government modernization and digital innovation to continue at a rapid pace and at a much larger scale, government must turn to IT automation.

HERE ARE FOUR REASONS GOVERNMENT NEEDS IT AUTOMATION:

1 APPLICATION DELIVERY IS FUEL FOR GROWTH

Today every government agency operates in IT and software. Meeting mission need depends on critical systems to engage with customers and gather data. The demands that rising citizen expectations place on government IT teams and infrastructure will only continue to increase.

2 AUTOMATION NEVER SLEEPS

Throwing people at the problem helps agencies meet mission need, but the law of diminishing returns limits ability to scale. Adding people adds complexity and costs, and with budget and hiring challenges in government, it can sometimes be impossible.

3 IT PROFESSIONALS DON'T WANT TO REPEAT THE SAME TASKS OVER AND OVER

Just as manual work in factories is tiring, endless and repetitive work squanders the creative energy of your best and often most highly paid people.

4 AUTOMATION SPEEDS UP THE WORK SO YOUR PEOPLE CAN MOVE ON TO OTHER PROJECTS

Every agency has IT infrastructure it needs to modernize, but modernizing important legacy systems manually is a time-consuming task in which not all IT departments are eager to fully invest. The best IT professionals want to work on new, engaging, strategic projects that drive the needs of an agency forward and deliver citizen services effectively.

**AUTOMATION DOES MORE THAN JUST IMPROVE EFFICIENCY, TOO.
BY IMPLEMENTING IT AUTOMATION ACROSS AGENCIES, DEPARTMENTS
CAN REAP IMPROVEMENTS IN THE FOLLOWING AREAS:**

CLOUD

In government, the adoption of hybrid clouds has skyrocketed. But the benefits of hybrid cloud computing, where some of the data and resources live on an internal cloud, and some are sent out to an external cloud to be managed, can be offset by serious challenges like data security and scaling the workload. Additionally, deployment of these cloud environments can be challenging due to their complexity and the maturity of the technology.

IT automation is important to cloud environments because it uses tools to dramatically speed up cloud deployments while reducing human errors associated with manual intervention. It also ensures the successful execution of workflows by automatically spinning up additional resources when needed.

SECURITY DEVOPS

As government agencies plan their technology investments, they must carefully balance their needs for efficiency and performance with an equally strong need for security. Automating repetitive processes helps you monitor any security breaches or failures and helps meet compliance regulations. In this way, you can protect your agency from mistakes and unintentional gaps in security and compliance caused by inconsistencies and human error.

Next-generation applications and technology are great, but they often only succeed when supported by new cultural methodologies like DevOps. In order for the continuous delivery of DevOps to succeed, you need a toolchain – a set of distinct software development tools that are linked (or chained) together by specific stages – that allows developers to release early and often. IT automation tools are a critical addition to any DevOps toolchain, because they can deploy a large amount of changes to complex architectures and instances in a short amount of time.

But using automation, IT admins can begin moving away from the drudgery of daily tasks. Automation frees admins up to focus on efforts that deliver more value to the business by speeding time to application delivery, and building on a culture of success.

PEOPLE

Government knows that its people are its most valuable asset. In IT, however, many employees are caught up in repetitive tasks and day-to-day maintenance of legacy systems that don't allow them to work on impactful projects that drive mission need. This can be bad both for the agency and the staff – the agency doesn't get its smartest people working on large-scale projects, and IT staff caught up in mindless tasks supporting legacy IT are not fulfilled in their careers.

THEN AND NOW: IT AUTOC

IT automation in government is on the rise, thanks to key efforts focused on reducing federal data centers and moving to cloud environments. That ongoing journey hasn't been without challenges, but agencies are gradually reaping the cost savings and efficiency benefits of automation. Here are a few of the recent initiatives that have had the greatest impact on government modernization and digitization.

