

OVF Tool User Guide

Open Virtualization Format (OVF) Tool 4.6.2
with vSphere 8.0 Update 2
VMware vSphere 8.0

You can find the most up-to-date technical documentation on the VMware by Broadcom website at:

<https://docs.vmware.com/>

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About This Book

This *OVF Tool User Guide* provides information about how to use VMware® OVF Tool to package virtual machines and vApps into Open Virtualization Format (OVF) standard packages.

Revision History

Table 1-1. *Revision History* shows the changes made for various versions of this manual.

Table 1-1. Revision History

| Revision | Description |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 09/2023 | Revised with vSphere 8.0 U2. New <code>vmxFromConfigFile</code> option. Updated procedure for signing OVF packages. |
| 06/2023 | Changed chapter and section titles for search engine optimization. |
| 04/2023 | Revised with vSphere 8.0 U1. Deleted references to discontinued products, added pull mode. |
| 09/2022 | Revised with vSphere 8.0, including new virtual TPM support (vTPM). |
| 09/2021 | Reissued with vSphere 7.0 Update 3. |
| 10/2020 | Clarified password percent encoding for Update 1. |
| 04/2020 | Updated with new flags and features for vSphere 7.0 release. |
| 04/2019 | Clarified OVF Tool with ESXi as target. |
| 05/2018 | OVF Tool 4.3.0. Large upload retry, SHA digest fix, NVM and PMEM, Curl update, better logging, VBS and TPM support. |
| 10/2016 | OVF Tool 4.2.0. New options for SSL version and cipher list, NVRAM support for EFI boot. |
| 02/2016 | Mention need for explicit extraConfig flags on ESXi hosts. |
| 03/2015 | OVF Tool 4.1.0 User's Guide. Added DVS port group, and <code>--proxy</code> option for vSphere or vCloud. |
| 12/2014 | Increased Open SSL compatibility version to 1.0.1j. See http://www.openssl.org/news/vulnerabilities.html . |
| 10/2014 | OVF Tool 4.0.0 User's Guide. Added <code>--allowAllExtraConfig</code> and <code>--decodeBase64</code> command line options. |
| 06/2014 | OVF Tool 3.5.2 User's Guide. Increased security for Open SSL. |
| 04/2014 | OVF Tool 3.5.1 User's Guide. |
| 08/2013 | OVF Tool 3.5.0 User's Guide. Includes new command line options. |
| 08/2012 | OVF Tool 3.0.1 User's Guide. |
| 08/2011 | OVF Tool 2.1 User's Guide. |

Table 1-1. Revision History (continued)

| Revision | Description |
|-----------------|-----------------------|
| 06/2010 | OVF Tool 2.0.1 Guide. |
| 05/2009 | OVF Tool 1.0 Guide. |

Intended Audience

This book is intended for anyone who needs to convert an OVF package to a virtual machine, or a virtual machine to an OVF package. Users typically include: system administrators, software developers, QA engineers, and anyone who need to package or unpackage virtual machines using open industry standards.

Document Feedback

VMware welcomes your suggestions for improving our documentation. If you have comments, you can post your feedback in topics on the documentation website.

VMware OVF Tool

1

Open Virtualization Format (OVF) is an industry standard to describe metadata about virtual machine images in XML format. VMware OVF Tool is a command-line utility that helps users import and export OVF packages to and from a wide variety of VMware products.

Read the following topics next:

- [The Open Virtualization Format](#)
- [Using the VMware OVF Tool](#)
- [Examples of OVF Tool Use](#)

The Open Virtualization Format

VMware implemented a tool for importing and exporting virtual machines in OVF standard format.

The OVF Standard

The OVF specification describes a secure, portable, efficient, and flexible method to package and distribute virtual machines and components. It originated from the Distributed Management Task Force (DMTF) after vendor initiative. Companies that contributed to the OVF standard include VMware, Dell, HP, IBM, Microsoft, XenSource, and Citrix.

Version 1.1 was published in January 2010, which supersedes the 1.0 specification published April 2009, and is available on the DMTF Web site, along with a white paper.

- Specification: http://www.dmtf.org/standards/published_documents/DSP0243_1.1.0.pdf
- Whitepaper: http://www.dmtf.org/standards/published_documents/DSP2017_1.0.0.pdf

Benefits of OVF

Using OVF to distribute virtual machines has the following benefits:

- Ease of use. When users receive a package in OVF format, they do not have to unzip files, execute binaries, or convert disk formats. Adding a vApp can be as simple as typing a URL and clicking Install.

- Virtual hardware validation. OVF supports fast and robust hardware validation. You do not have to install a complete virtual machine before determining whether it is compatible with an ESXi host (for example, because it uses IDE virtual disks).
- Metadata inclusion. Additional metadata, such as an end-user license agreement, can be packaged with the OVF and displayed before installation.
- Optimized download from the Internet. Large virtual disks are compressed for fast download and to reduce disk space for large template libraries.

Using the VMware OVF Tool

The VMware OVF Tool is available on many platforms and can be downloaded if not built into a product.

VMware Platforms Using the OVF Standard

VMware supports the OVF standard on the following platforms:

- The OVF Tool is useful with many VMware products, including Workstation, Player, VMware Fusion, ESXi hosts, vCenter Server, and vCloud Director.
- OVF version 0.9 and 1.0 are supported for import and export by VMware products.
- VMware Studio can generate OVF packages.

OVF support is built into the vSphere Client that installs from and is compatible with vCenter Server.

Setting Up the OVF Tool

You can find the latest information about System Requirements, supported VMware software and platforms, installation, and known issues by reading the latest release notes located at the following web page:

<https://developer.broadcom.com/tools/open-virtualization-format-ovf-tool/latest/>

OVF Tool Highlights

The OVF Tool provides the following key features:

- Supports import and generation of OVA packages (OVA is part of the OVF standard, and contains all the files of a virtual machine or vApp in a single file.)
- Directly converts between any vSphere, vCloud Director, VMX, or OVF source format to any vSphere, vCloud Director, VMX, or OVF target format
- Accesses OVF sources using HTTP, HTTPS, FTP, or from a local file
- Deploys and exports vApp configurations on vSphere 4.0 (and all newer) targets and on vCloud Director 1.5 (and all newer) targets

- Provides options to power on a VM or vApp after deployment, and to power off a virtual machine or vApp before exporting (caution advised)
- Show information about the content of any source in probe mode
- Provides context sensitive error messages for vSphere and vCloud Director sources and targets, showing possible completions for common errors, such as an incomplete vCenter inventory path or missing datastore and network mappings
- Provides an optional output format to support scripting when another program calls OVF Tool
- Uses new optimized upload and download API (optimized for vSphere 4.0 and newer)
- Signs OVF packages and validates OVF package signatures
- Validates XML Schema of OVF 1.0 and OVF 1.1 descriptors
- Import and export of OVF packages into a vApprun 1.0 workspace.

For more information about vApprun, see <http://labs.vmware.com/flings/vapprun>.

Examples of OVF Tool Use

OVF import and export are built into the vSphere Client and the vSphere Web Client, and various other enterprise oriented VMware products.

For VMware products without built-in OVF support, or when you need to accomplish specialized OVF operations, you can download the OVF Tool over the Web.

Importing and Exporting OVF Using vSphere Client

Using the vSphere 5.0 or 4.0 Client, you can import an OVF package and export a vApp into an OVF package. For example, to import an OVF package using vSphere Client 4:

Click **File > Deploy OVF Template**.

For example, to export a vApp into an OVF package using vSphere Client 4:

Click **File > Export OVF Template > Export**.

Using the vSphere Client 2.5, you can import an OVF virtual machine into an ESXi host and export a virtual machine to an OVF file (note that vSphere Client 2.5 is limited to OVF 0.9). For example, to import an OVF vApp into an ESXi host using vSphere Client 2.5:

Click **File > Virtual Appliance > Import** .

For example, to export a virtual machine to an OVF file using vSphere Client 2.5:

Click **File > Virtual Appliance > Export** .

OVF packages imported or exported by OVF Tool are completely compatible with packages imported or exported by the vSphere Client or the vSphere Client.

VMware OVF Tool Delta Disk Facilities

VMware OVF Tool automatically compresses disk files. In the streaming VMDK files that OVF Tool generates, the tool compresses each 64KB disk grain. It is possible to achieve even better compression using the `--compress` option. In addition, if a package contains multiple virtual machines, it is possible to compress an OVF package even more using a technique called delta disk compression. This compression algorithm is invoked using the `--makeDeltaDisks` option.

```
ovftool --makeDeltaDisks package.ovf output-dir/
```

Delta disk compression identifies disk segments that are equal and combines these equal parts in a parent disk. This process prevents storing the same segment twice.

As an example, consider a software solution that consists of an Apache Web server virtual machine and a MySQL database virtual machine, both installed on top of a single-disk Ubuntu server. The two virtual machines were created with the following process:

- 1 Create a plain Ubuntu installation on one virtual machine.
- 2 Clone the virtual machine.
- 3 Install Apache on the first virtual machine.
- 4 Install MySQL on the second virtual machine.

Using delta disk compression on the two virtual machine disks creates a parent disk containing all of the information they share, which is essentially the entire operation system and two child disks containing the MySQL and Apache parts.

A plain Ubuntu server can use 400–500MB of space, and two would use 800–1000MB of space. By contrast, using delta disk compression, an OVF package with these two servers uses only 400–500MB (plus the size of the MySQL and Apache installations), which saves 400–500MB by not duplicating the Ubuntu server.

vSphere 4 and later support the deployment of OVF packages that contain delta disk hierarchies. Any number of disks can be combined creating various disk trees and saving more space.

For delta disk compression, keep in mind the following:

- Only disks with equal capacity can be combined. If you expect to use delta disk compression, you must keep disk capacities equal.
- Delta disk compression necessitates that segments that might be put in a parent disk are at the same offset from the beginning of their respective files. In the Ubuntu example, if the setup varies between the two installations, it can completely offset each segment on one of the disks from the segments on the other disk. In this case, delta disk compression does not produce any significant disk space savings. This is why the example specified cloning the Ubuntu server before installing the MySQL and Apache parts, respectively.
- Delta disk compression takes OVF packages and vSphere and VMX files as input, but not OVA packages.

- The delta disk compression algorithm needs to read the contents of each disk up to two times. It might make sense to invoke OVF Tool on a local copy of the OVF package.
- The delta disk compression algorithm always generates an OVF package in the given output directory. To convert this OVF package into an OVA package, reinvoke OVF Tool.

Using OVF Tool Commands

2

The VMware OVF Tool is a command-line utility that supports importing and exporting of OVF packages, VMX files, or virtual machines from ESXi hosts and other VMware products.

Read the following topics next:

- [Definitions and Command Syntax](#)
- [Command-Line Options](#)
- [Specifying a Locator](#)
- [Configuration Files](#)

Definitions and Command Syntax

A source location or source URL locator refers to an OVF package, VMX file, or virtual machine in a VMware product, such as Workstation, Fusion, ESXi, vCenter Server, or vCloud Director.

A target location or destination URL locator specifies either a file location, or a location within a VMware product, such as Workstation, Fusion, ESXi, vCenter Server, or vCloud Director.

Run VMware OVF Tool From the Command Line

Procedure

- 1 At the command-line prompt, run the OVF Tool as follows

```
ovftool <source locator> <target locator>
```

<source locator> and <target locator> are paths to the source and target for the virtual machine, OVF package, OVA package, or vSphere location. See [Command-Line Options](#) for options. [Table 2-1. OVF Tool Definitions of Source and Target Locators](#) describes the source and target locators. For details, see [Specifying a Locator](#).

If you are using an operating system where spaces are not allowed in paths on the command line, and need the full path to run OVF Tool, enclose the path in quotes as shown below:

```
"/Applications/VMware OVF Tool/ovftool" --help
```

- If you want to specify additional options, type them before the source and target locators.

```
ovftool <options> <source locator> <target locator>
```

- To display all options, type **ovftool -h**.

