Spectro Cloud
GOVERNMENT

VIRTUAL MACHINE ORCHESTRATOR:

An easy, cost-effective way to merge virtual machines with cloud-native Kubernetes

Introduction

The idea of "doing more with less" is an old-hat strategy government agencies use. Still, it has taken on a new urgency with the Department of Government Efficiency (DOGE) efforts to reduce the federal workforce and the Trump administration's plans to shrink most agencies' budgets in fiscal year 2026.

Workforce and budget cuts don't change the goals: agencies still need to do their jobs, reduce cybersecurity risk and meet modernization mandates through digital transformation.

The DOGE-driven changes, however, emphasize doing so efficiently. For agencies, that means finding the optimal way to modernize networks, including a hodgepodge of on-premises systems, monolithic software deployments, cloud-based systems and a heavy dose of virtual machines (VMs).

Shifting from VMware to Kubernetes

The VM market has been shifting in the wake of Broadcom's takeover of market-leading VMware in December 2023, as Spectro Cloud's 2024 State of Production Kubernetes report found. In fact, many organizations are considering moving to cloud-native environments, among other options, for cutting costs.

However, wholesale changes won't happen overnight. VMs are common within government systems, and agencies will continue using them, whether they look for lower-cost VM providers, decide to maintain some VMs for now while planning to keep others indefinitely, or develop hybrid environments of VM and cloud-native Kubernetes stacks.

A hybrid environment may seem attractive, but operating in both the VM and cloud-native worlds could require maintaining dual hardware, infrastructure and skill sets among IT teams, which could prove complex, inefficient and expensive.

The answer lies in a cloud-native, containerized solution that covers both approaches. Government agencies have been making increased use of Kubernetes, an open-source container orchestration platform that has become the preferred choice for application delivery in increasingly complex cloud environments. Now, organizations can easily bring VMs under the Kubernetes umbrella without having to rewrite applications or sacrifice governance.

Rather than running dual stacks, agencies can adopt Spectro Cloud's Virtual Machine Orchestrator (VMO), enabling them to run VM applications natively within Kubernetes clusters, whether running on data center servers or at the edge. VMO, part of Spectro Cloud's Palette platform, allows organizations to increase efficiency by standardizing on a Kubernetes operating model. It gives them the flexibility and resiliency that comes with it while saving on licensing fees associated with maintaining and consolidating VMs.

VMO builds on the open-source *KubeVirt* engine to run traditional virtual machines directly inside Kubernetes clusters. "It's basically a bridge between virtualization and containerization," said Spectro Cloud's Director of Public Sector Growth Mark Perry. Introduced more than eight years ago and continually upgraded since, KubeVirt allows agencies to manage VMs using the same tools and policies as containerized workloads, providing a unified platform for old and new applications.

KubeVirt also provides a flexible infrastructure that allows agencies to start with VMs and gradually move — with VMO — toward a fully integrated Kubernetes and VM environment.

For high-security or disconnected environments, VMO is also available as part of **Palette VerteX**, Spectro Cloud's hardened edition explicitly built for public sector and defense use cases.

VMO lets virtual machines and containers run together in the same Kubernetes cluster — as first-class citizens — utilizing the same networking, storage and monitoring tools. This capability means agencies and teams can manage both types of applications in one place.

VMO's streamlined implementation and ease of use enable agencies to show value in the short term while allowing them to adapt as conditions rapidly change. The platform includes automation tools for seamless VM migration and allows for low-risk, pilot-friendly deployments that immediately enable organizations to show positive results.

In addition, VMO has a compliance-ready architecture to support mandates such as the Federal Information Security Management Act (FISMA), NIST 800–53 and FIPS-validated cryptography.

Again, for high-security or air-gapped environments, Spectro Cloud offers **Palette VerteX**, a hardened edition of the platform built to meet strict federal and defense requirements, with FedRAMP authorization actively in progress.

By aligning their efforts with DOGE's priorities and demonstrating early wins, agencies' modernization projects can gain momentum and support from leadership.

Kubernetes paves the way to modernization

Kubernetes — which can run in any environment, from on-premises data centers to public clouds — has been steadily gaining traction within government agencies in recent years, driven by twin emphases on modernization and cybersecurity. Agencies, often saddled with a mix of legacy systems while simultaneously pursuing greater use of cloud-based technologies, are making containerized software distributions part of their digital transformations.

