

# Application-Centric Pathways to the Hybrid Cloud

A guide to building a modern  
cloud strategy for healthcare

## Executive Summary

Modern applications drive the modern healthcare industry, and the dependency healthcare institutions have on their applications is growing stronger. IDC predicts that from 2018 to 2023, 500 million new logical apps will be created, equal to the number built over the past 40 years.<sup>1</sup> With new app adoption, there is more demand for flexibility, scalability, and agility. But IT Ops teams struggle to manage modern and traditional applications across today's diverse and disjointed architectures. While diversity helps meet healthcare business needs, managing a wide range of deployment environments can present unique needs and challenges.

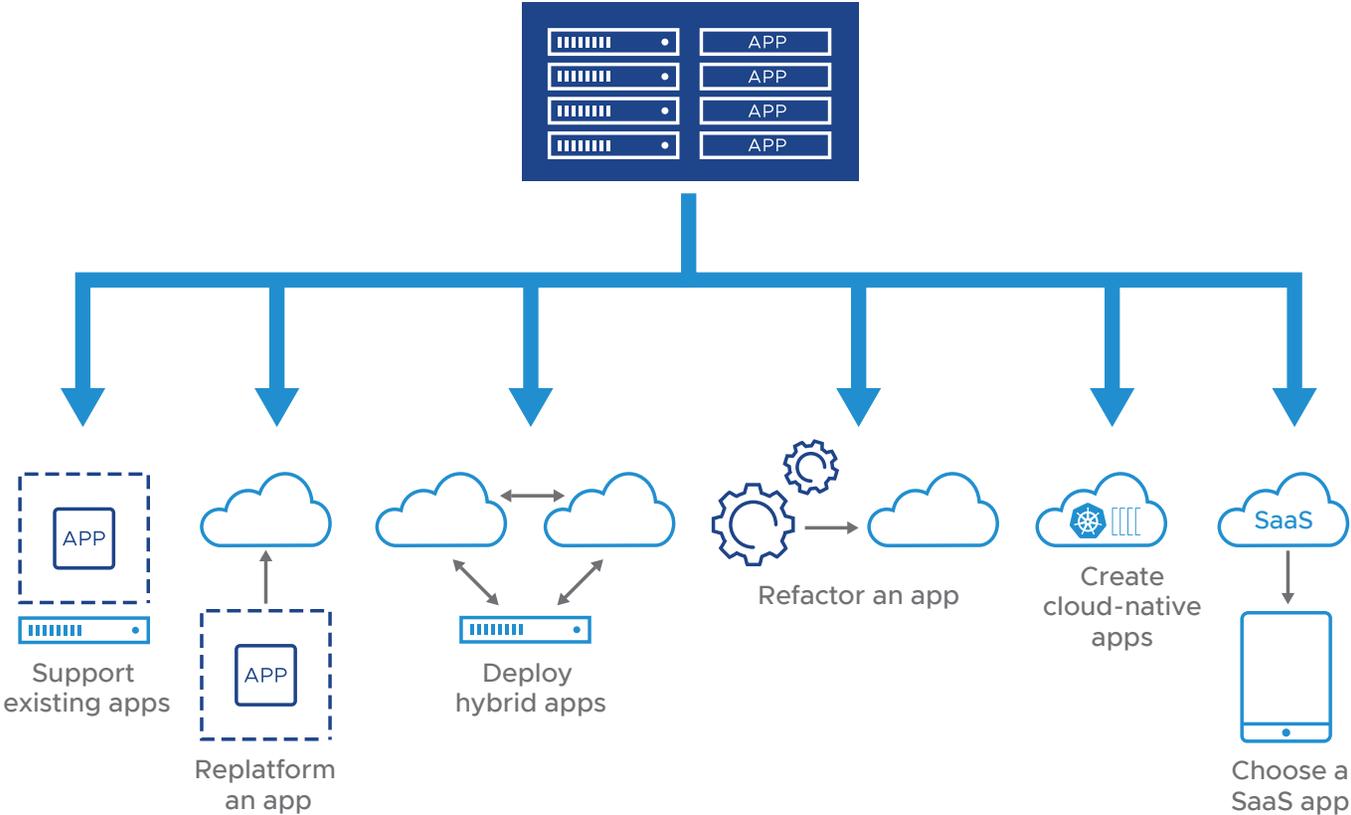
The current leading approach to meet the needs of a typical application portfolio is a hybrid cloud model. The industry defines hybrid cloud as the combination of private cloud, public cloud, and edge environments, unified with consistent infrastructure and consistent operations. A hybrid approach is preferred by IT organizations as they determine what aspects of public cloud fit their unique traditional and modern application needs—in fact, two-thirds of cloud buyers are seeking a hybrid cloud solution.<sup>2</sup> The good news is that IT organizations can build on existing infrastructure investments, bridging the gap to modern public cloud solutions while consolidating IT control and management.

