ESG WHITE PAPER

Cisco's Hybrid Cloud Infrastructure Enables Cost-effective, Optimized Virtual Desktop Infrastructure (VDI)

Leveraging Converged Infrastructure/Hyperconverged Infrastructure (CI/HCI) to Run VDI On-premises

By Aviv Kaufman, Sr. IT Validation Analyst; Bob Laliberte, Sr. Analyst; and Leah Matuson, Research Analyst

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The Shift to Support Remote Workers

The global pandemic has fundamentally changed how and where we work, creating an immediate need to respond to a burgeoning remote workforce. While originally envisioned as a short, temporary situation, organizations are now dealing with the reality that remote environments will become a permanent addition to their business resiliency plans.

In fact, in 2019, ESG digital work research found that 64% of respondents worked in the office every day.[1] Yet, less than a year later and, as a result of the COVID-19 pandemic, a separate ESG research survey shows 84% of ITDMs report that at least half of their organization's knowledge workers are working from home, which equates to approximately 76% of knowledge workers (see Figure 1).[2]

Figure 1. Remote Work Has Proliferated as a Result of the Pandemic

As a result of the COVID-19 situation, approximately what percentage of your organization's knowledge workers are currently working from home? (Percent of respondents, N=488)
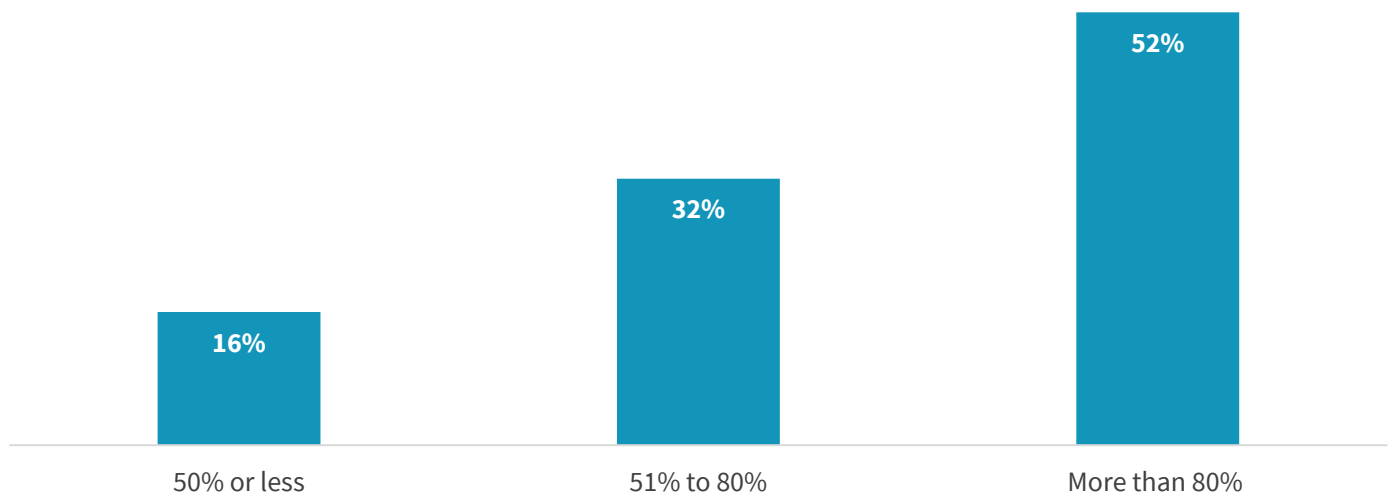
Source: Enterprise Strategy Group

To maintain efficiency, grow productivity, and enhance worker satisfaction, it's essential for organizations to deliver a productive workplace experience any place, at any time, and on practically any device on which their employees are working. This means organizations must be able to provide their workers with adequate connectivity and access to their applications and appropriate data, along with proper collaboration tools for an efficient desktop (or other workspace) environment. Above all, organizations must ensure that the environment is secure, and that business-critical data, intellectual property, and applications are safeguarded.

Looking back at the onset of the pandemic, most organizations thought they were employing a short-term, 90-day work model to shepherd them through a relatively brief period of time—before getting back to business as usual. At that point, many organizations turned to the cloud to rapidly spin up solutions, anticipating that employees would find it easy to work and collaborate from home with little or no interruption, while the business would remain protected.