"Everybody's either looking to it, moving to it or investigating the possibilities," said Mike Wood, vice president of public sector for Spectro Cloud. Within the Department of Defense (DOD), for example, the Air Force has incorporated Kubernetes into its Platform One Program, the Army has several projects underway and the Navy has deployed it on some afloat systems.

The Intelligence Community (IC) is also using Kubernetes containers, and civilian agencies are now following suit, whether they are on VMware or their homegrown systems, Wood said. Even state and local organizations are beginning to adopt Kubernetes. "Every level of government has Kubernetes clusters or are planning to start using them very soon," he added.

DOGE, for its part, is forcing the acceleration of those efforts through its cuts to programs and workforces. For example, it may look at a large professional services contract over several years and eliminate it as too expensive or wasteful. For agencies, that means adapting to the changes by making the best use of the technologies, tools and skills on hand.

As they move away from large professional services or enterprise licensing contracts, they need to optimize the investments they've already made. "The government is looking to do more with less, utilizing existing hardware," Wood said. "They want to know: How can I use my existing hardware and move to something more nimble and cloud-native without being crushed by licensing costs?" With the workforce shrinking, they also need to know how to do it with the existing skill sets of staff.

In the DOD, for instance, "you have these old monolithic applications that have been in one place for many years," Perry said. However, the current environment of non-traditional adversaries and asymmetric tactics requires the military to adjust accordingly. "Everything from an airborne unit to a tactical team has to be very flexible in how they move," he said.

That reality requires a distributed, containerized system that enables the military to deploy microservices — small, independent services that can be tailored to teams, units or regions. Meanwhile, DOD labs are regularly developing new capabilities to support warfighters. A cloud-native Kubernetes environment can significantly reduce the costs of getting those capabilities into the field.

"Instead of paying outrageous amounts to have the services deploy it, we can wrap that up and move it into their environment by changing only a few variables," Perry said.

"Truly, the only way to do this is with a cloud-native platform," he added. "It will allow you to assign those services to a container, and that container can be attributed to a region, and even to that team," while also being secured with mechanisms such as Role-Based Access Control (RBAC) and persistent monitoring.

Cloud-native containerization is also ideal for uses such as healthcare system modernization, secure remote field operations and inter-agency platforms that support both legacy and modern services. However, any agency, particularly those running VMs, can take advantage of the benefits of cloud-native Kubernetes.

VMO provides a cost-effective and low risk way to support multi-cloud, on-prem and bare-metal Kubernetes deployments. It frees organizations from being locked into a single infrastructure or cloud vendor, making deploying and managing Kubernetes at scale significantly easier.

Those benefits also include cybersecurity. "Containers have been out long enough that we have a sound security story," Perry said. Organizations are managing applications throughout their ecosystem, many running VMs, which can harden containers with attributes and controls such as RBAC and vulnerability scanning specific to that application. By segmenting containers or clusters from the underlying architecture, organizations can address the increased attack surface that comes with a distributed computing approach.

Kubernetes: A complex technology made easy

Kubernetes has been around for over a decade and is now the de facto standard for container orchestration — but that doesn't make it easy. Its flexibility and power come with complexity, often requiring deep expertise in networking, storage and infrastructure. For government agencies under pressure to modernize while operating with leaner teams, the learning curve can feel steep.

Hence, moving to Kubernetes can seem like a daunting task for the uninitiated. "There are a lot of moving parts that go into a Kubernetes environment," Perry said, citing networking layers, storage, control planes and other factors. Then there is the question of whether an agency has the on-staff skills to manage the job effectively, especially when teams may have recently had their numbers reduced by government efficiency efforts.

