

Async Patch Tool 1.1.0.2

VMware Cloud Foundation

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Async Patch Tool 1.1.0.2

1

The Async Patch Tool is a utility that allows you to apply critical patches to certain VMware Cloud Foundation components (NSX Manager, vCenter Server, and ESXi) outside of VMware Cloud Foundation releases. The Async Patch Tool also supports ESXi and VxRail Manager patching of VMware Cloud Foundation on VxRail.

For example, you could use the Async Patch Tool to get a vCenter Server patch that addresses a critical security issue as described in a VMware Security Advisory (VMSA). You use the Async Patch Tool to download the patch and upload it to the internal LCM repository on the SDDC Manager appliance. Then you use the SDDC Manager UI to apply the patch.

Note Patched components will have different versions than those listed in the Bill of Materials (BOM).

The Async Patch Tool is supported with VMware Cloud Foundation 4.2.1 and later. This release also supports ESXi and VxRail Manager patching of VMware Cloud Foundation on VxRail.

The process for downloading and uploading patches varies depending on whether or not the SDDC Manager appliance has access to the internet. If the SDDC Manager appliance has access to the internet (online), you perform all Async Patch Tool operations from the SDDC Manager appliance. If the SDDC Manager appliance does not have access to the internet (offline), you perform some operations from a computer with internet access and some operations from the SDDC Manager appliance. See:

- [Chapter 2 Apply an Async Patch to VMware Cloud Foundation in Online Mode](#)
- [Chapter 3 Apply an Async Patch to VMware Cloud Foundation in Offline Mode](#)

After you apply an async patch, and one or more of the VMware Cloud Foundation component versions deviates from the BOM, you may have to use the Async Patch Tool to enable an upgrade to a later version of VMware Cloud Foundation.

Target version	Requires use of Async Patch Tool?
VMware Cloud Foundation 4.y	<p>Yes.</p> <p>If you are upgrading an async patched system from VMware Cloud Foundation 4.x to 4.y, you must use the Async Patch Tool to enable the upgrade.</p> <p>For example, if you apply a vCenter Server patch to a VMware Cloud Foundation 4.3.1 instance, you must use the Async Patch Tool to enable an upgrade to VMware Cloud Foundation 4.4. See:</p> <ul style="list-style-type: none"> ■ Chapter 4 Upgrade an Async Patched Version of VMware Cloud Foundation in Online Mode ■ Chapter 5 Upgrade an Async Patched Version of VMware Cloud Foundation in Offline Mode
VMware Cloud Foundation 5.0	<p>No.</p> <p>If you are upgrading an async patched system from VMware Cloud Foundation 4.x to 5.0, you do not need to use the Async Patch Tool to enable the upgrade. Upgrades to 5.0 are automatically enabled and you can upgrade using the SDDC Manager UI or the Bundle Transfer Utility. See the VMware Cloud Foundation Lifecycle Management Guide.</p> <hr/> <p>Note You should still use the Async Patch Tool to deactivate all async patches and run an inventory sync before upgrading to VMware Cloud Foundation 5.0. See Chapter 6 VCF Async Patch Tool Options for more information.</p>

For information about known issues, see the [Async Patch Tool Release Notes](#).

Apply an Async Patch to VMware Cloud Foundation in Online Mode

2

If your SDDC Manager appliance has a connection to the internet (either directly or through a proxy server), you can run the Async Patch Tool from the SDDC Manager appliance to download and enable an async patch. Once the patch is successfully enabled, you can use the SDDC Manager UI to apply the patch to all workload domains.

Prerequisites

- Refer to [KB 88287](#) to ensure that the async patch is supported with your version of VMware Cloud Foundation. Contact VMware Support if you have questions about the available async patches and which versions of VMware Cloud Foundation support them.
- You must have the latest version of the Async Patch Tool.

Note If an existing or older version of the Async Patch Tool exists in the directory, you will need to remove these files before downloading the latest version of the Async Patch Tool.

```
rm -r /home/vcf/asyncPatchTool
rm -r <outputdirectory>
```

The default directory is `/home/vcf/apToolBundles` if *outputDirectory* was not specified when the Async Patch Tool was previously run.

-
- Configure TCP keepalive in your SSH client to prevent socket connection timeouts when using the Async Patch Tool for long-running operations.
 - The Async Patch Tool is supported with VMware Cloud Foundation 4.2.1 and later. This release also supports ESXi and VxRail Manager patching of VMware Cloud Foundation on VxRail.

Procedure

- 1 Download the Async Patch Tool to a computer that has access to the SDDC Manager appliance.
 - a Log in to VMware Customer Connect and browse to the Download VMware Cloud Foundation page.
 - b In the **Select Version** field, select your current version of VMware Cloud Foundation.
 - c Click **Drivers & Tools**.

- d Expand VMware Cloud Foundation Tools and click **Go To Downloads** in the Async Patch Tool row.
- e Click **Download Now**.

2 Copy the Async Patch Tool to the SDDC Manager appliance and configure it for use.

- a SSH in to the SDDC Manager appliance using the **vcf** user account.
- b Create the `asyncPatchTool` directory.

```
mkdir /home/vcf/asyncPatchTool
```

- c Copy the Async Patch Tool file (`vcf-async-patch-tool-<version>.tar.gz`) that you downloaded in step 1 to the `/home/vcf/asyncPatchTool` directory.
- d Navigate to `/home/vcf/asyncPatchTool` and extract the contents of `vcf-async-patch-tool-<version>.tar.gz`.

```
tar -xvf vcf-async-patch-tool-<version>.tar.gz
```

- e Set the permissions for the `asyncPatchTool` directory.

```
cd /home/vcf/
```

```
chmod -R 755 asyncPatchTool
```

```
chown -R vcf:vcf asyncPatchTool
```

3 List the available async patches.

- a Navigate to `/home/vcf/asyncPatchTool/bin`.
- b Run the following command:

```
./vcf-async-patch-tool --listAsyncPatch --du customer_connect_email
```

Replace *customer_connect_email* with your VMware Customer Connect email address.

