

## ESG Economic Validation

# Analyzing the Economic Benefits of Operationalizing Kubernetes with VMware Tanzu Standard

By Brian Garrett, EVP Validation Services  
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## Executive Summary

A growing number of organizations are using Kubernetes and agile software development methods to reduce the time and complexity associated with developing and running modernized applications. While most IT professionals recognize the value of Kubernetes, the technology is still maturing and can be complex to learn, deploy, and operationalize due in part to a global skills shortage of Kubernetes talent.

ESG performed a three-year ROI analysis for the business unit of an enterprise-class organization with 1,000 developers with a goal of quantifying the operational benefits that customers can achieve with VMware Tanzu Standard. Comparing Tanzu Standard to a project that leverages previous generation tools and open source Kubernetes, ESG has confirmed that VMware customers can get started with Kubernetes on their existing infrastructure 300% faster with Tanzu Standard and the familiar vSphere management interface. Centralizing the control of multiple Kubernetes clusters with Tanzu Standard increased operational efficiency by 91%, which freed up 1.5 full time engineers and resulted in a net savings of \$272,208 over three years.



VMware Tanzu Standard



**91%**  
Increased  
Operational Efficiency



**1.5 FTEs**  
Saved/Redeployed  
per Year



**\$272,208**  
Net Savings  
over 3 Years

Based on ESG's three-year ROI analysis for a business unit of an enterprise-class organization with 1,000 developers.

## Introduction

This ESG Economic Validation explores the benefits that organizations can expect from operationalizing Kubernetes with VMware Tanzu Standard.

## Background

A growing number of organizations have embraced containers and microservices for application modernization, and Kubernetes has become the industry standard for deploying containers in production. A recent VMware survey found that 59% of respondents are running Kubernetes in production.<sup>1</sup>

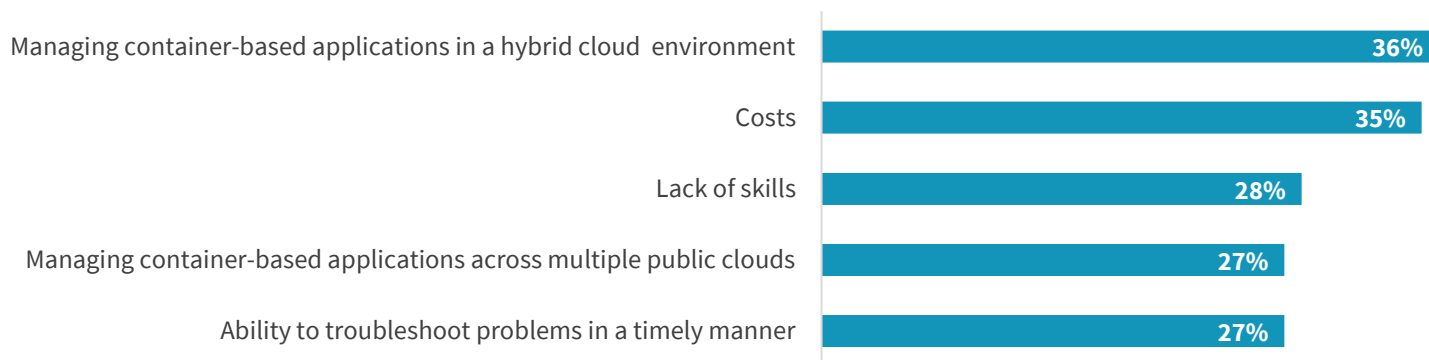
One of the key reasons why Kubernetes is so powerful is that it can run on-premises, in public clouds and at the edge. This optionality is important because many organizations are adopting a hybrid approach to IT infrastructure. In a research survey conducted by ESG, 70% of respondents said their container-based applications are or will be deployed in a combination of public cloud platforms and private data centers.<sup>2</sup>