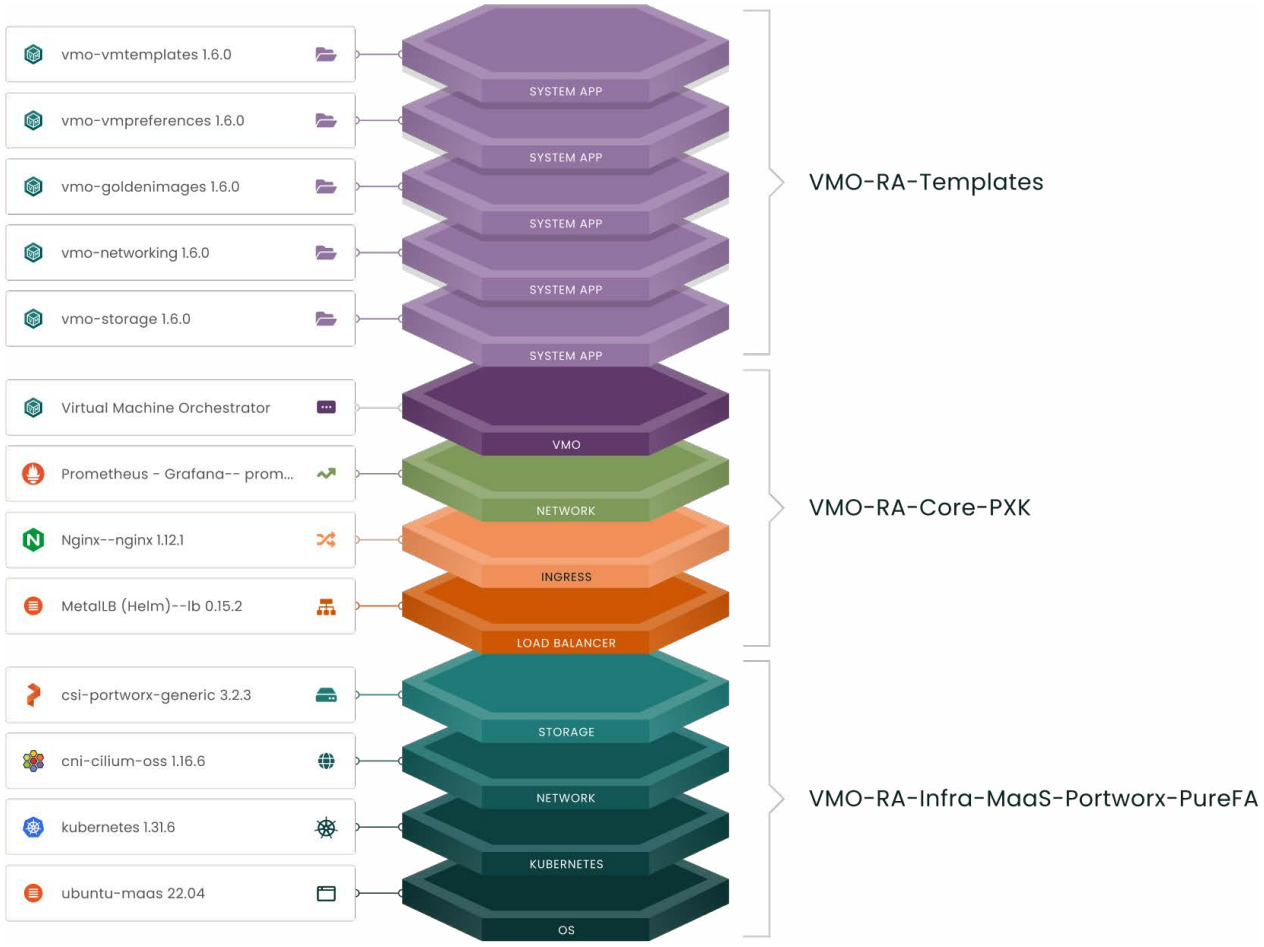
In the early days of containerization, organizations needed people with highly specialized skills — what Wood called "Kubernetes ninjas" — to implement and manage the environment. But that has changed with platforms such as Palette and Palette VerteX.

"We've taken something that was super scary and complicated and made it easy for normal people to use. We call it Kubernetes for the common person," Wood said. Spectro Cloud often works with agencies that are

familiar with Kubernetes. Still, even for agencies completely new to the technology, the first step doesn't have to be a challenging or significant task.

With VMO, which comes at no extra charge within the Palette Kubernetes management platform, a VMO pack can be added to each cluster, whether bare metal or at the edge, including air-gapped clusters. It applies the profile for that cluster and includes all the components a team requires. It allows people with limited tech skills to perform tasks once reserved for ninjas.

"It allows someone with a little bit of background to do a lot with complicated technologies," Wood said. "It allows someone like me to take our platform, build a cluster, deploy it to Azure and quickly move on to something else. Once you have a Kubernetes cluster built and you're ready to deploy, throwing the application layer and workloads on top of that is relatively easy. And you just pick the deployment location."



A big advantage is that it lets agencies with limited staff focus on their mission rather than the technology. "This makes it easy," Perry said. "I don't have to worry about Kubernetes. I can pay attention to the application, not the underlying cluster." And the Palette platform allows for centralized control of the entire environment.