1 IDC. "IDC FutureScape, Doc #US44403818." October 2018.

2 Forrester. "The Total Economic Impact™ of VMware Cloud on AWS." August 2019.

This eBook summarizes an application-centric approach to shape cloud strategy for any healthcare organization looking to streamline and modernize their IT landscape. It provides six app-centric paths for IT organizations to adopt a hybrid cloud environment. Depending on your organization’s application landscape, you will use some or many of these paths to optimize your cloud strategy.

### Application-centric pathways to the hybrid cloud



# The Paradigm Shift: The Rise of the App-Centric Data Center

Healthcare CIOs have shifted their thinking in recent years. Focus changed away from infrastructure toward applications and the new opportunities they enable. Applications drive modern organizations and touch every aspect of the healthcare industry, from serving patients with online self-service portals to increasing employee productivity by putting any and all information at their fingertips. And dependency on applications is growing stronger.

Applications are now deployed and operated across a diverse infrastructure landscape, from on-premises data centers, to the public cloud, to remote or branch locations. Now more than ever, it is essential that healthcare organizations approach their IT landscape with a holistic and application-centric vision. This means application strategy—both past decisions and new deployments moving forward—should drive cloud strategy.

## Common questions CIOs have about their application strategy:

- What are the requirements of my applications?
- How will these applications be managed and scaled?
- What value will this app have to the organization?
- What kind of environment gives this app what it needs to make the biggest impact on the mission?
- Should this app be migrated to the cloud?
- Is the cost of rebuilding for the cloud warranted?

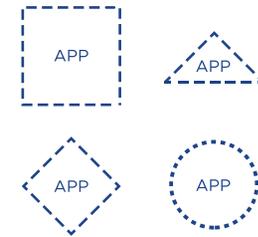
## Current data center architectures are not streamlined for this shift

Installing apps in traditional data centers is becoming more and more complex, and that complexity leads to decreased efficiency for both your IT staff and the applications themselves. As your organization's IT landscape expands to new locations—in the cloud or remote data centers—it becomes more difficult to decide where to host and maintain applications. The interconnectedness of apps is also leading to a rise in complexity. Few apps exist in a silo, and it can be painful to manage the patchwork of your app landscape after years of unguided deployments.

The prominence of legacy systems only compounds issues for your diverse portfolio of applications. New apps that cannot be run on outdated architecture mean more development or installation time as they are adapted to legacy systems. Thus, a complicated installation landscape leads to more diverse application deployments, and inconsistencies in execution and support. All this application diversity means lower operational efficiency of new apps, less time to treat patients, and more administrative overhead as IT struggles to document and maintain the messy app catalog.

