WHITE PAPER – **SEPTEMBER 2018**

VMWARE WORKSPACE ONE IS A BETTER CHOICE THAN CITRIX

vmware®

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Introduction

The intended audience for this paper is IT decision makers and line-of-business owners that are tasked with transitioning their workforce into a modern place of work. The insights presented here will be helpful for executing a digital workspace transformation strategy.

"VMware data center and desktop virtualization solutions enable us to slash costs, accommodate district growth, and deliver outstanding customer service to students, faculty, and administrators—all without increasing the size of our IT staff."

BROOKS MOORE,
DCS TECHNOLOGY
HELP DESK MANAGER,
ALEDO INDEPENDENT
SCHOOL DISTRICT

The Future of Work

Automation. Robotics. Artificial intelligence. Organizations across the globe are becoming technology driven to remain competitive in the era of digital commerce. Broad trends in the industry are leading organizations to become nimble in managing the activities of their workforce and providing state-of-the-art customer service. Choosing who to partner with for your organization's digital transformation will be one of the most critical decisions you make. The purpose of this paper is to help you with that choice.

This paper provides guidance for selecting the best digital workspace solution to enable a more productive workforce. It focuses on comparing two solutions: VMware Workspace ONE® and Citrix Workspace.

VMware has steadily prepared for digital workspace transformation by building innovative products designed with the future in mind, while Citrix has chosen to "retool" existing technology. The VMware Just-in-Time Management Platform (JMP), virtual storage area network (VMware vSAN™), mobile workflows, and network micro-segmentation (VMware NSX®) are a few of the game-changing technologies VMware has developed to help organizations transform the way they work. Citrix has repurposed legacy products and called the digital workspace "a framework for describing desktop and application delivery technologies." Sounds like a description of the same technology they have sold for the past 25 years.

Gartner Magic Quadrant

VMware Named a Leader in the 2018 Gartner Magic Quadrant for Unified Endpoint Management

ESG Report

ESG Lab Validation of Workspace ONE: Integrated Workspace Provides Simplicity, Security, and a Seamless User Experience

Four Pillars of Differentiation

VMware Workspace ONE is a powerful digital workspace solution that addresses the requirements of organizations needing a secure, simple, and cost-effective approach to modernizing their workspace. Four major areas of competitive differentiation demonstrate VMware leadership in innovation: 1) Leading digital workspace platform, 2) Delivering the right app to the right user on the right device, 3) Providing the most secure workspace, and 4) Offering the best value.