## Challenges

Most organizations lack the experience and expertise needed to realize the full potential of Kubernetes with open source software and tools. As shown in Figure 1, ESG survey respondents indicated that this lack of skills is one of the many challenges associated with managing Kubernetes infrastructure and services at scale. Other challenges included managing container-based applications in hybrid and multi-cloud environments, costs, and troubleshooting in a timely manner.<sup>3</sup>

**Figure 1. Top Five Container-based Application Environment Management Challenges**

What are your biggest challenges related to managing container-based application environments?  
(Percent of respondents, N=332, three responses accepted, top five responses)



Source: Enterprise Strategy Group

It's early days for enterprise Kubernetes adoption. A recent VMware survey found that more than half of respondents (57%) are operating fewer than 10 Kubernetes clusters and only 20% have more than 50 clusters in production.<sup>4</sup> Operating a larger number of small Kubernetes clusters provides more flexibility and efficiency (e.g., better security and isolation, resource utilization, compliance, and recoverability), but most early adopters start with just a few clusters (e.g., one for production and a couple more for development and test) due to the complexity associated with managing multiple Kubernetes clusters with open source and legacy tools.

<sup>1</sup>Source: VMware Research Report, [The State of Kubernetes 2020](#), May 2020.

<sup>2</sup>Source: ESG Master Survey Results, [Trends in Modern Application Environments](#), December 2019.

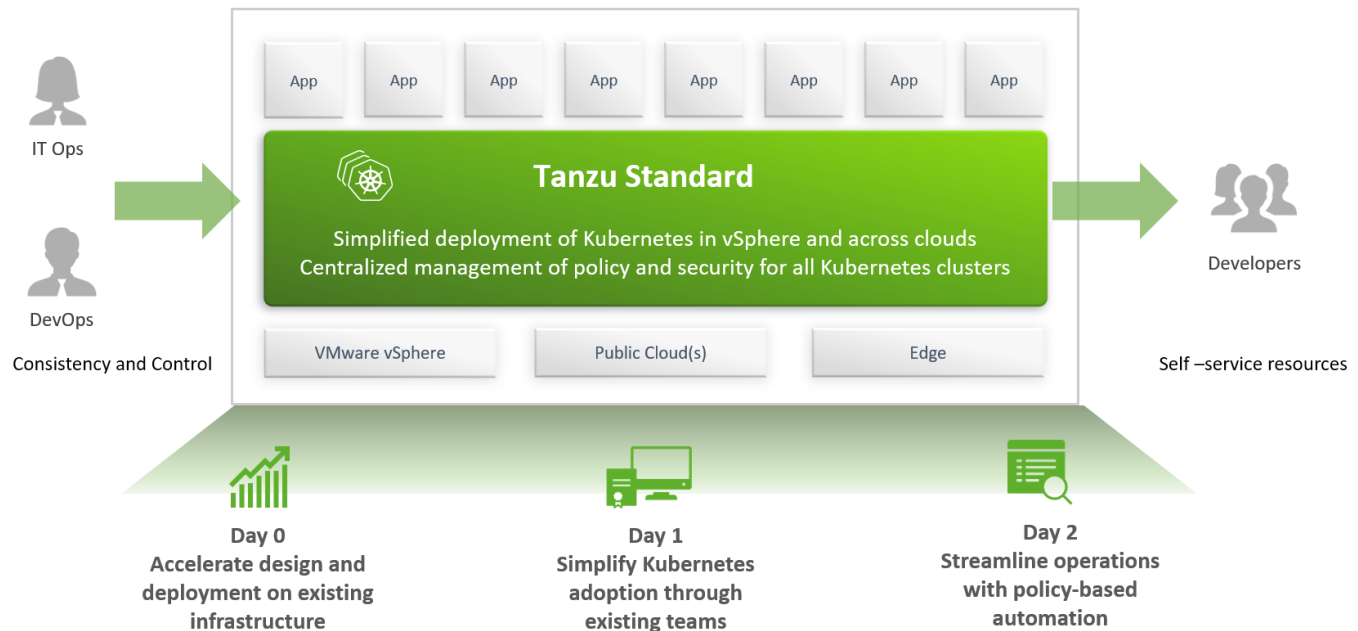
<sup>3</sup>Ibid.