Optionally, you can use the `--sku` and `--productType` options to filter the list of patches. See [Chapter 6 VCF Async Patch Tool Options](#) for details.

`--outputDirectory` is optional and can be used to specify a location for the download. Select a directory that has enough free space for the bundle. If you do not specify a location, the Async Patch Tool displays the default location in its output. For example: `/root/apToolBundles`.

Note If you connect to the internet through a proxy server, use the `--proxyServer`, `--ps` option to specify the FQDN and port of the proxy server. For example, `--proxyServer FQDN:port`.

- c Enter **y** to confirm that you are running the latest version of the Async Patch Tool.

- d Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
- e Enter your VMware Customer Connect (Depot) password.

The Async Patch Tool lists all available async patches.

- 4 (VxRail async patch only) Copy the VxRail async patch-specific partner bundle metadata file using [KB 91830](#).

- 5 Enable an async patch.

- a Run the following command:

VMware Cloud Foundation:

```
./vcf-async-patch-tool -e --patch product:version --du customer_connect_email --sddcSSOUser SSOuser --sddcSSHUser vcf --it ONLINE
```

VMware Cloud Foundation on Dell EMC VxRail:

```
./vcf-async-patch-tool -e --patch product:version --du customer_connect_email --pdu dell_emc_depot_email --sddcSSOUser SSOuser --sddcSSHUser vcf --it ONLINE
```

- Replace *product:version* with the product and version of a patch retrieved in step 3. For example: **VCENTER: 7.0.3.00300-19234570**.
- Replace *customer_connect_email* with your VMware Customer Connect email address.
- Replace *dell_emc_depot_email* with your Dell EMC depot email address. (VxRail only)
- Replace *SSOuser* with the management domain SSO user account, for example, **administrator@vsphere.local**.

Note If you connect to the internet through a proxy server, use the `--proxyServer`, `--ps` option to specify the FQDN and port of the proxy server. For example, `--proxyServer FQDN:port`.

- b Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
- c Read the information and enter **Y** to acknowledge the pre-requisites.
- d Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
- e Enter the password for the super user (**vcf**) account.
- f Enter the password for the root user account.
- g Enter the password for the management domain SSO user account.

- h Enter your VMware Customer Connect (Depot) password.
- i If the product type is `VX_MANAGER`, enter your Dell EMC Depot user name and password. (VxRail only)

The Async Patch Tool downloads the patch and uploads it to the internal LCM repository on the SDDC Manager appliance.

- 6 Log in to the SDDC Manager UI and apply the async patch to all workload domains.
 - For clusters in workload domains with vSphere Lifecycle Manager baselines, you can upgrade ESXi to the async patch version with a custom ISO from your vendor. See "Upgrade ESXi with Custom ISOs" in *VMware Cloud Foundation Lifecycle Management*.
 - For clusters in workload domains with vSphere Lifecycle Manager images, you can upgrade ESXi to the async patch version by following the procedure "Upgrade ESXi with vSphere Lifecycle Manager Images for VMware Cloud Foundation" in *VMware Cloud Foundation Lifecycle Management*.
- 7 After the async patch is successfully applied, use the Async Patch Tool to deactivate the patch.
 - a SSH in to the SDDC Manager appliance using the **vcf** user account.
 - b Navigate to `/home/vcf/asyncPatchTool/bin`.
 - c Run the following command:

```
./vcf-async-patch-tool --disableAllPatches --sddcSSOUser SSOuser --sddcSSHUser vcf
```

Replace *SSOuser* with the management domain SSO user account, for example, **administrator@vsphere.local**.

- d Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
 - e Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
 - f Enter the password for the super user (**vcf**) account.
 - g Enter the password for the root user account.
 - h Enter the password for the management domain SSO user account.
- 8 (VxRail only) If you applied an async patch to VMware Cloud Foundation on Dell VxRail, reconnect SDDC Manager to the VMware Depot using the SDDC Manager UI or VMware Cloud Foundation API.

What to do next

If you deploy a new workload domain after you have applied an async patch, that workload domain will not include the async patch. Use this procedure to apply the async patch to the new workload domain.

Note After you update the hosts in a workload domain to an async patch version of ESXi, any new hosts that you add to the workload domain must use the async patch version of ESXi and not the version listed in the VMware Cloud Foundation BOM.

Apply an Async Patch to VMware Cloud Foundation in Offline Mode

3

If your SDDC Manager appliance does not have a connection to the internet, you can run the Async Patch Tool from a computer that does. Download an async patch, copy the patch and the Async Patch Tool to the SDDC Manager appliance, and enable the patch. You can then use the SDDC Manager UI to apply the patch to all workload domains.

Prerequisites

- A Windows or Linux computer with internet connectivity (either directly or through a proxy server) for downloading the bundles.
- The computer must have Java 8 or Java 11.
- A Windows or Linux computer with access to the SDDC Manager appliance for uploading the bundles.
- Refer to [KB 88287](#) to ensure that the async patch is supported with your version of VMware Cloud Foundation. Contact VMware Support if you have questions about the available async patches and which versions of VMware Cloud Foundation support them.
- You must have the latest version of the Async Patch Tool.

Note If an existing or older version of the Async Patch Tool exists in the directory, you will need to remove these files from both the Linux or Windows computer and the SDDC manager before downloading the latest version of the Async Patch Tool.

```
rm -r <AP Tool directory>
```

```
rm -r <outputdirectory>
```

The default directory is `/home/vcf/apToolBundles` if *outputDirectory* was not specified when the Async Patch Tool was previously run.

-
- Configure TCP keepalive in your SSH client to prevent socket connection timeouts when using the Async Patch Tool for long-running operations.
 - The Async Patch Tool is supported with VMware Cloud Foundation 4.2.1 and later. This release also supports ESXi and VxRail Manager patching of VMware Cloud Foundation on VxRail.