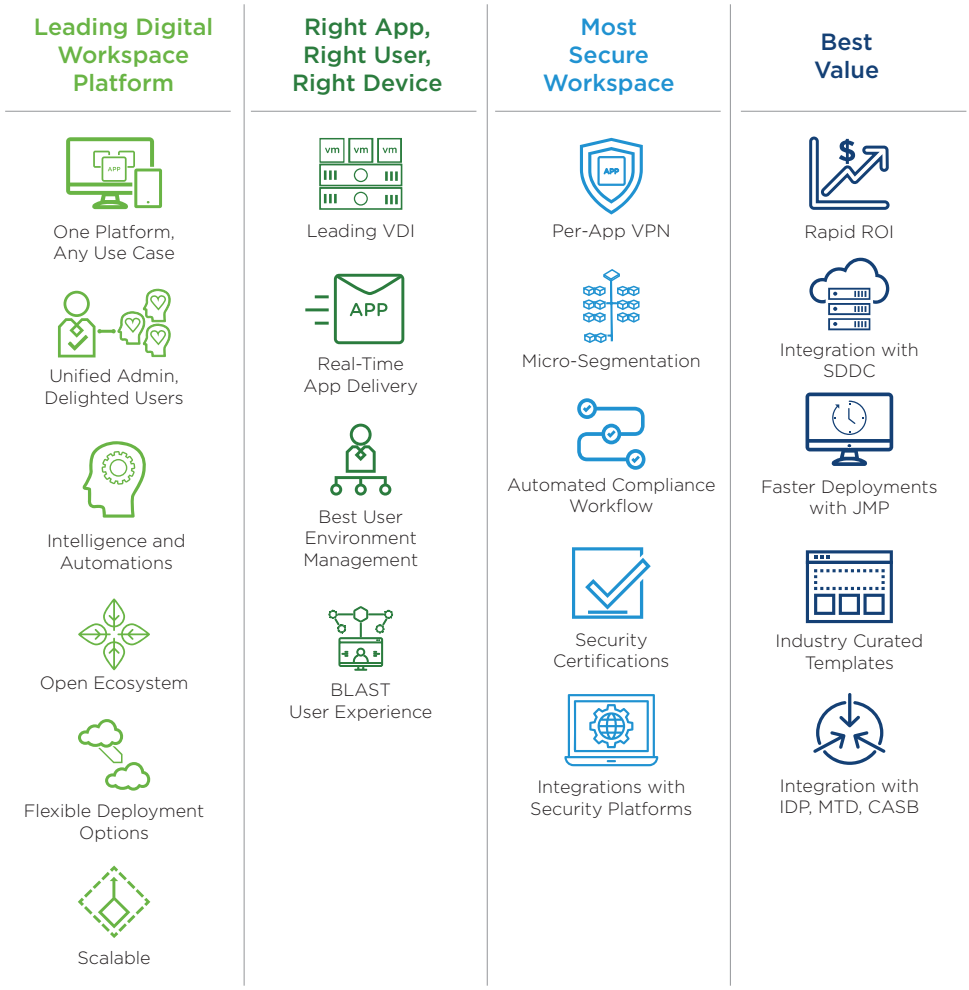

Figure 1: Workspace ONE Key Differentiators

LEADING DIGITAL WORKSPACE PLATFORM

VMware Workspace ONE is leading the revolution to unified endpoint management with the best platform available for digital transformation. Workspace ONE offers several outstanding advantages over the Citrix legacy approach:

- Uses a modern approach to applications supporting cloud-native apps, containerization, and legacy apps
- Supports any use case including rugged devices, peripherals, IoT, and customer specific
- Provides a unified admin experience while delighting end users
- Offers insights, intelligence and automation to improve the overall system performance
- Features an open ecosystem that supports integrations with other major components
- Provides a scalable and flexible architecture that easily grows with the organization

The platform's unified admin experience supports any use case. End users can bring any device to work and the organization's content is protected. Even extreme use cases such as rugged devices are supported, in addition to trending applications like IoT and important capabilities such as peripheral support. The Workspace ONE open ecosystem approach to endpoint management guarantees support for important security vendors.

Multitenancy

Of particular importance for scalability is multitenancy: the ability to serve multiple tenants on a single instance. Each tenant can be further divided down infinitely using an orthogonal structure to group or segregate devices, users, regions, languages, administration, and more. Workspace ONE multitenancy has the following advantages over Citrix:

- Ability to provide the same UI limited to a specific tenant
- Hierarchical view as global administrator
- Support for enterprise integration on a per-tenant level (i.e., Active Directory, PKI, Syslog)
- Hierarchical policy flow down with inheritance and override capabilities
- Support for smart groups defined dynamically by console admins
- Ability to assign both device and app policies by smart groups
- Ability to define tenant types