Probe mode allows you to investigate the contents of a source. To invoke probe mode, use the `ovftool` command with only a source and no target. OVF Tool prints information about the source such as hardware, EULA, and OVF properties.

```
ovftool <options> <source locator>
```

Use probe mode to examine an OVF package before deploying it. For example, you can examine the download and deployment sizes, determine the set of networks to be mapped, determine the OVF properties to be configured, read the EULA, and determine the virtual hardware requirements.

The probe operation is fast, as it only needs to access the OVF descriptor. It does not need to download the entire OVA or VMDK files. Probe mode also validates the certificate if the source is signed. For details about Probe Mode and sample output, see [Chapter 5 Using OVF Tool Probe Mode](#).

Run OVF Tool With ESXi and vCenter Target Locations

If you are deploying with the `ovftool` command targeting vCenter Server, you can use the command line options in the table below to specify parameters when you deploy.

If you are deploying with the `ovftool` command targeting an ESXi host, you must “inject” the parameters into the resulting VM when it is powered on. This is because the ESXi host lacks a cache to store the OVF parameters, as with vCenter Server. Therefore, you must use the `--X:injectOvfEnv` debug option with the `--poweron` flag in the command line if you are deploying a virtual machine targeting ESXi. Example below. (You can also do this using the Create a VM from an OVA/OVF option in the ESXi host client, then browse to the .ova file.)

```
>./ovftool/ovftool\
--name="Cloudvm_2074586_with_inject"\
--X:injectOvfEnv\
--X:logFile=ovftool.log\
--X:logLevel=trivia\
--acceptAllEulas\
--ds=cl-storage-1\
--dm=thin\
--net:'Network 1=VM Network'\
--X:enableHiddenProperties\
--noSSLVerify\
--allowExtraConfig\
--machineOutput\
--prop:vami.netmask0.VMware_vCenter_Server_Appliance=255.255.255.0\
--prop:guestinfo.cis.appliance.net.prefix=24\
--prop:guestinfo.cis.appliance.net.gateway=X.X.X.123\
--prop:guestinfo.cis.appliance.time.tools-sync=True\
```

```

--prop:vami.gateway.VMware_vCenter_Server_Appliance=X.X.X.123\
--prop:guestinfo.cis.appliance.net.dns.servers=X.X.X.1,X.X.X.2\
--prop:vami.ip0.VMware_vCenter_Server_Appliance=X.X.X.145\
--prop:guestinfo.cis.appliance.root.passwd=vmware\
--prop:guestinfo.cis.appliance.net.addr=X.X.X.145\
--prop:vami.DNS.VMware_vCenter_Server_Appliance=X.X.X.1,X.X.X.2\
--prop:vami.vmname=vmc-srm-vc10\
--prop:guestinfo.cis.appliance.root.shell=/bin/bash\
--prop:guestinfo.cis.vmdir.first-instance=True\
--prop:guestinfo.cis.appliance.ssh.enabled=True\
--prop:guestinfo.cis.appliance.net.mode=static\
--prop:guestinfo.cis.appliance.net.addr.family=ipv4\
--prop:guestinfo.cis.vmdir.domain-name=vsphere.local\
--prop:guestinfo.cis.vmdir.password=vmware\
--powerOn\
--X:waitForIp\
http://<directory_w/cloudvm>/VMware-vCenter-Server-Appliance-6.0.0.XXXX-XXXXXXX_OVF10.ovf\
vi://root:pwd@vm_name

```

You will need to replace the variables (IP addresses, build numbers, root password, and VM names) in the above example with values from your own system.

Deploy a Virtual Machine to Static DVS Port Group

At this time, you can not use the OVF Tool to deploy a virtual machine to a static port group.

To work around this issue:

Procedure

- 1 Use vCenter Server to create an ephemeral port on the desired network.
- 2 Deploy the appliance to that port group on an ESXi host.
- 3 Switch the appliance over to that static port group.
- 4 Use vCenter Server to delete the ephemeral port group.

Command-Line Options

This section contains a long table of OVF Tool command-line options.

For every command, you specify source and target locators. [Table 2-1. OVF Tool Definitions of Source and Target Locators](#) defines each locator type.

Table 2-1. OVF Tool Definitions of Source and Target Locators

| Locator | Definition |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <source locator> | <p>Path to source, which must be a virtual machine, vApp, vApprun workspace entity, or an OVF package. The source locator can be one of the following:</p> <ul style="list-style-type: none"> ■ A path to an OVF or OVA file (a local file path, or an HTTP, HTTPS, or FTP URL). ■ A virtual machine (a local file path to a .vmx file). ■ A vSphere locator identifying a virtual machine or vApp on vCenter, ESXi, or VMware Server. ■ A vCloud Director locator identifying a virtual machine or a vApp in vCloud Director. ■ A local file path to a vApprun workspace entity. |
| <target locator> | <p>The target locator can be one of the following:</p> <ul style="list-style-type: none"> ■ A local file path for VMX, OVF, OVA, or vApprun workspace. ■ A vSphere locator identifying a cluster, host, or a vSphere location. ■ A vCloud Director locator identifying a virtual machine or a vApp in vCloud Director. |

Table 2-2. OVF Tool Command-Line Options shows all the command-line options. Options perform actions only between certain source and target types. The table shows source and target types for each option. If you specify an option using an irrelevant source or target type, the command does nothing.

All options can be set using the form `--option=value`. Binary options can be switched on and off explicitly. For example: `--option=true` and `--option=false`.