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[1] Source: ESG Research Report, *2019 Digital Work Survey*, December 2019.
[2] Source: ESG Research Report, *The Impact of the COVID-19 Pandemic on Remote Work, 2020 IT Spending, and Future Tech Strategies*, June 2020.

Fast forward to the present. We have seen this "temporary" situation evolve into an extended period of time with no concrete end in sight. With this in mind, ESG research shows that 59% of knowledge workers, and 79% of IT decision makers anticipate that organizations will be more flexible when it comes to working from home (WFH) policies (see Figure 2).[3]

Figure 2. Work-from-home Policies Expected to Become More Flexible

Do you think that your organization will be more flexible with work-at-home policies once the current COVID-19 pandemic subsides? (Percent of respondents)

■ ITDM (N=500)   ■ Knowledge worker (N=1,008)

	Yes	No	Not sure
ITDM	79%	12%	10%
Knowledge worker	59%	14%	27%
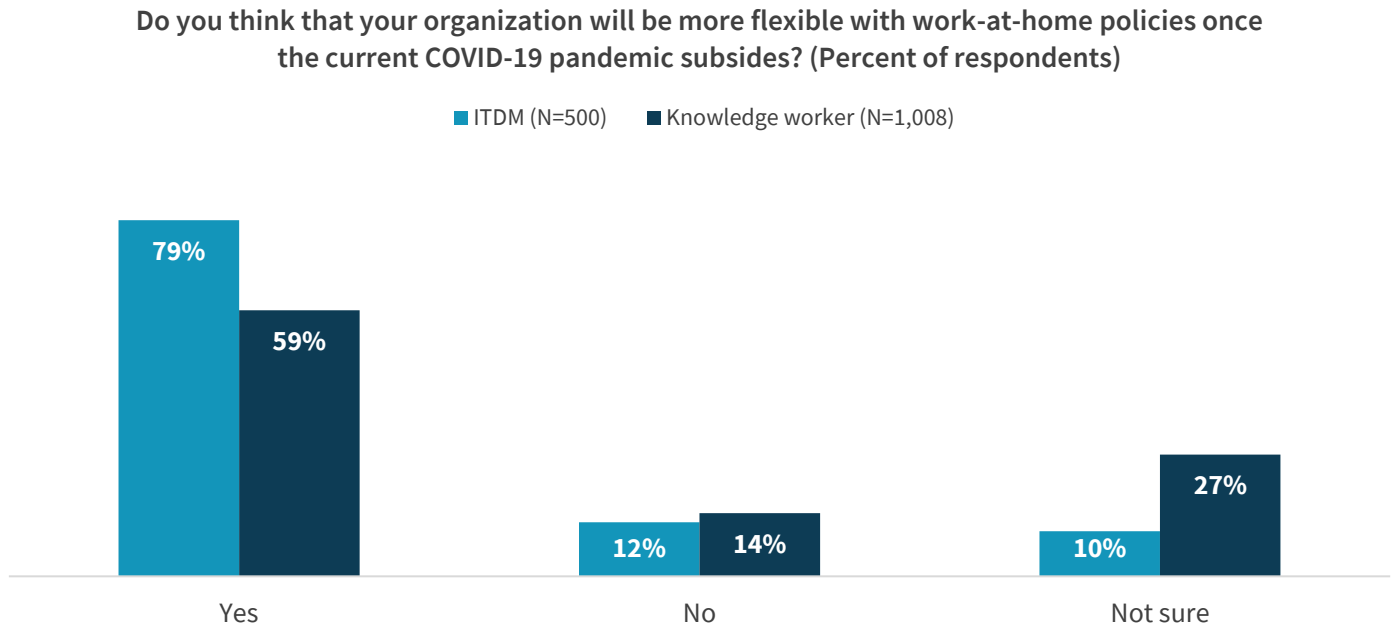
Source: Enterprise Strategy Group

A New Reality

With a rapidly growing remote workforce, organizations have been forced to speed up digital transformation to ensure an enhanced user experience, agility, and performance, while mitigating potential risk, and lowering the total cost of ownership. Organizations must not only look to optimizing across clouds, but optimizing on-premises as well.