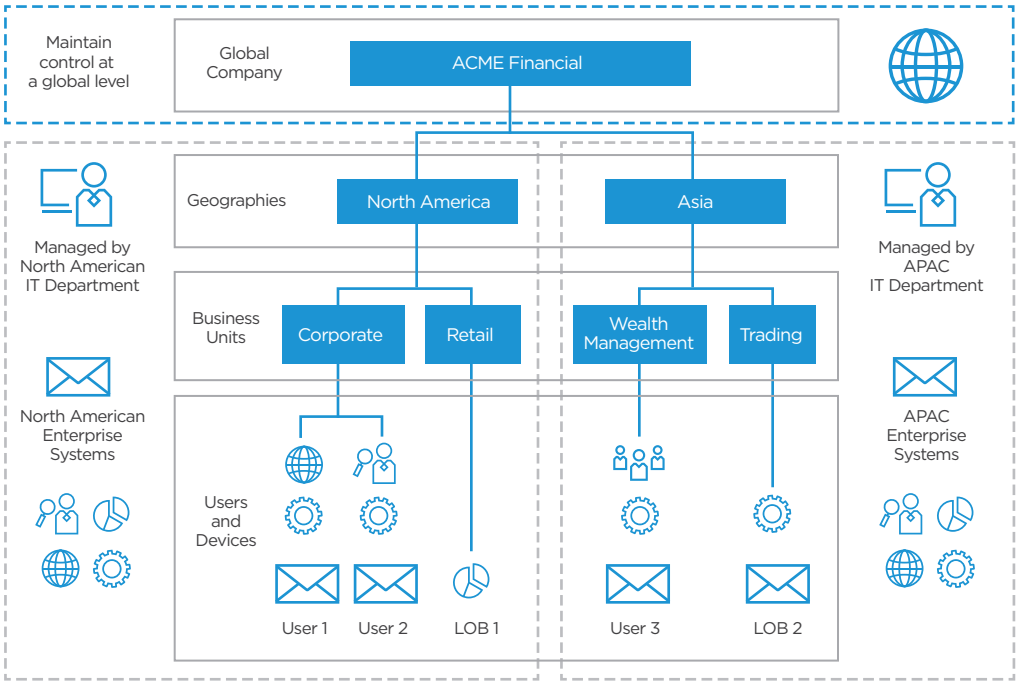

Figure 2: Workspace ONE Multitenancy Architecture

Flexible Deployment

Deploy on premises, in the cloud, or a combination of both. The VMware platform provides an architecture that supports your organization's needs now and in the future:

- Multitenant, cloud-scale architecture
- Choice of where virtual desktops and apps reside: on premises, in the cloud, or both
- Ability to transition virtual desktops and apps to the cloud and maximize current investments
- Flexibility – Available on Microsoft Azure, SoftLayer (IBM), VMware Horizon® Cloud Service™, and AWS

Desktops-as-a-service provides the ability to quickly scale your desktop environment, reduce start-up infrastructure costs, decrease management overhead, and improve end-user mobility. VMware Horizon Cloud Service enables the delivery of cloud-hosted or on-premises virtual desktops and apps to any device, anywhere, from a single cloud control plane. Citrix does not have a comparable desktops-as-a-service offering.

Horizon Cloud customers take advantage of many of the same beneficial technologies as in our on-premises solution: just-in-time management technologies, VMware App Volumes™, and VMware User Environment Manager™.

JMP

The VMware platform leads in innovation with Just-in-time-Management (JMP) technology. This revolutionary capability bypasses the cycle time incurred with traditional cloning where several power cycles and reconfiguration calls are usually made. The JMP platform allows customers to easily scale and deliver feature-rich, secure desktops to their end users whenever needed. Citrix does not offer the same time-saving capabilities.

One Platform

The industry's leading virtualization platform brings together three critical technologies under one umbrella: storage (VMware vSAN), computing (VMware vSphere®), and networking (VMware NSX). Tailored integration with Workspace ONE results in real benefits, including a substantial reduction in storage costs, simplified network provisioning, security, micro-segmentation, and extensive 3D graphics support. The Citrix platform doesn't offer these critical technologies.

BLAST

Horizon Cloud leverages BLAST, the Horizon UDP-based transport. BLAST provides a great user experience across various network conditions— especially those with low bandwidth, high latency, and high packet loss. In addition to supporting Windows, macOS, iOS, Android, and Chrome, BLAST supports over 125 Windows and Linux thin clients. Horizon Cloud with Hosted Infrastructure supports developers and end users looking for 3D desktops with NVIDIA GRID vGPU. Citrix is not able to leverage any of these important cost-saving capabilities.

DELIVER THE RIGHT APP TO THE RIGHT USER ON THE RIGHT DEVICE

Complexities at the endpoint are disrupting previous management paradigms. End users and their evolving use of devices, apps, and content have driven the demand for a consumer-like experience across all workspaces. As mobile and other new devices increasingly become standard for businesses of all sizes, separate management tools across siloed organizations lead to increased IT complexities and costs. Further, with more and more remote and mobile users off-network or off-domain, traditional PC lifecycle management (PCLM) solutions do not provide the real-time management and security capabilities required by today's IT organizations.

IT must pivot from a device-centric to a user-centric management approach in order to enable common security and management policies across endpoints and provide a consistent user experience. Workspace ONE supports all major operating systems including Android, iOS, Windows 10, macOS, Windows CE, QNX, and Tizen, and frameworks like Android Enterprise and Samsung Knox. VMware has close relationships with major OEMs, enabling same-day support for new releases and the latest features. VMware is the exclusive UEM partner for Chrome OS devices.