Procedure

- 1 Download the Async Patch Tool to a computer that has access to the internet.
 - a Log in to VMware Customer Connect and browse to the Download VMware Cloud Foundation page.
 - b In the **Select Version** field, select your current version of VMware Cloud Foundation.
 - c Click **Drivers & Tools**.
 - d Expand VMware Cloud Foundation Tools and click **Go To Downloads** in the Async Patch Tool row.
 - e Click **Download Now**.
- 2 Extract `vcf-async-patch-tool-<version>.tar.gz`.
- 3 Navigate to `vcf-async-patch-tool-<version>/bin` and confirm that you have execute permissions.
- 4 List the available async patches.
 - a Run the following command:

Linux:

```
./vcf-async-patch-tool --listAsyncPatch --du customer_connect_email
```

Windows:

```
vcf-async-patch-tool.bat --listAsyncPatch --du customer_connect_email
```

Replace `customer_connect_email` with your VMware Customer Connect email address.

Optionally, you can use the `--sku` and `--productType` options to filter the list of patches. See [Chapter 6 VCF Async Patch Tool Options](#) for details.

`--outputDirectory` is optional and can be used to specify a location for the download. Select a directory that has enough free space for the bundle. If you do not specify a location, the Async Patch Tool displays the default location in its output. For example: `/root/apToolBundles`.

Note If you connect to the internet through a proxy server, use the `--proxyServer`, `--ps` option to specify the FQDN and port of the proxy server. For example, `--proxyServer FQDN:port`.

- b Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
- c Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
- d Enter your VMware Customer Connect (Depot) password.

The Async Patch Tool lists all available async patches.

- 5 (VxRail async patch only) Copy the VxRail async patch-specific partner bundle metadata file using [KB 91830](#).
- 6 Download an async patch.

- a Run the following command:

Linux:

```
./vcf-async-patch-tool -d --patch product:version --du customer_connect_email --sku sku_type --pdu dell_emc_depot_email
```

Windows:

```
vcf-async-patch-tool.bat -d --patch product:version --du customer_connect_email --sku sku_type --pdu dell_emc_depot_email
```

- Replace *product:version* with the product and version of a patch retrieved in step 4. For example: **VCENTER: 7.0.3.00300-19234570**.
- Replace *customer_connect_email* with your VMware Customer Connect email address.
- Replace *sku_type* with **VCF** or **VCF_ON_VXRAIL**.
- Replace *dell_emc_depot_email* with your Dell EMC Depot email address. (VxRail only)
- `--outputDirectory` is optional and can be used to specify a location for the download. Select a directory that has enough free space for the bundle. If you do not specify a location, the Async Patch Tool displays the default location in its output. For example: `/root/apToolBundles`.

Note If you connect to the internet through a proxy server, use the `--proxyServer`, `--ps` option to specify the FQDN and port of the proxy server. For example, `--proxyServer FQDN:port`.

- b Enter **y** to confirm that you are running the latest version of the Async Patch Tool.
- c Enter your VMware Customer Connect (Depot) password.
- d If the product type is `VX_MANAGER`, enter your Dell EMC Depot user name and password. (VxRail only)

The Async Patch Tool downloads the patch and required artifacts (for example, the LCM manifest).

7 Copy the patch and set permissions.

- a Copy the entire output directory (for example, `apToolBundles`) to the SDDC Manager appliance.

You can select any location that has enough free space available, for example, `/nfs/vmware/vcf/nfs-mount/apToolBundles`.

- b SSH in to the SDDC Manager appliance using the `vcf` user account.
- c Navigate to `/nfs/vmware/vcf/nfs-mount/apToolBundles`.

If you copied the output directory to a different location, navigate to that directory instead.

- d Run the following commands:

```
chmod -R 755 apToolBundles
```

```
chown -R vcf:vcf apToolBundles
```

8 Copy the Async Patch Tool to the SDDC Manager appliance and configure it for use.

- a SSH in to the SDDC Manager appliance using the `vcf` user account.
- b Create the `asyncPatchTool` directory.

```
mkdir /home/vcf/asyncPatchTool
```

- c Copy the entire contents of the Async Patch Tool directory from the computer with internet access to the `/home/vcf/asyncPatchTool` directory on the SDDC Manager appliance.

- d Set the permissions for the `asyncPatchTool` directory.

```
cd /home/vcf/
```

```
chmod -R 755 asyncPatchTool
```

```
chown -R vcf:vcf asyncPatchTool
```

9 Enable an async patch.

- a Navigate to `/home/vcf/asyncPatchTool/bin` and run the following command:

```
./vcf-async-patch-tool -e --patch product:version --sddcSSOUser SSOuser --sddcSSHUser vcf --outputDirectory bundleDirectory --it OFFLINE
```

- Replace *product:version* with the product and version of a patch retrieved in step 4. For example: **VCENTER:7.0.3.00300-19234570**.
 - Replace *SSOuser* with the management domain SSO user account, for example, **administrator@vsphere.local**.
 - Replace *bundleDirectory* with the location of the bundle directory from step 6. For example, `/nfs/vmware/vcf/nfs-mount/apToolBundles`.
- b Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
- c Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
- d Read the information and enter **Y** to acknowledge the pre-requisites.
- e Enter the password for the super user (**vcf**) account.
- f Enter the password for the root user account.
- g Enter the password for the management domain SSO user account.

The Async Patch Tool uploads the patch to the internal LCM repository on the SDDC Manager appliance.

10 Log in to the SDDC Manager UI and apply the async patch to all workload domains.

- For clusters in workload domains with vSphere Lifecycle Manager baselines, you can upgrade ESXi to the async patch version with a custom ISO from your vendor. See "Upgrade ESXi with Custom ISOs" in *VMware Cloud Foundation Lifecycle Management*.
- For clusters in workload domains with vSphere Lifecycle Manager images, you can upgrade ESXi to the async patch version by following the procedure "Upgrade ESXi with vSphere Lifecycle Manager Images for VMware Cloud Foundation" in *VMware Cloud Foundation Lifecycle Management*.

