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What Is VMware Horizon FLEX?

Traditionally, IT administrators have protected corporate data and applications and controlled costs by providing workers with company-issued, Windows-based laptops or desktops and by defining how and from where workers could access corporate applications and data.

However, the evolving workforce of today puts new demands on IT administrators. Road warriors must be productive when disconnected from the corporate network. More and more users demand Macs, even in organizations where Windows is the corporate computing standard. In addition, many companies are moving a significant percentage of their workforce from permanent to temporary or contract roles, eliminating traditional IT controls over corporate applications and data.

VMware Horizon® FLEX™ is a policy-based, containerized desktop solution that allows IT administrators to create, secure, and manage local desktops to meet the needs of workers with their own computers, road warriors, and Mac users in the enterprise. End users work within a restricted virtual machine on their endpoints and can be either connected or disconnected from the enterprise network.

Horizon FLEX is a combination of existing VMware products, with additional beneficial features. Horizon FLEX is composed of VMware Fusion® Pro, VMware Player Pro™, VMware Mirage™ for Horizon FLEX, and the new Horizon FLEX Policy Server. The Horizon FLEX Client is composed of Fusion Pro and Player Pro.

With the Horizon FLEX package, administrators can create multiple restricted virtual machines (Horizon FLEX virtual machines) and entitle them to a variety of end users.

The Horizon FLEX solution complements existing VMware virtual desktop infrastructure (VDI) environments by allowing administrators to cater to both online and offline user requirements. Because the Horizon FLEX virtual machine is stored locally, corporate applications are accessible to the user even when offline.

With the Horizon FLEX virtual machine, IT can resolve the challenges presented by the intermittent network disconnection of bring-your-own-PC (BYOPC) and mobile users, while continuing to provide VDI desktops to other users.
Terminology for Horizon FLEX

The following terminology is used throughout this brief.

- **Horizon FLEX Client** – Combination of Fusion Pro and Player Pro on the endpoint. The user connects to the Horizon FLEX Policy Server with the Horizon FLEX Client. One license key is used for both Fusion Pro and Player Pro.

- **Fusion Pro** – Fusion Pro enables a user to connect to a restricted virtual machine from a Mac endpoint. In addition, the administrator creates a restricted virtual machine with Fusion Pro.
  
  **Note:** You can also use VMware Workstation™ to create a Horizon FLEX virtual machine, but it is not included in the current Horizon FLEX bundle.

- **Player Pro** – Player Pro enables a user to connect to a restricted virtual machine from a Windows endpoint.

- **Mirage for Horizon FLEX** – The standard Mirage server that provides optional image management. The layering technology allows administrators to easily manage, back up, and patch virtual machine desktops.

- **Horizon FLEX Policy Server** – Handles the restricted virtual machine functionality. The administrator applies policies with the Horizon FLEX Policy Server.

- **Restricted virtual machine** – The administrator creates a restricted virtual machine with Fusion Pro. The user downloads this restricted virtual machine to a physical machine.

- **Horizon FLEX virtual machine or source virtual machine** – Other terms for the restricted virtual machine.

- **Host** – The physical computer on which the Horizon FLEX Client is installed.

- **Guest OS** – The operating system installed on the restricted virtual machine.

- **Guest content** – The applications and user data and settings installed on the restricted virtual machine.

- **Entitlement** – The assignment of restricted virtual machines to users. The administrator entitles Active Directory users and groups through the Horizon FLEX Policy Server. Users can access their entitled virtual machines from their Horizon FLEX Clients.

Key Benefits of Horizon FLEX

Using Horizon FLEX, administrators can

- Embrace Macs in the enterprise
- Enable offline productivity by providing users with corporate desktops that run locally on Windows or Mac endpoints
- Retain control of corporate applications and data by using policies to control USB device access, and copying and pasting
- Easily manage and maintain virtual machines using a centralized console
- Accommodate temporary workers and contractors with policy-based desktop expiration dates and remote lock

Remote lock is one of the exciting features that Horizon FLEX introduces. Remote lock allows administrators to instantly lock out a virtual machine and make it inaccessible to the user. This feature is useful in a scenario in which a user’s contract expires prematurely.
Deploying Horizon FLEX

To access the restricted virtual machine, the user must first install the Horizon FLEX Client (Fusion Pro or Player Pro) on a Mac or Windows endpoint. The user can then launch the Horizon FLEX Client to connect to the Horizon FLEX Policy Server and download the restricted virtual machine.

The administrator can mass-deploy the Horizon FLEX Client to Mac or Windows endpoints with standard package deployment tools, such as

- Apple Remote Desktop
- JAMF Casper Suite
- Microsoft System Center 2012 Configuration Manager

**Note:** You can include a restricted virtual machine as part of the deployment package.

Tested Host Operating Systems for Horizon FLEX

VMware has verified the following host operating systems as compatible with the Horizon FLEX Clients:

- Mac OS X 10.9, Mac OS X 10.10

Additional operating systems as supported by Fusion Pro and Workstation Player may be used but have not been tested at this time.