Table 2-2. OVF Tool Command-Line Options

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|-------------------------------------|--------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--acceptAllEulas</code> | OVF, OVA | N/A | Accepts all end-user licenses agreements (EULAs) without being prompted. Binary option. |
| <code>--addDevice</code> | | | Adds a virtual device for all VirtualHardwareSections. |
| <code>--allowExtraConfig</code> | | | Lets you specify the extra config options that can be converted to .vmx format. These options are a security risk as they control low-level and potentially unsafe options on the VM. Each option must be specified using a series of key value pairs (sometimes referred to as a white list). |
| <code>--annotation</code> | All | | Adds annotation to vi, vmx, vapprun, vCloud, OVF, and OVA source locators. |
| <code>--authdPortSource</code> | vSphere | vSphere | Overrides default VMware authd port (902) when using a host as source or as target. |
| <code>--authdPortTarget</code> | vSphere | vSphere | Overrides the default VMware authd port (902) when using a host as target. |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|----------------------------------------------|-----------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--chunkSize</code> | N/A | OVF, OVA | <p>Specifies the chunk size to use for files in a generated OVF or OVA package. The default is not to chunk.</p> <p>If you don't specify a unit for chunk size, the chunk size is assumed to be in megabytes (mb). Accepted units are b, kb, mb, gb. Example: 2gb or 100kb.</p> <p>When using this option, all output files (except the OVF descriptor, manifest and certificate files) are sliced into the specified chunk size. This is useful if you need to transport an OVF package on a series of 800MB CD-ROMs, or are only able to create files up to 2GB on FAT32 file systems.</p> <p>When you use chunking with the OVA package option, the result is similar to OVF because all files are chunked, but the OVA package is still a single file.</p> |
| <code>--compress</code> | N/A | OVF, OVA | <p>Compresses the disk when given an OVF or OVA target locator. The value must be between 1 and 9. Use 9 for the slowest processing time, but best compression. Use 1 for the fastest processing time, but least compression.</p> |
| <code>--computerName</code> | | | <p>Sets the computer name in the guest virtual using the syntax <code>--computerName:<VMID>=<value></code>.</p> <p>Only applies to vCloud targets of version 5.5 or later.</p> |
| <code>--configFile</code> | vSphere | vSphere | <p>Specifies a configuration file containing long-name options and settings. Useful for scripting, this overrides the local <code>ovftool.cfg</code> in the current directory, which overrides the global configuration file in <code>\$HOME/ovftool.cfg</code> on Linux and OS X, or <code>C:\Users\%USER%\AppData\Roaming\VMware\ovftool.cfg</code> on Windows.</p> |
| <code>--coresPerSocket</code> | | | <p>Specifies the distribution of the total number of CPUs over a number of virtual sockets using the syntax <code>--coresPerSocket:<VMID>=<value></code>. Only applies to vCloud targets of version 5.5 or later.</p> |
| <code>--datastore</code> or <code>-ds</code> | N/A | vSphere | <p>Target datastore name for a vSphere locator.</p> |
| <code>--decodeBase64</code> | | | <p>Enables Base64 decoding for values in the OVFTool command line.</p> |
| <code>--defaultStorageProfile</code> | | | <p>The storage profile for all VMs in the OVF package. The value should be an SPBM profile ID. Only applies to VI targets of version 5.5 or later.</p> |
| <code>--defaultStorageRawProfile</code> | | | <p>The storage profile for all VMs in the OVF package. The value should be a raw SPBM profile. The value overwrites that in <code>--defaultStorageProfile</code>. Only applies to VI targets of version 5.5 or later.</p> |
| <code>--deploymentOption</code> | OVF, OVA | N/A | <p>Deployment options for a deployed OVF package, if the source OVF package supports multiple options. An OVF package can contain several deployment configurations. This option allows you to select which configuration to use when deploying to the vSphere target.</p> |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|---------------------------------------------|-----------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--disableVerification</code> | OVF, OVA | N/A | Skips validation of signature and certificate. Binary option. |
| <code>--diskMode</code> or <code>-dm</code> | N/A | VMX, vApprun,vSphere | Select target disk format. Supported formats are: monolithicSparse, monolithicFlat, twoGbMaxExtentSparse, twoGbMaxExtentFlat, seSparse (vSphere target), eagerZeroedThick (vSphere target), thin (vSphere target), thick (vSphere target), sparse, and flat. |
| <code>--diskSize</code> | | | Sets the size of a VM disk in megabytes using the syntax <code>--diskSize:<VMID>,<diskInstanceID>=<value></code> . Only applies to vCloud targets of version 5.5 or later. |
| <code>--eula</code> | N/A | OVF, OVA | Inserts the EULA in the first virtual system or virtual system collection in the OVF. If the EULA is in a file, use this format: <code>--eula@=filename</code> |
| <code>--exportFlags</code> | | | Specifies the source of an export. The supported values for vSphere source are: mac, uuid, and extraconfig. The supported value for vCloud source is preservelidentity. You can provide one or more options, separated by commas. |
| <code>--extraConfig</code> | N/A | All | Sets an ExtraConfig element for all VirtualHardwareSections. This option applies to vi, vmx, vapprun, vCloud, ovf, and ova source locators. The syntax is <code>-:extraConfig:<key>=<value></code> |
| <code>--fencedMode</code> | vCloud | | If a parent network exists on a vCloud target, this option specifies the connectivity to the parent. Possible values are bridged, isolated, allowIn, allowInOut, allowOut. |
| <code>--help</code> or <code>-h</code> | N/A | N/A | Prints the VMware OVF Tool message that lists the help options. |
| <code>--hideEula</code> | OVF,OVA | N/A | Does not include the EULA in the OVF probe output. Binary option. |
| <code>--I:morefArgs</code> | vSphere | vSphere | Integration option. Interpret arguments for networks, datastores, and folders as VIM Managed Object Reference identifiers (type:id) for vSphere source and destination locators. |
| <code>--I:sourceSessionTicket</code> | vSphere | vSphere | Integration option. Specifies the session ticket used for authenticating the vSphere source locator. |
| <code>--I:targetSessionTicket</code> | vSphere | vSphere | Integration option. Specifies the session ticket used for authenticating the vSphere target locator. |
| <code>--importAsTemplate</code> | | | Imports VM as a template when deployed on a VI target. |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|------------------------------------------|-------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--ipAllocationPolicy</code> | OVF,OVA | N/A | <p>IP allocation policy for a deployed OVF package. Supported values are: <code>dhcpPolicy</code>, <code>transientPolicy</code>, <code>fixedPolicy</code>, or <code>fixedAllocatedPolicy</code>.</p> <p>In OVF descriptors, you can specify a VMware specific IP assignment policy that guides the deployment process by expressing which of the policies the OVF package supports. Only values listed in the OVF descriptor are supported when the OVF or OVA package is deployed.</p> |
| <code>--ipProtocol</code> | OVF, OVA | N/A | <p>Specifies which IP protocol to use. For example, <code>IPv4</code>, <code>IPv6</code>. As with the <code>ipAllocationPolicy</code> option, you can specify which IP version this OVF package uses when it is deployed. Use only the values listed in the OVF descriptor.</p> |
| <code>--lax</code> | OVF, OVA | N/A | <p>Relax OVF specification conformance and virtual hardware compliance checks. (For advanced users only.)</p> |
| <code>--locale</code> | OVF, OVA | N/A | <p>Selects the locale for the target.</p> |
| <code>--machineOutput</code> | N/A | N/A | <p>Outputs OVF Tool messages in a machine readable format. Binary option.</p> |
| <code>--makeDeltaDisks</code> | OVF, vSphere, VMX, vApprun | Must be directory | <p>Use delta disk compression to create an OVF package from a disk source. Binary option.</p> |
| <code>--maxVirtualHardwareVersion</code> | | | <p>The maximal virtual hardware version to generate.</p> |
| <code>--memorySize</code> | | | <p>Sets the memory size in megabytes of a VM using the syntax <code>--memorySize:<VMID>=<value></code>. Example: <code>--memorySize:vm1=1024</code>. Applies to VI and vCloud targets of version 5.5 or later.</p> |
| <code>--multiDatastore:dsk=ds</code> | OVF, OVA | vSphere | <p>Allows multi-disk VM deployment onto separate datastores. Use this option as many times as needed. The VM disk is placed on datastore <code>ds</code> as follows, where <code>vmname</code> is the name specified by <code>--name</code> option or in the OVF file, and <code>vmDisk</code> is specified in the OVF disk section by <code>ovf:diskId</code>.</p> <pre>[ds] vmname/vmDisk1.vmdk</pre> |
| <code>--name</code> or <code>-n</code> | N/A | All | <p>Specifies the target name. Defaults to the source name.</p> |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|--------------------------------------------|-----------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--net</code> | OVF, OVA | N/A | <p>Sets a network assignment in the deployed OVF package. For example, <code>--net:<OVFname>=<target name></code>. OVF packages contain symbolic names for network names which are assigned with this option.</p> <p>For multiple network mappings, repeat the option, separating them with a space, for example, <code>--net:s1=t1 --net:s2=t2 --net:s3=t3</code>.</p> <p>If the target is vCloud 5.5 or later, a fence mode can also be specified using the syntax <code>--net:<OVFname>=<targetName>, <fenceMode></code>. Possible fence mode values are: <code>bridged</code>, <code>isolated</code>, and <code>natRouted</code>.</p> |
| <code>--network</code> or <code>-nw</code> | OVF, OVA | N/A | Target network for a vSphere deployment. Use this option in place of the <code>--net</code> option when only one network exists in the OVF package. This option maps the symbolic OVF name to the specified network name. |
| <code>--nic</code> | | | <p>Specifies NIC configuration in a VM using the syntax <code>--nic:<VMID>,<index>=<OVFnetName>,<isPrimary>,<ipAddressingMode>,<ipAddress></code>.</p> <p>Possible values for <code>ipAddressingMode</code> are: <code>DHCP</code>, <code>POOL</code>, <code>MANUAL</code>, and <code>NONE</code>. <code>ipAddress</code> is optional and should only be used when <code>ipAddressingMode</code> is set to <code>MANUAL</code>.</p> <p>Only applies to vCloud targets of version 5.5 or later.</p> |
| <code>--noDestinationSSLVerify</code> | | | Skips SSL verification for target VI connections. |
| <code>--noDisks</code> | N/A | All | Creates and uploads the virtual machine or vApps but does not upload any disk files. Disks are created empty. (Disables disk conversion.) |
| <code>--noImageFiles</code> | N/A | All | Creates and uploads the virtual machine or vApps but does not upload ISO files to a CD-ROM. That is, does not include image files in destination. |
| <code>--noNvramFile</code> | vSphere | vSphere | Skips the NVRAM file when exporting a VM to OVF or deploying OVF to a VM. It does not download the NVRAM file during VM export, nor does it upload the NVRAM file during deployment or OVF import. |
| <code>--noProxyVerify</code> | vCloud | vCloud | Do not check the proxy's SSL certificate, as is done by default. |
| <code>--noSSLVerify</code> | vSphere | vSphere | Skip SSL verification for vSphere connections. As of OVF Tool 4.4.0 you can skip source or destination verification with <code>--noSourceSSLVerify</code> (unless you also specify <code>--sourceSSLThumbprint</code>) or <code>--noDestinationSSLVerify</code> . |
| <code>--numberOfCpus</code> | | | Sets the number of CPUs for a VM using the syntax <code>numberOfCpus:<VMID>=<value></code> . Applies to VI and vCloud targets of version 5.5 or later. |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|---------------------------------------------|------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--overwrite</code> or <code>-o</code> | N/A | All | Forces an overwrite of existing files. Binary option. |
| <code>--packageCert</code> | OVF | OVA | Packages an OVF into OVA with a required signature file, as-is, instead of generating one. This is the only way to create an OVA with a certificate file in it, resulting in a signed package. |
| <code>--parallelThreads=N</code> | vSphere | vSphere | Upload to the host, or from the host, in parallel using N threads. VMX<=>OVF, OVF<=>VI, VMX<=>VI, but not OVA. N may be a number from 1 to 100 but should approximate the number of CPU cores minus one. |
| <code>--powerOffSource</code> | vCloud, vSphere | N/A | Ensures that a virtual machine or vApp is powered off before importing from a vSphere source. Binary option. |
| <code>--powerOffTarget</code> | N/A | vCloud, vSphere | Ensures that a virtual machine or vApp is powered off before overwriting a vSphere target. Binary option. |
| <code>--powerOn</code> | N/A | vCloud, vSphere | Powers on a virtual machine or vApp deployed on a vSphere target. Binary option. |
| <code>--preCheck</code> | | | Require pre check validations before import or export. |
| <code>--privateKey</code> | N/A | OVF, OVA | Signs the OVF package with the given private key (.pem file). The file must contain a private key and a certificate. |
| <code>--privateKeyPassword</code> | N/A | OVF, OVA | Password for the private key. Used in conjunction with <code>--privateKey</code> if the private key requires password authentication. If required but not specified, the tool prompts for the password. |
| <code>--prop</code> | OVF, OVA | N/A | Sets a property in the deployed OVF package. For example, <code>--prop:<key>=<value></code> . Use probe mode to learn which properties an OVF package can set. For multiple property mappings, repeat the option, separating them with a blank, for example, <code>--prop:p1=v1 --prop:p2=v2 --prop:p3=v3</code> . |
| <code>--proxy</code> | OVF, OVA, vCloud, vSphere | OVF, OVA, vCloud, vSphere | Specifies and enables a proxy for HTTP, HTTPS, FTP, vSphere, and vCloud access. The proxy is expressed as the URL to the proxy. For example, for <code>proxy.example.com</code> , the option value is: <code>https://proxy.example.com:345</code> OVF Tool supports proxies that require authentication. If you do not provide credentials in the URL, the OVF Tool prompts you for them. The <code>--proxy</code> flag enables both vSphere (VI) and vCloud proxies. |
| <code>--proxyCert=vcdCert</code> | vCloud | vCloud | Specifies the certification file for vCloud. |
| <code>--proxyNTLMAuth</code> | OVF, OVA, vCloud, vSphere | OVF, OVA, vCloud, vSphere | Enables support for the NTLM authentication and security protocol. NT LAN Manager is the authentication protocol used on networks that include systems running the Windows operating system and on stand-alone systems. |
| <code>--proxyPassword</code> | | | Proxy password. |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|-----------------------------------------------|---------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--proxyUsername</code> | | | Name of proxy user. |
| <code>--pullUploadMode</code> | HTTP, HTTPS | vSphere | Offers fast deployments of OVF packages by enabling a mode where OVF source files (VMDKs etc.) are copied directly from source to ESXi without <code>ovftool</code> in between. See Deploying an OVF Package using Pull Mode for details. |
| <code>--quiet</code> or <code>-q</code> | N/A | N/A | Prints only errors. No other output is sent to the screen. Binary option. |
| <code>--requireSignature</code> | OVF, OVA | OVF, OVA | A certificate file (signature) must be present for the package when reading (probing) or opening a package. |
| <code>--schemaValidate</code> | OVF, OVA | N/A | Validates OVF descriptor against the OVF schema. Binary option. |
| <code>--shaAlgorithm</code> | sha1, sha256, sha512 | | Use this option to condense with Secure Hash Algorithm (SHA) for manifest validation, digital signing, and OVF package creation. Can be either <code>sha1</code> (SHA-1), <code>sha256</code> (SHA-256), or <code>sha512</code> (SHA-512). The default value is <code>sha256</code> . |
| <code>--skipManifestCheck</code> | OVF, OVA | N/A | Skips validation of the OVF package manifest. Binary option. |
| <code>--skipManifestGeneration</code> | N/A | OVF, OVA | Skips generation of the OVF package manifest. Binary option. |
| <code>--sourcePEM</code> | | | File path to a Privacy Enhanced Mail (.pem) file used to verify vSphere connections. Example: <code>--sourcePEM:<filename>.pem</code> |
| <code>--sourceSSLThumbprint</code> | vSphere | N/A | SSL thumbprint of the source. OVF Tool verifies the SSL thumbprint that it receives from the source, if this value is set. |
| <code>--sourceType</code> or <code>-st</code> | OVF, OVA, VMX, VMX, VI, vCloud, ISO, FLP, vApprun | N/A | Explicitly expresses that the source is <code>OVF</code> , <code>OVA</code> , <code>VMX</code> , <code>VMX, vSphere</code> , <code>vCloud</code> , <code>ISO</code> , <code>FLP</code> , or <code>vApprun</code> . |
| <code>--sslCipherList</code> | | | Allows override of the default cipher list. Diffie-Hellman is disabled by default. |
| <code>--sslVersion</code> | | | Either <code>TLSv1_0</code> , <code>TLSv1_1</code> , or <code>TLSv1_2</code> . The <code>TLSv1_0</code> protocol is disabled by default. |
| <code>--storageProfile</code> | | | Sets the storage profile for a VM using the syntax <code>--storageProfile:<VMID>=<value></code> . Applies only to vCloud targets of version 5.5 or later. |
| <code>--targetPEM</code> | | | File path to a Privacy Enhanced Mail (.pem) file used to verify vSphere connections. Example: <code>--targetPEM:<filename>.pem</code> |

Table 2-2. OVF Tool Command-Line Options (continued)

| Option's Long Name (and Short Name) | Source Types | Target Types | Description |
|-----------------------------------------------|-----------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>--targetSSLThumbprint</code> | N/A | vSphere | SSL thumbprint of the target. OVF Tool verifies the SSL thumbprint that it receives from the target, if this value is set. |
| <code>--targetType</code> or <code>-tt</code> | N/A | OVF, OVA, VMX, VI, vCloud, ISO, FLP, vApprun | Explicitly express that the target is OVF, OVA, VMX, VMX, vSphere, vCloud, ISO, FLP, or vApprun. |
| <code>--vCloudTemplate</code> | | | Create only a vAppTemplate. |
| <code>--vService</code> | OVF, OVA | N/A | Set a dependency on a vService provider in the OVF package, using the following syntax: <code>--vService:<dependencyId>=<providerId></code> |
| <code>--verifyOnly</code> | All | N/A | Do not upload the source; just verify it. This applies only to vSphere 4. |
| <code>--verifyViTargetManifest</code> | vSphere, VI | vSphere, VI | Upon import of OVF, does extra check and validates the SHA1 digest of a file transferred to a VI Target against the SHA1 digest of the source file being transferred. SHA1 takes effect for all SHA calculations, so the host must support SHA1. Not compatible with <code>--pullUploadMode</code> . |
| <code>--version</code> or <code>-v</code> | N/A | N/A | Shows version information for OVF Tool. Binary option. |
| <code>--viCpuResource</code> | N/A | vSphere | Specify the CPU resource settings for VI locator targets. The syntax is: <code>--viCpuResource=<shares>:<reservation>:<limit></code> |
| <code>--viMemoryResource</code> | N/A | vSphere | Specify the memory resource settings for vSphere locator targets. The syntax is: <code>--viMemoryResource=<shares>:<reservation>:<limit></code> |
| <code>--vmFolder</code> or <code>-vf</code> | N/A | vSphere | The target virtual machine folder in vSphere inventory (for a datacenter). |
| <code>--X:ignoreLinkLocalIp</code> | vSphere | vSphere | While waiting for an IPv4 or IPv6 address, ignore a link local address, 169.254.0.0/16 or fe80::/10. |
| <code>--X:skipContentLength</code> | N/A | N/A | Avoids sending the Content-Length header in HTTP(S) requests. This is the default option for vCloud targets. |
| <code>--X:vmxFromConfigFile</code> | vSphere | vSphere | Extract ConfigInfo from a live VM, convert it to VMX, and save results in the specified file. You can also specify a file to log this transaction. For example: <code>--X:vmxFromConfigFile=vmxConfigInfoAsVmx</code> <code>--X:logFile=cfgInfo.log</code> |
| <code>--X:waitForIpv4</code> | vSphere | vSphere | Have OVF Tool wait for an IPv4 address to be sure the network is initialized. |
| <code>--X:waitForIpv6</code> | vSphere | vSphere | Have OVF Tool wait for an IPv6 address to be sure the network is initialized. |

Run `ovftool -h debug` for explanations of the available `--X` options.