11 After the async patch is successfully applied, use the Async Patch Tool to deactivate the patch.

- a SSH in to the SDDC Manager appliance using the **vcf** user account.
- b Navigate to `/home/vcf/asyncPatchTool/bin`.

- c Run the following command:

```
./vcf-async-patch-tool --disableAllPatches --sddcSSOUser SSOuser --sddcSSHUser vcf
```

Replace *SSOuser* with the management domain SSO user account, for example, **administrator@vsphere.local**.

- d Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
- e Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
- f Enter the password for the super user (**vcf**) account.
- g Enter the password for the root user account.
- h Enter the password for the management domain SSO user account.

What to do next

If you deploy a new workload domain after applying an async patch, that workload domain will not include the async patch. Use this procedure to apply the async patch to the new workload domain.

Note After you update the hosts in a workload domain to an async patch version of ESXi, any new hosts that you add to the workload domain must use the async patch version of ESXi and not the version listed in the VMware Cloud Foundation BOM.

Upgrade an Async Patched Version of VMware Cloud Foundation in Online Mode

4

After you apply an async patch, and one or more of the VMware Cloud Foundation component versions deviates from the BOM, you may have to use the Async Patch Tool to enable an upgrade to a later version of VMware Cloud Foundation.

After you apply an async patch, and one or more of the VMware Cloud Foundation component versions deviates from the BOM, the process for upgrading to a later version of VMware Cloud Foundation depends on the target version of VMware Cloud Foundation.

Target Version	Upgrade Process
VMware Cloud Foundation 4.y	<p>You must use the Async Patch Tool to enable an upgrade to a later version of VMware Cloud Foundation.</p> <p>For example, if you apply a vCenter Server patch to a VMware Cloud Foundation 4.3.1 instance, you must use the Async Patch Tool to enable upgrade to VMware Cloud Foundation 4.4.</p> <p>The following procedure describes this process.</p>
VMware Cloud Foundation 5.0	<p>Upgrades to 5.0 are automatically enabled and you can upgrade using the SDDC Manager UI.</p> <p>This process is described in the VMware Cloud Foundation Lifecycle Management Guide.</p> <p>Note You should still use the Async Patch Tool to deactivate all async patches and run an inventory sync before upgrading to VMware Cloud Foundation 5.0. See Chapter 6 VCF Async Patch Tool Options for more information.</p>

If your SDDC Manager appliance has a connection to the internet (either directly or through a proxy server), you can run the Async Patch Tool from the SDDC Manager appliance to download and enable upgrade bundles. Once the bundles are successfully enabled, you can use the SDDC Manager UI to upgrade VMware Cloud Foundation.

If you configured a connection to the VMware Depot in the SDDC Manager UI (**Administration > Repository Settings**), then the upgrade bundles get downloaded automatically. However, you cannot apply the bundles to a workload domain until use this procedure to enable the upgrade.

Prerequisites

- Refer to [KB 88287](#) to ensure that the target version of VMware Cloud Foundation is supported for upgrade. Contact VMware Support if you have questions about support for your upgrade path.
- You must have the latest version of the Async Patch Tool.

Note If an existing or older version of the Async Patch Tool exists in the directory, you will need to remove these files from both the Linux or Windows computer and the SDDC manager before downloading the latest version of the Async Patch Tool.

```
rm -r <AP Tool directory>
```

```
rm -r <outputdirectory>
```

The default directory is `/home/vcf/apToolBundles` if *outputDirectory* was not specified when the Async Patch Tool was previously run.

-
- Configure TCP keepalive in your SSH client to prevent socket connection timeouts when using the Async Patch Tool for long-running operations.
 - The Async Patch Tool is supported with VMware Cloud Foundation 4.2.1 and later. This release also supports ESXi and VxRail Manager patching of VMware Cloud Foundation on VxRail.
 - You are upgrading from VMware Cloud Foundation 4.x to VMware Cloud Foundation 4.y.

Note This procedure is not required if you are upgrading from VMware Cloud Foundation 4.x to VMware Cloud Foundation 5.0.

Procedure

- 1 SSH in to the SDDC Manager appliance using the `vcf` user account.
- 2 Navigate to `/home/vcf/asyncPatchTool/bin`.

3 Enable the upgrade.

- a Run the following command:

VMware Cloud Foundation:

```
./vcf-async-patch-tool --enableVCFUpgrade targetVcfVersion --du customer_connect_email
--sddcSSOUser ssoUsername --sddcSSHUser vcf --it ONLINE
```

VMware Cloud Foundation on Dell EMC VxRail:

```
./vcf-async-patch-tool --enableVCFUpgrade targetVcfVersion --du customer_connect_email
--pdu dell_emc_depot_email --sddcSSOUser ssoUsername --sddcSSHUser vcf --it ONLINE
```

- Replace *targetVcfVersion* with the target version of VMware Cloud Foundation. For example: **4.4.0.0**.
- Replace *customer_connect_email* with your VMware Customer Connect email address.
- Replace *dell_emc_depot_email* with your Dell EMC depot email address. (VxRail only)
- Replace *ssoUsername* with the management domain SSO user account, for example, **administrator@vsphere.local**.
- `--outputDirectory` is optional and can be used to specify a location for the bundle download. If you do not specify a location, the Async Patch Tool download to the default location, `/root/apToolBundles`.

Note Ensure that the output directory has enough free space for the bundles.

Note If you connect to the internet through a proxy server, use the `--proxyServer`, `--ps` option to specify the FQDN and port of the proxy server. For example, `--proxyServer FQDN:port`.