Like it or not, we're living in a new reality. The global pandemic has dramatically changed the playbook for business continuity. Organizations must not only consider the well-being and productivity of their workers, but must act quickly to create, modify, and establish viable business resiliency plans to ensure continued operations. To that end, it's essential for organizations to determine the best model (for their unique needs) to support virtual desktop infrastructure (VDI) as they move forward.

And now that most of the world recognizes that the pandemic is not going away tomorrow, organizations must examine the true cost of cloud-based virtual desktop infrastructure, taking steps to evaluate the value of deploying VDI on-premises versus running it in the cloud.

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[3] Ibid.

Taking Steps to Ensure Business Continuity and Growth

The Importance of ROI

In this "new normal" business environment, return on investment (ROI) is more important than ever. According to ESG research conducted post-pandemic, 77% of respondents now have already purchased new technologies that provide them with improved ROI or plan to.[4]

Accelerating Digital Transformation: Modernizing the Data Center, Increasing Spending on Remote Worker Solutions

Organizations across the board continue to accelerate digital transformation, which was also already a key force in corporate IT before the pandemic. In fact, ESG research shows that, over the past two years, year-over-year digital transformation has increased, with 58% of organizations implementing and optimizing several digital transformation initiatives, or in the process of doing so, and another 18% saying they have formalized initiatives but have not yet begun to implement them.[5]

One integral part of digital transformation is modernizing the data center via a hybrid cloud infrastructure and creating a software-defined data center (SDDC). In fact, according to ESG research, when respondents were asked about future actions their organizations might take regarding on-premises data centers based on their COVID-19 experiences, 38% of them said that they would be implementing an SDDC.[6] In addition, separate ESG research indicates that deploying hyperconverged infrastructure was one of the three most commonly selected areas of data center modernization in which organizations expected to make the most significant investments in 2020, as it was in the previous year. [7]

Furthermore, because of the need to ensure business resiliency and a productive work-from-home environment, more than one-third of organizations (35%) expected to spend more than their original 2020 IT budget on remote/telework solutions, which was defined as online meetings, virtual desktops, and screen share technologies.[8]

With this in mind, it should come as no surprise that organizations require workable solutions optimized for cost and performance. Enter Cisco.

Across industries, many organizations have standardized on Cisco Nexus networking technology. Thus, extending that technology to converged infrastructure (CI) and hyperconverged infrastructure (HCI) solutions has enabled Cisco to become a leading systems provider, especially for VDI solutions. Cisco's CI solutions such as FlexPod data center platform (with NetApp), and Cisco HyperFlex HCI systems offer a viable means for reliably and cost-effectively deploying VDI solutions on-premises.

The Economic Value of Deploying Cisco CI and HCI VDI Desktop Solutions On-premises

To better understand the economics of deploying, managing, and maintaining virtual desktop solutions on-premises, ESG compared the expected costs of deploying Cisco CI and HCI VDI solutions against several VDI desktop services from leading public cloud service providers.

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[4] Ibid.

[5] Source: ESG Master Survey Results, _2020 Technology Spending Intentions Survey,_ January 2020

[6] Source: ESG Research Report, _The Impact of the COVID-19 Pandemic on Remote Work, 2020 IT Spending, and Future Tech Strategies_, June 2020.

[7] Source: ESG Master Survey Results, _2020 Technology Spending Intentions Survey,_ January 2020.

[8] Source: ESG Research Report, _The Impact of the COVID-19 Pandemic on Remote Work, 2020 IT Spending, and Future Tech Strategies_, June 2020.

Factors to be Considered

ESG considered the costs to provide 1,000, 2,500, and 5,000 virtual desktops to employees over a three-year period, including the cost to purchase, maintain, operate, and administer Cisco solutions in-house against published rates for the equivalent number and configuration of desktops from each cloud VDI service.

ESG assumed that each virtual desktop would be provisioned 2 vCPUs, 4 GB of RAM, an 80 GB root volume, and 15 GB of user data. For the cloud services, ESG selected the closest equivalent offering and most cost-effective pricing option, which in some cases required upfront reservations to receive the maximum discount. ESG assumed that the desktops would be heavily used, and thus selected monthly, rather than hourly, pricing.

