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FUTURE PROOF YOUR INVESTMENT STRATEGY FOR DATA CENTER AND CLOUD

Evolve People, Processes, and Technologies
to a Software-Defined Environment

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Digital Disruption Is Fundamentally Changing IT

Today's organizations are under more pressure than ever to innovate fast and offer a superior experience to every customer. Nimble, digitally enabled competitors can bring new applications to market in record time, over the cloud and on mobile devices. As barriers to entry fall and time to market accelerates, organizations are fundamentally changing their operating models. They are looking to explore opportunities in new areas of business, as well as unlock more value from their current core business. And they are seeking to build digital capabilities deep into their business processes and foundation, as well as their data infrastructure.

These new business imperatives are driving IT to become more strategic. But they may be hampered by complex environments, siloed architectures, and slow, manual processes. Their existing teams may lack the skills and knowledge to support changing demands and technologies. Many are also struggling to smoothly integrate their existing on-premises systems and processes that they have accumulated over the years, without having to rip and replace key parts of their infrastructure. By embracing a modernized data center, IT and their business constituents can overcome these challenges and position themselves to deliver the speed and innovation that are essential for businesses in the digital economy.

In this white paper, we'll explore the advantages that a modernized data center can bring for IT organizations seeking to keep pace in a dynamic environment. We'll talk about challenges that are holding back business and IT, and discuss how a software-defined approach can help them move forward. And we'll present examples showing how VMware solutions can enable IT teams to develop a future-proof strategy to build a foundation that is ready for change—from cloud, multi-cloud, and hybrid environments, to global expansion, customer acquisitions, and beyond.

Top Challenges to Modernizing the Data Center

Today's organizations face unprecedented challenges as they strive to keep pace with digital transformation. The challenges aren't limited to technology—they extend across an organization's people and processes as well. As technology plays an increasingly strategic role in unlocking business value, driving growth, and serving customers better, the needs of IT and business are more closely connected than ever.

Business Challenges Limit Options and Efficiency

Business leaders see data center modernization as a tremendous opportunity to power innovation and make their organizations more agile and competitive, but they also face major obstacles that are slowing their progress.

- **A growing skills gap** – As organizations focus more on new technology investments like cloud, security, IoT, and data science, they are quickly realizing they have a significant skills shortage across their teams, which have never worked with these emerging technologies before. That often requires retraining or hiring new employees to pick up the slack.

Digital business/digital transformation ranked as one of the top two business objectives for CIOs across geographies for the next two years.[1]

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1 "2018 CIO Agenda: Global Perspectives on the New Job of the CIO." Gartner, March 2018

- **Acquiring and keeping top IT talent** – The IT skills gap is real: Will your organization experience any IT skills shortages during the next 12 months? 59% of IT decision-makers reported experiencing skills shortages.[2] This is an issue for organizations trying to keep OpEx in check, as hiring and onboarding new staff is often expensive and saps productivity.
- **Compliance risks and outdated management** – As data center environments become more complex, the lack of standard interfaces and tools to properly orchestrate and manage all workload types is becoming a major pain point. Workload portability, a key prerequisite to a proper hybrid cloud strategy, can be hampered by a lack of standard APIs and runtime environments. Similarly, lack of a common platform and unified operational visibility has made cross-cloud provisioning, orchestration, and operations management difficult at best. These shortcomings can limit an organization's choice, flexibility, and ease of use.
- **Balancing future planning with investment protection** – Most organizations have made significant investments in technology over the past decade, and they want continued value from those investments. They would also like the freedom of choice to extend applications or infrastructure elements to private, hybrid, or public cloud services. At the same time, they want to continue to realize the benefits of on-premises investments, resources, deployments, and the skills and knowledge they have accumulated.

IT Challenges Impact Strategy and Agility

IT teams are seeking to collaborate with business leaders to drive business growth, innovation, and competitive advantage, while maximizing the value of their existing investments. Significant challenges are slowing their efforts.