Creating and Using the VM ID

When the parameters for one of the command line options includes the *VM ID*, this ID refers to an attribute in the OVF descriptor file. Specifically, it is the ID attribute of the VirtualSystem element that will appear in the OVF file that describes the VM you want to create or customize. If you are creating a VM, you need to specify the ID in the descriptor file. For example, the ID of the VM specified in the descriptor fragment below is *vm1*.

```
<ovf:VirtualSystem ovf:id="vm1">
  <ovf:Info>A virtual machine</ovf:Info>
  <ovf:Name>WinServer2012</ovf:Name>
  <ovf:OperatingSystemSection ovf:id="74" vmw:osType="windows8Server64Guest">
    <ovf:Info>Specifies the operating system installed</ovf:Info>
    <ovf:Description>Microsoft Windows Server 2012 (64-bit)</ovf:Description>
  </ovf:OperatingSystemSection>
  ...
```

For example, you must use the VM ID when specifying the size of memory for a VM, as in this option: `--memorySize:vm1=1024`

If you are customizing an existing VM, look at the descriptor file to get the VM ID. You can also have the `ovftool` read an OVF file and extract the IDs before importing or deploying it.

```
> ovftool --verifyOnly --machineOutput <src ovf>
```

Specifying Disk ID to Set Size

When specifying disk sizes, you will need to specify the instance ID as well as the VM ID. The instance ID is the value of RASD InstanceID element of the virtual hardware section element describing the disk that should be resized.

```
<ovf:DiskSection>
  <ovf:Info>Virtual disk information</ovf:Info>
  <ovf:Disk ovf:capacity="4" ovf:capacityAllocationUnits="byte * 2^20"
    ovf:diskId="disk1" ovf:fileRef="disk1-file"
    ovf:format="http://www.vmware.com/interfaces/specifications/vmdk.html#streamOptimized"/>
</ovf:DiskSection>
<ovf:VirtualSystem ovf:id="vm1">
  ...
  <ovf:VirtualHardwareSection>
  <ovf:Info>Virtual hardware requirements</ovf:Info>
  <ovf:Item>
    <rasd:AddressOnParent>0</rasd:AddressOnParent>
    <rasd:Description>SCSI Hard disk</rasd:Description>
    <rasd:ElementName>SCSI Hard disk 1</rasd:ElementName>
    <rasd:HostResource>ovf:/disk/disk1</rasd:HostResource>
    <rasd:InstanceID>2000</rasd:InstanceID>
    <rasd:Parent>2</rasd:Parent>
    <rasd:ResourceType>17</rasd:ResourceType>
  </ovf:Item>
  ...
```

In the above example specifying instance ID “2000” (without quotes) would cause the disk with ID “disk1” (without quotes) to be resized: `--diskSize:vm1,2000=256` (set the size to 256).

Note that if multiple disk devices are backed by the same disk (i.e. the OVF contains multiple disk RASD items that refer to the same disk) you must specify the new size for all disk elements, not just one. Sharing disks between VMs is not common, but allowed in the OVF spec.

Note that you cannot shrink disks.

Specifying the Storage Profile ID

When you specify a storage profile, the ID refers to the UID of the storage profile in the vCD cell. This can be obtained using the vCD REST API.

More Help Topics

For more help, type: `--help <topic>`, where topics are:

| | |
|-------------|--------------------------------------------------------------------------------------------------------------|
| locators | : detailed source and destination locator syntax |
| debug | : lists the debug settings |
| examples | : examples of usage |
| config | : syntax of configuration files |
| integration | : list of options primarily used when you execute the <code>ovftool</code> from another tool or shell script |

Using the Log Settings

Use OVF Tool’s log options if you are not seeing the results you expect. The log options allow you to see the operations of OVF Tool, and send results to the console or to a file.

Two of the most commonly used log options are:

- `--X:logFile=filename` to log the complete `ovftool` session to a file.
- `--X:logLevel=level` to control the verbosity of logs.

For example, you can use a command like this to write the log in a file called `ovf.log`:

```
ovftool --X:logFile=ovf.log --X:logLevel=info LAMP.ovf vi://localhost/Datacenter/host/Cluster
```

The following table lists all the log options.

| Log Option | Use option to: |
|------------------------------------------|----------------------------------------------------------------------------------------------|
| <code>--X:logFile=<i>filename</i></code> | Log internal events to a specified log file. |
| <code>--X:logLevel=<i>level</i></code> | Log level. Valid values are: none, quiet, panic, error, warning, info, verbose, and trivia). |

| | |
|----------------------------------------|-----------------------------------------------------------------------------------------|
| <code>--X:logToConsole</code> | Log internal events to console |
| <code>--X:logTransferHeaderData</code> | Add transfer header data to the log. Use with care. Default value is <code>false</code> |

OVF Tool includes many other debug options that you can set to retrieve specific data. You can see all the `-X` options and their definitions by running `ovftool --help debug`.

OVF Tool does not log passwords.

Specifying a Locator

A source or target locator points to a specific resource. Locators must specify a protocol, which defines how to reach the resource. Supported protocols are file access, vSphere, HTTP, HTTPS, and FTP.

File locators can point to an OVF package (`.ovf` or `.ova`), a virtual machine (`.vmx`). HTTP, HTTPS, or a vApprun workspace entity. FTP locators can point to OVF and OVA files. The resource type is determined from the filename suffix, unless one or both of the options `--sourceType` and `--targetType` are used explicitly.

vSphere locators can point to various resource types: virtual machines, vApps, hosts, clusters, or resource pools. For a source locator, the resource type must be a virtual machine or vApp. For a target locator, the resource type must be a host, cluster, or a resource pool. A vSphere locator is used for a vSphere server, vCenter Server, VMware Server, or an ESXi host.

At the command line, type `--help locators` to display the online help for locators.

[Table 2-3. Source Locator](#) and [Table 2-4. Target Locator](#) list the default extensions of the different source and target types, as well as which protocols are supported.

Table 2-3. Source Locator

| Source Type | Default File Extension | Protocol | Example |
|-----------------|------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------|
| OVF | <code>.ovf</code> | File, HTTP, HTTPS, FTP | <code>/ovfs/my_vapp.ovf</code> |
| OVA | <code>.ova</code> | File, HTTP, HTTPS, FTP | <code>/ovfs/my_vapp.ova</code> |
| VMX | <code>.vmx</code> | File | <code>/vms/my_vm.vmx</code> |
| vApprun | N/A | File | <code>~/my_vApprun_workspace/MyVM</code> |
| vCloud Director | N/A | HTTPS | <code>vcloud://username:password@mycloud.org/ \ org=MyOrg&vdc=MyVDC&catalog=MyCatalog \ &vapp=myVapp</code> |
| vSphere | N/A | vSphere | <code>vi://username:pass@localhost/ my_datacenter/vm/ \ my_vms_folder/ my_vm_name</code> |

Table 2-4. Target Locator

| Target Type | File Extension | Protocol | Example |
|-----------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| OVF | .ovf | File | /ovfs/my_vapp.ovf |
| OVA | .ova | File | /ovfs/my_vapp.ova |
| VMX | .vmx | File (Source must be a single virtual machine) | /vms/my_vm.vmx |
| vApprun | N/A | File | ~/my_vApprun_workspace/MyVM |
| vCloud Director | N/A | HTTPS | vcloud://username:password@mycloud.org/ \ org=MyOrg&vdc=MyVDC&catalog=MyCatalog \ &vapp=myVapp |
| vSphere | N/A | vSphere (If the vSphere target locator is on a VMware Server system, or directly on an ESXi host, the source must be a single virtual machine) | vi://username:pass@localhost/ my_datacenter/vm/ \ my_vms_folder/ my_vm_name |

File Locators

File locators are the same for source and target. They are specified using ordinary path syntax.

Windows Path Syntax

On Windows, paths are specified as either absolute or relative.

This is an example of an absolute path on Windows:

```
C:\folder1\folder2\package.ovf
```

These examples show relative paths on Windows:

```
..\folder1\package1.ovf
package1.ovf
```

Linux and Mac OS Path Syntax

On Linux, paths are specified, similarly, as either absolute or relative.

The following is an example of an absolute path on Linux:

```
/folder1/folder2/package.ovf
```

The following are examples of relative paths on Linux:

```
../folder1/package1.ovf
package1.ovf
```

URL File or Web Syntax

It is possible to specify files or websites as a URL by prefixing the path with `file://` or `http://`, as shown in the following examples.

Examples of file locations:

```
file://c:\folder1\folder2\package.ovf (Absolute, Windows)
file:///folder1/folder2/package.ovf (Absolute, Linux)
file://package.ovf (Relative for both Windows and Linux)
```

Encoding Special Characters in a URL

When you specify a URL, special characters must be escaped with percent % followed by the respective ASCII hex value. For instance, if you use at-sign @ in a URL, it must be specified as %40, and backslash in a Windows domain name (\) must be specified as %5c.

When you specify a login name and password in a URL, or interactively, `ovftool` uses an open source library for URL encoding, also called percent encoding, to make the result acceptable on the web. For VI and vCloud locations, percent encoding is unnecessary and not done.

HTTP, HTTPS, and FTP Locators

You can use HTTP, HTTPS, and FTP to refer to an OVF package (OVF or OVA file) on a Web server. You can only use these protocols to specify a source locator. In the following syntax, `protocol` is HTTP, HTTPS or FTP:

```
protocol://username:password@host:port/<path to OVF package>
```

It is possible to omit the user name and password from the locator. If needed, OVF Tool prompts you for them. If you use the standard port, it is not necessary to specify the port. [Table 2-5. Standard Ports](#) shows the standard ports.

Table 2-5. Standard Ports

| Protocol | Port |
|----------|------|
| HTTP | 80 |
| HTTPS | 443 |
| FTP | 21 |

vSphere Locators

vSphere source locators point to a virtual machine or vApp within the virtual infrastructure. The vSphere target locator provides all required information for importing an OVF package or virtual machine into a cluster, host or resource pool. Both source and target locator use the same syntax:

```
vi://<username>:<password>@<host>:<port>/<search-term>
```

The server name and port can designate either a vCenter server or an ESXi host. If you omit credentials, OVF Tool prompts you for them. Default installations of vCenter Server and ESXi use port 443. If you are using the default port, you do not need to specify it. When using OVF Tool with VMware Server, you had to specify port 8333, the default port for this discontinued product.