### Troubles with the Legacy Data Center

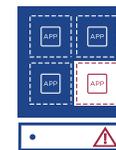
#### Diverse application portfolio



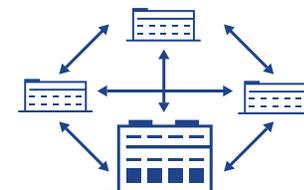
#### Underpowered legacy hardware



#### Insecure underlying architecture



#### Complicated application environments



## Make security part of your strategy

In the rush to adapt new apps to old architecture, security is often left by the wayside. Only 16 percent of organizations polled reported that the capabilities of traditional security tools were sufficient to manage security across the cloud.<sup>3</sup> Old architecture is rarely patched adequately as vulnerabilities emerge, and a flawed foundation allows risk to propagate through to newer applications. This means if your organization is running outdated hardware, risk is increased for each new app, regardless of how safe or cutting-edge the app itself is.

The legacy data center has seen much evolution over the past 30 years, but its time for achieving greater cost efficiencies has ended. New apps can't run on much of the legacy hardware cluttering up old data centers as modern requirements outpace old capabilities—across compute, storage, networking, software features, and more. IT teams must face forward toward new technologies and embrace new platforms and architecture, lest they get left behind by their competition.

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Source: Cybersecurity Insiders, "Cloud Security Report," 2018

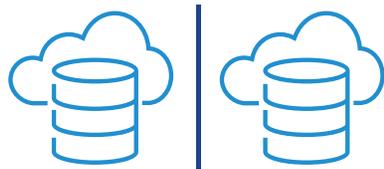
<sup>3</sup> Cybersecurity Insiders. "Cloud Security Report." 2018.

## Application strategy drives platform decisions

The needs of applications drive the decision for what platform must be purchased, and healthcare organizations are asking, “What is the best infrastructure to match the needs of our applications? What are the unique requirements of each application? And how might these answers change over time?”

Payers and providers must decide which platform to invest in carefully, as investing in the wrong platform can be costly. You don’t want to keep rewriting your apps every time a new tool or system comes along. Your next platform will need to be flexible enough to accommodate future features and standards, whatever they may be.

### What to avoid when determining your cloud platform



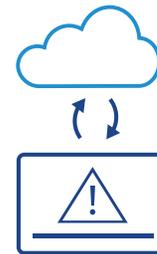
Cloud silos



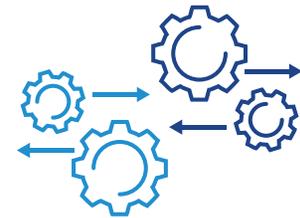
Limitations  
on scaling or  
data recovery



Overpaying  
for capacity  
limits



Proprietary  
hardware  
or software



Inconsistent management  
and operations between  
environments

## Hybrid cloud is the bridge from traditional infrastructure to the app-centric data center

The hybrid cloud approach utilizes your investment in current infrastructure and bridges the gap between data center and public cloud by leveraging common tools and management processes across every phase of your cloud journey. You can start leveraging new innovations now while preserving existing investments, minimizing disruption to IT processes and the services they provide.

Public cloud is not one-size-fits-all, and most payers and providers don't make the switch to public cloud cold-turkey or fully. IT organizations prefer a hybrid approach as they determine what aspects of public cloud fit their unique organizations; the majority of cloud buyers seek a hybrid cloud solution.<sup>4</sup> Any proprietary or business-critical applications that need to be maintained on company servers can exist along with public cloud and SaaS solutions, with the biggest change being the reduction in administrative overhead necessary to manage both systems.

# 22%

The healthcare cloud computing market is set to grow at a rate of 22 percent through 2022, as organizations continue to move data — including sensitive information — to the cloud.

Source: Health Tech Insider, Multicloud vs. Hybrid Cloud: What's Right for Your Healthcare Organization, April 2019.

<sup>4</sup> Forrester, "The Total Economic Impact™ of VMware Cloud on AWS," August 2019.