- b Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
- c Enter **Y** or **N** to choose whether or not to participate in the VMware Customer Experience Improvement Program (CEIP).
- d Read the information and enter **Y** to acknowledge the pre-requisites.
- e Enter the password for the super user (**vcf**) account.
- f Enter the password for the root user account.
- g Enter the password for the management domain SSO user account.
- h Enter your VMware Customer Connect (Depot) password.
- i If the product type is `VX_MANAGER`, enter your Dell EMC Depot user name and password. (VxRail only)
- j Enter **Y** or **N** to choose whether or not to download vRealize bundles.

The Async Patch Tool determines which bundles are required, downloads the bundles, and uploads them to the internal LCM repository on the SDDC Manager appliance.

- 4 Log in to the SDDC Manager UI and apply the bundles to all workload domains.

Upgrade an Async Patched Version of VMware Cloud Foundation in Offline Mode

5

After you apply an async patch, and one or more of the VMware Cloud Foundation component versions deviates from the BOM, you may have to use the Async Patch Tool to enable an upgrade to a later version of VMware Cloud Foundation.

After you apply an async patch, and one or more of the VMware Cloud Foundation component versions deviates from the BOM, the process for upgrading to a later version of VMware Cloud Foundation depends on the target version of VMware Cloud Foundation.

Target Version	Upgrade Process
VMware Cloud Foundation 4.y	<p>You must use the Async Patch Tool to enable an upgrade to a later version of VMware Cloud Foundation.</p> <p>For example, if you apply a vCenter Server patch to a VMware Cloud Foundation 4.3.1 instance, you must use the Async Patch Tool to enable upgrade to VMware Cloud Foundation 4.4.</p> <p>The following procedure describes this process.</p>
VMware Cloud Foundation 5.0	<p>Upgrades to 5.0 are automatically enabled and you can upgrade using the Bundle Transfer Utility and SDDC Manager UI.</p> <p>This process is described in the VMware Cloud Foundation Lifecycle Management Guide.</p> <p>Note You should still use the Async Patch Tool to deactivate all async patches and run an inventory sync before upgrading to VMware Cloud Foundation 5.0. See Chapter 6 VCF Async Patch Tool Options for more information.</p>

If your SDDC Manager appliance does not have a connection to the internet, you can run the Async Patch Tool from a computer that does. Download the upgrade bundles to the computer, copy the bundles to the SDDC Manager appliance, and enable the upgrade using the Async Patch Tool. You can then use the SDDC Manager UI to upgrade VMware Cloud Foundation.

Prerequisites

- A Windows or Linux computer with internet connectivity (either directly or through a proxy server) for downloading the bundles.
- The computer must have Java 8 or Java 11.

- A Windows or Linux computer with access to the SDDC Manager appliance for uploading the bundles.
- Refer to [KB 88287](#) to ensure that the target version of VMware Cloud Foundation is supported for upgrade. Contact VMware Support if you have questions about support for your upgrade path.
- You must have the latest version of the Async Patch Tool.

Note If an existing or older version of the Async Patch Tool exists in the directory, you will need to remove these files from both the Linux or Windows computer and the SDDC manager before downloading the latest version of the Async Patch Tool.

```
rm -r <AP Tool directory>
```

```
rm -r <outputdirectory>
```

The default directory is `/home/vcf/apToolBundles` if *outputDirectory* was not specified when the Async Patch Tool was previously run.

-
- Configure TCP keepalive in your SSH client to prevent socket connection timeouts when using the Async Patch Tool for long-running operations.
 - The Async Patch Tool is supported with VMware Cloud Foundation 4.2.1 and later. This release also supports ESXi and VxRail Manager patching of VMware Cloud Foundation on VxRail.
 - You are upgrading from VMware Cloud Foundation 4.x to VMware Cloud Foundation 4.y.

Note This procedure is not required if you are upgrading from VMware Cloud Foundation 4.x to VMware Cloud Foundation 5.0.

Procedure

1 Download upgrade bundles.

- a On the computer with internet access, navigate to `vcf-async-patch-tool-<version>/bin`.
- b Run the following command:

Linux VMware Cloud Foundation:

```
./vcf-async-patch-tool --download --targetVcfVersion targetVcfVersion --
sourceVcfVersion sourceVcfVersion --sku VCF --depotUser customer_connect_email
```

Linux VMware Cloud Foundation on Dell EMC VxRail:

```
./vcf-async-patch-tool --download --targetVcfVersion targetVcfVersion --
sourceVcfVersion sourceVcfVersion --sku VCF_ON_VXRAIL --depotUser
customer_connect_email --pdu dell_emc_depot_email
```

Windows VMware Cloud Foundation:

```
vcf-async-patch-tool.bat --download --targetVcfVersion targetVcfVersion --
sourceVcfVersion sourceVcfVersion --sku VCF --depotUser customer_connect_email
```

Windows VMware Cloud Foundation on Dell EMC VxRail:

```
vcf-async-patch-tool.bat --download --targetVcfVersion targetVcfVersion
--sourceVcfVersion sourceVcfVersion --sku VCF_ON_VXRAIL --depotUser
customer_connect_email --pdu dell_emc_depot_email
```

- Replace *targetVcfVersion* with the target version of VMware Cloud Foundation. For example: **4.4.0.0**.
- Replace *sourceVcfVersion* with the source version of VMware Cloud Foundation. For example: **4.3.1.0**.
- Replace *customer_connect_email* with your VMware Customer Connect email address.
- Replace *dell_emc_depot_email* with your Dell EMC depot email address. (VxRail only)
- `--outputDirectory` is optional and can be used to specify a location for the download. Choose a directory that has enough free space for the bundles. If you do not specify a location, the Async Patch Tool displays the default location in its output. For example: `/root/apToolBundles`.

Note If you connect to the internet through a proxy server, use the `--proxyServer`, `--ps` option to specify the FQDN and port of the proxy server. For example, `--proxyServer FQDN:port`.