The search term has the following format:

```
<path>[?<query>=<value>]
```

If a query is not given, a VC inventory path lookup is performed using the specified path. Otherwise, the object matching the query is used. The meaning of the query depends on the object type. [Table 2-6. Source and Target Values for All Query Types](#) shows the different values that you can use in the query field.

Table 2-6. Source and Target Values for All Query Types

| Name | Query | Source | Target |
|------------|-------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| BIOS | bios | BIOS ID of a virtual machine | BIOS ID of a host |
| Datastore | ds | Datastore path to a virtual machine | N/A |
| IP Address | ip | IP address of a virtual machine | IP address of a host |
| DNS | dns | DNS name of a virtual machine | DNS name of a host |
| Mo-Ref | moref | Managed object reference (vSphere specific identifier) of a virtual machine or vApp | Managed object reference (vSphere specific identifier) of a host, cluster, or resource pool |

[Table 2-7. Examples of Query Values](#) shows example values for each query type.

Table 2-7. Examples of Query Values

| Name | Query | Example Value |
|------------|-------|------------------------------------------------------|
| BIOS | bios | vi://localhost?bios=234290984 |
| Datastore | ds | vi://localhost/TestDatacenter?ds=[foo]/myvm/myvm.vmx |
| IP Address | ip | vi://localhost?ip=123.231.232.232 |
| DNS | dns | vi://localhost?dns=production-vm3.example.com |
| Mo-Ref | moref | vi://localhost?moref=vim.VirtualMachine:vm-23423 |

Note: For the same VM, the Managed Object Reference (MoRef) will be different for vCenter Server than it is for the ESXi host. For instance, the same VM can have a MoRef of 'vm-92' in vCenter Server and '118' in the ESXi host. Also note that the syntax contains 'vm-' for a vCenter Server MoRef. When the Motif is defined by vCenter Server, you can see it in the browser address and use it directly. The OVF Tool script doesn't define and parse the format of a MoRef.

You can enter a partial source locator if you do not know the entire inventory path. In this case, the tool fails but suggests possible inventory path completions.

Specifying the Inventory Path to a Virtual Machine or vApp

To specify an inventory path for a virtual machine or vApp, use the following syntax:

```
<datacenter name>/vm/<folders>/<vm or vApp name>
```

or

```
<datacenter name>/host/<resource pool path>/<vm or vApp name>
```

The use of the `vm` tag after the datacenter name specifies that you are locating a virtual machine or vApp in the VM and Template view. Use the `host` tag after the datacenter name if you are locating a virtual machine or vApp in the Host and Clusters view.

The following example shows an inventory path without any folders:

```
MyDatacenter/vm/MyVM
```

The following example shows an inventory path with two nested folders:

```
MyDatacenter/vm/Folder 1/Sub Folder/MyVM
```

Specifying the Inventory Path for a Cluster, Host, or Resource Pool

You can specify an inventory path for a host or a resource pool. You can nest resource pools similar to folders. To specify an inventory path for a host or a resource pool as part of target locators, use the following syntax:

```
<datacenter name>/host/<host name>/Resources/<resource pool>
```

- `host` and `Resources`. Fixed parts of the path.
- `Resources`. Specify only when a resource pool is specified.
- `<resource pool>`. Can take the value of one or more nested resource pools. If no resource pools are specified, the default resource pool for the host is used.

The following example is of an inventory path without a specified resource pool:

```
vi://username:pass@localhost/my_datacenter/host/esx01.example.com
```

The following example is of an inventory path with a specified resource pool:

```
vi://username:pass@localhost/my_datacenter/host/esx01.example.com/Resources/
my_resourcepool
```

Note You must specify the `/host/` section of an inventory path when using a `vi` destination locator. If you are specifying the destination of a resource pool, you must include the `/Resources/` section of the path.

vCloud Director Locators

The syntax for vCloud locators are the same as for other locators:

```
vcloud://username:password@host:port?org=name_of_org&vapp=name_of_deployed_vapp&
catalog=name_of_catalog&vappTemplate=name_of_vapp_template_in_catalog&vdc=name_of_vdc
```

Some of the options are not needed if there is only one virtual datacenter to choose from. If there are more than one datacenter, the catalog option is required. The `org` option is mandatory, because it is used to log in to vCloud Director.

Note OVF Tool supports all source types for vCloud Director 1.5. For vCloud Director 1.0, OVF Tool only supports OVF/OVA/vCloud sources. OVF Tool does not support vi, vmx, or vapprun sources for vCloud Director 1.0.

Examples of vCloud Locators

The following example uploads and deploys an OVF named test into vCloud Director and names the vApp my_test1.

```
ovftool /tmp/test.ovf vcloud://user1:password@10.99.99.99:7443?
org=o&vapp=my_test1
```

This example exports a vCloud Director vApp to the OVF file /tmp/test1.ovf

```
ovftool vcloud://user1:password@10.10.99.99.99:7443?org=o&vapp=my_test1 /tmp/
test1.ovf
```

If you use a network, you map the network in the usual way:

```
--net:sourceNET=targetNET
```

You also apply properties in the usual way.

Partial Locators

When using OVF Tool, it is often not necessary to specify source and target types as long as certain filename conventions are used. It is possible to ignore locator type and specify the source and target explicitly using the arguments `--sourceType=...` and `--targetType=`.

OVF Tool assumes the locator type based on the following rules:

- If the name starts with `vcloud://`, OVF Tool assumes vCloud Director type.
- If the name starts with `vi://`, OVF Tool assumes vSphere type.
- If the name ends with `.ovf`, OVF Tool assumes OVF type.
- If the name ends with `.vmx`, OVF Tool assumes VMX type.
- If the name ends with `.ova`, the OVF tool assumes OVA type.
- If the locator is a file path to a directory that represents a vApprun workspace or an entity in a vApprun workspace, then OVF Tool assumes vApprun type.

Similarly, source and target types can be inferred from folder locators. OVF Tool assumes the type using the following rules:

- If the source locator is a folder, OVF Tool assumes that the source is an OVF package and that the OVF descriptor is called the same as the folder, for example, `my-ovf/my-ovf.ovf`.

- If the source is an OVF package and the target locator is a directory, such as `MyVirtualMachines/`, OVF Tool assumes that the target is a VMX locator. The created VMX/VMDK file is put in a directory with the target name, for example, `MyVirtualMachines/MyVM/MyVM.vmx`.
- If the source is a VMX locator and the target locator is a directory, OVF Tool assumes that the target is an OVF package.
- If the source is a vSphere locator, and the target locator is a directory, OVF Tool assumes that the target is an OVF package.

OVF Tool supports partial vSphere locators when deploying or exporting. For an incomplete locator path, the tool suggests completions at the command line. [Partial vSphere Locators at the Command Line](#) shows the command-line dialog when partial locators are used.

Example: Partial vSphere Locators at the Command Line

```
> ovftool LAMP.ovf vi://localhost/
Opening source: LAMP.ovf
Opening target: vi://user@localhost/
Error: Found wrong kind of object (Folder)
Possible completions are:
  Datacenter/
  Remote Datacenter/
  Secondary Datacenter/

> ovftool LAMP.ovf vi://localhost/Datacenter
Opening source: LAMP.ovf
Opening target: vi://user@localhost/Datacenter
Error: Found wrong kind of object (Datacenter)
Possible completions are:
  vm/
  host/

> ovftool LAMP.ovf vi://localhost/Datacenter/host
Opening source: LAMP.ovf
Opening target: vi://user@localhost/Datacenter/host
Error: Found wrong kind of object (Folder)
Possible completions are:
  host1.foo.com/
  host2.foo.com/

> ovftool LAMP.ovf vi://localhost/Datacenter/vm/host1.foo.com
```

OVF Tool supports partial vSphere locators when deploying or exporting. For an incomplete locator path, the tool suggests completions at the command line. [Partial vCloud Director Locators at the Command Line](#) shows the command-line dialog when partial locators are used. First, OVF Tool signals that there is more than one virtual datacenter present, then multiple catalogs, then multiple networks. At each attempt, you must select one of the options that OVF Tool presents.

Example: Partial vCloud DirectorLocators at the Command Line

```

ovftool LAMP.ovf vcloud://jd:PASSWORD@example.com:443/?org=myOrg&vapp=test1
Opening OVF source: LAMP.ovf
Warning: No manifest file
Opening vCloud target: vcloud://js:PASSWORD@example.com:443/
Error: Multiple VDCs found. Possible VDC completions are:
    orgVdc
    orgVdc2
Completed with errors

ovftool LAMP.ovf "vcloud://jd:PASSWORD@example.com:443/?org=myOrg&vapp=test1&vdc=orgVdc"
Opening OVF source: LAMP.ovf
Warning: No manifest file
Opening vCloud target: vcloud://js:PASSWORD@example.com:443/
Error: Multiple catalogs found. Possible catalog completions are:
    catalog
    catalog2
Completed with errors

"vcloud://jd:PASSWORD@example.com:443/?org=myOrg&vapp=test1&vdc=orgVdc&catalog=catalog"
Opening OVF source: LAMP.ovf
Warning: No manifest file
Opening vCloud target: vcloud://js:PASSWORD@example.com:443/
Error: Multiple networks found on target. Possible completions are:
    extNet2
    extOrgNet
    intNet2
    intnet
Completed with errors

ovftool --net:"VM Network=intnet" LAMP.ovf "vcloud://jd:PASSWORD@example.com:443/
?org=myOrg&vapp=test1&vdc=orgVdc&catalog=catalog"
Opening OVF source: LAMP.ovf
Warning: No manifest file
Opening vCloud target: vcloud://js:PASSWORD@example.com:443/
Deploying to vCloud: vcloud://js:PASSWORD@example.com:443/
Disk Transfer Complete
Completed successfully

```

Configuration Files

OVF Tool has many options. Rather than repeatedly entering long commands on the command line, you can create a configuration file. A configuration file uses the following syntax:

```

option1=value
...
#comment
optionN=value

```

The following is an example of a configuration file:

```
proxy=http://proxy.example.com
datastore=storage-test42
# Comment on something
locale=dk
```

You can create local or global configuration files. The local configuration file `ovftool.cfg` is read in the folder where you invoke OVF Tool. The global configuration file is per user.

On Windows (after XP), the global configuration file is in the following location:

```
C:\Users\%USER%\AppData\Roaming\VMware\ovftool.cfg
```

Linux and OS X look for the global configuration file in the following location:

```
$HOME/ovftool.cfg (example ~/ovftool.cfg)
```

When reading configuration files, globally defined options are overwritten by locally defined options, and locally defined options are overwritten by the `--configFile` command-line option. Some variables, such as `proxy`, do not allow you to specify the option in multiple places. If `ovftool` stops running with the error “already exists“ it is likely that you specified an option on the command line and in a configuration file.

You can use the `ovftool --help config` command to get information about how to use a configuration file. In addition, the current contents of the global configuration file as well as any local configuration file is shown.

Handling Authentication

OVF Tool generates AUTHENTICATION output messages if access to a resource requires username and password. A vSphere or vCloud locator, a proxy server, or an authenticated URL require usernames and passwords. OVF Tool generates AUTHENTICATION messages only for resources where passwords are not explicitly provided as command-line arguments or as part of the locator.

OVF Tool can authenticate the following types of objects:

- source locators
- target locators
- proxyServer

For source and target locators, you must provide the username on the command-line. If you do not provide a password, OVF Tool generates an AUTHENTICATION message and you must provide the password on STDIN. If the proxy server requires authentication, you must provide both the username and password on STDIN. OVF Tool supports the following commands on STDIN:

```
For the source password:
  PASSWORDSOURCE
  password
For the target password:
  PASSWORDTARGET
  password
For the proxy:
  PASSWORDPROXY
  username password
```

For an example of the output of running `machineOutput` in authentication mode, see [Output from Running machineOutput in Import Mode](#).

Launching the OVF Tool as a Helper Process

You can use the integration options to make it more convenient to launch OVF Tool as a helper process to a client of the vSphere Web Services API, such as a script using Perl bindings.