VMware Named Leader in the IDC MarketScape: Worldwide Enterprise Mobility Management Software 2018 Vendor Assessment

Unify the management of every endpoint—smartphones, tablets, laptops, rugged devices, wearables, peripherals, and IoT devices—across the organization with Workspace ONE. IT can manage the full lifecycle for all endpoints—from onboarding to retirement—and even manage macOS and Windows desktop and laptop devices right alongside mobile devices using a modern approach.

- Easily register devices during initial power-up with configuration tools like Apple Device Enrollment Program (DEP) and Windows Out-of-Box enrollment.
- Leverage user self-service workflows and corporate credentials to initiate device registration.
- Configure enterprise resources such as email, VPN, Wi-Fi, apps, content, intranet sites, and other backend resources with device profiles.

Unified Endpoint Management

Unified endpoint management (UEM) allows users to configure and manage their digital workspaces as well as track operations and automate certain IT workflows. VMware UEM technology provides five key differentiators:

- Cradle-to-grave control over operating system and applications – Lifecycle management allowing IT to centrally deploy, upgrade, and end-of-life their most changeable assets
- Asset analytics for tracking and inventory provides key insights into systems and operations information resulting in higher SLAs
- IT automated workflows provide structure and tracking of process requirements for compliance and remediation
- Management support for Chromebooks
- PCLM capabilities – Windows drop ship and macOS Bootstrap for a streamlined out-of-box management experience for Windows and macOS

Citrix XenMobile lacks several of these key endpoint-management features and is not proven at scale.

Virtual Apps and Desktops

Workspace ONE is the leader in delivering virtual desktops and published apps over an efficient and high-quality connection for the best possible end-user experience. Given all the challenges with managing employee mobility and providing IT security, the digital workspace of today must be dynamic and context driven. Workspace ONE makes informed context-aware decisions regarding who can access which information while keeping users productive.

VMware Horizon is the leading platform for delivery of all types of desktops. It offers persistent, non-persistent, session-based, hosted, and just-in-time desktops. In addition to every type of desktop, Horizon also offers every type of application: containerized, hosted, remote, and just-in-time applications.

VMware App Volumes improves app delivery and app management for a Horizon or Citrix environment. It includes real-time app delivery, user personalization, application packaging, and VMware vRealize® Operations™ for Horizon or Citrix.

Citrix lacks capabilities in many of these areas, and, while they may have some of these capabilities, their products are not fully developed. VMware provides comprehensive application and workspace management.

"The benefits of using VMware Horizon are in hardware cost and time savings. It equals out to be about $3.2 million savings per year for the organization. That's money that we can put back into services for the citizens of Mecklenburg County."

CLIFF DUPUY,
DIRECTOR OF
TECHNICAL SERVICES,
MECKLENBURG COUNTY,
NORTH CAROLINA

App Delivery

VMware App Volumes eases the burden of getting the right apps to the right people throughout an application's lifecycle. From delivery to updates and into retirement, App Volumes provides the only real-time application management and delivery solution on the market today. The Citrix/Unidesk method of creating multiple layers to deploy apps is cumbersome and slow, therefore updating layers is difficult. Unidesk also requires that both the application and OS layer be managed in the Unidesk console. It does not allow for managing VDI and server images through the Citrix or VMware management consoles.

Personalized User Experience

VMware User Environment Manager™ provides a consistent and dynamic desktop experience that is independent of the operating system, device, and location, enabling true "business mobility." Citrix refers customers to AppSense for more complete user personalization. Even with the capabilities acquired with the small startup company Norskale, Citrix is not able to offer the full enterprise-class, scalable user environment management solution that VMware offers.

Policy Management and Smart Policies

Policy management and smart policies offer time-saving capabilities such as streamlined single sign-on (SSO), which bypasses secondary login requests for users who have already authenticated via VMware Workspace ONE. Smart policies include security-enhancing capabilities such as contextually aware, fine-grained control of client-side features. The VMware Unified Access Gateway™ provides a more complete security solution that supports RADIUS, SecurID, and SmartCard, and is built upon a hardened Linux appliance that is optimized for a customer's DMZ. For federal and public-sector agencies, Horizon is FIPS 140-2 compliant.

