



Managing Ready Clones

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HX Data Platform Ready Clones Overview

HX Data Platform Ready Clones is a pioneer storage technology that enables you to rapidly create and customize multiple cloned VMs from a host VM. It enables you to create multiple copies of VMs that can then be used as standalone VMs.

A Ready Clone, similar to a standard clone, is a copy of an existing VM. The existing VM is called the host VM. When the cloning operation is complete, the Ready Clone is a separate guest VM.

Changes made to a Ready Clone do not affect the host VM. A Ready Clone's MAC address and UUID are different from that of the host VM.

Installing a guest operating system and applications can be time consuming. With Ready Clone, you can make many copies of a VM from a single installation and configuration process.

Clones are useful when you deploy many identical VMs to a group.

Benefits of HX Data Platform Ready Clones

HX Data Platform Ready Clones provide the following benefits:

- **Create multiple clones of a VM at a time** - Simply right-click a VM and create multiple clones of the VM using the Ready Clones feature.
- **Rapid cloning** - HX Data Platform Ready Clones are extremely fast and more efficient than legacy cloning operations because they support VMware vSphere® Storage APIs – Array Integration (VAAI)

data offloads and supported for powered on VMs. VAAI also called hardware acceleration or hardware offload APIs, are a set of APIs to enable communication between VMware vSphere ESXi hosts and storage devices. Use HX Data Platform Ready Clones to clone VMs in seconds instead of minutes.

- **Batch customization of guest VMs** - Use the HX Data Platform Customization Specification to instantly configure parameters such as IP address, host name, VM name for multiple guest VMs cloned from a host VM.
- **Automation of several steps to a one-click process** - The HX Data Platform Ready Clones feature automates the task to create each guest VM.
- **VDI deployment support** - Ready Clones are supported for desktop VMs on VDI deployments which are using VMware native technology.
- **Datastore access** - Ready Clone work on partially mounted/accessible datastores as long as the VM being cloned is on an accessible mountpoint.

Supported Base VMs

HX Data Platform supports:

- Base VMs stored on a HX Data Platform datastore
- Base VMs with HX Data Platform Snapshot. For Powered-on VMs, the Ready Clone workflow takes an HX Snapshot, and then uses the snapshot to create a clone after the clone is created. The same workflow happens when an HX Snapshot is removed.



Note For sentinel based HX snapshot, sentinel snapshots are not automatically deleted after ready clone operation. See the [HX Native Snapshots Overview](#) for implications of using sentinel based HX snapshots.

- Storage vMotion is not supported on VMs with HX native snapshots.
- Maximum 2048 Ready Clones from one base VM.
- Maximum 256 Ready Clones created in one batch at a time.

HX Data Platform does not support:

- Powered on base VMs with > 30 snapshots
- Powered on base VMs with Redo log snapshots

Ready Clone Requirements

- VMs must be within the HX Data Platform storage cluster. Non-HX Data Platform VMs are not supported.
- VMs must reside on a HX Data Platform datastore, VM folder, and resource pool.

Ready Clones fail for any VM that is not on a HX Data Platform datastore. This applies to Ready Clones on a VM level, VM folder level, or resource pool level.

- VMs can have only native snapshots. Ready Clones cannot be created from VMs with snapshots that have redo logs, (non-native snapshots).
- Use only the single vNIC customization template for Ready Clones.
- Beginning in Cisco HX Release 3.0, SSH does not need to be enabled in ESX on all the nodes in the storage cluster.

Ready Clone Best Practices

- Use the customization specification as a profile or a template.
- Ensure that properties that apply to the entire batch are in the customization specification.
- Obtain user-defined parameters from the HX Data Platform Ready Clone batch cloning work flow.
- Use patterns to derive per-clone identity settings such as the VM guest name.
- Ensure that the network administrator assigns static IP addresses for guest names and verify these addresses before cloning.
- You can create a batch of 1 through 256 at a given time. The HX Data Platform plug-in enables you to verify this.
- Do not create multiple batches of clones simultaneously on the same VM (when it is powered on or powered off) because it causes failures or displays incorrect information on the master task updates in the HX Data Platform plug-in.

Creating Ready Clones Using HX Connect

Use HX Data Platform Ready Clones feature to populate your cluster by creating multiple clones of a VM, each with different static IP addresses.



Note If you click **Ready Clones** to clone a VM when the OVA deployment of that VM is in progress, you will get an error message. You can clone a VM only after the successful VM deployment.

Step 1 Log into HX Connect as an administrator.

Step 2 From **Virtual Machines** page, select a *virtual machine*, then click **Ready Clones**.

Step 3 Complete the **Ready Clone** dialog fields.

UI Element	Essential Information
Number of clones	Enter the number of Ready Clones that you want to create. You can create a batch of 1 through 256 clones at a given time.