<sup>4</sup>Source: VMware Research Report: [The State of Kubernetes 2020](#), May 2020

## VMware Tanzu Standard Edition

VMware Tanzu Standard is an open source-aligned Kubernetes runtime environment with a centralized management console that simplifies the deployment and operation of multiple Kubernetes clusters in on-premises and multi-cloud environments. As shown in Figure 2, with Tanzu Standard, the IT operations (IT Ops) and Development Operations (DevOps) teams can centrally manage infrastructure and security for all Kubernetes clusters as they provide the self-service delivery of Kubernetes sandboxes and production environments for developers.

**Figure 2. Tanzu Standard Edition**



*Source: Enterprise Strategy Group*

In software development, Day 0 represents the design phase where project requirements are identified and the architecture of a solution is defined. Day 1 not only involves the development of the applications that were designed in the Day 0 phase, but also the development and deployment of the infrastructure, network, external services, and security policies that those applications will need. Day 2 operations with Kubernetes focus on running and managing the applications and the underlying infrastructure that developers—and the business—rely on.

The balance of this report explores how Tanzu Standard:

- Accelerates Day 0 Kubernetes deployment with existing infrastructure.
- Simplifies Day 1 Kubernetes adoption with existing teams.
- Streamlines Day 2 operations with automated security and availability policies.

## ESG Economic Validation

ESG's Economic Validation process is a proven method for understanding, validating, quantifying, and modeling the economic value propositions of a product or solution. The process leverages ESG's core competencies in market and industry analysis, forward-looking research, and economic modelling. ESG reviewed the results of existing Tanzu case studies and end-user surveys, vendor analysis, and third-party economic analysis. In addition, ESG conducted in-depth interviews with end-users to better understand and quantify how Tanzu Standard has impacted their organizations, particularly in comparison with how they used to operate prior to deploying Tanzu Standard. The qualitative and quantitative findings were used as the basis for a simple ROI model that calculates the operational savings and benefits that an organization might expect with an investment in Tanzu Standard.

### Tanzu Economic Overview

ESG's economic analysis revealed that customers that have deployed Tanzu Standard were very satisfied with the product and felt that they had greatly streamlined their operations, were operating more efficiently, and were doing a better overall job at running and managing multiple Kubernetes clusters. ESG found that Tanzu Standard provides significant operational savings during Day 0/1 Kubernetes platform deployment and the Day 2 management and operation of containerized applications.



#### Accelerate Day 0 Kubernetes Deployment with Existing Infrastructure

Customers that ESG spoke with reported that Tanzu Standard significantly reduces the time to plan and architect a Kubernetes environment with existing vSphere managed infrastructure.

- **Leverage existing infrastructure**

Tanzu Standard allows organizations to reuse their existing vSphere environments to rapidly deploy Kubernetes clusters for their development teams. This simplifies and accelerates the time that it takes to learn, plan, and architect a Kubernetes platform with existing IT infrastructure. A VMware reseller that ESG spoke with summarized these benefits for its customers: *"98% of my customers already use VMware products. They have heard they can deploy and run Kubernetes with their existing infrastructure and tools that they already know. They're excited about the opportunity to automate the creation of Kubernetes infrastructure and operate efficiently at scale."*

***"deploy and run  
Kubernetes with their  
existing infrastructure and  
tools they already know"***

- **Shorten design and proof-of-concept cycles**

One customer estimated it would take six months to deploy a new Kubernetes platform with previous generation technology, but that timeline is cut to less than two months with Tanzu Standard. Another customer said, *"Several years ago, we estimated that it would take three months for two to three full time engineers to architect and deploy our Kubernetes infrastructure and one to two full time cluster engineers to maintain it. Today with Tanzu, that initial effort would take only a month for one or two full time engineers and just a couple of hours per week for maintenance."*

***70-80% Lower  
Administrative Costs***

Multiple customers that ESG spoke with had similar feedback. Tanzu Standard reduces the administrative costs associated with Kubernetes infrastructure planning, configuration, and deployment by 70 to 80 percent. Familiar tools and the ability to centrally manage policies across multiple Kubernetes clusters accelerates the time to deploy an organization's first containerized application by three to five times.

