IBM SmartCloud Desktop Infrastructure with VMware for branch offices

Desktops from VMware and IBM
Central image management for branch office workers

The IBM® SmartCloud™ Desktop Infrastructure with VMware for branch offices is a powerful architecture solution that enables a consistent and reliable desktop experience for users located in branch offices. The SmartCloud Desktop Infrastructure solution is based on a joint reference architecture with VMware that supports a wide range of hardware and software.

Hosted virtual desktops provide a streamlined, cost-effective and secure way to manage branch users who access their applications and data from remote locations. With SmartCloud Desktop Infrastructure, you have the flexibility to choose what you need to meet your unique business requirements while giving your employees more flexible, secure and productive ways to work. This solution simply, securely and cost effectively addresses the requirements of branch office employees while maximizing worker uptime and efficiency. Where wide area networks are robust and reliable, VMware View with VMware vShield and vCenter Operations Manager for View enable organizations to do more with less and to adopt an automated, policy driven approach to managing end users in their branches.

By using VMware View physical appliances from the VMware Rapid Desktop Program, IT organizations that need a more distributed virtual desktop infrastructure (VDI) model can move the infrastructure closer to end users to optimize application response times and improve performance. IT can, in turn, remotely manage, patch and back up user information in the data center.

For end users with laptops, desktops or unmanaged virtual machines, where VDI is not a good fit because of sporadic or poor connectivity, IT staff can use VMware Mirage. Mirage centralizes complete copies of endpoint images in the data center, where they are protected and managed, while end users continue to enjoy the power of their local PC.

By providing continuous synchronization over the wide area network (WAN) between the local and central copies, Mirage ensures endpoint images are easily managed, maintained and updated. The IT organization manages a single image across a diverse range of devices that can be easily recovered in case of disaster, moved when hardware is refreshed, or migrated to a newer operating system. By decoupling the individual components of the image into different layers, Mirage ensures IT staff can easily maintain core images in compliance without disrupting user data or profiles, while still allowing branch employees to install applications to personalize their PCs.

Mirage can also be used to manage VMware View persistent desktops for disaster recovery. An employee on a physical device that is centrally managed by Mirage can have their persona restored onto a virtual machine. Mirage can be effectively used alongside View Composer and vCenter clones as part of this design, depending on user requirements.

Flexible architecture and design

The SmartCloud Desktop Infrastructure with VMware View and VMware Mirage includes these core components:

VMware vSphere and vCenter
The solution is built on top of vSphere, a virtualization platform that enables you to run business-critical applications.

VMware View
This central component of the solution architecture is a VDI product, with which desktop administrators can virtualize the operating system, applications and user data to deliver modern desktops to end users.
**VMware Mirage**

This can quickly and easily distribute a single image to a group of PCs anywhere on the network. These images are seamlessly merged into a Microsoft Windows end point. With just a few clicks in the Mirage Management Console, an IT administrator can initiate a base layer enforce operation that brings any desktop back into full compliance, without affecting user profiles or data. The administrator can maintain or remove user-installed applications during this operation as well.

**VMware vCloud Networking and Security**

This is a software-defined networking and security solution that enhances operational efficiency, unlocks agility and enables extensibility in order to help organizations rapidly respond to business needs. It provides a broad range of services in a single solution, including virtual firewall, virtual private network, load balancing and VMware VXLAN extended networks.

**VMware vCOps**

One of the biggest challenges faced by an IT organization is on-demand management of the entire environment and the ability to proactively identify and plan the infrastructure. VMware vCOps for View provides the management infrastructure required for the environment.

**Persona management and user-installed applications**

Many use cases defined in the solution require persistent user information across sessions. The biggest cost savings, both in terms of capital expenditures and operating expenditures, can be achieved by using “stateless” desktops. VMware View has a feature called “persona management” which maintains user data and profile persistence across stateless sessions. In addition to the profile persistence, some use cases also require support for user-installed applications, which can be achieved using partner products.