UI Element	Essential Information
<p>Customization Specification</p>	<p>Optional field.</p> <p>Click the drop-down list and select a Customization Specification for the clone from the drop-down list (which includes the customization specifications available in vCenter).</p> <p>The system filters the customization specifications for the selected host virtual machine. For example, if the selected host virtual machine uses Windows OS for guest virtual machines, the drop-down list displays Windows OS customization specifications.</p>
<p>Resource Pool</p>	<p>Optional field.</p> <p>If you have resource pools defined in your HX Storage Cluster, you can select one to store the Ready Clones of the selected virtual machine.</p>
<p>VM Name Prefix</p>	<p>Enter a prefix for the guest virtual machine name.</p> <p>This prefix is added to the name of each Ready Clone created.</p> <p>Note The VM Name Prefix which is used to name a Ready Clone, must contain only letters, numbers, and the hyphen (-) character. The name must start with a letter and cannot contain only digits or hyphen.</p>
<p>Starting clone number</p>	<p>Enter a clone number for the starting clone.</p> <p>Each Ready Clone must have a unique name, numbering is used to ensure a unique element in the name.</p>
<p>Increment clone numbers by</p>	<p>Enter a value using which the clone number in the guest virtual machine name must be increased, or leave the default value 1 as is. The system appends a number to the names of the virtual machine Ready Clones (such as clone1, clone2, and clone3). By default, the number starts from 1. You can change this value to any number.</p>
<p>Use same name for Guest Name</p>	<p>Select this check box to use the vCenter VM inventory name as the guest host virtual machine name.</p> <p>If you uncheck this box, a text box is enabled. Enter the name you want to use for the guest host virtual machine name.</p>
<p>Preview</p>	<p>After required fields are completed, HX Data Platform lists the proposed Ready Clones names. As you change the content in the required fields, the Clone Name and Guest Name fields update.</p>
<p>Power on VMs after cloning</p>	<p>Select this check box to turn the guest virtual machines on after the cloning process completes.</p>

Step 4 Click **Clone**.

HX Data Platform creates the number of Ready Clones with the naming and location specified.

Creating Ready Clones Using the HX Data Platform Plug-In

If you use the VMware cloning operation, you can create only a single clone from a VM. This operation is manual and slower than batch processing multiple clones from a VM. For example, to create 20 clones of a VM, you must manually perform the clone operation over and over again.



Note Use HX Data Platform Ready Clones to create multiple clones of a VM in one click!

For example, you can create ten different clones with different static IP addresses from a Windows VM.

Step 1 From the vSphere Web Client Navigator, select **Global Inventory Lists > Virtual Machines**. This displays the list of VMs in vCenter.

Step 2 Select the VM to clone, and open the **Actions** menu. Either right-click the VM or click the **Actions** menu in the VM information portlet.

If needed, view the list of clusters and associated VMs to verify the VM is a storage cluster VM.

Step 3 Select **Cisco HX Data Platform > Ready Clones** to display the Ready Clones dialog box.

Step 4 Specify the following information in the Ready Clones dialog box:

Control	Description
Number of clones	Type the number of clones that you want to create. You can create a batch of 1 through 256 clones at a given time.
Customization Specification	Click the drop-down list and select a Customization Specification for the clone from the drop-down list (which includes the customization specifications available in vCenter). The system filters the customization specifications for the selected host VM. For example, if the selected host VM uses Windows OS for guest VMs, the drop-down list displays Windows OS customization specifications.
VM name prefix	Type a prefix for the guest VM name. Note The VM Name Prefix which is used to name a Ready Clone, must contain only letters, numbers, and the hyphen (-) character. The name must start with a letter and cannot contain only digits or hyphen.
Starting clone number	Type a clone number for the starting clone.
Use same name for 'Guest Name'	Select this check box to use the vCenter VM inventory name as the guest host VM name. If you uncheck this box, a text box is displayed. Enter the name you want to use for the guest host VM name. The system displays the guest VM names in the Guest Name column in the dialog box. There is a similar option in the Customization Specification itself. This HX Data Platform Ready Clone batch customization process overrides the option that you specify in the Customization Specification option.

Control	Description
	<ul style="list-style-type: none"> • If the Customization Specification contains a NIC or network adapter that uses a static gateway and static subnet and the guest name resolves to a static IP address, then the system assigns the network adapter the static IP address associated with the guest name. It also sets the storage cluster name or host name to the guest name specified. • If the Customization Specification contains a NIC or network adapter that obtains the IP address using DHCP, then the systems sets only the storage cluster name or host name to the guest name specified.
Increment clone number by	Type a value using which the clone number in the guest VM name must be increased, or leave the default value 1 as is. The system appends a number to the names of the VM clones (such as clone1, clone2, and clone3). By default, the number starts from 1. You can change this value to any number.
Power on VMs after cloning	Select this check box to turn the guest VMs on after the cloning process completes.