App Isolation

VMware ThinApp® provides packaged apps that customers can run from almost anywhere because they do not need to install software or device drivers. ThinApp takes an agentless, package-centric approach to app virtualization, increasing portability and deployment flexibility. Citrix XenApp only provides published applications and requires a dedicated infrastructure and database to run. ThinApp does not have these requirements, resulting in reduced administrative overhead. Further, Citrix no longer offers an app streaming capability and instead defers to Microsoft App-V.

MOST SECURE WORKSPACE

VMware provides serious security across all product areas from the data center and network to the endpoint, including mobile devices. Workspace ONE prevents user data loss, keeps corporate data secure, and integrates with Horizon and Citrix products. Workspace ONE provides secure access to Citrix XenApp and XenDesktop in addition to Horizon Apps and Desktops. Citrix StoreFront is limited to Citrix products. Apps cannot be deployed from other sources such as Microsoft RDSH apps or VMware Horizon RDSH apps.

Workspace ONE has been awarded security certifications for Common Criteria NIAP, FIPS encryption, FedRAMP, DISA STIG, CAC/PIV, and other standards. It offers built-in integrations with leading DLP, MTD, and endpoint-management platforms. Workspace ONE Trust Network provides an ecosystem of security partners that integrate with Workspace ONE. Citrix doesn't offer the same breadth of integrations. Workspace ONE per-app VPN and automated compliance workflow saves time and creates a barrier for would-be intruders. Don't trust the security of your organization's critical data to "free" solutions or solutions that don't play well with others.

VMware offers a suite of end-to-end security solutions to enable zero trust. Virtual desktop infrastructure ensures all data is secured in the data center and not on the endpoint devices. Enterprise mobility management provides device security and protects data if a device is compromised. Centralized image management and App Volumes enable simplified single image management and rapid deployment. VMware enables organizations to protect information to help safeguard against regulation breaches:

- Ensure compliance requirements for sensitive data
- Secure and encrypt data and protect personally identifiable information (PII) and privacy
- Maximize data-loss prevention with security restrictions and access controls
- Automate device compliance and perform remote actions if a device is detected as noncompliant, including device wipe
- View device and user details with advanced reporting and logging capabilities in a single admin console
- Strengthen security by giving IT visibility into their digital workspace, helping detect and remediate vulnerabilities

Per-App VPN

VMware AirWatch® per-app VPN establishes connectivity at an application level, instead of on a per-device basis. When an authorized app launches, VMware Tunnel™ establishes a silent connection for seamless and secure access.

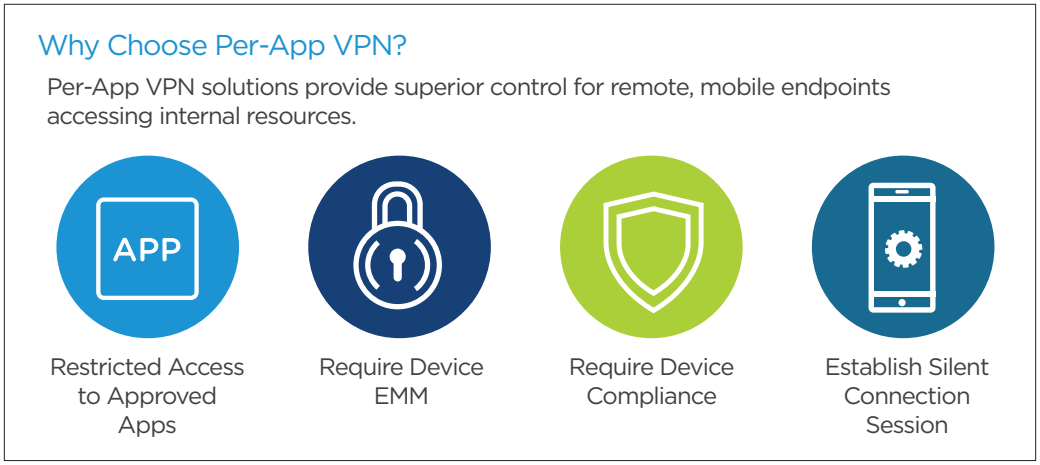

Figure 3: Per-App VPN Provides Seamless and Secure Access

> "This was the first instance where devices were deployed into the field where staff would be accessing sensitive information from various uncontrolled environments. AirWatch allows our IT department to use mobile mechanisms to increase security."
>
> BRIAN SMITH, DIRECTOR OF TECHNICAL OPERATIONS, ACARIA HEALTH