**3-5x Faster**  
**Time to Value**



### Simplify Day 1 Kubernetes Adoption with Existing Teams

Customers that ESG spoke with reported that adopting Kubernetes via Tanzu Standard required minimal incremental training or specialists. Every organization that we spoke with felt that Tanzu Standard had helped them transform their organization to make the most of the resources they had.

- **Familiar vSphere management**

One customer that ESG spoke with said the primary reason that their organization chose to go with Tanzu for Kubernetes was that their team already had experience with VMware vSphere. They said, *"The cost of change was very low."* Another summarized this well when he said, *"If you've managed infrastructure with vSphere, it feels like software you already know."*

***"If you've managed infrastructure with vSphere, it feels like software you already know."***

- **Open source alignment**

ESG learned from multiple customers that the open source alignment of Tanzu helps shortens the learning curve and simplifies support and maintenance. A customer that ESG spoke with said, *"We chose Tanzu because it helped us flatten the learning curve. It's really well documented. And if you can't find what you need to solve a problem right away, all you have to do is look online and your questions will already be answered in some kind of forum or the open source community itself."*

***"It helped us flatten the learning curve."***



### Streamline Day 2 Operations with Automated Security and Availability Policies

Customers told ESG that they realized a significant reduction in Day 2 operations effort with Tanzu. They reported that their IT Ops and DevOps teams were significantly more productive as they accelerated the deployment, operation, and monitoring of containerized microservices and applications.

- **Operations**

All the Tanzu Standard customers that ESG spoke with highlighted the Day 2 operation benefits that they have achieved with centralized policy-based management across multiple clusters. One customer summed up the benefits of policy-based automation and operations when he said, *"Tanzu helped us automate the deployment of a standard Kubernetes environment with consistent networking topology, high availability, backup, and security policies."* Multiple customers said that Tanzu Standard has nearly eliminated routine operations tasks. Instead of monitoring exceptions and putting out fires, they are tuning alert levels and working more strategically with developers.

***"Tanzu helped us automate the deployment of a standard Kubernetes environment with consistent networking topology, high availability, backup, and security policies."***

- **Security**

Tanzu Standard simplifies security and reduces risk in a variety of ways, including centralized policy-based automation of application-level security policies, role-based access control for developers and admins, and automated patch management of the underlying Kubernetes software stack. One customer that ESG interviewed said, *“From an engineering perspective, it’s easy to keep our Kubernetes platform up to date, which is key for us from a security perspective.”* Having a centrally managed platform that works across multiple Kubernetes clusters also simplifies security and compliance audits.

- **Availability**

Tanzu Standard automates the backup and policy-based deployment of Kubernetes clusters in multiple availability zones for recoverability and high availability. A Tanzu Standard customer that ESG interviewed touted the benefits of the open source Velero tool that his organization has integrated with Tanzu Standard to safely back up and restore resources in Kubernetes clusters, perform disaster recovery operations, and migrate resources between clusters.

- **Networking**

Tanzu Standard supports the creation of centrally managed networking policies across all of the Kubernetes clusters in an organization. One customer that ESG spoke with said this makes it easier to define reusable network topologies and policies for applications that have different connectivity needs. For example, one set of policies might cover applications that are subject to compliance mandates and must be run on internal networks and another might address applications that will be accessible for customers on the internet. Another customer that ESG spoke with uses Tanzu Standard in conjunction with VMware NSX for on-premises network virtualization to improve their operational efficiency and security posture.

