Contents

Introduction ........................................................................................................................................... 1
About This Guide .................................................................................................................................... 1
Overview .................................................................................................................................................. 1
VMware Desktop Virtualization ............................................................................................................. 1
  VMware View Composer ....................................................................................................................... 2
  Clone Technology ................................................................................................................................. 2
    Full Clones and Linked Clones ........................................................................................................... 2
    Parent Image and Replica ................................................................................................................... 2
  User Data Disk ....................................................................................................................................... 3
  Image Management with View Composer ............................................................................................ 3
  Storage Management with View Composer .......................................................................................... 4
  Rebalancing Desktops .............................................................................................................................. 5
  View Composer and Array-based Cloning .............................................................................................. 5
Conclusion ................................................................................................................................................ 6
About the Author ...................................................................................................................................... 6
Introduction

As enterprises explore desktop virtualization, they realize that it offers a simplified IT structure and cost-effective IT utilization and management. VMware® View Composer, introduced with VMware® View 3, further enhances this value proposition.

VMware View Composer is a product component of VMware® View. It works with VMware® View Manager to reduce storage requirements and enhance the image management capability of virtualized desktops.

This document describes View Composer and some of its functionality and benefits.

About This Guide

After reading this document, the reader should be able to understand the benefits of View Composer and the features it brings to VMware View product suite.

This document does not describe best practices or deployment considerations.

Overview

The adoption of desktop virtualization has seen great success in the past several years, largely because of the enhanced security, simplicity, and operational benefits it promises. Moving desktops from local cubes and offices to the datacenter is very attractive, but it adds components to the datacenter architecture. One such component is the storage area network (SAN).

Although the SAN enhances the solution, it can also add considerable expense for acquisition and maintenance. For instance, a virtual machine’s operating system (OS) image may typically vary in size between 10GB and 50 GB. When hundreds of such images need to be stored on the SAN, they can run up a hefty SAN investment.

In addition, deploying a physical desktop to a user involves various stages: procuring the hardware, delivering it to the user’s physical location, installing the OS and needed applications, and then making sure the user can access the desired data files. While VMware® Virtual Desktop Infrastructure (VDI) greatly simplifies this process, it still takes from fifteen to thirty minutes to deploy a virtualized desktop, and up to a week to deploy a physical desktop.

VMware VDI also calls for intelligent OS image management features to leverage the advanced intelligence of the VI and SAN feature set. Basics tasks such as application patching and OS updates need to be simplified. Today’s patch and update management tools still lack reliability, and there is room for improvement in their handling of virtualized desktops.

VMware Desktop Virtualization

VMware® View Manager is the new name for VMware® Desktop Manager, which provides integrated individual and desktop pool management capabilities. Desktops types can be PCs, Blade PCs, or virtual machines (VM). View Composer is tightly coupled with View Manager to provide seamless administration.
VMware View Composer

VMware View Composer is a software package offered with the premier bundle of VMware View 3. View Composer offers customers key benefits such as storage reduction, better OS management, and rapid deployment capabilities for virtualized desktops. While precise storage savings may vary, this technology reduces duplicate storage of virtual machines’ data transparently to the virtual machine. To this end, View Composer allows multiple VMs to share common data in a single base disk while maintaining separate storage for the data written by each virtual machine.

Clone Technology

A clone is a copy of an existing, or parent, virtual machine. When the cloning operation is complete, the clone becomes a separate virtual machine with unique identity of its own.

Full Clones and Linked Clones

A full clone is an independent copy of a virtual machine that shares nothing with the parent once the cloning operation is complete: the ongoing operation of a full clone is entirely separate from its parent.

A linked clone is a copy of a virtual machine that continues to share virtual disks with its parent. The differential—the bits of software that are unique to the linked clone—is stored in what is sometimes referred to as a diff disk or redo disk. This arrangement allows the linked clone to occupy a smaller virtual disk space than the parent yet still access software installed on the parent. Due to the sharing mechanism, however, a linked clone must always have access to the parent disk, without which it becomes unusable.

Each linked clone can thus act like an independent desktop OS, with a unique personal identity, including unique hostname and IP address, yet require significantly less storage than a full clone. Hundreds of linked diff disks can be created from one parent image, reducing the total storage space required.

VMware View Composer leverages linked clone technology to enable enterprises to reduce storage space from 50% to 90%, depending on their environment. Sharing the parent virtual machine’s code bits also results in innovative ways to deliver software into the linked clone.

Parent Image and Replica

Linked clones created with View Composer are linked to a full clone virtual disk called a replica. Replicas are created on a per-logical unit number (LUN) basis, so that each LUN used for desktop creation and storage carries a replica.