VMware Workspace ONE supports a number of methods for delivering connectivity to remote mobile endpoints that Citrix lacks. Per-app VPN functionality, in particular, delivers on the promise of endpoint security by limiting connections to an application instead of a device level. Workspace ONE per-app tunnel takes per-app VPN further by restricting app access to whitelisted domains with split-tunneling, and specifying which database the whitelisted domains can access with VMware NSX micro-segmentation.

Data Loss Prevention

Virtually every organization is concerned about data leakage from both intentional break-ins and unintentional mistakes. Workspace ONE helps prevent user data loss and keeps corporate data secure. Workspace ONE enables the federation of existing Identity Management point solutions, providing investment protection and simplifying the path to digital workspace transformation.

Built-in integrations with leading DLP, MTD, and endpoint-management platforms make Workspace ONE a powerful choice for preventing data loss over Citrix.

Automated Compliance Workflows

VMware helps you meet compliance regulations and operating best practices through automated compliance and remediation. Your IT team can confidently administer sensitive compliance regulations through an automated process guaranteed to meet regulatory compliance requirements every time.

Conditional-Access for Context-Driven Security

VMware Workspace ONE combines identity and device policy enforcement for "intelligent" conditional access for every application. Others are only able to provide effective conditional access for Office 365 applications.

Single Sign-On

Managing multiple passwords is a risky proposition, both for end users and administrators. End users need to track several passwords. Consequently, many users create passwords that are simple and hackable. Administrators worry about enforcing password policy, which resets periodically via Microsoft Active Directory (AD), while simultaneously ensuring those credentials stay safe within company walls.

With Workspace ONE single sign-on (SSO) with built-in multifactor authentication, a user logs in once with a single set of credentials and gains access to the various systems they need without having to re-enter passwords at every turn. SSO gives users the ability to navigate through their applications, workspaces, and data freely, which, in turn, boosts their productivity. Workspace ONE enables a single identity-based application catalog to be established across all categories of applications.

Workspace ONE SSO provides the following capabilities and benefits in an easy-to-manage platform:

- Removes the need for complex logins by establishing trust between user, device, and the enterprise for one-touch authentication
- Provides the ability to step up to seamless biometric or other multifactor authentication methods for more sensitive applications
- Enables users to sign on to published apps and mobile devices without the need to make changes to the applications or meet SDK or wrapper requirements
- Reduces the amount of time IT spends ensuring password security as well as addressing help-desk calls about access privileges

Establish Trust

Workspace ONE establishes trust between the end user and their devices by providing convenient one-touch access, advanced admin controls that secure and protect data, and an identity-defined app catalog that delivers the right apps to the right user.

Figure 4: Establish Trust Between the End User and Device

With Workspace ONE you can

1. Remove the friction of access security with one-touch convenience
   - Eliminate the need for users to remember multiple usernames and passwords
   - Integrate with existing identity providers or use the included identity provider or token generator (IdP)
   - Enable two-factor authentication (2FA) for an additional layer of security
   - Support web apps, virtual desktops, published apps, packaged apps, and native mobile apps
2. Secure and protect corporate data with advanced administrative controls
   - Enforce conditional access policies based on authentication strength, data sensitivity, user location, device compliance, and more
   - Leverage easy-to-use analytics to understand usage trends and assist with capacity planning, licensing management, and new service development
   - Enable advanced data loss prevention (DLP) policies to protect against rooted or jailbroken devices, whitelist and blacklist apps, set open-in and cut/copy/paste restrictions, and more
3. Create an identity-defined app catalog
   - Provide a single app catalog with a consistent user experience across any device, including Android, iOS, macOS, and Windows devices
   - Enable self-service by allowing employees to subscribe to the apps they need across all their devices
   - Deliver the widest variety of legacy and modern Windows apps; web-based, SaaS, and native mobile apps; and virtualized desktops and apps to any device
   - Brand the app catalog experience with personalization options including company logo, colors, backgrounds, textures, and design elements

"Modernizing the desktop infrastructure gives our technology teams greater mobility and access to solutions that serve students and student-facing advisors."