- **Expanding IT roles limit innovation** – Business leaders are asking IT to invest more heavily in initiatives to power growth and get to market faster, with a new focus on security, cloud technologies, analytics, and other imperatives. These management priorities are consuming so much of their responsibilities that there is little time left for technical innovation.
- **Reprioritization of IT budgets** – Studies show that IT spend is growing, but much of this budget growth comes with increased influence from "non-IT" parts of the organization. More than 75% of cloud purchases are now influenced by the CEO or CFO.[2] IT teams are under increasing pressure to adjust budgets away from traditional infrastructure toward a more business-aligned spend.
- **Lack of agility due to operational complexity** – Heterogeneous environments, siloed infrastructures, and manual, fragmented management plague most competing hybrid cloud architectures and traditional cloud offerings. Each environment brings different tools and technologies that must be mastered and managed by a team—all of which hampers IT agility.
- **Supporting the latest technology while leveraging existing investments** – Evolving business needs, geographical expansions, new-product introductions, and the demands of today's modern applications create constant challenges for IT. They must seamlessly integrate new technologies with existing frameworks and on-premises systems built over many years, without having to rebuild and replace infrastructure components. They prefer a standardized approach to evolving their technology, avoiding vendor lock-in that can limit their ability to negotiate a better situation.

Through 2020, 80% OF MODE 1 modernization projects will fall short of cost savings targets due to a failure to first simplify and address unnecessary complexity.[3]

2 "State of the CIO Report," IDG/CIO 2018
3 "Follow These Five Simple Steps to Rationalize and Renovate Your IT Infrastructure," Gartner, August 2017
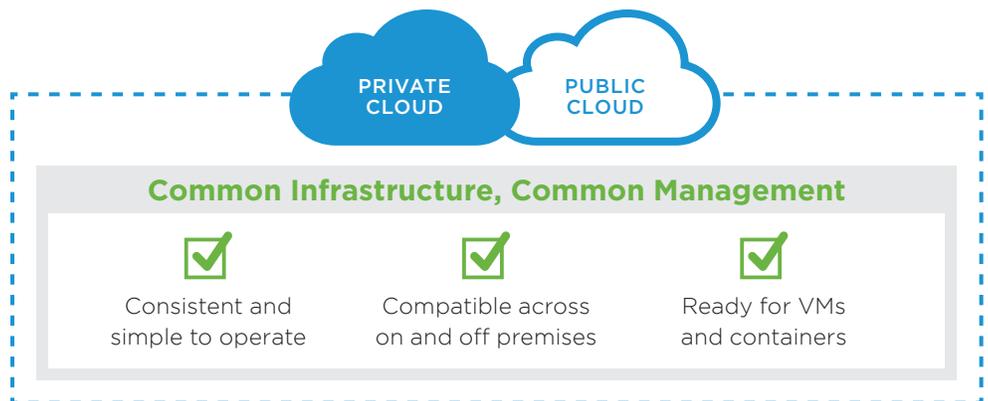
What Is a Modernized Data Center?

To overcome their most pressing issues and help their organizations keep up with the digital economy, IT organizations are exploring ways to modernize the data center. They need an agile, service-oriented IT model that's highly flexible, and can scale up or down as required. That means building a data center that is virtualized, software-defined, and automated, with an operational model across hybrid clouds. This approach provides the agility and scalability that IT needs to support today's applications and business requirements.

Key Attributes for a Modernized Data Center

A modernized data center isn't a single solution that replaces the existing infrastructure, but a strategy that enables organizations to build on and expand their existing investments. The most important qualities of a modernized data center include:

- Software-defined
- Consistent operational model
- Secure and compliant
- Agile and highly virtualized
- Extensible to the public cloud
- Highly automated
- Standards-based
- Lifecycle management

Modern Enterprises Demand a Common Approach

PRIVATE CLOUD   PUBLIC CLOUD

Common Infrastructure, Common Management

☑	☑	☑
Consistent and simple to operate	Compatible across on and off premises	Ready for VMs and containers

Key IT Initiatives for the Digital Era

An evolutionary approach toward a modernized Software-Defined Data Center (SDDC) enables IT to unleash rapid access to infrastructure, applications, data, and IT services. This software-defined approach abstracts traditional infrastructure silos into a cohesive platform that can respond to the dynamic needs of the business, support both legacy and new applications, and extend to the cloud with simplicity and consistency.