- c Enter **y** to confirm that you are running the latest version of the Async Patch Tool.

- d Enter your VMware Customer Connect (Depot) password.
- e If the product type is `VX_MANAGER`, enter your Dell EMC Depot user name password. (VxRail only)
- f Enter **Y** or **N** to choose whether or not to download vRealize bundles.

The Async Patch Tool determines which bundles are required and downloads the bundles .

2 Copy the upgrade bundles and set permissions.

- a Copy the entire output directory (for example, `apToolBundles`) to the SDDC Manager appliance.

You can choose any location that has enough free space available, for example, `/nfs/vmware/vcf/nfs-mount/apToolBundles`.

- b SSH in to the SDDC Manager appliance using the **vcf** user account.
- c Navigate to `/nfs/vmware/vcf/nfs-mount/apToolBundles`.

If you copied the output directory to a different location, navigate to that directory instead.

- d Run the following commands:

```
chmod -R 755 apToolBundles
```

```
chown -R vcf:vcf apToolBundles
```

3 Enable the upgrade.

- a Navigate to `/home/vcf/asyncPatchTool/bin`.
- b Run the following command:

```
./vcf-async-patch-tool --enableVCFUpgrade targetVcfVersion --sddcSSOUser ssoUsername --sddcSSHUser vcf --outputDirectory bundleDirectory --it OFFLINE
```

- Replace *targetVcfVersion* with the target version of VMware Cloud Foundation. For example: **4.4.0.0**.
 - Replace *ssoUsername* with the management domain SSO user account, for example **administrator@vsphere.local**.
 - Replace *bundleDirectory* with the location of the bundle directory from step 2. For example, `/nfs/vmware/vcf/nfs-mount/apToolBundles`.
- c Enter **Y** to confirm that you are running the latest version of the Async Patch Tool.
- d Read the information and enter **Y** to acknowledge the pre-requisites.
- e Enter the password for the super user (**vcf**) account.

- f Enter the password for the root user account.
- g Enter the password for the management domain SSO user account.

The Async Patch Tool uploads the upgrade bundles to the internal LCM repository on the SDDC Manager appliance.

- 4 Log in to the SDDC Manager UI and apply the bundles to all workload domains.

VCF Async Patch Tool Options

6

The Async Patch Tool is a utility that allows you to apply critical patches outside of the normal VMware Cloud Foundation lifecycle management process. It also provides options for managing async patches and upgrading a VMware Cloud Foundation instance that includes async patches.

Async Patch Tool Help Option

Option	Description
<code>-h, --help</code>	Provides information about the Async Patch Tool options.

Example:

```
./vcf-async-patch-tool -h
```

Customer Experience Improvement Program (CEIP) Option

The Async Patch Tool participates in the VMware Customer Experience Improvement Program (CEIP). You can enable or deactivate CEIP for the Async Patch Tool.

The Customer Experience Improvement Program provides VMware with information that enables VMware to improve its products and services, to fix problems, and to advise you on how best to deploy and use our products. As part of the CEIP, VMware collects technical information about your organization's use of the VMware products and services regularly in association with your organization's VMware license keys. This information does not personally identify any individual. For additional information regarding the CEIP, refer to the Trust & Assurance Center at <http://www.vmware.com/trustvmware/ceip.html>.

Option	Description
<code>--ceip true/false</code>	Enable or deactivate telemetry (CEIP) for the Async Patch Tool. Note The <code>--ceip</code> option is deprecated. You will be prompted to specify the CEIP settings when running other options using the Async Patch Tool, for example, <code>-l, --listAsyncPatch</code> or <code>-e, --enableAsyncPatch</code> .

Example:

```
./vcf-async-patch-tool -ceip false
```

List Async Patches Option

This option requires an internet connection. Use this option before applying an async patch. See [Chapter 2 Apply an Async Patch to VMware Cloud Foundation in Online Mode](#) and [Chapter 3 Apply an Async Patch to VMware Cloud Foundation in Offline Mode](#).

Option	Description
-l, --listAsyncPatch	Lists the available async patches. Refer to KB 88287 to see which versions of VMware Cloud Foundation support each async patch.

Required Inputs	Optional Inputs
<p>--depotUser, --du</p> <p>Enter your VMware Customer Connect email address for connecting with the VMware Depot.</p>	<ul style="list-style-type: none"> ■ --sku <p>Filters the async patch list by SKU. Enter VCF or VCF_ON_VXRAIL.</p> ■ --productType, --ptype <p>Filters the async patch list by product type. Enter ESX_HOST, NSX, or VCENTER.</p> <hr/> <p>Note Product type ESX_HOST is not available for VMware Cloud Foundation on Dell EMC VxRail.</p> <hr/> ■ --proxyServer, --ps <p>If you connect to the internet through a proxy server, use the --proxyServer, --ps option to specify the FQDN and port of the proxy server. For example, --proxyServer FQDN:port.</p>

Example:

```
./vcf-async-patch-tool --listAsyncPatch --depotUser user@vmware.com --productType VCENTER
```

Enable Patch Option

The enable patch option must be run on the SDDC Manager appliance. After you enable an async patch, you can log in to the SDDC Manager UI and apply the patch to all workload domains. See [Chapter 2 Apply an Async Patch to VMware Cloud Foundation in Online Mode](#) and [Chapter 3 Apply an Async Patch to VMware Cloud Foundation in Offline Mode](#).

Option	Description
<code>-e, --enableAsyncPatch</code>	Enabling a patch performs an inventory sync, bundle download (online mode only), enable patch precheck, and enable patch postcheck. It also uploads the patch to the SDDC Manager appliance internal LCM repository.