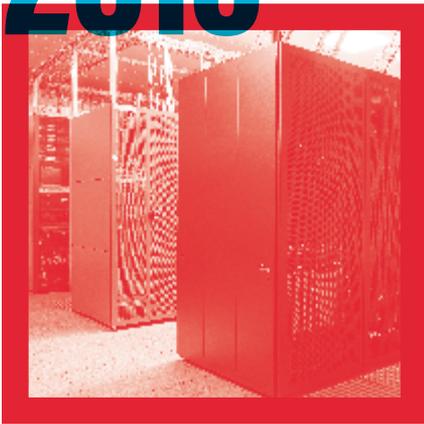
2014



The Federal Information Technology Acquisition Reform Act (FITARA), passed by Congress in December 2014, is a historic law that represented the first major overhaul of federal information technology in almost 20 years. The law requires federal agencies to provide the Office of Management and Budget (OMB) with a comprehensive inventory of data centers; a strategy to consolidate and optimize their data centers (including performance metrics, timelines, investment and cost-savings plans) and quarterly progress reports on the agency's strategy.

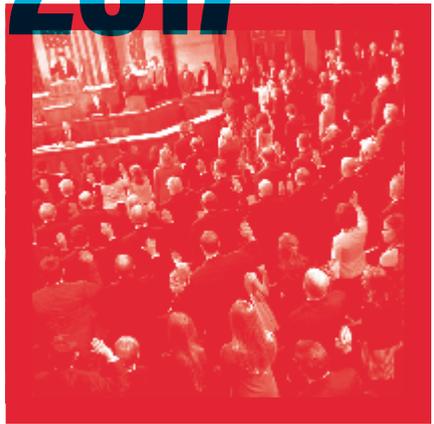
OMATATION

2016



The Data Center Optimization Initiative (DCOI) established in OMB Memorandum M-16-19 requires agencies to transition to more efficient infrastructure, such as cloud services and interagency shared services and leverage technology advancements to optimize infrastructure. Automation is a large part of the plan to optimize infrastructure, according to the memo – a certain percentage of data centers must be provisioned with automated monitoring.

2017



The Modernizing Government Technology Act passed the House of Representatives. The bill creates a \$500 million central fund to support rapid IT modernization and authorizes working capital funds at two dozen large agencies that can be used to pay for IT modernization. Agencies can then use any savings they create on further IT projects. "This approach eliminates the traditional use-it-or-lose-it approach that has plagued government technology for decades," said lead sponsor Rep. Will Hurd (R-Texas) in remarks in support of the bill. Automation will be a critical part of IT modernization and this bill will give funds to support its continued deployment.

INDUSTRY SPOTLIGHT AUTOMATION: SIMPLE BUT POWERFUL

An interview with **Steven Carter**, Chief Cloud Architect for Red Hat's Public Sector

IT in the federal government is multifaceted. Siloed approaches to development and infrastructure operations can make effective digital transformation difficult.

But this is no excuse in a time of rising citizen expectations and modernization imperatives. Government must overcome the encumbrances of legacy infrastructure and IT in order to build the technology that the government of the future wants and that the citizens of today need.

One approach to achieving these lofty but important goals is IT automation. Automation helps IT organizations address the increasing demand for speed and simplicity coming from the lines of business (LOB) across a wide range of key initiatives – and it can be a game-changer for government IT modernization today.

In order to understand more about how IT automation works and why it's a simple but powerful approach for government IT to modernize as well as meet mission needs, GovLoop sat down with Steven Carter, Chief Cloud Architect for Red Hat's Public Sector. Red Hat is a leading provider of open-source technology and IT services for both the private and public sectors.

Carter explained that one of the biggest challenges facing government IT today is simply the time it can take to get things done. "The fact is that today it takes

too long for government to develop applications, and it shouldn't be that way," said Carter. "Reducing repetitive IT tasks can help government agencies tackle many different challenges, from reducing costs to adopting more agile approaches like DevOps."