If you use the `--I:morefArgs` argument, the values for `--vmFolder`, `--network`, `--net`, and `--datastore` are interpreted as MoRefs instead of names, as shown in the following example:

```
> ovftool --name=vm5 \
  --I:morefArgs \
  --net:VM Network=vim.Network:network-12 \
  --datastore=vim.Datastore:datastore-17 \
  c:\temp\vm1\ \
  vi://root:@localhost?moref=vim.ResourcePool:resgroup-42
```

Use the `--I:sourceSessionTicket` or `--I:targetSessionTicket` options to authenticate with a session ticket retrieved from `SessionManager.AcquireSessionTicket`, when using the vSphere source or destination.

Examples of OVF Tool Syntax

3

This chapter provides many examples of OVF Tool usage, that are divided into the following categories:

You can see similar examples within the OVF Tool, by typing `--help examples` on the command line while you are in the directory where the `ovftool` script is running.

Read the following topics next:

- Supported File Types and Package Formats
- Changing File or Package Formats
- Setting OVF Package Properties
- Modifying an OVF Package
- Deploying OVF Packages
- Importing an OVF Package
- Exporting Virtual Machines to OVF Packages
- Displaying Summary Information
- Validating an OVF 1.0 or OVF 1.1 Descriptor
- Downloading an OVF Package from a Protected Web Site
- Using a Proxy
- Overwriting a Running Virtual Machine or vApp from vSphere
- Canceling the VMware OVF Tool While it Is Running

Supported File Types and Package Formats

As discussed in earlier chapters, you can use the OVF Tool to package virtual machines as vApps (ready-to-use virtual machine groups with cooperating systems and applications). The package formats supported by the OVF Tool can be read and/or imported by other VMware and third-party software.

The table below describes each of the supported formats:

Table 3-1. Supported File and Package Types for OVF Tool Input and Output

| Package Type | Full Name | Usage |
|--------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OVF (.ovf) | Open Virtualization Format | <p>National ANSI standard for packaging software for virtual machines, originally created by an industry consortium, the Distributed Management Task Force (DTMF).</p> <p>An OVF package includes: a descriptor file, optional manifest and certificate files, optional disk images, and optional resource files (such as ISOs). The disk image files can be in VMware's .vmdk disk image format or any other supported disk image format. OVF packages can be used by the software of any hypervisor or processor architecture that supports this format.</p> |
| OVA (.ova) | Open Virtual Appliance | A TAR archive that contains an OVF package. |
| VMX (.vmx) | Virtual Machine Configuration File | <p>When you create a new virtual machine, this file is created to store information about the operating system, disk sizes, networking, and virtual hardware.</p> <p>Files in this format and in .vmdk format are sometimes referred to together as VMware runtime format.</p> |
| VMDK (.vmdk) | Virtual Machine Disk | Files with this extension may contain disk characteristics (.vmdk), contents (-flat.vmdk), or snapshot files (-delta.vmdk). These files are called out on the OVF Tool command line, but may exist within the package. |
| VI (vi://) | VMware Infrastructure | This is an older term that originated with ESX 3, but is still seen in the command line syntax for the OVF Tool. As an OVF command line option, 'vi//' is used before the credentials and path to a server. |
| vCloud | vCloud Director format | The vCloud Director REST API makes basic transfer between clouds possible using OVF packages, which preserve application properties, networking configuration and other settings. |
| ISO (.iso) | Optical Image File | An ISO archive is a CD/DVD image. Creating a package as an ISO image allows you to install a virtual appliance using a CD ROM drive. This type of archive is called an ISO because it was created by the International Standards Organization's 9660 standard. |
| FLP (.flp) | Floppy Disk Image File | Use this format if you need to transfer data from a floppy drive or to the virtual machine floppy drive. See the VMware Knowledge Base for FLP information. |
| vApprun | vApprun | This format allows you to run a virtual appliance on VMware Fusion or Workstation. You can use OVF Tool to convert vApps to the vApprun format, and you can use VMware Workstation to convert vApps to OVF format. |

Use the OVF Tool with the Target Type option to specify the target out as OVF, OVA, VMX, VI, vCloud, ISO, FLP, vApprun.

In this following example, the target type is set to the 'vmx' or VMware runtime format (.vmx and .vmdk files)

```
> ovftool -tt=vmx /ovfs/my_vapp.ovf /vms/
```

The resulting files are: /vms/my_vapp/my_vapp.vmx and /vms/my_vapp/my_vapp.vmdk, the typical VMware runtime format for a virtual machine folder.

Changing File or Package Formats

The examples below show you how to convert from an existing format to a different format.

Converting an OVF Package to an OVA Archive

To convert an OVF package, to a single OVA archive, use the following syntax:

```
> ovftool /ovfs/my_vapp.ovf /ovfs/my_vapp.ova
```

Converting an OVA Archive to OVF Package

To extract an OVA archive to an OVF package, use the following syntax:

```
> ovftool /ovfs/my_vapp.ova /ovfs/my_vapp.ovf
```

Converting VMX Format to an OVF Package

To convert a virtual machine in VMware runtime format (.vmx and .vmdk files) to an OVF package, use the following syntax:

```
> ovftool /vms/my_vm.vmx /ovfs/my_vapp.ovf
```

The result is located in /ovfs/my_vapp.ovf

Converting VMX Format to an OVA Archive

To convert VMX files to an OVA archive, use the following syntax:

```
> ovftool vms/Nostalgia.vmx ovfs/Nostalgia.ova
```

Converting an OVA Archive to VMX Format

To convert an OVA archive to VMware runtime format (.vmx and .vmdk files), use the following syntax:

```
> ovftool https://my_ovf_server/ovfs/my_vapp.ova /vm/my_vm.vmx
```

Converting an OVF Package to VMX Format

To convert an OVF package to VMware runtime format (.vmx and .vmdk files), use the following syntax:

```
> ovftool http://www.mycompany.com/ovflib/BigDemo.ovf x:/myvms/BigDemo.vmx
```

Because the source is an OVF package, you can specify it as a URL or a local file path.

If you convert an OVF package to a VMX format without specifying the target directory, OVF Tool creates a directory using the OVF package name and writes the .vmx and .vmdk files in it.

```
> ovftool "Windows 7.ovf" .
```

The VMX file is written at `Windows 7/Windows 7.vmx`.

You can also convert from an ovf format to a vmx format using a URL, as shown:

```
> ovftool https://my_ovf_server/ovfs/my_vapp.ova /vm/my_vm.vmx
```

Installing an ESXi host from an OVF Package

To install an OVF package as an ESXi host, use the following syntax:

```
> ovftool /ovfs/my_vapp.ovf vi://username:pass@my_esx_host
```

(Uses default mappings.)

Installing an ESXi host from an OVF Package on a Web Server

To install an OVF package on a web server as an ESXi host, use the following syntax:

```
> ovftool http://my_ovf_server/ovfs/my_vapp.ovf vi://  
username:pass@my_esx_host
```

(Uses default mappings.)

Installing an ESXi host or Adding Files from a VMX Format

To install an ESXi host from a VMware runtime format (.vmx and .vmdk files), or to add .vmx files to an ESXi host, use the following syntax (uses default mappings):

```
> ovftool /ovfs/my_vm.vmx vi://username:pass@my_esx_host  
> ovftool Nostaliga.vmx vi://user:pwd@host/Datacenter/host/host1.foo.com
```

Installing a vCenter Server or Adding Files from an OVF Package

To install or add files to a vCenter Server from an OVF package, use the following syntax (uses a managed ESXi host's IP address):

```
> ovftool /ovfs/my_vapp.ovf vi://username:pass@my_vc_server/?ip=10.20.30.40
```

Converting a VM on ESXi or vCenter Server to an OVF Package

This example uses a datastore location query to convert a VM (located on a vCenter Server) to OVF format.

```
> ovftool vi://username:pass@my_vc_server/my_datacenter?ds=[Storage1] foo/  
foo.vmx c:\ovfs\
```

or

```
> ovftool vi://username:pass@my_host/my_datacenter/vm/my_vm_folder/
my_vm_name /ovfs/my_vapp.ovf
```

Installing vCenter Server from an OVF Package Using an Inventory Path

This example uses a vSphere inventory path to install or add files to a vCenter Server from an OVF package.

```
> ovftool /ovfs/my_vapp.ovf vi://username:pass@my_vc_server/my_datacenter/
host/my_host
```

Setting OVF Package Properties

The following sections show you how to set properties for OVF packages.

Setting OVF Properties When Deploying to vSphere or vCloud Director

OVF descriptors can contain configuration properties for the deployed OVF package. You can set only one property at a time, but you can have multiple instances of the option per command. The property option has the following syntax:

```
--prop:<option>=<value>
```

This example sets two properties: the administrator's email address and the number of concurrent sessions.

```
> ovftool --prop:adminEmail=john@example.com --prop:concurrentSessions=200 package.ovf vi://
localhost/?dns=fast-esx=host1.example.com
```

Setting OVF Network Maps When Deploying to vSphere

OVF descriptors can use symbolic identifiers for network names. These identifiers must be mapped to a network that is available on the chosen vSphere platform. If only one network is available on the target and only one network is described in the OVF descriptor, OVF Tool selects that network automatically. In this case, you do not need to specify a network map. The `--net` option has the following syntax:

```
--net:<OVF network name>=<target network name>
```

In the following example, a network is selected.

```
> ovftool --net:"Example net 1"="VM Network" <source> <vSphere locator>
```

If the OVF descriptor only specifies one network name, you can specify the target network name of the network mapping, as in the following example:

```
> ovftool --network="VM Network" <source> <vSphere locator>
```

Setting a vService Dependency

You can dependency so that your application deploys as a service using the following option:

```
ovftool --vService:vDepl=provider_1 /ovfs/my_vapp.ovf
      vi://username:pass@localhost/my_datacenter/host/esx01.example.com
```

Modifying an OVF Package

The following sections show you how to modify OVF packages.

Renaming the OVF Package

You can rename an OVF package by converting the OVF to an OVF. This action also renames all the disk names and changes the references in the OVF descriptor.

```
> ovftool "Windows 7.ovf" win7.ovf
```

Omitting Disks in the VMware OVF Tool Output

If you want only information about the OVF descriptor and not about the disks that it refers to, you can suppress output. The following example command omits disk output and simply copies the OVF descriptor and any message bundle files that might be associated with it:

```
> ovftool --noDisks http://example.com/ovf/InterestingVirtualAppliance package.ovf
```

Compressing an OVF Package

For maximum compression of an OVF package with multiple virtual machines, set both the `--compress=9` and `--makeDeltaDisks` options. The following are examples of using maximum compression:

```
> ovftool --compress=9 --makeDeltaDisks package.ovf output-dir
> ovftool --compress=9 --makeDeltaDisks vi://localhost/dc/vm/VirtualAppDemo output-dir/
```

If the source contains only a single virtual machine, the `--makeDeltaDisks` option does not yield any compression boost. In this case, the `--compress=9` option gives maximum compression.

Chunking or Splitting OVF Packages

Some file systems have a restriction on maximum file size. For example, FAT32 allows files only up to 2GB. You can split the OVF files from a generated package into pieces of a specified

maximum size. The default measurement is megabytes (keyword `mb`). You can specify other units using one of the following keywords:

| Unit | Keyword |
|-----------|-----------------|
| Bytes | <code>b</code> |
| Kilobytes | <code>kb</code> |
| Gigabytes | <code>gb</code> |

For example, to create an OVF package optimized for a FAT32 file system, use the following command:

```
> ovftool --chunkSize=2gb <source> package.ovf
```

Each file chunk has a sequentially numbered suffix. For example, for a 6GB disk, the chunks have these names:

```
disk1.vmdk.000000000, disk1.vmdk.000000001, disk1.vmdk.000000002
```

TPM as a Virtual Device in OVF

Trusted platform module (TPM) is a hardware device that can establish a chain of trust for the software that is being loaded onto a machine. VMware virtual TPM (vTPM) is a fully compatible implementation for virtual machine equivalence.