Tested Guest Operating Systems for Horizon FLEX

VMware has verified the following guest operating systems as compatible with the Horizon FLEX Clients:

- Windows XP, Windows 7 (all versions, including 32-bit and 64-bit), Windows 8 (all versions)
- Ubuntu 14.04
- Mac OS X 10.9, Mac OS X 10.10

Additional operating systems as supported by Fusion Pro and Workstation Player may be used but have not been tested at this time.

Network Specifications for Horizon FLEX

The Horizon FLEX solution allows users to run corporate applications even when disconnected from the network. Virtual desktops are stored locally for a complete desktop experience that does not require a network connection.

A network connection between the Horizon FLEX Policy Server and the Horizon FLEX Client is required only in the following scenarios:

- For the initial download of the FLEX virtual machine
- To receive virtual machine restriction and policy updates

**Note:** You can also manage and update guest content if you use Mirage for Horizon FLEX. Users must connect to the network to receive updates to guest content.

The administrator specifies a download location (URL) for the Horizon FLEX virtual machine. The Horizon FLEX Policy Server must be accessible via HTTPS to the Horizon FLEX Client for the end user to download the virtual machine. After the user powers on the virtual machine and logs in, the user can access the virtual machine offline.
The administrator can also specify the number of days that the virtual machine can run without connecting to the Horizon FLEX Policy Server. When the time period is reached, the virtual machine is not usable. When the user regains access to the network, updates to the guest OS or virtual machine policies are applied.

**Administrative Functions in the Horizon FLEX Policy Server**

You can manage and control containerized desktops with the Horizon FLEX Policy Server. After the Horizon FLEX license has been applied to Mirage for Horizon FLEX, the Horizon FLEX Policy Server is activated.

- Administrators can perform a myriad of tasks, including
- Manage an inventory of restricted virtual machines
- Browse a list of users and groups in the Active Directory service
- Entitle users and groups to one or more restricted desktops
- Specify virtual machine policies for a given entitlement
- Prevent user access to restricted virtual machines with remote lock
- Examine virtual machine details and status at any given point in time

**Restricted Virtual Machine Policies**

The administrator can define a specific set of policies for a Horizon FLEX virtual machine from the Horizon FLEX Policy Server Web management user interface.
Figure 3 shows the Add Virtual Machine Policy window and the various policy and restriction settings. Details of these policies follow.

**General Settings in Add Virtual Machine Policy Window**

General Settings include setting a **Name** and **Description** for the virtual machine policy.

**General Restrictions in Add Virtual Machine Policy Window**

General Restrictions apply to all users entitled to a virtual machine. Field explanations follow.

- **Expiration date** – You can configure the virtual machine to expire at a specific date and time.
- **Folder Sharing** – You can specify whether the guest can share folders with the host.
- **File copy operations** – You can control copy-and-paste and drag-and-drop functionality between the host and the virtual machine.
- **Passphrase** – You can choose whether to require the user to change the power-on password whenever moving or copying a restricted machine. You can also replace the admin supplied encryption passphrase with the user’s AD credentials.
- **Single Instance** - You can restrict the user from copying the guest OS.
End User Messages in Add Virtual Machine Policy Window

In End User Messages, the administrator can choose to do the following:

• Display an expiration message to the user when the virtual machine expires
• Display a warning message to the user before the virtual machine expires
• Set the number of days before expiration that the warning message is shown

Server Settings in Add Virtual Machine Policy Window

Server settings apply to the Horizon FLEX Policy Server. Field explanations follow.

• **Restrictions management server** – Specify the URL and port number for the Horizon FLEX Policy Server.
• **Server contact frequency** – You can specify how frequently in minutes, hours, or days the Horizon FLEX Client must check the Horizon FLEX Policy Server for policy updates. The virtual machine always attempts to contact the Horizon FLEX Policy Server at the specified time, but policy updates are retrieved only when the user is online. If this time is exceeded, the virtual machine uses the last retrieved policy set.
• **Maximum time the VM can be used without server contact** – You can specify how long the virtual machine is allowed to run without contacting the Horizon FLEX Policy Server. This period must be greater than the server contact frequency. If this time is exceeded, the user receives a warning message, and the virtual machine becomes inaccessible. When the virtual machine can contact the Horizon FLEX Policy Server, the virtual machine again becomes accessible. The administrator does not need to reactivate the virtual machine.
Device Control in the New Policy Window

On this screen you can control how the guest OS interacts with USB devices connected to the host machine.

