VMware Horizon Mirage App Layer Capture Guidelines

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Contents

Overview

This guide describes the VMware® Horizon Mirage™ application layer concept and provides guidelines to ensure successful application layer creation.

What is a Mirage App Layer?

Traditional application deployment mechanisms employ application installers (e.g. MSI) which the administrator delivers to endpoints, where they are executed to completion. But applications may fail to deploy successfully due to network issues, mismatching configurations at the endpoints, user interruption during installation and various other reasons. The traditional solutions may require the administrator to also wrap the installers with customization scripts to improve deployment success prospects.

Mirage's new deployment mechanism enables easier application deployment across the enterprise. You capture single or multiple applications after installing them on a clean reference machine and customizing them as desired. The result of the capture process is a "Mirage application layer" or "app layer". An app layer automatically contains all the elements installed by the captured applications (e.g. file and registry changes) and any global application customizations that you make. Unlike application virtualization solutions (such as ThinApp), Mirage does not deploy or execute applications in a virtualized sandbox. Instead, after deployment with Mirage, applications run as usual – without any Mirage intervention. Thus, applications deployed by Mirage can also include kernel drivers, system services, shell extensions, plug-ins, and so on.

An app layer can be deployed with other app layers and/or a base layer in a set of endpoints. The deployment process is WAN-optimized, robust and transparent to users. WAN-optimization techniques enable Mirage to transfer only necessary blocks and re-use any existing blocks on the target endpoints, and better handle network disruptions and low bandwidth, including support for branch reflectors. Deploying app layers on endpoints doesn't require running the original application installers on each endpoint – Mirage deploys app layers at the file-system/registry level, in the background, while users continue to work with their existing applications and operating system (OS).

An app layer can be captured with a single application, or a suite of applications from the same vendor. App layers can be flexibly created to include applications relevant for a specific department or group. App layers can be combined with other app layers and deployed on any compatible endpoint.

Capturing an App Layer

The steps below describe how to capture a single app layer. For information about capturing multiple app layers, see Capturing Multiple App Layers on a Virtual Machine, on page 9.

1. **Prepare the reference machine:** A clean reference machine is required for capturing an app layer. A virtual machine is suitable for capturing most applications. For more information, see How to Prepare a Clean Reference Machine, on page 5.

2. **Capture the pre-install state:** Once the reference machine is ready, invoke the Start App Layer Capture wizard to capture the pre-installation state of the machine. For more information, see How to Install Applications for Layer Capture Part 1 – Pre-scan, on page 6.

3. **Install the applications:** You then install the applications to be captured, apply any application updates and patches, and customize global settings or configurations. For more information, see the following sections:

    - How to Install Applications for Layer Capture Part 2 – Application Installation, on page 6.

    - What can be Captured as Part of an App Layer, on page 7.

    - Capturing OEM App Layers, on page 8.

    - Note about application upgrades, below.

4. **Capture the post-install state:** Once applications are installed, updated and configured as desired, use the Finalize App Layer Capture wizard to complete the capture. This will upload the app layer to the Mirage server and add it to the list of available app layers in the Mirage Management Console (MMC). For more information, see How to Install Applications for Layer Capture Part 3 – Post-scan and Layer Creation on page 7.

5. **Test the app layer deployment:** Before deploying app layers to many endpoints, it is good practice to test each captured app layer by deploying it to a selected sample of target endpoints to verify that the applications work as expected on these endpoints after deployment. In upcoming versions of Mirage, conflict reports will help to identify conflicts between app layers and user-installed applications on the target endpoints. For more information about testing, see the *VMware Horizon Mirage Administrator's Guide*.

6. **Deploy the app layer:** Once testing is completed, the app layer is ready for deployment to any selected collection of target endpoints. To deploy app layers, use the Update App Layers wizard for a selected CVD or CVD collection in the MMC. For more information, see the *VMware Horizon Mirage Administrator's Guide*.

Note about application upgrades: When a new version of an application is available, you can replace the existing app layer with a new layer. To do this, you capture the upgraded application in an app layer (together with any other applications or updates required at that time) by the same process as described above (starting with a clean reference machine and capturing the installed new application). Once you have a new app layer, use Update App Layers to replace the old app layer with the new app layer.

How to Prepare a Clean Reference Machine

This section provides guidelines for preparing a clean reference machine.

- A virtual machine is suitable and good practice for capturing most app layers (except for hardware-specific app layers).

- The first step in capturing an app layer is to prepare a reference machine with a clean ("vanilla") installation of the required OS (e.g. Windows XP, Windows 7 32-bit or Windows 7 64-bit).