Step 5 Click **OK** to apply your configuration changes.

The vSphere Web Client Recent Tasks tab displays the status of the Ready Clones task. The system displays:

- Top-level progress with the initiator as the logged in vCenter user.
- Implementation work flows with the initiator as the logged in vCenter user and a HX Data Platform extension.
- As part of the Ready Clone workflow a temporary snapshot is listed in vCenter and HX Connect. This is listed as an extra powered off VM transiently, only while the Ready Clones are being created.

Prepare to Customize HX Data Platform Ready Clones

- Create a customization specification per the VMware documentation.
 - Apply the customization settings described in the following topics specific to either Linux or Windows VMs.
- Obtain the IP addresses from the administrator. For example, ten IP addresses 10.64.1.0 through 10.64.1.9.
- Gather information specific to your network such as the subnet mask for these IP addresses.
- Ensure that the base VM is valid (not disconnected, undergoing snapshots, or vMotion).
- Ensure that Guest Tools is installed on the base VM. Update it if necessary.
- Go to the VM Summary tab and verify that Guest Tools is working.

Creating a Customization Specification for Linux in the vSphere Web Client

Use the vSphere Web Client Guest Customization wizard to save guest operating system settings in a specification that you can apply when cloning virtual machines or deploying from templates.

Complete the wizard with the following considerations.

- You can use the HX Data Platform Ready Clones feature to overwrite the guest name that you specify in when you create the customization specification.
- HX Data Platform Ready Clones enable you to use patterns in the VM name or guest name.
- HX Data Platform supports only one NIC.
- Editing the NIC of a Customized Linux VM
 - You can use a fake IP address because the HX Data Platform Ready Clone customization process overwrites this address.
 - HX Data Platform Ready Clones resolve VM guest names to static IP addresses and sets them for the cloned VMs.

The customization specification you created is listed in the Customization Specification Manager. You can use it to customize virtual machine guest operating systems.

Create a Customization Specification for Windows in the vSphere Web Client

Use the vSphere Web Client Guest Customization wizard to save Windows guest operating system settings in a specification that you can apply when cloning virtual machines or deploying from templates.



Note The default administrator password is not preserved for Windows Server 2008 after customization. During customization, the Windows Sysprep utility deletes and recreates the administrator account on Windows Server 2008. You must reset the administrator password when the virtual machine boots the first time after customization.

Complete the wizard with the following considerations:

- The operating system uses this name to identify itself on the network. On Linux systems, it is called the host name.
- HX Data Platform supports only one NIC.
- Editing the NIC of a Customized Windows VM
 - You can use a fake IP address because the HX Data Platform Ready Clone customization process overwrites it.

The customization specification you created is listed in the Customization Specification Manager. You can use it to customize virtual machine guest operating systems.

Configuring Ready Clones Using Customized Specifications

Use a customized specification to ensure IP addresses are applied correctly to the new VMs if you use static IP addresses.

For example, if you create a Windows server VM clone and you use DHCP, the guest VMs are automatically assigned new IP addresses. But, if you use static IP addresses, the IP address is not automatically replicated in the guest VM. To resolve this, configure HX Data Platform Ready Clones using a Customization Specification.

Step 1 Obtain the valid DNS names and ensure that they resolve to valid IP addresses.

For example, to provision a batch of 100 Windows VMs where the guest name is userwinvm1 to userwinvm100, check that userwinvm1 through userwinvm100 are valid IP addresses.

Step 2 Install Guest VM tools on the source VM.

Step 3 Clone the source VM using the Ready Clones feature. The cloned guest VMs obtain the identity of the source VM.

Step 4 Use the Customization Specification to change the identity of all cloned VMs. You can configure parameters such as IP address, host name, and VM name.

Managing Virtual Machine Networking

After you have made changes to your storage cluster, you can ensure that the networking for the virtual machines on the nodes in the clusters is configured correctly. See the UCS Manager documentation for complete virtual machine networking information.

Step 1 Verify the VLANs are configured correctly.

See the VLANs chapter in the *Cisco UCS Manager Network Management Guide* at, [Cisco UCS Manager Network Guide](#).

Step 2 Verify the vNICs are configured correctly.

See the Configuring vNIC Templates topics in the *Cisco UCS Manager Network Management Guide* at, [Cisco UCS Manager Network Guide](#).

Step 3 Verify the Virtual Port Groups are configured correctly.

See the "Add a Virtual Machine Port Group" topic in the *VMware vSphere 7.0 Documentation* on the vmware site.