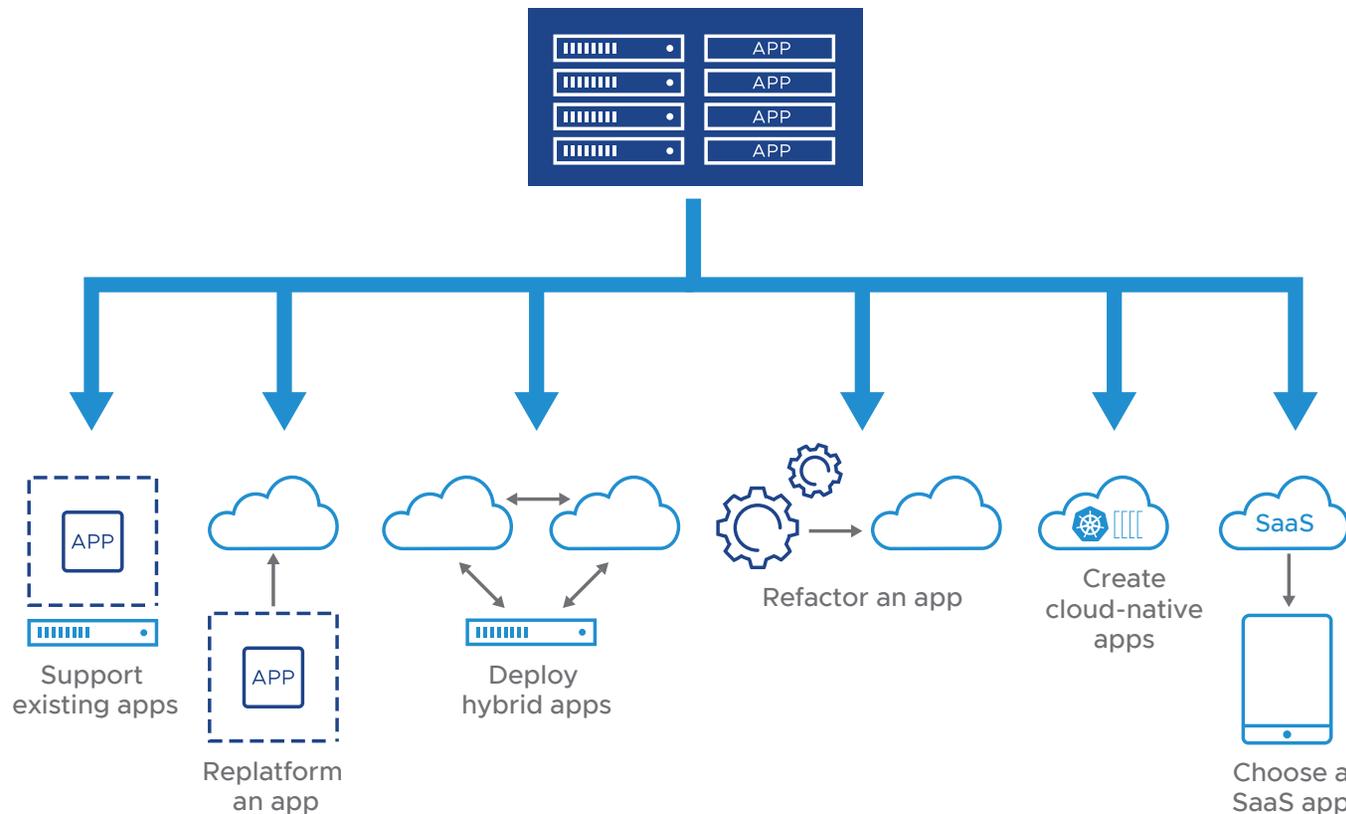
What is the hybrid cloud? The industry defines hybrid cloud as the combination of private cloud, public cloud, and edge environments, unified with consistent infrastructure and consistent operations. All layers of the stack—compute, storage, and networking—are defined in software, with integrated management, governance, and security.