- App layers can only be deployed to compatible OS versions. Thus, app layers need to be captured separately for Windows XP, Windows 7 32-bit and Windows 7 64-bit. An app layer captured on Windows XP cannot be deployed on a Windows 7 (32-bit or 64-bit) machine, and vice versa. Similarly, an app layer captured on Windows 7 32-bit can't be deployed to Windows 7 64-bit, and vice versa.

- Avoid software in the clean state of the reference machine:

  - That can cause changes to be made to the machine while you are installing the applications.

  - That is auto-updating. If this is not possible, try to disable the auto-update feature of any pre-existing software. For example, turn off automatic Windows Update installation and automatic anti-virus definition updates.

- If you plan to capture a .NET-based application which uses a version of .NET not included in the vanilla Windows OS you installed, it is good practice to install the required .NET framework in the clean reference machine before starting the capture and installing your application. Deliver the .NET framework itself via the base layer, if possible.

- It is generally good practice for the clean reference machine to be similar in content to the base layers used throughout the organization (e.g. with the same Windows service pack version and .NET framework version as the base layer).

Once the clean reference machine has been set up,

1. Install the Mirage client on the reference machine. The VM device will be "Pending Assignment" in the MMC.

2. Continue to capture the pre-install state of the machine - see How to Install Applications for Layer Capture Part 1 – Pre-scan, on page 6.

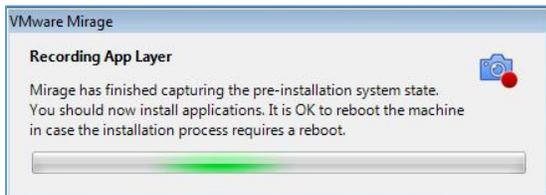# How to Install Applications for Layer Capture

Part 1 – Pre-scan

Once a clean reference machine is ready with the Mirage client, use the Start App Layer Capture wizard to enable Mirage to capture the pre-installation system state. The wizard will run a series of validations to check that the machine is ready for capture. Follow the on-screen instructions to remove any validation warnings or errors.

During the pre-scan process, the Mirage client will display the following window, indicating that the pre-scan is in progress:

VMware Mirage

Initializing App Layer Recording

Mirage is capturing the pre-installation system state.
Please do not make any changes until the scan is completed.

Part 2 – Application Installation

Once the pre-scan process is completed, the Mirage client will display the following window, notifying that the system is ready for application installation.

VMware Mirage

Recording App Layer

Mirage has finished capturing the pre-installation system state.
You should now install applications. It is OK to reboot the machine
in case the installation process requires a reboot.

At this stage, install the application(s) you would like to capture and configure them as necessary. Note the following guidelines for the application installation process:

- Mirage does not capture application installations or configuration changes made for specific user profiles for an app layer. Whenever applications (such as Google Chrome) give options to install (or set shortcuts), for either a specific user or globally for all users, always choose the "all users" option so that these installations/configurations will be captured as part of the app layer.

- When installing applications, do not make any changes that are not wanted in the capture. For example:

    1. Avoid installing software updates or applications that you don't want to capture.

    2. Avoid hardware changes, domain membership changes and any other configurations which are not required.

    3. Avoid launching other applications/Windows components which are not required by the installation process of the application you want to capture.

    4. Avoid GPO scripts running on the machine during the recording phase.

- To reduce intra-vendor conflicts, it is good practice to install applications of the same vendor in the same single app layer.

- Whenever possible, install software which can be volume-licensed and doesn't require hardware-bound licensing/activation. Delivering hardware-bound licensed applications via app layers will usually trigger re-activation of the software on the endpoints.

- **Important:** Any file/registry change that you make inside the captured area (this area can be configured by the Mirage policy), will be part of the app layer and applied to endpoints when you deliver the app layer. Avoid putting sensitive information in the reference machine used for capturing app layers.

Part 3 – Post-scan and Layer Creation

Invoke the capture finalization wizard only after you complete installation of your application(s), updates and configuration changes, including any machine restarts required by the application installer. Do not start the finalization process before all installations have been successfully completed. Follow the on-screen instructions in the finalization wizard to handle any validation warnings or errors.

During the post-scan process, the Mirage client will show the following window, indicating the progress of the post-scan:
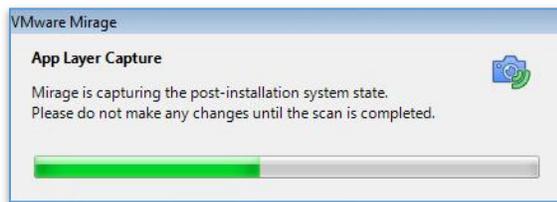
What can be Captured as Part of an App Layer

An app layer can contain:

- A single application or a set of applications.