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*Figure 1. This simplified network diagram represents a typical branch office deployment using VMware View, VMware Mirage and the IBM SmartCloud Desktop Infrastructure.*
Backup and restore
Backup and restore capabilities are added as a core component in the design to protect the data at each branch site. The solution incorporates two types of backup: image-level protection and guest-level protection. Image-level protection enables backup clients to make a copy of all the virtual disks and configuration files associated with the particular virtual desktop in the event of hardware failure, corruption or accidental deletion of a virtual desktop.

High availability and reliability
Industry-recognized for quality, reliability and innovation, IBM System x® servers and the IBM PureFlex™ System, along with robust IBM storage systems, offer powerful building blocks for the SmartCloud Desktop Infrastructure. A broad portfolio of flexible configurations offer enhanced memory, high-speed I/O and industry-leading availability and reliability features. This combination is designed to reduce operating costs, simplify management and keep your virtualized desktop infrastructure up and running. The SmartCloud Desktop Infrastructure includes the following components:

IBM System x servers
System x offerings include rack servers with the latest Intel Xeon processor technology, advanced memory designs and solid-state storage that can deliver up to 40 percent better performance for virtualized workloads. The System x3650 M3 offers an energy-efficient design that supports more cores, memory and data capacity in a scalable 2U package that is easy to service and manage. With outstanding uptime, performance and I/O flexibility for cost efficiency and rock-solid reliability, the System x3650 M4 server provides an energy-smart, affordable and easy-to-use rack solution with a pay-as-you-grow design that helps reduce costs and manage risks.

IBM BladeCenter
In blade environments, the IBM BladeCenter® platform delivers an open platform that can simplify management, networking and complexity, with enhanced energy efficiency to help reduce costs and power consumption. The versatile BladeCenter HS22 blade server provides flexible options to support a broad range of workloads, including virtualization and enterprise applications. The two-socket BladeCenter HS23 blade server is ideal for virtualization. It is optimized for performance and highly scalable I/O with the combination of integrated 10 GbE Virtual Fabric, 16 memory slots and the latest Intel Xeon processor technology.

IBM PureFlex System
Ideal for a virtual desktop environment, the PureFlex System combines compute, storage, networking, virtualization and management into a single infrastructure system that senses and anticipates resource needs to optimize your infrastructure. Multiple configurations include:

- Express. The most affordable PureFlex System, Express is designed for small and medium businesses.
- Standard. Optimized for application servers with supporting storage and networking, Standard is designed to support key vendor solutions.
- Enterprise. Optimized for scalable cloud deployments, Enterprise has built-in redundancy for more reliable and resilient operation to support critical applications and cloud services.

Storage
IBM Storwize® V7000 Unified complements virtual desktop environments. It is a virtualized storage system that provides both block and file volumes. The Storwize V7000 Unified offers robust enterprise-class storage capabilities including thin provisioning, automated tiering, internal and external virtualization, clustering, replication, multiprotocol support and a next-generation graphical user interface. The system is flexible enough to support entry virtual desktop environments, but can also be scaled to support enterprise virtual desktop environments.
Networking and security
F5 BIG-IP Application Delivery Networking solutions for intelligent local and global traffic management include BIG-IP Local Traffic Manager (LTM), which offers an application-centric perspective to traffic management. BIG-IP Global Traffic Manager (GTM) can direct traffic to the closest or best performing data center. Together, LTM and GTM can offer scalability, security and availability to virtual desktops deployments of any size.

Trend Micro Deep Security server security platform includes tightly integrated modules for anti-malware, intrusion detection and protection, applications and firewalls to help ensure server, application and data security across physical, virtual and cloud servers, as well as virtual desktops.

IBM Security Access Manager for Enterprise Single Sign-on lets you log into all your applications with a single password. These features can be incorporated to ensure streamlined user access with automated sign-on and sign-off. Having a single password for all applications can reduce help desk costs, improve productivity and strengthen security for virtualized desktops.

IBM Tivoli® Endpoint Manager is built on IBM BigFix® technology and helps you achieve smarter, faster endpoint management. It combines endpoint and security management into a single solution that enables your team to see and manage physical and virtual endpoints, such as servers, desktops, roaming laptops, mobile devices and specialized equipment such as point-of-sale devices, ATMs and self-service kiosks.