A replica is created for each variant of the desktop image used in the deployment. For example, if two types of desktops, one with Windows XP and other with Windows Vista, are deployed on a single LUN, two replica disks are created on that LUN, one for each image type.

The View Composer replica mechanism helps linked clones to scale up in large environments and makes it easier to install patches by updating the parent virtual machine. The replica is also protected from being erased from VMware® Virtual Center. This is critical because deleting the replica would mean that the linked clone desktops would no longer be available.
When leveraging VMware View Composer and linked clones to provision desktops, administrators have the option of creating a separate user data disk for each virtual desktop instance. A user data disk is a separate storage location attached to the desktop image upon creation.

The user data disk redirects the user’s profile and data to a second virtual disk, ensuring that each user’s personal settings and data are restored during boot time. This can be useful, after a master image has been updated, to restore the user profile data to maintain continuity. This approach resembles a locally cached profile, in that it is not stored centrally.

The user data disk is created when the desktop is provisioned and destroyed when the desktop is deleted from the data center. The administrator should take care to preserve the user data and profiles stored on this disk in case they are needed after the desktop is removed.

Image Management with View Composer

View Composer offers the following OS image management tasks:

- Recompose image
- Refresh image

The Recompose function allows the desktop administrator to update the parent virtual machine and push the new version of the image out to all or a subset of users and desktops. Recomposing desktops can be used to achieve a variety tasks, such as:

- Applying OS or software patches
- Applying service packs
- Adding additional software
- Making virtual hardware changes
- Upgrading OS versions
Sometimes, for instance, to comply with IT policies disallowing users from adding or removing software or changing user settings, the administrator may need to bring the deployed desktop back to default values and settings. Over time, as the OS disk starts to grow, it may also be useful to clean up the bloated disk to improve OS performance.

Refresh is the process of resetting linked clones back to the initial state of the parent virtual machine without adding additional software or patches or making other changes. Refreshing desktops can also be used to reduce the size of linked clones that have grown over time (see Figure 3). Several options are available for initiating a desktop Refresh such as:

- Refresh on demand
- Refresh when a specific size has been reached
- Refresh as a timed event

**Storage Management with View Composer**

VMware View Composer offers several approaches for managing the growing disk space of linked clones, the most important of which is Storage Overcommit. The following levels are available:

- None
- Conservative (default)
- Moderate
- Aggressive
Storage Overcommit determines how aggressively virtual machines are allocated to available free space. The more aggressive the Overcommit, the more virtual machines are placed on a data store with free space. As more virtual machines are assigned to the available free space, less space becomes available to accommodate the growth of virtual machines over time, so storage administrators need to manage their storage environment actively to ensure that they do not run out of space. In non-persistent use cases, where virtual machines are always refreshed and reset to their initial state, this is less of an issue than for more persistent virtual desktops.

**Rebalancing Desktops**

One of the challenges facing enterprises is to predict how much storage will be consumed over time. The Rebalance function greatly simplifies the process by allowing the administrator to relocate virtual machines from one LUN to another, by selecting the desktops to be moved and clicking Rebalance from the View Manager. This triggers a move of the linked desktop(s) to another LUN, recreates the replica on the LUN, if needed, and registers the virtual machine with the View Manager.

Desktops are refreshed automatically when the Rebalance function is invoked.

Rebalancing is not an online process, so desktops need to be powered off. The administrator needs to schedule some downtime for this operation.

**View Composer and Array-based Cloning**

Many storage vendors have developed deduplication technologies that can create similar linked clones—and in some cases, virtual machines—within a storage array. This cloning.
technology offers rapid provisioning of a large number of individual virtual machine desktops. These array-based solutions are not currently integrated with View Manager and require several manual steps or scripting to create and integrate virtual machines with VMware View before the virtual machines are ready for use. Virtual machine images must be created within the array, registered with vCenter, and then added to View Manager as a manual desktop pool. Some VMware storage partners provide management tools that automate the creation of these clones for import into VMware View Manager. See your storage vendor for details.

**Conclusion**

The cost of storage for VDI can be a cause for concern in terms of capital expenditure; in some cases, it has even been barrier to adoption. View Composer addresses this problem by enabling significant savings for enterprises particularly interested in reducing the cost of storage for VDI solutions.

View Composer also provides great image management tools that help desktop administrators perform patch and OS management. Features such as Refresh and Recompose offer extra flexibility. Because View Composer is integrated with View Manager, administrators find it easy to use as well as powerful.

**About the Author**

Anjan Srinivas is part of the Desktop Solutions Group in the Technical Marketing team, where he is chartered to enable customer adoption of desktop virtualization technologies. Anjan’s expertise includes the VMware Infrastructure in the areas of security and networking and View Manager. He has worked in the past with Cisco Systems and Aruba Networks.