Additionally, as many agencies look to adopt DevOps and agile development methodologies, there's a need for tools to manage the application lifecycle, and make it easier and more predictable to deploy and manage entire application environments.

Enter automation – and in particular, Ansible, Red Hat's solution for IT automation.

"By deploying the right automation solution like Ansible," Carter said, "tasks are automated using a simple, human-readable language that anyone in your IT organization can understand."

Ansible and Ansible Tower are a complete automation platform capable of provisioning, deploying applications, orchestrating complex workflows and managing the configuration of IT systems, networks and apps. Its open-source technology platform offers configuration management, application deployment and task automation.

It's not just the simplification of IT tasks that makes Ansible's automation platform so potentially powerful for government, Carter said. It's that it can save agencies a profound amount of money via consolidation, deduplication and setting up a common IT language to increase efficiencies. In an age of shrinking budgets and severe cuts to potential IT funding, that can matter more than ever.

"Ansible can be used by the infrastructure teams that do the network, storage, servers, and security as well as by the developers," Carter said. "So, once you've got this common language, everybody can collaborate in a much more efficient manner without duplication. Development specifies what the applications need, operations specifies how that is to be implemented on the infrastructure, and the security team makes sure everything is secure. Everyone knows what everyone else is doing so they

"With Ansible, tasks are automated using a simple, human-readable language that anyone in your IT organization can understand."

***—Steven Carter,
Chief Cloud Architect
for Red Hat's Public Sector***

can collaborate more efficiently. And once all of this is described as code, the code gets managed like any other code, which makes it easier to onboard new people and gives continuity to your IT operations"

In addition to simplifying legacy IT and application environments, and creating massive cost savings, automation provides another significant benefit for government: the management of complex and hybrid cloud environments that have come significantly more popular in the public sector in the last five to 10 years.

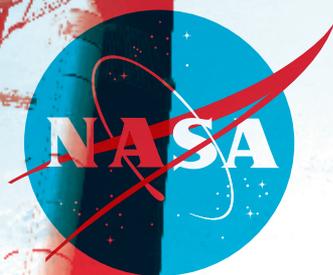
Maximizing automation helps prepare agencies and their workloads for cloud deployment. "Even before deciding you need or want to move to the cloud," Carter said, "you should standardize and automate your workloads and environments. What this standardization and automation does is it elevates your IT above infrastructure. You transcend infrastructure so it doesn't care whether you put your IT operations on something on premise, or in a cloud or in this vendor or that vendor. That freedom it can give your IT team is enormous."

In short, automating your cloud workloads gives agencies much more flexibility to deliver faster and scale workloads and services in a way that reduces bottlenecks.

"By using Ansible, you can completely transform the velocity at which the government can offer new services to citizens," Carter said.

LEARNING FROM OTHERS: A NASA CASE STUDY

Now that you've learned the basics of IT automation, here's an example of IT automation in action to inspire you and help you build a case for the application of automation at your agency.





“Ansible Tower has allowed us to provide better operations and security to our clients. It has also increased our efficiency as a team.”

—NASA team member

Everybody knows NASA. And they know that this government agency is one that dares to do mighty things and explore the unexplored, whether it's in outer space or on Earth. But in order to do this, it has to stay on the leading (and sometimes bleeding) edge of technology. Even for an organization that got a man to the moon, this isn't always an easy task.

Take a recent situation, for example. NASA needed to move roughly 65 applications from a traditional hardware-based data center to a cloud-based environment for better agility and cost savings. The rapid timeline resulted in many applications being migrated “as-is” to a cloud environment. This created an environment spanning multiple virtual private clouds (VPCs) and AWS accounts that could not be easily managed. Even simple things, like ensuring every system administrator had access to every server, or simple patching, were extremely burdensome.

What did NASA do? It turned to Red Hat, and Red Hat's automation solution, Ansible, to leverage Ansible Tower to manage and schedule the cloud environment.