"We look at the Kubernetes stack as a Lego block, independent of all the other Lego blocks," Wood said. "So, if I'm using a load balancer and that goes away, I can just put a new load balancer in there, provision the cluster and deploy it. The time I spend doing updates and changes can go from hours, weeks or months to just a couple of minutes."

Efficiency and future flexibility under one roof

VMO allows agencies to greatly increase their operational efficiency while giving them the flexibility to manage changing conditions, for example, with software that automatically optimizes clusters moving from the cloud to on-prem without user intervention. To reiterate some of VMO's key advantages, it enables agencies to:

- Migrate without rewriting legacy applications.
- Eliminate legacy hypervisor license costs.
- Provide a unified platform for managing VMs and containers.
- Modernize governance with Kubernetes-native tooling.
- Easily move workloads to or from the cloud.

Worker nodes can achieve these goals quickly if needed or at whatever pace an agency is comfortable optimizing its infrastructure and efficiencies.

Conclusion

Modernization and digital transformation have been among the most important goals of government agencies for several years. Still, they are being asked to achieve those goals amid the DOGE-driven budget and workforce reductions. Spectro Cloud VMO offers federal agencies a straightforward, low-risk path to making the best use of their resources by modernizing their legacy VM infrastructures without costly, time-consuming disruptions. It does this without having to rewrite applications being moved into a cloud-native Kubernetes environment. By aligning with DOGE and leveraging Kubernetes-native tooling, agencies can cut costs, strengthen security and streamline operations across any environment.

Under the hood: The features of full integration

As agencies become more comfortable with Kubernetes and begin to standardize on it, the next challenge is integrating the legacy virtual machines that still power many mission-critical applications. KubeVirt, the open-source technology at the core of VMO, provides an efficient way to run VMs within a Kubernetes environment. But organizations going to a cloud-native environment will need more than just KubeVirt.

They'll also need a storage platform that allows for capabilities such as live migration, snapshotting, cloning, site replication and backup/restore, as well as a load-balancing capability and ways to automate deployment of both bare metal Kubernetes cluster nodes and Kubernetes clusters at the edge. On its own, KubeVirt also lacks some functionality, such as day-two operations and built-in support for edge.

That's where VMO comes in — a fully productized, enhanced version of KubeVirt, deeply integrated into the Spectro Cloud Palette platform. With enterprise-grade lifecycle automation, security, and support, VMO builds on the core KubeVirt engine but adds operational simplicity, robust integrations and end-to-end automation. It includes features such as a persistent Container Storage Interface (CSI) infrastructure, a VLAN-capable network infrastructure and RBAC for granular VM access control across teams.

VMO enables seamless integration through features such as:

- Easy migration via its VM Migration Assistant — this can significantly save time and reduce the effort required of your IT team.
- Native multi-cluster support via a single UI/API for managing VMs across the agency.
- Always-on declarative management to enforce a cluster's desired state, ensuring compliance and eliminating configuration drift.
- Production-grade VM management includes live migration, dynamic resource rebalancing, maintenance modes, full backups and RBAC.
- Easy, safe access to ecosystem innovation using over 50 pre-configured integrations available out of the box.
- Canonical Metal as a Service (MAAS) integration for bare-metal automation supports complete lifecycle management.

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About Spectro Cloud

Turn the chaos of Kubernetes into effortless control, wherever your mission takes you

Spectro Cloud Government delivers the power of Kubernetes to missions where security, compliance and resilience are critical.

Through our award-winning Palette VerteX platform, purpose-built for regulated organizations, we give public-sector teams the power to design, deploy and manage Kubernetes at scale. Palette VerteX provides a consistent, governance-approved platform with FIPS 140–2 cryptography that functions across every domain, from the classified data center, hyperscaler gov clouds and air-gapped sites to the far tactical edge.

Palette VerteX is already trusted by teams across the Army, Navy and Air Force, and is 'Awardable' on both the Platform1 and CDAO Tradewinds solution marketplaces. Industry analysts GigaOm position us as a "Leader" and "Outperformer" in their 2025 Radars for both Managed Kubernetes and Kubernetes for Edge Computing. Our certifications with standards like ISO 27001 and SOC 2 Type 2 evidence of our continuous, audited controls.

Whether you're powering AI-driven situational awareness for war-fighters or digital services for millions of citizens, Spectro Cloud Government with Palette VerteX delivers secure, compliant and scalable Kubernetes — so your agency can focus on mission outcomes, not infrastructure.

Learn more about Spectro Cloud and the Palette platform at spectrocloud.com.