CLAUDIU BUDURLEAN, DIRECTOR OF IT, CLIENT-COMPUTING ARCHITECTURE, APOLLO EDUCATION GROUP, INC.

Network Security

VMware NSX provides a software firewall that is easy to deploy and manage. Its advantages over other products in the market include providing security within the hypervisor, no additional hardware requirement, and integration with VMware vSphere. NSX paired with VMware vRealize Automation Desktop™ automates configuration and enforces governance and control.

Micro-Segmentation

VMware NSX for Horizon effectively secures east-west traffic within the data center, while ensuring IT can quickly and easily administer networking and security policies that dynamically follow end users' virtual desktops and apps across infrastructure, devices, and locations—bringing speed and simplicity to VDI and networking. This joint solution delivers multi-layered defense from the data center to the desktop, built on an extensible platform that integrates with industry-leading, third-party security solutions.

Figure 5: VMware NSX for Horizon Offers Fast, Easy, and Extensible VDI Networking and Security

VMware NSX for Horizon provides

- **Fast and simple VDI networking** – NSX with Horizon let you create, change, and manage security policies across all virtual desktops with a few clicks. Map these policies to user groups to accelerate virtual desktop onboarding.
- **Automated policy that dynamically follows end users and desktops** – Set policies that dynamically adapt to the end user's computing environment, with network security services that map to the user based on role, logical grouping, desktop operating system, and more—independent of the underlying network infrastructure.
- **Platform for advanced security** – NSX offers an extensible platform that can be integrated with best-in-class capabilities from an established ecosystem of security partners. By dynamically adding services, virtual desktop security can be easily extended to take advantage of malware protection, antivirus production, and advanced threat detection.

Citrix lacks these robust networking security features and relies on a third-party product (such as VMware NSX) to provide them. VMware provides serious security across all product areas from the data center and network to the endpoint, including mobile devices.

Transform Your Workspace with Workspace ONE Today.

Find out more about why VMware is the best choice for workspace transformation by visiting https://www.vmware.com/company/why-choose-vmware/workspace-transformation.html

For more information or to purchase VMware products,

CALL
877-4 -VMWARE
(outside North America, +1-650 -427-5000), or

VISIT
http://www.vmware.com/products, or search online for an authorized reseller. For detailed product specifications and system requirements, refer to the product documentation.

BEST VALUE

If given the choice, most IT administrators would prefer to use one platform throughout their environment and not spend time installing and managing separate management infrastructures. With VMware, they can.

SDDC

The VMware software-defined data center (SDDC) is the only platform optimized for VMware Horizon and other end-user-computing (EUC) products.

A single platform provides the following unique advantages:

- Reduced CapEx and streamlined management
- Trusted brand with leading statistics for reliability, performance, robustness, and security
- Reduced support costs and increased uptime

Saving time saves you money. Provisioning users faster, saves money. Workspace ONE provides the most rapid ROI through technologies like

- JMP, which provisions desktops and apps instantaneously
- Industry-curated templates that provide a head start to vertical-specific mobility use cases
- Key integration points between Horizon and vSphere to reduce storage costs
- Other time saving integrations with IdP, MTD, and CASB vendors that no other vendor delivers

VMware Cloud Foundation

VMware Cloud Foundation™ is the industry's most advanced hybrid cloud platform. It provides a complete set of software-defined services for compute, storage, networking, security, and cloud management to run enterprise applications—traditional or containerized—in private or public environments. VMware Cloud Foundation drastically simplifies the path to the hybrid cloud by delivering a single integrated solution that is easy to deploy and operate, providing the following benefits:

- Support for diverse infrastructure
- Reduction of risks against cybersecurity threats
- Delivery of enterprise-level service-level agreements to mission-critical apps
- Cost controls
- Management of public cloud sprawl driven by shadow IT
- Avoidance of vendor or cloud lock-in

Conclusion

Digital workspace transformation is upon us. Organizations everywhere are looking for ways to adopt new technology that will make them more competitive in the marketplace. VMware Workspace ONE is the most comprehensive solution from a trusted provider. Based on the leading SDDC and AirWatch platforms, Workspace ONE offers Innovative technologies and capabilities that benefit virtually all organizations. Try VMware Workspace ONE today.

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