Required Inputs	Optional Inputs
<ul style="list-style-type: none"> ■ <code>--patch</code> Enter the product and version (product:version) of an async patch. For example: VCENTER:7.0.3.00300-19234570. ■ <code>--sddcSSOUser, --ssou</code> Enter the management domain SSO user. For example: administrator@vsphere.local. ■ <code>--sddcSSHUser, --sshu</code> Enter vcf. ■ <code>--depotUser, --du</code> (online only) Enter your VMware Customer Connect email address for connecting with the VMware Depot. ■ <code>--partnerBundleDepotUserName, --pdu</code> (online VxRail only) Enter your Dell EMC depot email address. ■ <code>--instanceType, --it</code> Enter ONLINE or OFFLINE. 	<ul style="list-style-type: none"> ■ <code>--op, --outputDirectory</code> Enter the full path to the location to download the patch (online mode) or the location to which you uploaded the patch (offline mode). For example, <code>/nfs/vmware/vcf/nfs-mount/apToolBundles.</code> If you do not specify an output directory the Async Patch Tool uses <code>/root/apToolBundles.</code> ■ <code>--proxyServer, --ps</code> If you connect to the internet through a proxy server, use the <code>--proxyServer, --ps</code> option to specify the FQDN and port of the proxy server. For example, <code>--proxyServer FQDN:port.</code>

Example:

```
./vcf-async-patch-tool -e --patch VCENTER:7.0.3.00300-19234570 --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf --outputDirectory /nfs/vmware/vcf/nfs-mount/apToolBundles --it ONLINE
```

Precheck Option

Prechecks are performed as part of the `-e, --enableAsyncPatch` and `-r, --enableVCFUpgrade` options. You can also run the precheck option on its own prior to enabling an async patch or enabling a VCF upgrade to make sure the operation will succeed. You must run the precheck option on the SDDC Manager appliance.

Option	Description
<code>--pre, --precheck</code>	Validates that the system is able to enable an async patch or enable a VCF upgrade.

Required Inputs	Optional Inputs
<ul style="list-style-type: none"> ■ <code>-e, --enableAsyncPatch</code> Or <code>-r, --enableVCFUpgrade</code> For <code>-r, --enableVCFUpgrade</code> you must provide the target version for VCF. For example: 4.4.0.0. ■ <code>--patch</code> (enable patch only) Enter the product and version (product:version) of an async patch. For example: VCENTER:7.0.3.00300-19234570. ■ <code>--sddcSSOUser, --ssou</code> Enter the management domain SSO user. For example: administrator@vsphere.local. ■ <code>--sddcSSHUser, --sshu</code> Enter vcf. ■ <code>--depotUser, --du</code> (online only) Enter your VMware Customer Connect email address for connecting with the VMware Depot. ■ <code>--partnerBundleDepotUserName, --pdu</code> (online, VxRail, enable VCF upgrade only) Enter your Dell EMC depot email address. ■ <code>--instanceType, --it</code> Enter ONLINE or OFFLINE. ■ <code>--op, --outputDirectory</code> (offline only) Enter the full path to the location to which you uploaded the patch or bundles. For example, <code>/nfs/vmware/vcf/nfs-mount/apToolBundles</code>. 	<ul style="list-style-type: none"> ■ <code>--op, --outputDirectory</code> (online only) Enter the full path to the location to download the patch or bundles. For example, <code>/nfs/vmware/vcf/nfs-mount/apToolBundles</code>. If you do not specify an output directory the Async Patch Tool uses <code>/root/apToolBundles</code>. ■ <code>--proxyServer, --ps</code> If you connect to the internet through a proxy server, use the <code>--proxyServer, --ps</code> option to specify the FQDN and port of the proxy server. For example, <code>--proxyServer FQDN:port</code>.

Online Mode Example:

```
./vcf-async-patch-tool -e --pre --patch VCENTER:7.0.3.00300-19234570 --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf --depotUser user@vmware.com --outputDirectory /nfs/vmware/vcf/nfs-mount/apToolBundles --it ONLINE
```

Offline Mode Example:

```
./vcf-async-patch-tool --pre --enableVCFUpgrade 4.4.0.0 --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf --outputDirectory /nfs/vmware/vcf/nfs-mount/apToolBundles --it OFFLINE
```

Postcheck Option

Postchecks are performed as part of the `-e, --enableAsyncPatch` option. You can also run the postcheck option on its own after enabling an async patch. You must run the postcheck option on the SDDC Manager appliance.

Option	Description
<code>--post, --postcheck</code>	Validates that an async patch has been uploaded to the SDDC Manager appliance internal LCM repository and is available for upgrade.

Required Inputs	Optional Inputs
<ul style="list-style-type: none"> ■ <code>-e, --enableAsyncPatch</code> ■ <code>--patch</code> Enter the product and version (product:version) of an async patch. For example: VCENTER:7.0.3.00300-19234570. ■ <code>--sddcSSOUser, --ssou</code> Enter the management domain SSO user. For example: administrator@vsphere.local. ■ <code>--sddcSSHUser, --sshu</code> Enter vcf. ■ <code>--op, --outputDirectory</code> Enter the full path to the bundle download location that you used when you enabled the patch. For example, <code>/nfs/vmware/vcf/nfs-mount/apToolBundles.</code> 	None.

Example:

```
./vcf-async-patch-tool -e --post --patch VCENTER:7.0.3.00300-19234570 --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf --outputDirectory /nfs/vmware/vcf/nfs-mount/apToolBundles
```

Deactivate All Patches Option

You cannot enable async patches or enable VCF Upgrades if your VMware Cloud Foundation instance already has any async patches enabled. All patches are deactivated when you run the Async Patch Tool with `-r, --enableVCFUpgrade` option. You can also run the `--disableAllPatches` option on its own. You must run the option on the SDDC Manager appliance.

Option	Description
<code>--da, --disableAllPatches</code>	Deactivates all async patches on the system that were previously enabled.