If you want a VM to contain a vTPM device, you can either create it as a placeholder in the OVF and have it auto configured, or you add the vTPM device after OVF import.

Prepare OVF with Virtual TPM Placeholder

This procedure is convenient for OVF re-use in the long run, but requires more work initially:

- 1 Prepare the guest VM for vTPM removal by ensuring that none of its applications are using the vTPM device, such as BitLocker, etc.
- 2 Remove the vTPM device from the VM. The VM home will be decrypted unless there is a feature or policy that requires encryption.
- 3 If it was encrypted, decrypt the VM. OVF export does not work on encrypted VMs, so the VM must be decrypted before export.
- 4 Export the VM.
 - Using `ovftool` (recommended) you can add a vTPM placeholder in the destination OVF descriptor with the `addDevice:vtpm` option. This option creates the vTPM placeholder in the destination OVF descriptor (`file.ovf`) and calculates the proper manifest file checksum. For example:

```
ovftool --addDevice:vtpm vi://user:pass@my_vc/datacenter?ds=[Storage1] vm/vm.vmx
c:\ovfs\
```

- Using the vSphere Client UI (more difficult) you can export the VM to an OVF template. After export, open the OVF descriptor file (*file.ovf*) and manually add a vTPM device placeholder, as below.

You must also open the OVF manifest file (*.mf*) and fix the SHA256 checksum for the *.ovf* file. Because you manually edited the OVF descriptor file, the checksums in the OVF manifest are no longer correct. You must recalculate the checksum for the *.ovf* file and manually set it in the manifest file.

(Optional) Re-sign the OVF template if it should be security signed. Perform this step after editing the *.ovf* and *.mf* files.

```
<Item ovf:required="false">
  <rasd:AutomaticAllocation>>false</rasd:AutomaticAllocation>
  <rasd:ElementName>Virtual TPM</rasd:ElementName>
  <rasd:InstanceID>13</rasd:InstanceID>
  <rasd:ResourceSubType>vmware.vtpm</rasd:ResourceSubType>
  <rasd:ResourceType>1</rasd:ResourceType>
</Item>
```

- 5 Import the OVF to VSphere. You can do this with `ovftool`. Upon importing the VM, the vTPM device will be auto-provisioned, and a unique Endorsement Key (EK) will be generated.

Note The OVF descriptor will contain a placeholder for a vTPM device, which does not contain any secrets. The actual EK will be set upon when creating a VM from this OVF template upon import.

Prepare OVF and Add Virtual TPM During or After Import

- 1 Prepare the guest VM for vTPM removal by ensuring that none of its applications are using the vTPM device, such as BitLocker, etc
- 2 Remove the vTPM device from the VM. The VM home will be decrypted unless there is a feature or policy that requires encryption.
- 3 If it was encrypted, decrypt the VM. OVF export does not work on encrypted VMs, so the VM must be decrypted before export.
- 4 Export the VM. You can do this either with the vSphere Client UI or with `ovftool`.
- 5 Import the OVF into vSphere.
 - Unless the OVF contains a vTPM placeholder, import using the `ovftool --addDevice:vtpm` option. Specifying this option on the command line creates a vTPM device attached to the destination VM. If the OVF contains a vTPM placeholder, you do not need the `--addDevice` option. The placeholder will automatically become a vTPM device on the imported VM.
 - With the vSphere Client, import the VM. After importing the VM, you can add a vTPM device manually using the vSphere Client.

Deploying OVF Packages

The following sections show various ways to deploy OVF packages.

Deploying an OVF Package Directly on an ESXi Host

The following command deploys an OVF package on an ESXi host.

```
> ovftool package.ovf vi://my.esx-machine.example.com/
```

If your host has multiple data stores, select with `-ds` option:

```
> ovftool package.ovf -ds=storage1 vi://my.esx-machine.example.com/
```

See also [Run OVF Tool With ESXi and vCenter Target Locations](#).

Deploying an OVF Package using Pull Mode

OVF Tool 4.4.1 with vSphere 6.7 introduced the pull mode flag, which allows an ESXi host to directly download (pull) from a remote URL, assuming connectivity. Previously, data had to pass through another system, adding an unnecessary hop if an ESXi host can directly access the remote URL.

Pull mode speeds up file transfers and allows for quicker deployments of Virtual Machines. It enables an option in which OVF source files (VMDKs and others) are copied directly to ESXi from HTTP(S) source without going through `ovftool`.

Pull mode is actually a capability of ESXi hosts that `ovftool` takes advantage of. If property `pullModeSupported` is true in the `HttpNfcLease` managed object, then pull mode is triggered for deployments using the `--pullUploadMode` flag. Here are caveats for this option:

- The ESXi host must have access to HTTP(S) source, and permission to view the source files.
- The source must be HTTP(S) and not a filesystem based URL, for example `http://www.example.com:80/path/to/package.ova` or `https://www.example.com:443/path/to/package.ova`
- The ESXi host validates the source HTTP server before access, so the Thumbprint of the HTTP source server should be supplied. If the Thumbprint is not supplied the ESXi host may or may not be able to validate the server. If the source HTTP server is not known to the ESXi then source validation fails and deployment fails also.
- Validation described in last step, with Pull mode, cannot be suppressed with the `--noSSLVerify` flag.
- Flag `--verifyViTargetManifest` will not work with Pull mode due to the way checksum of the transferred file is done. In Pull mode `ovftool` is not involved in transferring the file so it cannot calculate the checksum and compare it to what the manifest shows.

Syntax and example of working command (final two lines are continuations):

```
ovftool --pullUploadMode source target
ovftool --acceptAllEulas --pullUploadMode
  https://download3.vmware.com/software/vmw-tools/nested-esxi/AV50_EX_OVF.ovf
  vi://user:pass@192.168.1.1/Datacenter/host/Cluster
```

Deploying an OVF Package through vCenter Server

The following command deploys `testVM.ovf` from a local Windows disk to a data store named `storage1` on host (10.2.3.56) from vCenter (10.2.3.4). the VM will be named `myVM` on the host. (To test this on your system, replace the incorrect IP addresses in this example with your actual data store and host IP addresses.)

```
> ovftool -ds=storage1 -n=myVM C:\testVM.ovf vi://user1:passwd@10.2.3.4/?ip=10.2.3.56.
```

Deploying an OVF Package and Powering It On

OVF Tool can power on a virtual machine or vApp after deployment. This action can be done on all supported platforms. The following example powers on the VM or vApp on a particular host through vCenter Server:

```
> ovftool --powerOn package.ovf vi://MyvCenterServer/?dns=fast-esx-host1.example.com.
```

Deploying an OVF Package into vCloud Director

You can deploy an OVF package from OVF Tool into vCloud Director. The following example connects to vCloud Director and deploys the OVF package `LAMP.ovf`.

```
> ovftool --net:"VM Network=intnet" LAMP.ovf "vcloud://jd:PASSWORD@example.com:443/?
org=myOrg&vapp=test1&vdc=orgVdc&catalog=catalog"
```

Deploying an OVF Package into a vApprun Workspace

A vApprun workspace allows Workstation and Fusion users to run vApps. It provides a complete vApprun execution environment, that includes nested vApps, OVF properties, and an OVF environment. The environment is fully compatible with vSphere 4 and all later releases.

Read more about vApprun at: <http://labs.vmware.com/flings/vApprun>.

To deploy an OVF package into a vApprun workspace, simply use a target locator that points to your vApprun workspace, as shown in the following example:

```
> ovftool myOvfPackage c:\My_vApprun_workspace\
```

A common scenario is that the current directory is the vApprun workspace (since all vApprun commands are relative to this), so you can just use a "." as the target locator, as shown in the following example:

```
> ovftool http://www.mycompany.com/ovflib/BigDemo.ovf.
```

Importing an OVF Package

The following sections show you how to import OVF packages.

Importing an OVF File into a vCloud instance

This section provides two examples of importing using a URL to create a vCloud instance from an OVF file. The first example names the resulting vApp as 'vApp'.

```
> ovftool http://my_ovflib/vm/my_vapp.ovf \  
vcloud://username:pass@my_cloud?org=MyOrg&vdc=MyVDC&catalog=MyCatalog&vapp=myVapp
```

(Imports an OVF from http into a vCloud instance and names the vApp myVapp)

The second example also creates a vApp template:

```
> ovftool http://my_ovflib/vm/my_vapp.ovf \  
vcloud://username:pass@my_cloud?org=MyOrg&vdc=MyVDC&catalog=MyCatalog&vappTemplate=myTemplate
```

(This imports an OVF from http into a vCloud instance and creates a vApp template)

Importing a Virtual Machine from vSphere to vCloud

The following command imports a virtual machine from vSphere into a vCloud instance and names the resulting vApp 'myVapp'.

```
> ovftool vi://username:pass@my_host/my_datacenter/vm/my_vm_folder/my_vm_name \  
vcloud://username:pass@my_cloud?org=MyOrg&vdc=MyVDC&catalog=MyCatalog&vapp=myVapp
```

Importing VMX Files into a vApprun Workspace

To import a VMX format into a vApprun workspace, use the following syntax:

```
> ovftool /virtualmachines/MyVM.vmx ~my_vApprun_workspace/
```

Exporting Virtual Machines to OVF Packages

The following sections show you how to export virtual machines within OVF packages.

Exporting a Virtual Machine from a vCloud instance to an OVF Package

The following command exports a Virtual Machine from a vCloud instance into an OVF package.

```
> ovftool vcloud://username:pass@my_cloud?org=MyOrg&vdc=MyVDC&catalog=MyCatalog&vapp=myVapp \  
/ovfs/myVapp.ovf
```

Exporting a Running Virtual Machine or vApp from vSphere

You must power off a virtual machine or vApp before exporting it. The following example locates the virtual machine or vApp based on its DNS name through the vCenter Server and powers it off:

```
> ovftool --powerOffSource vi://MyvCenterServer/?dns=test-vm test-vm.ova
```

Note This option does not perform a shutdown of the operating system. This is only a power off operation.

Exporting a vApprun Entity to an OVF Package

Both virtual machine and vApp entities in your vApprun workspace can be exported as OVF packages, as shown in the following example:

```
> ovftool c:\My_vApprun_workspace\BigDemo c:\ovflib\
```

Prepend the name of the entity to export to the path. If the current directory is the vApprun workspace, you only specify the name, as shown in the following example. This example takes advantage of the fact that any source locator can be used with any destination locator. Thus, the vApp transfers directly from the vApprun workspace to the vCenter installation.

```
> ovftool BigDemo vi://MyvCenterServer/...
```

Note vApprun does not keep the same level of meta-data around as vSphere. Thus, the vApprun-created OVF packages will not contain any EULAs, description of properties, and such.

Displaying Summary Information

To display a summary of information about the OVF package [in probe mode], use the following syntax:

```
> ovftool https://my_ovflib/vm/my_vapp.ovf
```

(shows summary information about the OVF package [probe mode])

Validating an OVF 1.0 or OVF 1.1 Descriptor

If you are generating OVF 1.0 or OVF 1.1 descriptors manually, you can check whether the descriptors comply with OVF 1.0 or OVF 1.1. The following examples show how to validate descriptors:

```
> ovftool --schemaValidate package.ovf
> ovftool --schemaValidate package.ova
> ovftool --schemaValidate http://example.com/folder1/package.ovf
> ovftool --schemaValidate http://example.com/folder1/package.ova
```

If everything is correct, OVF Tool shows the result of probing OVF. Otherwise, it shows warnings and errors.

Important Being compliant with OVF 1.0 or 1.1 is only part of the requirements for a valid OVF package. Schema validation does not check for all the requirements specified in the OVF 1.0 and OVF 1.1 specifications.