Organizations can progress toward a modernized data center by focusing on four key initiatives: software-defined private cloud, hybrid cloud, agility by automation, and support for next-gen applications.

Scale and Accelerate with HCI and Software-Defined Private Cloud

A primary step in modernizing the data center is modernizing the infrastructure itself. The advent of server (compute) virtualization was the first major step toward a modernized data center infrastructure. Further steps occurred when flash storage costs dramatically dropped, and network virtualization emerged.

These changes, combined with the increased capabilities of x86 servers and all-flash storage, have led to the emergence of the hyper-converged infrastructure (HCI). An HCI data center strategy extends virtualization across the entire infrastructure (compute, storage, and networking) through common hardware that is managed with existing tools and skill sets. This lets organizations speed deployments and unify and ease operations, monitoring, and IT management—all while improving their ability to scale.

With this modernized infrastructure, IT can:

By 2020, 20% of business-critical applications currently deployed on three-tier IT infrastructure will transition to hyper-converged infrastructure (HCI).[4]

- Evolve the data center without risk
- Lower total cost of ownership
- Prepare for the era of multi-cloud IT environments
- Deploy self-driving operations

Evolve the Data Center Without Risk

A truly modern infrastructure must be able to keep pace with change, while making the most of existing technology investments. An effective approach to modernizing the data center will enable IT to natively extend compute virtualization to storage and the network via a unified platform that supports both traditional enterprise apps and cloud-native apps. IT can continue to leverage existing skill sets and use familiar tools—minimizing disruption and the need for additional training.

Lower Total Cost of Ownership

Driven by the demand for better business alignment, simplification, and greater agility, organizations are looking for a more integrated, cost-effective approach to modernizing their data center. They need better ways to address these challenges and correctly align spending to the right strategic solutions. An effective solution will enable IT organizations to take advantage of server-side economics, affordable flash technologies, and elastic scalability to reduce their total cost of ownership.

The market for software-defined data center (SDDC) solutions is expected to grow at a CAGR of 21.9% from 2017 to 2022.[5]

Prepare for the Era of Multi-Cloud IT Environments

IT requires a modern infrastructure to be future-ready to support new applications, technologies, and public cloud. With VMware solutions, IT can establish a common infrastructure with a unified operational model that extends across private and public clouds. This approach enables IT to scale up or down and move workloads on- or off-premises as needs change, while maintaining security and control.

Deploy Self-Driving Operations

An effective HCI and software defined private cloud should also include self-driving operations to help automate and simplify the day-to-day operations of these modern data centers. Just as self-driving cars, in the near future, will use Artificial Intelligence/Machine learning (AI/ML) to understand and continue to learn, adapt, and react to the massive number of situations that the cars can find themselves in, self-driving operations

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4 "Seven Deadly Sins of I&O Cost Optimization and Transformational Investment," Gartner, February 6, 2018
5 "Global Software Defined Data Center (SDDC) Market," Wise Guy Reports, 2018

should similarly use AI/ML to help customers continuously optimize performance, operate as efficiently as possible and take proactive actions with a platform that can sense, connect, and adapt to the environment.

Self-driving operations deliver continuous and automated performance optimization, optimal densification and efficient capacity management, proactive planning and intelligent remediation across infrastructure and applications, along with deep visibility into infrastructure and cloud costs to accelerate decision-making on placement of workloads.