For the Cisco CI and HCI solutions, ESG assumed typical pricing based on a 36-month fair market value (FMV) lease at 0% interest, which avoids a large upfront capital investment, and provides the organization with a monthly OpEx expense similar to that provided by the cloud services. ESG considered the cost to purchase the HCI nodes, CI servers and storage, any required software and subscriptions, VMWare Horizon licensing costs, as well as support, maintenance, and expected power, cooling, floor space, and cost to administer the hardware and VDI environment over three years.

Lower Average Monthly Cost Per VDI Desktop

ESG models found that Cisco CI and HCI solutions can provide a 13% to 35% lower average monthly cost per VDI desktop than the equivalent cloud-based VDI solutions over a three-year period. It should be noted that, while the monthly cost per desktop may remain constant for the cloud-based solutions (only guaranteed if paid up front), the average monthly cost per desktop for the Cisco CI and HCI solutions improves with larger numbers of desktops (i.e., the benefit of economies of scale and improved density), and when considered over a longer period of time (i.e., the fixed portion of the solution costs are spread over more time).

Figure 3 compares the expected average monthly cost per VDI desktop for Cisco CI or HCI solutions against cloud-based VDI solutions.

Figure 3. Cisco CI/HCI Solutions Compared to Cloud-based VDI Solutions (Average Monthly Cost per Virtual Desktop)
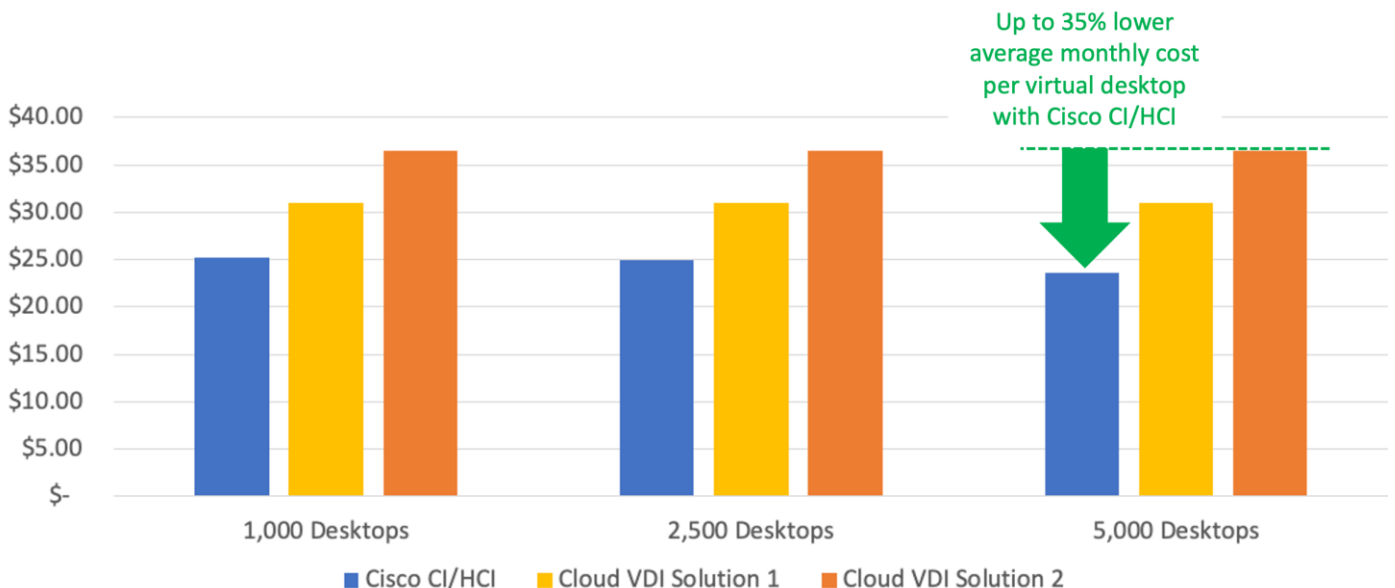
Source: Enterprise Strategy Group

Cisco HyperFlex or Converged Infrastructure Solutions for VDI

Cisco has a long history of providing organizations with scalable solutions that transform infrastructure. It has taken the same approach to delivering simple, easy-to-deploy VDI solutions for organizations across all industries. Cisco prides itself on performing comprehensive testing and documentation for VDI solutions, referred to as Cisco Validated Designs (CVDs), which enable organizations to quickly and easily deploy VDI.