IBM SmartCloud Desktop Infrastructure

Figure 2. IBM SmartCloud Desktop Infrastructure
Implementation assistance from IBM SmartCloud Desktop services

Transitioning to a virtualized environment from traditional desktops can be a time-consuming effort. It often requires specialized skills that are not readily available in-house. Implementations must be carefully managed to support a wide variety of users, applications and complementary software to help provide the security and management functions necessary to succeed.

Using time-tested methodologies, proprietary tools and extensive expertise developed through real-world client implementations, IBM SmartCloud Desktop services can accelerate your transition to a less complex, virtualized desktop environment. The robust services include assessment and planning, design and implementation, as well as operation and management. A phased delivery approach also helps speed your return on investment and reduces the risk of business disruption.

Validation testing

The IBM VDI Center of Excellence tested the IBM SmartCloud Desktop Infrastructure solution to validate the functional capabilities of the solution. The lab extended coverage of VMware View and Mirage, combining and exploring networking and interactions among products in a typical customer environment.

User Experience

The lab validation users were connected to VMware View desktops running PCoIP, with physical endpoints managed centrally by the VMware Mirage infrastructure. A physical endpoint in the branch site was selected and restored onto a persistent view desktop located in the headquarters site, and successfully demonstrated disaster recovery with Mirage over the infrastructure.

Management

VMware vSphere auto-deploy and host profile management were used to standardize the host configuration in the headquarters site. VMware Mirage was configured centrally in the headquarters site and the Mirage Branch Reflector was used in the branch site. All Mirage configuration and administration took place in the headquarters site. Role-based access was configured in both the vCenter and View administration elements, and successfully demonstrated delegation of authority over the distributed headquarters and branch infrastructure.

Security

To provide the secure infrastructure around intra- and inter-VM communications, vCloud Networking and Security was implemented. Data loss prevention with vShield was applied to test a use case with the PCI-DSS compliance template with successful results, ultimately verifying that the combination of VMware software running on IBM hardware worked as designed.

A Bank Goes Virtual

A large Japanese bank with a domestic network of more than 600 branches, sub-branches and agencies has approximately 100 facilities located in all of the major financial and commercial centers of the world. The bank had been renewing contracts for leasing client PCs every 3.5 years and was facing increasing costs.

Using System x servers running VMware View software, the bank implemented a SmartCloud Desktop Infrastructure environment that included virtual desktops to create easy-to-use terminals. The goal was to reduce costs related to the leased client PCs, and deploy smart and secure desktop environments that support a variety of work styles and business applications.

The bank has replaced 65,000 PCs with 50,000 thin clients running VMware View software. According to the bank management, company studies showed that the virtual desktop offering offered two key advantages. It made it possible to support more types of software and gave them the ability to prevent an application failure from bringing down the entire system.

Through SmartCloud Desktop services, everyone from power users to disconnected users can have faster, more security-rich access to resources, which can improve productivity and increase business flexibility.
Why IBM?
The SmartCloud Desktop Infrastructure solution can provide cost-effective and manageable capabilities for a wide range of industries. IBM has been a leader in large-scale virtualization for four decades, building strong intellectual capital and experience as a trusted adviser to more than 4,000 companies and an extensive network of virtualization partners.

About IBM Partners

Intel
Intel Xeon processor E5-4600/2600/2400/1600 product families are designed to deliver a combination of performance, built-in capabilities, and cost-effectiveness. They are the heart of a flexible and efficient data center that can meet diverse needs—from virtualization and cloud computing to design automation or real-time financial transactions. Offering excellent performance, I/O latency is dramatically reduced with Intel Integrated I/O, which helps you eliminate data bottlenecks, streamline operations and increase agility. More information is available at www.intel.com.

Trend Micro

For more information
To learn more about IBM SmartCloud Desktop Infrastructure solution, System x and BladeCenter solutions, please contact your IBM representative or IBM Business Partner, or visit: ibm.com/systems/x/solutions/desktopvirtualization

For more information about VMware vSphere and vCenter, visit: www.vmware.com/products/vsphere

Learn more about VMware View at www.vmware.com/products/view.

More information on VMware vCOps can be found at www.vmware.com/products/desktop_virtualization/vcenter-operations-manager-view/overview.html.

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