Baystate Health Delivers Enhanced Healthcare and Saves $3.5 Million

Baystate Health, one of the leading healthcare providers in the U.S., serves more than a million patients a year. Like many healthcare providers, the firm must evolve continuously to offer the highest-quality care. Its existing siloed infrastructure couldn't provide the speed, mobility support, and flexibility needed to support IT needs, and building a new data center would be too expensive. The provider needed a better way to scale its resources, deliver better healthcare, and control costs. To support its mission, Baystate decided to evolve to a virtualized, hyper-converged infrastructure based on VMware, to standardize its compute, network, and storage infrastructure on more affordable commodity hardware. Hyper-converged storage based on VMware vSAN™ provides a single, homogeneous storage environment that can scale out as its needs grow. Today, the provider has two petabytes of data and plans to consolidate it across three data centers into about 40 storage blades, which will save data center real estate by a factor of 10 to 1. The solution lets Baystate provision in hours instead of days or weeks, and has enabled the company to save $3.5 million in data center construction costs.

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The future of IT is multi-cloud and hybrid, with 69% of respondents planning to have some type of multi-cloud environment by 2019.[6]

Extend with Consistency to the Hybrid Cloud

The second key initiative focuses on seamlessly extending and scaling software-defined data centers to the public cloud, to achieve a hybrid cloud. Organizations are rapidly becoming more multi-cloud centric. Yet many application teams within these organizations are still focused on the use of a single cloud—whether their own private cloud or one of numerous available public clouds. When a team is working with a single cloud, whether private or public, it has only one operational model to contend with. In situations where a team must work across multiple clouds, organizational complexity increases, and operating across multiple clouds can become extremely challenging. Every cloud has its own operating model, and organizations must contend with disparate or inadequate tools, consoles, and technologies, as well as complex governance requirements, and limited skill sets.

An effective hybrid cloud strategy lets organizations support a single, consistent operational model across both private and public clouds. This lets organizations deliver dynamic capacity, consolidate or migrate on-premises infrastructure, implement a flexible disaster recovery plan, or develop and test new applications. The flexibility of the hybrid cloud helps organizations gain the freedom to choose the best platform, landing spot, or destination for their applications—whether they reside on- or off-premises.

6 http://www.information-age.com/multi-cloudhybrid-environment-dominate-enterprise-123469737/

A common approach between private and public clouds is imperative for a successful hybrid cloud strategy, specifically one that is consistent and simple to operate, compatible on- and off-premises, and ready for VMs, containers, and any next-generation application needs.

The simplified operational model of hybrid cloud is what it makes it so attractive to organizations adopting a multi-cloud strategy. Hybrid cloud offers organizations the maximum amount of flexibility around where to initially deploy a new application or where to move an already developed application. This flexibility greatly simplifies decision-making for application modernization strategies.

An effective approach to hybrid cloud should focus on three areas:

- **Make the cloud easy** – Use lifecycle management capabilities to make the cloud simple to deploy and manage. At the same time, provide quick time-to-value along with an integrated, easily consumable set of SaaS services to discover resources, track costs, and provide full visibility across the entire infrastructure.
- **Simplify developer consumption** – Employ a single control plane across clouds that provides a globally consistent IaaS for cloud APIs to consume native cloud services on any cloud. An integrated self-service catalog and simple blueprints enable iterative development capabilities at the speed that organizations require.
- **Provide consistent, unified operations for all apps** – Support applications across platforms, via automatic policy-based scheduling and closed-loop optimization. Enable real-time monitoring and metrics with integrated app intelligence to help discover new apps, view overall health, and assist in troubleshooting.

> "We have used VMware virtualization for a number of years. We are actually quite excited about where VMware are going from a multi-cloud perspective and being able to manage across AWS into private could give us significant benefits in the future."
>
> RUSSELL HARTE
> CIO
> DFS

DFS Adopts Multi-Cloud with VMware for a Seamless Customer Experience
DFS, the UK's largest furniture producer, wanted unbeatable service and quality for all its customers across any of its shopping platforms—whether in-store or online. A multi-cloud approach with VMware through Rackspace has enabled the retailer to roll out several IT transformation and migration projects. For example, a new commerce platform helps DFS to seamlessly stay ahead of the competition and cope with busy periods. The initiative has helped DFS dramatically improve its online and mobile customer experience, achieving market-leading status and reporting a double-digit increase in sales.