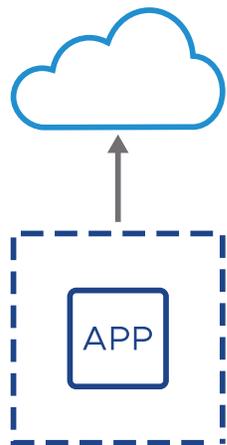
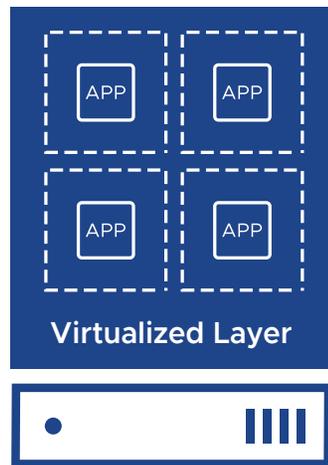
## Why is hybrid cloud so widely adopted?

- ✓ Optimized infrastructure that can support every application
- ✓ Efficient and simplified IT operations
- ✓ Avoids dependence on specialists for legacy infrastructure
- ✓ Rapid delivery of modern apps
- ✓ Reduced security and compliance risks

## Six application-centric pathways to the hybrid cloud

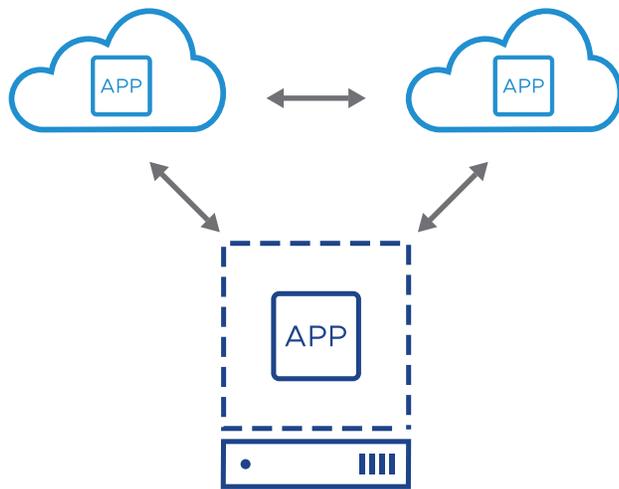
Now that the prominent role applications play when determining a cloud platform is clear, here are six pathways your organization can take to transition applications from a traditional data center to the hybrid cloud. Your individual journey may include one or several of these paths depending on your unique investments and challenges for migrating systems.



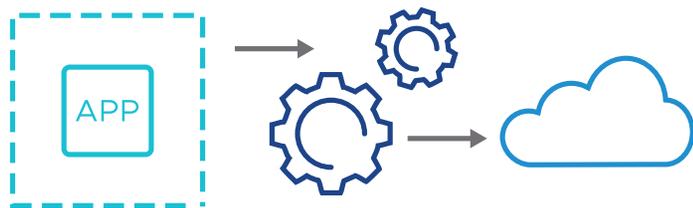


① **Support existing apps in the data center.** Applications continue to be maintained in data centers for a number of reasons, including data protection regulations, to better manage performance requirements, or to guarantee access to some unique in-house service. Highly virtualized data centers, maintained on premises, enhance performance, capacity, and sufficiency of applications without replacing existing hardware. Many healthcare organizations are turning to hyperconverged infrastructure (HCI)—that includes software-defined compute, network, and storage, managed with higher levels of automation—as a way to achieve these benefits and still reduce the demand for hardware and management resources. **Choose this path when you need to keep applications in your data center, but want to gain some cloud-like automation and efficiency in place.**

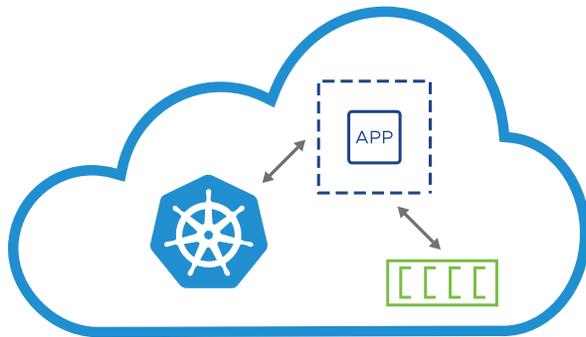
② **Replatform an app to the cloud.** Your organization might have a goal or target to move a certain percentage of applications to the cloud. Replatforming is the process of keeping the application unchanged, while moving it from an existing highly virtualized environment to the cloud. This approach supports cloud migration for bi-directional applications, as well as consistent policies and unified visibility and monitoring across on- and off-premises environments. **Choose this path when the app is unalterable, and needs moving without expensive rewriting.**