- **Global Use Of Device** - You can control whether all USBs are allowed or disallowed. Additionally you can specify specific permissions for certain classes of USB device.
- **Specified USB device** - You have the ability to ban all USB devices except those brands certified by your corporation.

Setting Remote Lock or Wipe

The administrator can prevent user access to a Horizon FLEX virtual machine with the Lockout feature. Alternatively, for extra security the virtual machine can be remotely wiped from the user’s machine.

Figure 4 shows the Lockout and Wipe buttons that are available from the Virtual Machines tab on the Horizon FLEX Policy Server Web management user interface.

![Figure 4: Lockout & Wipe features in the Horizon FLEX Policy Server](image)

The administrator logs in to the Horizon FLEX Policy Server Web management user interface to lockout or remotely wipe a restricted virtual machine.

Procedure to Lockout or Wipe Restricted Virtual Machine

1. Log in to the Horizon FLEX Policy Server Web management user interface.
2. Click the Virtual Machines tab.
3. Select a restricted virtual machine.
4. Click Lockout or Wipe.
5. Click OK to confirm the operation.

If you’re using Lockout then the status of this virtual machine changes to Pending Lockout. Upon next contact with the Horizon FLEX Policy Server, the virtual machine is locked out and the status changes to Locked Out.

The same process if followed if you’re remotely wiping a virtual machine.
Basic Administrator and User Workflows for Horizon FLEX

Horizon FLEX allows administrators to centrally manage and maintain restricted virtual machines while users access these virtual machines locally. Details of basic administrator and user workflows follow.

Administrator Workflow

The administrator prepares a restricted virtual machine for the user, as outlined in Figure 5.

![Administrator Workflow Diagram]

Figure 5: Administrator Workflow
User Workflow

The user can access the restricted virtual machine as illustrated in Figure 6.

1. Launches the Horizon FLEX Client and connects to the Horizon FLEX Policy Server.

2. Sees list of entitled VMs.

3. Downloads a VM.

   **Note:** The administrator can also provide a Horizon FLEX virtual machine to the user via:
   - USB device
   - Deployment tool
   - Email with URL link. The user downloads the virtual machine to their physical machine from the URL link provided.

4. Powers on the VM.

Figure 6: User Workflow
Use Cases

Horizon FLEX solves a broad number of enterprise use cases:

- **Bring Your Own PC (BYOPC)** – Supports employees using their own computer for work, or those employees assigned a Mac at work even though a Windows computer is “standard issue.”
- **Temporary or contract workers** – Enables temporary or contract workers to access the applications and data they need while protecting corporate data, especially if users have their own computers and might not always work onsite.
- **Disconnected workers** – Supports employees who are not always connected to the corporate network, for example, road-warrior sales reps, or consultants or employees working from home.
- **Regional office workers** – Supports workers in regional offices who need to exchange confidential information with the home office using a standard set of corporate applications.
- **Development and training** – Supports development, testing, and training efforts that require an isolated environment that is hardware- and operating-system-agnostic.

**Bring Your Own PC**

IT administrators are forced to support a heterogeneous environment with the recent BYOPC revolution. IT can no longer define the rules when it comes to hardware type or how users access the corporate network. Employees want flexibility to choose their own personal machine, and many of these are Macs. In an effort to reduce costs, companies might not want to provide laptops to new employees. Supporting different user machines presents challenges in terms of security and data protection.

<table>
<thead>
<tr>
<th><strong>CHALLENGE</strong></th>
<th><strong>SOLUTION</strong></th>
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<tbody>
<tr>
<td>User support – Employees want flexibility</td>
<td>Users can run a standardized, corporate Windows desktop on their own Mac or</td>
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<tr>
<td>to use their own computers for work, and</td>
<td>Windows machines, eliminating the need to provide support for Mac OS X.</td>
</tr>
<tr>
<td>more and more of these computers are Macs.</td>
<td>From a centralized server, IT can manage and maintain the Horizon FLEX</td>
</tr>
<tr>
<td>IT administrators are forced to support</td>
<td>Windows virtual machine without impacting the native OS on the endpoint.</td>
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<tr>
<td>multiple user environments (Windows and</td>
<td></td>
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<tr>
<td>Macs), and companies do not have time or</td>
<td></td>
</tr>
<tr>
<td>budget to up-skill Windows IT staff.</td>
<td></td>
</tr>
<tr>
<td>Security risk – Personal machines pose</td>
<td>IT administrators can create restricted and encrypted virtual machines,</td>
</tr>
<tr>
<td>security risks. Granting access to the</td>
<td>reducing security concerns. The virtual machine is locked down and can be</td>
</tr>
<tr>
<td>corporate network allows users to access</td>
<td>set to expire when the contract expires, protecting corporate applications</td>
</tr>
<tr>
<td>corporate applications and potentially</td>
<td>and data. Copy-and-paste functions can also be restricted, along with USB</td>
</tr>
<tr>
<td>capture sensitive data.</td>
<td>access.</td>
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**Temporary or Contract Workers**

Increasingly, many companies employ temporary and contract workers. These workers often have their own laptops and work from home, making it difficult for IT administrators to maintain security.