The results spoke for themselves. As a result of implementing Ansible Tower, NASA is better equipped to manage its AWS environment. Tower allowed NASA to provide better operations and security to its clients, and it has also increased efficiency as a team. By the numbers, the results are impressive, too: Updating nasa.gov went from over an hour to under five minutes; patching updates went from a multi-day process to 45 minutes. It also achieved near real-time RAM and disk monitoring (which it accomplished without agents).

Provisioning OS accounts across entire environment now takes under 10 minutes, and baselining standard AMIs went from one hour of manual configuration to becoming an invisible and seamless background process. Finally, application stack set-up went from one to two hours to under 10 minutes per stack.

“Ansible Tower has allowed us to provide better operations and security to our clients. It has also increased our efficiency as a team,” said a NASA team member.

CHEAT SHEET

This takeaway section gives a brief summary of the benefits of automation, as well as considerations and additional resources on IT automation.

BENEFITS OF AUTOMATION

IMPACT ON STAFF

- Save time and be more productive
- Eliminate repetitive tasks
- Fewer mistakes and errors
- Improve collaboration and job satisfaction

IMPACT ON THE IT DEPARTMENT

- Overcome complexity
- More resources for innovation
- Increase accountability and compliance

CREATING A CULTURE SHIFT FOR AUTOMATION

Understanding and adapting IT automation and its benefits often butts up against traditional government culture, which is used to hierarchy and manual processes. To best take advantage of IT automation and get it started at your agency, consider these tips on creating a cultural shift that will move toward accepting automation:

- Build a small team who is willing to test and champion the process.
- Pick the right project – try a straightforward initiative that gives your team room to test its new process.
- Consider DevOps an umbrella concept that encompasses people, processes and technologies required to connect development to execution.
- Communicate. There are multiple stakeholders who have to understand the vision, and each requires a tailored message. If you create a culture within your company that leads your employees to want to use DevOps, then that's success in itself.
- Share in the results. Federal organizations are risk-averse and have management processes that focus on the individual, not on the team. Sharing success as a team and rewarding outcomes, not individual contributions, builds shared responsibility. Creating a culture of continual experimentation and learning inspires innovation and improvement.

QUESTIONS TO ASK

Some agencies and organizations have taken the first steps toward automation and are reaping the rewards. Here are a few points to consider as you start on your automation journey:

1

Opportunities for automation likely already exist everywhere in your organization

As the amount of strategic thinking required to solve a problem decreases, opportunities for automation increase.

Is one person repeating the same task for multiple clients or machines? Are several members of your team solving the same problems? Can those in your organization requesting the work do it themselves instead?

2

Adding people to solve a problem adds complexity, which demands tools to be simpler

Look for automation tools that use simple interfaces and simple, human-readable language that ensure processes can be replicated. The right balance of simplicity and control gives your team the ability to solve a problem once and replicate it forever.

3

Focus your company's most valuable resource on more strategic tasks: innovation, deeper problem-solving, driving the business forward

In the case of factories, automation often did replace workers. But IT automation isn't just about doing more with fewer people – it means your people will be free to do more important work. It unleashes energy and creativity.

***THANKS TO
RED HAT FOR
THEIR SUPPORT
IN PRODUCING
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Red Hat® is the world's leading provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux® and middleware technologies. Today, Red Hat is at the forefront of open source software development for enterprise IT, with a broad portfolio of products and services for commercial markets. That vision for developing better software is a reality, as CIOs and IT departments around the world rely on Red Hat to deliver solutions that meet their business needs. Solutions that provide technology leadership, performance, security, and unmatched value to more than 90 percent of Fortune 500 companies.

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About GovLoop

GovLoop's mission is to inspire public sector professionals by serving as the knowledge network for government. GovLoop connects more than 250,000 members, fostering cross-government collaboration, solving common problems and advancing government careers. GovLoop is headquartered in Washington, D.C., with a team of dedicated professionals who share a commitment to the public sector.

For more information about this report, please reach out to info@govloop.com



***We believe that
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