Swift, Consistent, and Predictable Deployments

CVDs provide the basis for systems design based on common use cases or current engineering system priorities. Each design is the culmination of more than 2,000 man-hours (on average) of testing by Cisco engineers, incorporating the best practices of Cisco, VDI brokers, and storage infrastructure partners to ensure scalable, swift, consistent, and predictable deployments. In addition, Cisco Support stands ready to assist customers implementing a solution documented in a CVD.

To meet the growing need for increasing numbers of remote staff to be able to work efficiently, Cisco offers preconfigured VDI bundles that leverage best practices as defined in CVDs and work seamlessly with partner ecosystems. Organizations can choose VDI bundles for 500-seat or 1,000-seat VDI deployments, along with rapid deployment services from Cisco CX to help customers deploy a new VDI solution as quickly as possible. Cisco also offers preconfigured expansion nodes for existing Cisco HyperFlex environments.

Extensive Partner Ecosystem

Cisco's extensive partner ecosystem comprises a variety of software and hardware integrators, managed service providers, integrators, and VARs, which include Citrix, VMware, NetApp, NVIDIA, and Pure Storage.

Ability to Scale with Cisco Unified Computing System and Cisco HyperFlex

A global technology leader, Cisco is counted among the top tier of server vendors. Cisco's Unified Computing System (Cisco UCS) is a single, unified system; a fully programmable, integrated computing infrastructure using intent-based management (think alignment of infrastructure with business needs) to help organizations automate and accelerate their application deployments.

Supporting blade, rack, multimode, and storage-intensive servers, as well as converged and hyperconverged infrastructures (Cisco HyperFlex), and network edge solutions (Cisco UCS Mini and Cisco HyperFlex Edge), Cisco UCS and hyperconverged infrastructure can assist organizations to expand up to tens of thousands of users.

Integrated Security with Cisco Tetration

The shift to east-west traffic patterns in the on-premises data center has added to an ever-spreading attack surface. It's no wonder that security continues to be an ongoing priority across industries. Organizations are continually being challenged to adequately safeguard rapidly increasing volumes of data, burgeoning numbers of applications, and massive quantities of devices and users. Cisco Tetration, the vendor's hybrid cloud workload protection platform, is designed to effectively secure the on-premises data center and public cloud workloads. Cisco Tetration helps organizations implement a zero-trust model, assisting them to gain network performance insights, identify and quarantine any unauthorized software patches detected, and obtain a composite security score.

Cloud-based Operations with Cisco Intersight

Cisco Intersight is a cloud operations platform for delivering and managing the full infrastructure stack, workload, and cloud automation. Intersight can help organizations connect a world of highly distributed infrastructure and applications

while providing IT a single control point for simplified operations and enhanced agility. Through a single, cloud-based user interface, organizations can manage traditional, hyperconverged, edge, remote, and branch offices, allowing IT to track health status information, and manage any number of devices from just one screen. To help customers maintain system uptime, and avoid system pitfalls, system telemetry information can be easily uploaded to Cisco, assisting Cisco Support Services to identify any issues, and create and proactively provide patches—key to a VDI environment, especially where working remotely has become the norm.

The Bigger Truth

The COVID-19 pandemic has permanently altered the way we work; and organizations across industries are looking for feasible solutions to maintain business continuity and support growth. These solutions must deliver an enhanced user experience, offer cost-efficiency, demonstrate improved ROI, and provide security across the infrastructure. But businesses don't have time to take a wait-and-see attitude; they must make it a top priority to examine and choose the best long-term solutions that address their unique business needs.

Based on research, ESG has found that Cisco CI and HCI solutions can provide a 13% to 35% lower average monthly cost per VDI desktop than the equivalent cloud-based VDI solutions over a three-year period. Hence, organizations looking for a consistent, high performance, highly scalable, and cost-effective means for enabling virtual desktop solutions, especially at scale, should look to Cisco.