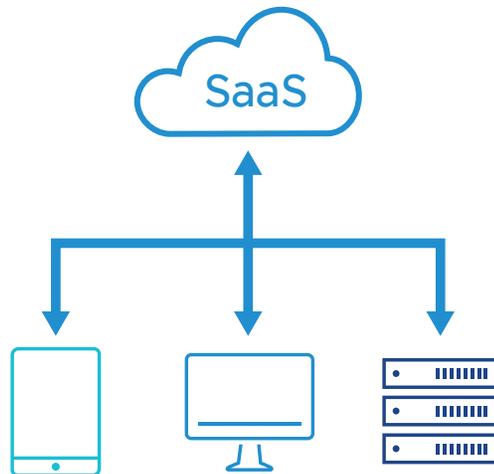
- ③ **Deploy hybrid apps.** Hybrid apps consist of portions of an existing app that are shifted to the cloud while other portions continue running in the data center. Alternatively, an application remains in its current environment while consuming specific services from a variety of clouds. **Choose this path to gain optimal application architecture for specific organizational needs while still leveraging unified management from a single view, automated and optimized network performance across diverse environments.**



- ④ **Refactor an app.** Refactoring an app means changing or rewriting an existing application code so it is optimized to fit modern cloud architecture, container environments, microservices, and cloud services. The cost of this method depends primarily on the development time rewriting code for the app. **Choose this path when no other option exists or when it is strategic (cost-justified) to update the application to take advantage of modern hyperscale cloud services.**



- 5 **Create cloud-native apps.** Cloud-native applications are designed from inception to leverage unique cloud services and commodity infrastructure in a pay-per-use environment. Increasingly, those building cloud-native applications use microservice architectures, and utilize Kubernetes for container orchestration to enable scale and availability of those microservices. **Consider this path for all new applications deployed on premises or in the cloud.**



- 6 **Choose a SaaS app.** Software-as-a-service (SaaS) applications are also viable options to replace many non-strategic commercial off-the-shelf (COTS) applications payers or providers have historically purchased and hosted internally. SaaS reduces the burden of installing and maintaining infrastructure, middleware, and the application itself. The most frequent limitation of this path is a required storage location for sensitive data collected or used by the app. **Choose this path when the application doesn't deliver differentiation to your stakeholders and doesn't need a high degree of customization.**