- **Bespoke clusters**

Tanzu Standard can be used to tailor the configuration of Kubernetes clusters to meet a variety of application performance and resource requirements (e.g., memory-heavy, storage-heavy, compute-heavy). One customer that ESG spoke with used Tanzu Standard to create a Kubernetes cluster tailored to meet the needs of a tax document scanning application that is very CPU resource intensive. That customer told a great story that illustrates how Tanzu Standard and agile software methodologies have accelerated software development cycles

***“Tanzu is really helpful with Kubernetes cluster operations because it handles 90-99% of our operations.”***

to react more quickly to the needs of the business, *“We recently developed and released a COVID loan verification application just two days after new legislation was announced. Without Tanzu Standard it would have taken at least twice as long.”*

Another customer summarized the benefits of Tanzu Standard for Day 2 operations well when he said, *“Tanzu is really helpful with Kubernetes cluster operations because it handles 90-99% of our operations.”*



## ESG Analysis

ESG performed a three-year return-on-investment analysis for a business unit within a large enterprise that is getting started with an application modernization effort and is leveraging Kubernetes for containerized applications. The analysis was focused on the operational benefits of Tanzu Standard compared to a do-it-yourself project that utilizes previous generation tools and open source Kubernetes. The key assumptions that were used in this ESG analysis are:

- Starting number of Kubernetes clusters: 30
- Starting number of developers and admins: 600
- Annual growth rate: 25%
- Average CPU core count per cluster: 24
- Kubernetes infrastructure administrator salary: \$120,000

A Kubernetes cluster is a set of servers (aka nodes) that run containerized applications. Containerized applications running on Kubernetes clusters are more lightweight and flexible than virtual machines, which makes it easier for applications to be developed, moved, and managed.

This ESG analysis started with 30 Kubernetes clusters, which is higher than the number of clusters that organizations have typically started with over the past couple of years. Some organizations, including two Tanzu Standard customers that ESG spoke with, have only a few clusters deployed—usually one for production and a couple for development and test. Others, including one Tanzu Standard customer that ESG spoke with, have more than 50 Kubernetes clusters in production. ESG modelled an organization that is starting with 30 clusters with a goal of leveraging Tanzu Standard as a centralized management plane to tailor the configuration of clusters to meet the specific needs of containerized applications and the business (e.g., security, HA, recoverability, networking, performance, cost, etc.).

The prototypical organization that was used for this ESG analysis has a multi-cloud strategy for legacy apps that are currently 90% virtualized with VMware. Eighty percent of legacy applications have been deployed on-premises and 20% are in the public cloud (AWS and Microsoft Azure). The organization has been struggling to recruit new hires with Kubernetes experience.

### Day 0/1 Operations

ESG spoke with multiple VMware customers that quantified the benefits associated with using Tanzu Standard for Day 0 architecture and planning and Day 1 installation and configuration of Kubernetes infrastructure and policies. Tanzu Standard reduced Day 1 operational complexity by 87% and accelerated the time associated with getting the organization ready to deploy the first containerized application by 300%. Customers that ESG spoke with indicated that these operational savings were due to several factors including:

- Leveraging existing IT infrastructure with familiar vSphere management tools.
- Simplifying learning and support with Tanzu Standard’s open source-aligned Kubernetes distribution.

## Why This Matters

A growing number of organizations are using Kubernetes and agile software development to reduce the time to develop and deploy new applications from months or years to days or weeks.

Getting started with Kubernetes is complex and time-consuming due in part to an industry-wide skills shortage.