- Any updates or patches related to the installed applications.

- Global application configurations and settings.

- Any custom set of files and registry entries.

For example, an app layer can contain Adobe Reader, Microsoft Visio 2010 or the entire Microsoft Office 2010 suite. An app layer can also be used to capture OEM software (e.g. the Dell software suite, including any drivers and utilities).

Unlike some application virtualization solutions, Mirage app layers can also contain any of the following elements:

- Windows services

- Kernel drivers

- Shell integration components (e.g. shell extensions)

- Browser plug-ins

- COM objects

- Global .NET assemblies

The following components cannot yet be delivered as part of Mirage app layers:

- User accounts and groups (both local and domain users) and any user-specific changes
- OS components or OS-bundled applications (e.g. the .NET framework, Windows updates, Internet Explorer, Windows Media Player, language packs)
- Windows license

Note: The components mentioned in the last two bullets can be delivered as part of a base layer instead.

The following applications are currently not or partially supported for delivery as app layers:

- Disk encryption software
- Any application which makes changes to the Master Boot Record or to disk blocks
- Kaspersky Internet Security
- Microsoft SQL Server

It is good practice to install the following applications in the base layer and not in app layers:

- Windows security applications (e.g. anti-virus, anti-malware, firewall)
- Windows components/frameworks (e.g. .NET, Java)
- Global Windows configuration/settings changes

Capturing OEM App Layers

To successfully capture hardware-specific software (e.g. Dell/HP application and driver suite), please follow these guidelines:

- Some vendors provide a single OEM application suite which is compatible with many or most of their hardware models. It is good practice to use this suite for the OEM layer capture.
- If the vendor only provides an OEM suite which is relevant for a specific hardware model or model line, make sure you install the OEM software on the hardware model for which it is intended or on a compatible model.
- Unlike OEM *applications*, which can only be delivered via app or base layers, Mirage provides several ways to deliver OEM *device drivers* to target endpoints:
  - **Via the Mirage driver library:** See the *VMware Horizon Mirage Administrator's Guide* for detailed instructions on how to deliver device drivers to specific hardware models in a rule-based manner.
  - **Via base or app layers:** In this method, you either install or place all relevant device driver packages in the reference machine, in a path which is also defined in the Windows DevicePath registry value. You can also install the corresponding OEM applications in the same reference machine. A base or app layer is then captured from the reference machine in the usual way. This layer can be used to deploy OEM applications and drivers to any endpoint of the matching hardware models.

Capturing Multiple App Layers on a Virtual Machine

When you need to capture multiple app layers, it is useful to use a single virtual machine (VM). The following steps describe this process:

1. Create a clean reference machine on a VM, install the Mirage Client and centralize the device to a reference CVD. For more information, see How to Prepare a Clean Reference Machine, on page 5.

2. Take a snapshot of the VM in this state (e.g. "Clean State").

3. In the MMC, use the Start App Layer Capture option to capture the pre-install state. For more information, see How to Install Applications for Layer Capture Part 1 – Pre-scan, on page 6.

4. Install the desired applications. For more information, see:

   - How to Install Applications for Layer Capture Part 2 – Application Installation, on page 6.

   - What can be Captured as Part of an App Layer, on page 7.

   - Capturing OEM App Layers, on page 8.

5. In the MMC, use the Finalize App Layer Capture option to complete the creation of the app layer. For more information, see How to Install Applications for Layer Capture Part 3 – Post-scan and Layer Creation on page 7.

6. Wait until the app layer appears in the "App Layers" view of the MMC.

7. Revert to the VM to the "Clean State" snapshot.

8. Wait for the device to become "Pending Assignment" and go back to Step 3 to capture the next app layer.

Configuring Post App Layer Deployment Scripts

In rare cases, you might need to execute a custom script after the app layer is deployed, for example, to apply a specific application license after it is installed via an app layer.

To have the Mirage client execute a custom script:

1. Invoke the App Layer Capture wizard in the usual way to complete a pre-scan of the reference machine.

2. Install the application to be captured in the usual way.

3. Give your script a unique name with this pattern: post_layer_update_*.bat

   (for example: "post_layer_update_myappv2_license.bat")

4. Copy this script into "**%programdata**%\Wanova\Mirage Service".

   This path usually translates into:

   - "c:\ProgramData\Wanova\Mirage Service" (Windows 7)

   - "c:\Documents and Settings\All Users\Application Data\Wanova\Mirage Service" (Windows XP)

5. Run the Finalize App Layer Capture wizard in the usual way to complete the post-scan and the creation of the app layer.

6. After the app layer is deployed to an endpoint, Mirage automatically launches your script.