## VMware Cloud Foundation is the ideal hybrid cloud platform for flexibility and choice

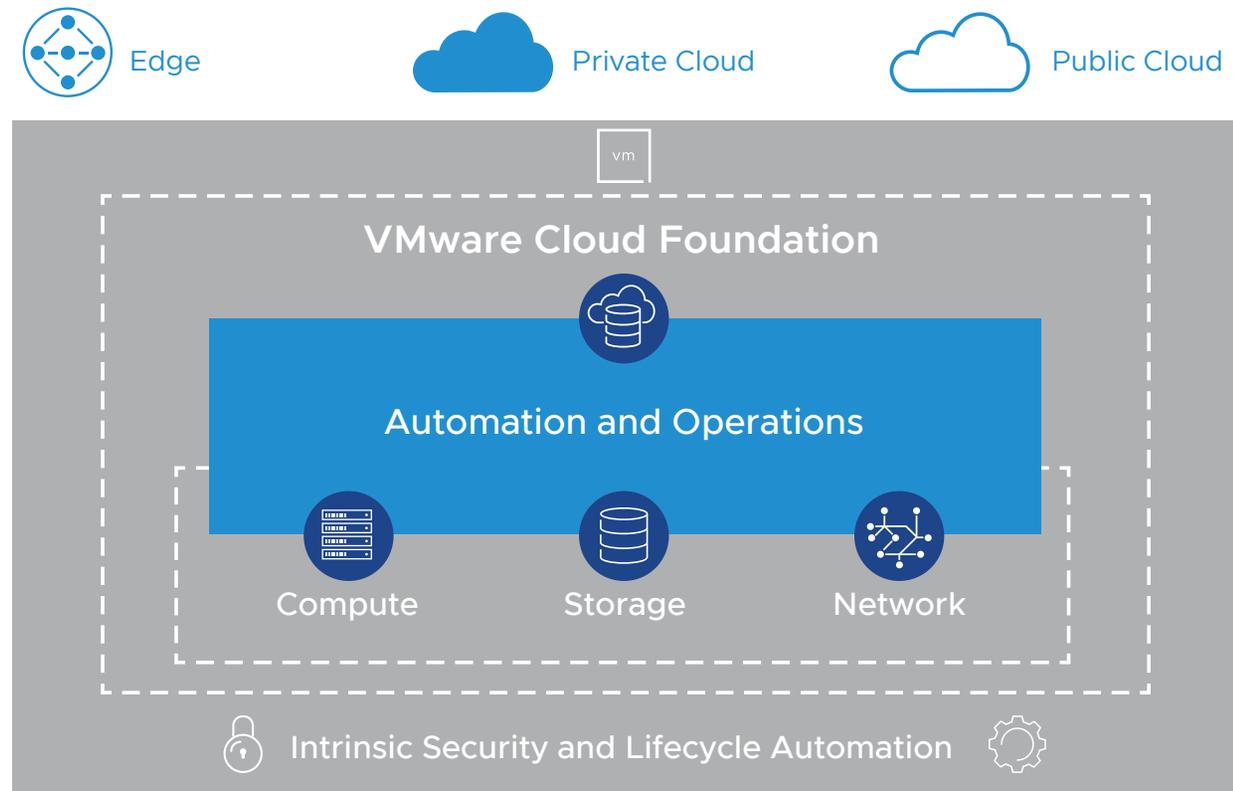
Built on one of the most widely deployed cloud infrastructures in the world, VMware Cloud Foundation™ is an integrated hybrid cloud solution for the data center and the foundation for cloud services and edge offerings. It is a unified cloud infrastructure that combines the essential capabilities for hybrid cloud as a single integrated solution or as interoperable and modular components that support existing investments within the data center. VMware Cloud Foundation is integral to VMware's HCI leadership position, and was mentioned in the Gartner Magic Quadrant for Hyperconverged Infrastructure: "VMware Cloud Foundation (VCF) offers users a full-stack HCI experience, with a complete set of software-defined services for compute, storage, networking, security and cloud management."<sup>5</sup>

5 Gartner, Inc. "Gartner Magic Quadrant for Hyperconverged Infrastructure." January 2019



## Hybrid cloud is the new normal

Modern healthcare organizations need a cloud strategy that supports the modern apps they need to compete and the legacy apps that are keeping the business running. VMware Cloud Foundation delivers the essential cloud infrastructure capabilities for some of the broadest, most demanding hybrid cloud strategies, enabling consistent infrastructure and consistent operations for private cloud, public cloud, and edge scenarios.



Whatever the state of your cloud strategy, one requirement is clear: It must support the legacy apps that keep the organization running, as well as the modern apps that the company needs to compete.

## Conclusion

VMware builds upon 20 years of success in the cloud hosting and security market, and VMware Cloud Foundation is one of the most broadly deployed, most trusted cloud infrastructures in the world today. It evolves VMware's market-leading server virtualization, VMware vSphere®, by extending the core hypervisor with integrated software-defined storage, networking, and security that can be consumed flexibly on premises or as a service in the public cloud. Now more than ever, it is essential that payers and providers approach their IT landscape with a holistic and application-centric vision. Wherever your path takes you, when you're building a cloud strategy, VMware can help.

### Learn more

INFOGRAPHIC: GUIDE TO HYBRID CLOUD

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