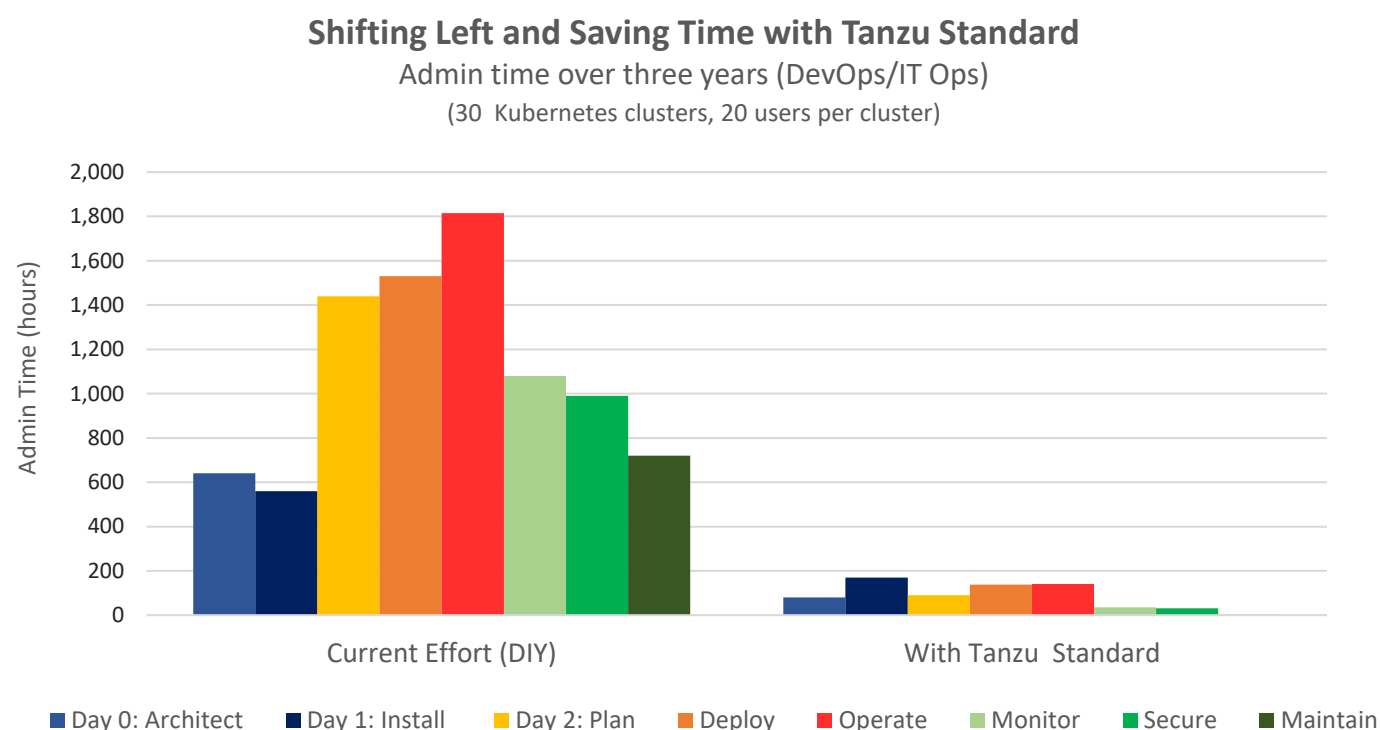
ESG has confirmed that VMware customers can get started with Kubernetes on their existing infrastructure 300% faster with Tanzu.

Tanzu reduces the time and complexity associated with running and managing Kubernetes infrastructure and containerized application services by 94%.

## Day 2 Operations

ESG spoke with Tanzu Standard customers with a goal of quantifying the operational time savings associated with operating, monitoring, securing, and maintaining containerized infrastructure and applications.<sup>5</sup> The admin time savings for IT Ops and DevOps teams are summarized in Figure 3 and Table 1.

**Figure 3. Operational Admin Time**



Source: Enterprise Strategy Group

**Table 1. Operational Admin Time**

Operational Phase	Current Effort (hours)	With Tanzu Standard (hours)	Operational Savings (percent saved)
Day 0: Plan/Architect	640	80	87%
Day 1: Install/Configure	560	170	70%
Day 2: Run/Manage	7,575	438	94%
<b>TOTAL</b>	<b>9,975</b>	<b>938</b>	<b>91%</b>

Source: Enterprise Strategy Group

<sup>5</sup> The operating tasks that were analyzed included scaling a cluster, upgrading a cluster, deploying a new app in a cluster, managing backups and restores, managing quotas, image registries, and networking policies. The monitoring tasks included managing application performance metrics and alerts, troubleshooting application problems, and capacity planning. The security tasks included configuring security and authentication policies and running conformance and CIS security tests. Finally, we examined the maintenance tasks associated with Kubernetes cluster software updates and patching that are automated and eliminated with Tanzu.