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Automate IT for Agility and Manageability
The third key initiative focuses on broadening business agility via effective IT automation and management. A more complete approach to virtualization ensures that IT can rapidly provision compute, storage, and network resources and boost overall efficiency by leveraging increased automation. Configuring the associated network and security services still requires many time-consuming manual processes. It can take days, or even weeks, to manually configure these services—and today, that's simply not fast enough. Many IT organizations are now taking steps to virtualize the network and fully automate the provisioning of complete application stacks to eliminate error-prone manual processes and create standardized processes to ensure consistency, accuracy, and reliability.

87% of organizations are planning to integrate on-premises data centers with public cloud.[7]

A key component of automation involves providing a single control plane across the cloud and data center, with access to native APIs that enable organizations to consume native services on any environment, while also ensuring the ability for continuous integration, development, and delivery of their most important apps and services.

By implementing both network virtualization and automation, IT can:

• Automate for full-stack provisioning of infrastructure and applications
• Virtualize networking and security components into the hypervisor layer
• Streamline infrastructure and application lifecycle management

Automate for Full-Stack Provisioning of Infrastructure and Applications

Manual configuration and provisioning takes time and strains resources while increasing the potential for errors. Automating the provisioning of all infrastructure and application components enables IT teams to minimize manual efforts, bottlenecks, and errors. They can turn templates of their infrastructure into blueprints, including networking and security profiles, to more quickly create and deliver the applications they need as standardized services. VMware solutions can help organizations make processes more flexible, enabling choice and self-service consumption of infrastructure and services through a GUI, as code, or via APIs. The solutions include built-in policy-based governance, so users get the right-size service at the appropriate service-level agreement (SLA) for the job.

Virtualize Networking and Security Components into the Hypervisor Layer

Most companies have virtualized their compute and storage environments, but many lag behind on virtualizing the network and associated security services. Network virtualization enables IT to replicate all networking and security functions in software embedded in the hypervisor, regardless of the topology of their physical infrastructures. Automation provides the ability to model infrastructure and complete multi-tier application environments as blueprints that include network profiles and security policies, so that networks are deployed in lockstep with their workloads. The blueprint approach enables virtualized network and security constructs to stay with the applications throughout their lifecycles. Upon updating a blueprint, any application using that blueprint will automatically be updated to reflect the modified configuration.

Streamline Infrastructure and Application Lifecycle Management

IT requires constant insight into, and control over, the state of IT resources and applications, regardless of where they are. With VMware solutions, IT teams can centrally manage the provisioning, delivery, and ongoing maintenance of infrastructure and applications. They can also govern their resources with consistent policies across public and private cloud environments. When business and technical requirements change, they can easily optimize and scale the performance, availability, and capacity of provisioned services to meet the specific needs of the environment and business.

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7 Avanade research on IT modernization, April 2017

"We can align our resources to the workload demand. VMware is solid. It is resilient, and it matched our need. We couldn't find anything else that would do that."

CAMPBELL MCCLEAN
GLOBAL CHIEF ARCHITECT
BHARTI AIRTEL

Bharti Airtel Uses Automation to Boost Market Agility

Bharti Airtel, a large telco based in India, strives to deliver the best possible experience to each of its 300 million customers. But its existing data center was slowing its ability to innovate and deploy new service offerings. Its legacy data center with vertically integrated hardware and software solutions was highly inefficient, running at only 25% capacity, which slowed development efforts. To accelerate its time to market, the telco needed an IT environment that would enable it to extend products and services to customers faster than competitors. Bharti Airtel transformed its IT environment by deploying VMware NSX® together with VMware vRealize® Suite. This secure, agile infrastructure enables the provider to address legacy needs and move into the future with agility to support modern application development. The solution empowers developers to provision the environments they need and manage them on their own, instead of waiting on requests to IT. This proactive approach significantly reduces the time from the requirement to provisioning cycle. VMware gives Bharti Airtel the capability and the flexibility to scale and move new services and solutions from thought into actuality in the marketplace.