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<tr>
<th><strong>CHALLENGE</strong></th>
<th><strong>SOLUTION</strong></th>
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<tbody>
<tr>
<td>Data access – Granting corporate access to</td>
<td>IT administrators can create restricted and encrypted machines, reducing</td>
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<tr>
<td>contractors poses security risks if users</td>
<td>security concerns. The desktop is locked down and can be set to expire at</td>
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<tr>
<td>launch corporate applications from their</td>
<td>a predefined date and time, thus protecting corporate applications and data.</td>
</tr>
<tr>
<td>personal computers. After a contract has</td>
<td>As an increased security measure, the Horizon FLEX virtual machine can be</td>
</tr>
<tr>
<td>expired, the applications remain on the</td>
<td>“poison-pilled” at any time. Copy-and-paste functions can be restricted,</td>
</tr>
<tr>
<td>user’s machine, allowing them to capture</td>
<td>along with USB access. If the contract is renewed, administrators can also</td>
</tr>
<tr>
<td>sensitive data.</td>
<td>renew the virtual machine, saving time and effort.</td>
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Disconnected Workers
Some companies have a large mobile workforce. Workers who travel frequently, like sales representatives and consultants, are often unable to get secure network access to corporate data and applications. In some organizations, managing an ever-growing client list can also pose issues.

<table>
<thead>
<tr>
<th>CHALLENGE</th>
<th>SOLUTION</th>
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<tbody>
<tr>
<td>Remote and offline workers</td>
<td>Road warriors have a local desktop, allowing them to leverage corporate data and applications even when offline, turning downtime into productive time. When the user is back online, updates to policies or the Horizon FLEX virtual machine are applied.</td>
</tr>
<tr>
<td>Isolate and safeguard client data</td>
<td>IT can provide consultants with one or more Horizon FLEX virtual machines per physical machine. Consultants can allot one virtual machine to each client, making it easier to isolate, manage, maintain, and locate client files and applications.</td>
</tr>
</tbody>
</table>

Regional Office Workers
Regional offices, dealerships, and franchises might need to create and submit confidential reports, like revenue or inventory, to other regional offices or to the central office. These regional offices might also need a way to maintain reports locally. IT staff might not be available in every branch to ensure that security policies are enforced.

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<th>CHALLENGE</th>
<th>SOLUTION</th>
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<tr>
<td>Regular reports with confidential data</td>
<td>IT can provide each regional office with a restricted, encrypted desktop that contains the applications needed to provide the head office with required reports. Horizon FLEX includes policies that can be applied to a local virtual machine to secure those reports, including restrictions on USB device access and copying and pasting.</td>
</tr>
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</table>

Development and Training
Development, testing, and training efforts often require an isolated environment that is hardware- and operating-system-agnostic. Providing a consistent training environment presents a challenge as more schools adopt a BYOPC approach. In addition, developers and testers might require a Linux environment but still need access to Windows-based productivity tools.

<table>
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<tr>
<th>CHALLENGE</th>
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<tbody>
<tr>
<td>Isolated environment</td>
<td>Horizon FLEX can deliver preconfigured applications, tailored for a specific class in an isolated, locked-down virtual machine. Users have the flexibility of running this restricted virtual machine on their own machine or on one provided for them. Engineers can use native Windows tools and applications on a machine of their choice.</td>
</tr>
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</table>
Summary

VMware Horizon FLEX is a containerized desktop solution that allows businesses to accommodate emerging modes of working, such as BYOPC, temporary or contract workers, and disconnected users. Organizations can deploy and control standardized Windows virtual machine desktops to groups of employees, a challenge that has been difficult or costly to address. IT can now give Mac users, contractors, and disconnected workers access to a secure corporate desktop in a cost-effective package without sacrificing security and corporate compliance.

IT administrators can create, secure, and manage restricted virtual machines from a centralized location, while users run their virtual machines locally. Horizon FLEX complements and extends an existing VDI environment, allowing flexibility for a broad spectrum of users.

The VMware Horizon FLEX solution offers you

• Secure delivery of a Windows virtual machine desktop on any Mac or Windows computer, managed from a single solution
• Horizon FLEX Policy Server to enforce corporate compliance
• Management of virtual machines from a centralized server without impacting the host OS on the endpoint
• Robust security features and granular control with restricted and encrypted virtual machines
• Desktops that can be used with or without a network connection
• Virtual machine expiration dates and remote lock

Author and Contributors

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Additional Resources

For more information, see the Horizon FLEX product Web page.