### What the Numbers Mean

Tanzu Standard reduces the number of hours that IT Ops and DevOps teams spend on Day 0, Day 1, and Day 2 operations by 91%. ESG’s economic analysis and modelling indicate that the highest level of savings (94%) can be achieved for Day 2 operations because Tanzu Standard:

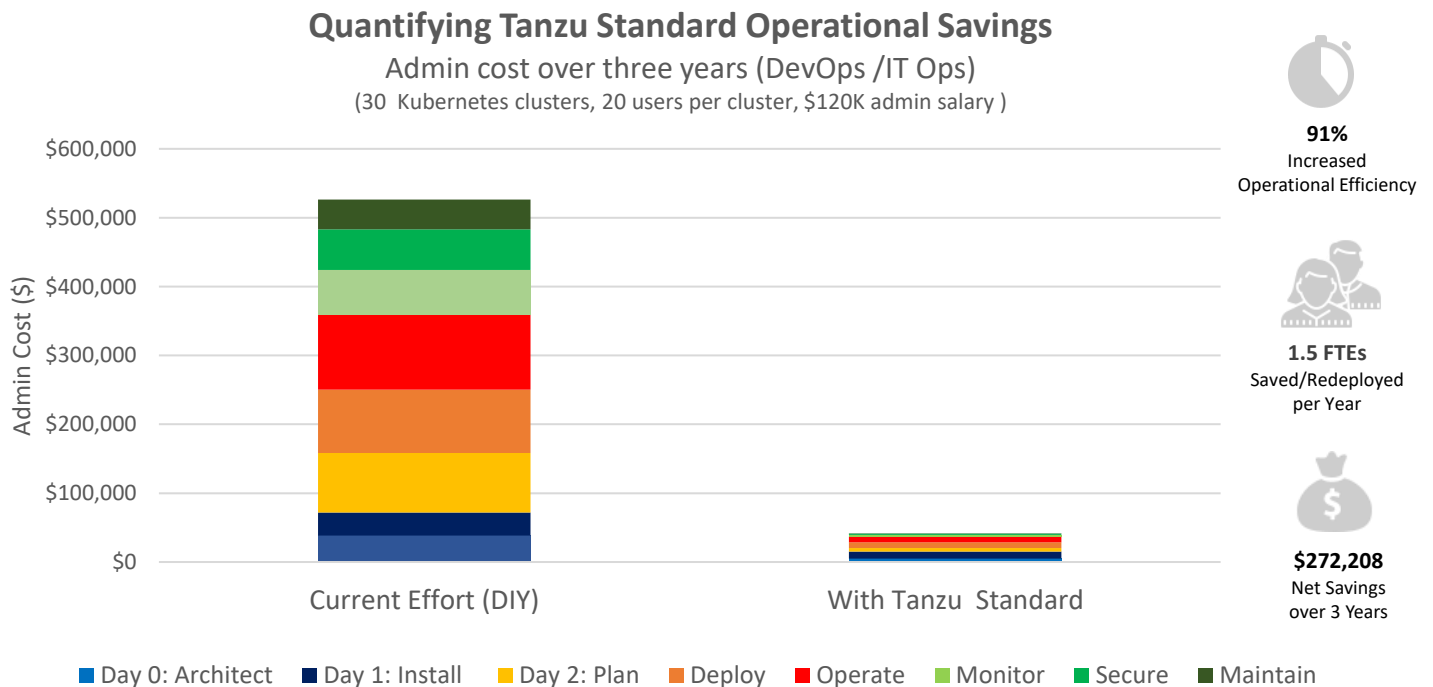
- Streamlines the management of infrastructure, security, and HA policies across multiple clusters.
- Automates policies for performance-sensitive applications and compliance initiatives.
- Reduces operational administration time for more strategic tasks.