Required Inputs	Optional Inputs
<ul style="list-style-type: none"> ■ <code>--sddcSSOUser, --ssou</code> Enter the management domain SSO user. For example: administrator@vsphere.local. ■ <code>--sddcSSHUser, --sshu</code> Enter vcf. 	None.

Example:

```
./vcf-async-patch-tool -disableAllPatches --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf
```

Enable VCF Upgrade Option

The enable VCF upgrade option must be run on the SDDC Manager appliance. After you apply an async patch, and one or more of the VMware Cloud Foundation component versions deviates from the BOM, you must use the Async Patch Tool to upgrade from VMware Cloud Foundation 4.x to VMware Cloud Foundation 4.y.

Note If you are upgrading to VMware Cloud Foundation 5.0, you do not need to use the Async Patch Tool to enable upgrade. You should still use the Async Patch Tool to deactivate all async patches and run an inventory sync before upgrading to VMware Cloud Foundation 5.0.

The `-r, --enableVCFUpgrade` option prepares an async patched environment for upgrade and uploads the upgrade bundles to the SDDC Manager appliance internal LCM repository. See [Chapter 4 Upgrade an Async Patched Version of VMware Cloud Foundation in Online Mode](#) and [Chapter 5 Upgrade an Async Patched Version of VMware Cloud Foundation in Offline Mode](#).

Option	Description
<code>-r, --enableVCFUpgrade</code> Requires the target version for VCF. For example: 4.4.0.0 .	Enables upgrade to a target version of VMware Cloud Foundation.

Required Inputs	Optional Inputs
<ul style="list-style-type: none"> ■ <code>--sddcSSOUser, --ssou</code> Enter the management domain SSO user. For example: administrator@vsphere.local. ■ <code>--sddcSSHUser, --sshu</code> Enter vcf. ■ <code>--depotUser, --du</code> (online only) Enter your VMware Customer Connect email address for connecting with the VMware Depot. ■ <code>--partnerBundleDepotUserName, --pdu</code> (online VxRail only) Enter your Dell EMC depot email address. ■ <code>--instanceType, --it</code> Enter ONLINE or OFFLINE. ■ <code>--op, --outputDirectory</code> (required for offline only) Enter the full path to the location to which you uploaded the patch or bundles. For example, <code>/nfs/vmware/vcf/nfs-mount/apToolBundles</code>. 	<ul style="list-style-type: none"> ■ <code>--op, --outputDirectory</code> (optional for online) Enter the full path to the location to download the patch or bundles. For example, <code>/nfs/vmware/vcf/nfs-mount/apToolBundles</code>. If you do not specify an output directory the Async Patch Tool uses <code>/root/apToolBundles</code>. ■ <code>--proxyServer, --ps</code> If you connect to the internet through a proxy server, use the <code>--proxyServer, --ps</code> option to specify the FQDN and port of the proxy server. For example, <code>--proxyServer FQDN:port</code>.

Online Mode Example:

```
./vcf-async-patch-tool --enableVCFUpgrade 4.4.0.0 --depotUser user@vmware.com --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf --it ONLINE
```

Offline Mode Example:

```
./vcf-async-patch-tool --enableVCFUpgrade 4.4.0.0 --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf --outputDirectory /nfs/vmware/vcf/nfs-mount/apToolBundles --it OFFLINE
```

Inventory Sync Option

Inventory sync is performed as part of the `-e, --enableAsyncPatch` and `-r, --enableVCFUpgrade` options. You can also run the inventory sync option on its own. You must run the inventory sync option on the SDDC Manager appliance.

This option updates the SDDC Manager inventory with the accurate information about the versions of vCenter Server, NSX, and VMware ESXi that are running in your VMware Cloud Foundation instance. The SDDC Manager inventory can get out of sync if you upgrade any of these components outside of VMware Cloud Foundation.

Option	Description
<code>--performInventorySync, --sync</code>	Updates the SDDC Manager inventory and saves a CSV file with information about each VMware Cloud Foundation component.

Sample output file (in /home/vcf/asyncPatchTool/bin):

Software Type	FQDN	Before sync Inventory Version	Current Version	Domain Id(s)	Domain Names	Cluster name
VCENTER	vcenter-1.vrack.vsphere.local	7.0.3.00500-19480866	7.0.3.00500-19480866	[48de0377-98ac-41c8-8dfc-fb916a76af19]	[sddcid-1001]	
NSXT_CLUSTER	vip-nsx-mgmt.vrack.vsphere.local	3.1.3.7.4-19762317	3.1.3.7.4-19762317	[48de0377-98ac-41c8-8dfc-fb916a76af19]	[sddcid-1001]	
ESXI	esxi-1.vrack.vsphere.local	7.0.3-19482537	7.0.3-19482537	[48de0377-98ac-41c8-8dfc-fb916a76af19]	[sddcid-1001]	SDDC-Cluster1
ESXI	esxi-2.vrack.vsphere.local	7.0.3-19482537	7.0.3-19482537	[48de0377-98ac-41c8-8dfc-fb916a76af19]	[sddcid-1001]	SDDC-Cluster1
ESXI	esxi-3.vrack.vsphere.local	7.0.3-19482537	7.0.3-19482537	[48de0377-98ac-41c8-8dfc-fb916a76af19]	[sddcid-1001]	SDDC-Cluster1
ESXI	esxi-4.vrack.vsphere.local	7.0.3-19482537	7.0.3-19482537	[48de0377-98ac-41c8-8dfc-fb916a76af19]	[sddcid-1001]	SDDC-Cluster1

Note In this example, no versions were updated as part of the inventory sync.

Required Inputs	Optional Inputs
<ul style="list-style-type: none"> ■ <code>--sddcSSOUser, --ssou</code> Enter the management domain SSO user. For example: administrator@vsphere.local. ■ <code>--sddcSSHUser, --sshu</code> Enter vcf. 	None.

Example:

```
./vcf-async-patch-tool --sync --sddcSSOUser administrator@vsphere.local --sddcSSHUser vcf
```