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Create Next-Gen Applications Without Compromises

The final modernization approach focuses on enabling organizations to build next-gen apps, while maintaining existing applications. It employs an agile, flexible, enterprise-grade platform that supports traditional and cloud-native applications. This gives developers the option to use their familiar existing development methodologies alongside container technologies and microservice-based architectures for faster and more frequent development. It also lets them maintain the same management, security, reliability, and governance policies across their entire development ecosystem.

Three Flexible Approaches to a Modernized Data Center

All businesses will have their own specific strategies and priorities, and they don't want to be restricted to a specific deployment model or supported platform. VMware solutions are built around choice, enabling IT to select the hardware, platforms, operating system, and other components that best align to their needs. Organizations can implement a modernized data center based on their own unique criteria:

- **Automated with VMware Cloud Foundation** – Organizations seeking the fastest, out-of-box path to implementing a private/hybrid cloud experience can deploy VMware Cloud Foundation. This integrated hybrid cloud platform provides a complete set of software-defined services for compute, storage, networking, security, and cloud management to run enterprise apps in private or public environment—Cloud Foundation drastically simplifies cloud operations by delivering a single integrated solution thanks to built-in automated lifecycle management, which enables faster time to market, improved productivity, and reduced risk. This software-defined platform resides below the most common application platforms, such as Platform-as-a-Service (PaaS) and container solutions, to enable operational consistency no matter where an application runs. Cloud Foundation can be deployed on premises on certified hardware or run as a service from the public cloud, enabling a true hybrid cloud with operational consistency and workload flexibility.

- **Build your own with VMware Validated Designs** – IT teams that prefer a more incremental, component-based approach to modernizing the data center can take a more evolutionary approach. The VMware Validated Designs provide complete data center-level designs for IT organizations that choose a "build your own" approach to adopting the SDDC using VMware software. This self-paced approach lets them use existing hardware, and provides design customization and flexibility for customers that may have some unique infrastructure or hardware requirements. Following a VMware Validated Design streamlines and simplifies the design process, shortens deployment cycles, and reduces risk for the IT organization.

- **Custom, do-it-yourself approach** – Organizations that prefer a completely custom and self-validated design, and possess a strong technical skill set, can employ a do-it-yourself approach to modernization. This is often the direction chosen for organizations that have unique hardware needs or constraints, with infrastructure components that have limited compatibility or need to meet highly specific business needs.

No matter which path to modernizing the data center that they choose, organizations can maximize the return on their existing infrastructure investments while implementing a flexible hybrid cloud strategy.

Accelerate Your Business for the Digital World

Today's digital transformation is driving rapid and fundamental changes in businesses and their operating models. To support this, IT must similarly transform their data centers. VMware enables IT organizations to modernize data centers and deliver IT infrastructure and application services with the speed and agility to support business innovation and growth while optimizing total cost of ownership. VMware's software-defined HCI architecture of natively integrated compute, network, and storage virtualization technologies, together with automation and management, enables businesses to modernize their infrastructure, automate IT, and run modern applications. This innovative, software-defined approach delivers cloud service provider agility and economics in the data center, and extends to an elastic hybrid cloud environment.

{Partner Value Proposition}

Single Point of Contact

The technology experts at Single Point of Contact have helped hundreds of firms migrate to a cloud platform. Our security team also stays on top of everything related to cyber security. We are more than just a Managed Service Provider. We take swift and thorough action to ensure your network and data is protected around the clock and we solve problems immediately when they occur. Contact us today to learn more about how our team can help your firm secure your data and select the right platform based on your requirements. Get in touch with our consulting department or call us at 800-791-4300.

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