ESG conversations with multiple VMware customers revealed that Tanzu Standard has helped organizations shift left. Shifting left means spending more time upfront on consistent software development, security, and application resources policies with a goal of reducing administrative time and risk after applications have been deployed. One customer that ESG spoke with noted, “Our legacy application infrastructure team spends about 80% of the time operating and troubleshooting application infrastructure, which leaves only 20% of the time for architecture and engineering. With Tanzu we’re spending less than 20% of our time operating and troubleshooting, which lets us spend 80% of our time meeting the needs of the developers with tools and policies that work across Kubernetes clusters.” In other words, shifting left with Tanzu Standard is not only saving operational time and money, it’s making applications more secure and reliable.

### The Bottom Line

The operational savings that were achieved with Tanzu Standard are summarized in Figure 4. Based on a \$120,000 assumption for the annual salary of a Kubernetes administrator, Tanzu Standard reduced operational costs by \$542,208 over three years with a net savings of \$272,208 and a return on investment (ROI) of 201% after including the cost of a CapEx investment in Tanzu Standard over three years.

**Figure 4. Operational Admin Cost**



Source: Enterprise Strategy Group

## Issues to Consider

ESG's economic analysis was focused on the quantifiable hard cost savings that can be achieved with centralized operations of Kubernetes across multiple clusters with Tanzu Standard. Softer business benefits that amplify those savings were not included in ESG's economic model and can vary depending on the vertical industry and size of the organization but should be considered:

- **Developer Productivity:** Self-service access to containerized software development infrastructure increases developer productivity. Developers are not wasting time configuring and waiting for infrastructure for a new application or release cycle. One customer that ESG spoke with stated that, *"Tanzu has turned our Kubernetes cluster into a black box for developers so they don't have to deal with infrastructure."*
- **Faster Development Cycles:** Faster access to application infrastructure speeds development cycles. Faster application development cycles have a variety of potential benefits for the business, including better customer experience and profitability.
- **Reduced Risk:** Centralized management of security and availability policies reduces risk for the business (e.g., reducing the risk of breach or an application outage). A customer that ESG spoke with stated that, *"There's very little work to keep the platform current with vulnerability patches—that's key for us from a security perspective."*
- **Multi-cloud Agility:** The portability and open source alignment of Tanzu Standard reduces complexity and avoids vendor lock-in for multi-cloud deployments. One customer that ESG spoke with stated that, *"with Tanzu, I can shift my applications from one cloud to another. I can create it once and run it anywhere. That's a big benefit for us."*

## The Bigger Truth

Unlike other recent emerging technologies, established IT vendors have been quick to embrace Kubernetes for application modernization. As such, it is not surprising that many IT managers are looking to technology stalwarts like VMware to help them implement and support the technology in a multi-cloud context.

IT operations teams are looking for ways to simplify and accelerate the adoption of Kubernetes while leveraging their existing investment in VMware software and management tools. Developers are looking for ways to get out of the business of managing infrastructure so they can spend more time developing applications that meet the needs of the business.

Tanzu Standard simplifies the operation of Kubernetes infrastructure on-premises, in multiple clouds, and at the edge with cloud-native constructs that can be managed with familiar vSphere management tools. Tanzu Standard centralizes management and governance across multiple Kubernetes clusters, which reduces operational complexity for IT Ops and DevOps and enables self-service access to application infrastructure for developers.

ESG's three-year ROI analysis for the business unit of an enterprise-class organization with 1,000 developers has proven that VMware customers can get started with Kubernetes on their existing infrastructure 300% faster with Tanzu Standard and the familiar VMware management interface of vSphere. Centralized control of multiple Kubernetes clusters with Tanzu Standard increases operational efficiency by 91%, which frees up 1.5 full time engineers with a net savings of \$272,208 over three years.

If your organization is looking to accelerate the delivery of modernized applications, starting from your existing vSphere-managed IT infrastructure and extending to multiple clouds, then ESG recommends that you consider the operational savings and benefits that can be achieved with VMware Tanzu Standard Edition.

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