Downloading an OVF Package from a Protected Web Site

The OVF Tool can read sources given by a URL using both HTTP and HTTPS. You access it with the user name and password. The following example downloads the LAMP OVF package and puts it in an OVA package. If you omit the user name and password, the OVF Tool will prompt you for them.

```
> ovftool https://user:pass@example.com/repository/ovf/LAMP.ovf LAMP.ova
```

Using a Proxy

You can specify a proxy for the OVF Tool. The following examples show the use of the `--proxy` option:

```
> ovftool --proxy=proxy.example.com http://external-site.com/ovf/package.ovf
> ovftool --proxy=http://proxy.example.com http://external-site.com/ovf/package.ovf
```

The OVF Tool allows proxies that require authentication. Credentials are supplied in the proxy path as shown in the following example:

```
> ovftool --proxy=user:pass@proxy.example.com http://external-site.com/ovf/package.ovf
```

If you omit the username or password for a proxy server that requires authentication, OVF Tool prompts for them. The `--proxy` option enables a proxy for either vSphere (VI) or vCloud.

```
> ovftool --proxy=proxy.example.com package.ovf vi://my.esx-machine.example.com/
> ovftool --proxy=proxy.example.com package.ovf
"vcloud://USERNAME:PASSWORD@example.com:443/?org=myOrg&vapp=test&vdc=orgVdc&catalog=catalog"
```

Overwriting a Running Virtual Machine or vApp from vSphere

The OVF Tool supports overwriting existing targets. If a target virtual machine or vApp has the same name as the source, OVF Tool overwrites the target when the `--overwrite` option is specified. If the target virtual machine or vApp is running, OVF Tool cannot overwrite it. OVF Tool does not automatically power off the target. To power off the target before overwriting it, use the `--powerOffTarget` option.

```
> ovftool --overwrite --powerOffTarget package.ovf vi://localhost/?dns=production-host.example.com
```

You can also power on the newly written virtual machine or vApp at the same time. In the following example, the target machine is powered off and deleted, the package.ovf is imported, and the imported virtual machine or vApp is powered on.

```
> ovftool --overwrite --powerOffTarget --powerOn package.ovf vi://localhost/?  
dns=production-host.example.com
```

Canceling the VMware OVF Tool While it Is Running

To cancel OVF Tool while it is running, type **Ctrl-C**. This halts OVF Tool and cleans up any generated files.

OVF Package Signing

4

A valid OVF signature requires two special files, a manifest (`.mf`) file that contains the SHA hash codes of all the files in the package (except the `.mf` and `.cert` files), and a certificate file (`.cert`) that contains the signed SHA of the manifest file and the X.509 encoded certificate. This appendix specifies how to use OpenSSL and VMware OVF Tools commands to sign and validate OVF packages.

Read the following topics next:

- [Publishing an OVF Package with a Digital Signature](#)
- [Creating an RSA Public/Private Key Pair and Certificate](#)
- [Signing an OVF Package](#)
- [Validating an OVF Package](#)

Publishing an OVF Package with a Digital Signature

If you are a vendor who has produced a virtual appliance that you want to publish as an OVF appliance for public consumption, you should incorporate a digital signature.

Digital signatures work by proving that a message or document was not modified (intentionally or unintentionally) from the time it was signed. Digital signatures do this by generating a unique hash of the message or document and encrypting it using the sender's private key. For more information, see *Understanding Digital Signatures* at the cisa.gov website.

OVF Tool helps in distributing virtual appliances by performing all required operations to digitally sign an OVF package. Operation steps include:

- 1 Calculate the SHA hashes of each file (OVF file, VMDK files, and so on).
- 2 Create a manifest file and store the calculated SHA hashes from the previous step.
- 3 Use the vendor's private key to digitally sign the manifest file's content thereby producing a digital signature.
- 4 OVF Tool then stores the digital signature from the previous step in the cert file. OVF Tool also stores the vendor's public key in the cert file for client side signature verification.

The steps above can also be done using the `openssl` tool.

Note SHA1 is no longer considered secure. SHA256 and above should be used instead. See the `--shaAlgorithm` command line option.

When a customer receives the vendor's OVF package, they can perform the following steps to verify integrity of the OVF package contents:

- 1 Customer uses the public key in the cert file to verify (for example with `openssl`) the signature of the manifest file content in the cert file, checking that the signature matches the manifest file contents.
- 2 Customer uses SHA hashes in the (now verified) manifest file to verify (with `openssl`) that the OVF file hash and the VMDK file hash match those in the manifest file. This proves that the files have not been corrupted or tampered with since the vendor published them.

OVF Tool can perform the above steps automatically and does so by default if a `.cert` file is found in the OVF package.

Note If option `--requireSignature` is passed to the OVF Tool command, the `.cert` and `.mf` files must exist in the OVF package and they must be valid.

VMware signs their own appliances. OVF Tool and vCenter Server Appliance have an embedded copy of the VMware public key to verify digital signatures of those products.

Creating an RSA Public/Private Key Pair and Certificate

To sign a package, a public/private key pair and certificate that wraps the public key is required. The private key and the certificate, which includes the public key, is stored in a `.pem` file.

The following OpenSSL command creates a `.pem` file:

```
openssl req -x509 -nodes -sha256 -days 365 -newkey rsa:1024 -keyout myself.pem -out myself.pem
```

Note No password is necessary. To include a password, remove the `--nodes` option.

Contents of the resulting `myself.pem` file are shown below.

Example: myself.pem File

```
-----BEGIN RSA PRIVATE KEY-----
MIICXAIBAKBgQDe0dCCKNFQ45+D0ezGGAuVSbhE8buqFCQnQnfi27Wt6bu4DhcE
bQtjgfuEpc14e31txJcu18XTv4icRL74DP7i2pMN2UVj6DZW/B7jIw4UPG2g96f
...
-----END RSA PRIVATE KEY-----
-----BEGIN CERTIFICATE-----
MIIC5DCCAk2gAwIBAgIJAKgUiZPOajC0MA0GCSqGSIb3DQEBAUMFYxCzAJBgNV
BAYTAkRMRMwEQYDVQQIEwpTb211LVN0YXR1MQ8wDQYDVQQHEwZBYXJodXMxITAf
```

```
...
-----END CERTIFICATE-----
```

To display the contents of a `.pem` file at the command line, type the following:

```
openssl -x509 -text -noout -in <filename>.pem
```

Contents of the file display as follows:

```
Certificate:
  Data:
    Version: 3 (0x2)
    Serial Number:
  ....
```

To create a trusted certificate, use the OpenSSL command, omitting the `-x509` option. This creates a certificate request in a `.pem` file that you can send to any public authority such as Verisign.

Signing an OVF Package

Signing an OVF package enables the person deploying it to validate the authenticity of the OVF package. Once the package is signed, OVF package files cannot be changed, without invalidating the signature. When a package comes from a trusted source and has a valid OVF signature, you can deploy the package knowing it has not been tampered with.

Signing an OVF package requires a `.pem` file that contains a private key and a certificate, as shown in section [Creating an RSA Public/Private Key Pair and Certificate](#).

To sign a generated OVF package, include the `--privateKey` option. The option syntax is shown in the following example:

```
> ovftool --privateKey=<path to .pem file> <source> <output OVF or OVA file>
```

When this option is used, OVF Tool uses the private key and certificate to generate a signature based on the SHA digest of each file that is included in the OVF package, including the OVF descriptor itself.

OVF Tool generates an additional `.cert` file with a signed SHA signature and the certificate used to sign it. [Certificate File Created by OVF Tool](#) shows an example of the `.cert` file generated by OVF Tool.

Example: Certificate File Created by OVF Tool

```
SHA256(signed-
package.mf)=5d9a307f0acdc1a424079eb38ff8954c153f978e599ed374dd784c853bab1856415fa16ef378bde348
7cd5dfa4d11a3017eda91886f98e3bba3adc2f4e28ce6d0ba3a19eef80ac0729511311603dcb221f9ba7a6008f1a87
fe15ebf3699c8a8744bd05c43b1387dd53d73723e7f0a3720d489e147e31c4570d15fb7a3beae770
-----BEGIN CERTIFICATE-----
MIIDTzCCArigAwIBAgIJAKDgFLg9WvBwMA0GCSqGSIb3DQEBBQUAMHkxCzAJBgNV
```

```

BAYTAkRLMQ8wDQYDVQQHEwZBYXJodXMxFTATBgNVBAoTDFZNd2FyZSwgSW5jLjEM
MAoGA1UECxmDVk1NMREwDwYDVQQDEwhLcmlzdG1hbGJhEhMB8GCSqGSIb3DQEJARYS
a2xhc3N1bkB2bXdhcmUuY29tMB4XDTA5MDMwNjEzMDUwNfoXDTewMDMwNjEzMDUw
NFoweTElMAkGA1UEBhMCRESxDzANBgNVBActBkFhcmh1czEVMBMGA1UEChMMVk13
YXJlLlCBJmMuMwQwwCgYDVQQLEwNWSU0xETAPBgNVBAMTCetyaXN0aWFMSEwHwYJ
KoZIHvcNAQkBFhJrbGFzc2VuQHZtd2FyZS5jb20wgZ8wDQYJKoZIhvcNAQEBBQAD
gY0AMIGJAoGBAM2xxX9a1YITiRrXPXGg9xbEP4Oepcs71ZcNp8Z3mQIb95mpEc6
SZemmjOsqwPkV/82RALOBgmJ/hotlnoSkiAZi01iPmX1M0BU3OS/pSim7VNKBmV
SUJfOC4T6/MygVpyfkSUhB5EWx0JCUvowRex6Yt1220MOGcXnLpvdF09AgMBAAGj
gd4wgdswhQYDVR0OBByEFM2KkX7pWTQmMg+iD6HWMOZRLrfJMIGrBgNVHSMEgaMw
gaCAFm2KkX7pWTQmMg+iD6HWMOZRLrfJoX2kezB5MQswCQYDVQQGEwJESzEPMAOG
A1UEBxMGQWFyaHVzMRUwEwYDVQQKEWxWTXdhcmUsIEluYy4xDDAKBgNVBAsTA1ZJ
TTERMA8GA1UEAxMIS3Jpc3RpyW4xITAfBgkqhkiG9w0BCQEWEmtsYXNzZW5Adm13
YXJlLmNvbYIJAkdGfLg9WvBwMAwGA1UdEwQFMAMBAf8wDQYJKoZIhvcNAQEFBQAD
gYEANaXv4QrN7iI0rDCordYDh1G7Z3j128ntSoxehGmz6ghYafBNhTVhWUZuX9X
UXKn8Q1tOF/Ynijuo6JTJw0/5V1o6TAaCmFahDW/Om02AXPdSbw4UQdidGmmgrAs
DYVQz2CNpk2YbkXITNeGBNHomTqsVU7MGdjReu96+V6O2zY=
-----END CERTIFICATE-----

```

Validating an OVF Package

If an OVF certificate file is present, OVF Tool always verifies if the signature fits the SHA digest of the files in the package and tests the authenticity of the certificate.

To quickly validate the authenticity of an OVF package, use the probe mode as shown in the following example:

```
> ovftool signed-package.ovf
```

Using OVF Tool Probe Mode

5

Read the following topics next:

- [About OVF Tool Probe Mode](#)
- [Example of Probe Mode](#)

About OVF Tool Probe Mode

Probe mode reveals information about the content of a source. You can probe OVA and OVF packages, VMX, and vSphere source types. You can then use the information gathered to find out how it can be configured when you deploy it.

To use the probe feature, omit the target locator when invoking OVF Tool. For example, type: `ovftool LAMP.ovf` at the command line. OVF Tool displays all available information about the `LAMP.ovf` package.

When probe mode is used on an OVF or OVA package, OVF Tool also validates the certificate file, if present. As of vSphere 8.0 U2, OVF Tool probe mode also detects and handles the virtual TPM (vTPM) device.

As part of the information displayed in probe mode, the EULA is displayed by default. To prevent the EULA from displaying, use the `--hideEula` option.

```
> ovftool --hideEula LAMP.ovf
```

Example of Probe Mode

The following example shows the result of probing the `LAMP.ovf` package.

```
OVF version: 1.0
VirtualApp: true
Name: LAMP running PHP-Fusion
Version: 0.1
Vendor: VMware Aarhus
Product URL: http://example.com/ovf/1.0/LAMP/readme.txt

Annotation: This vApp offers the programming environment stack: Linux, Apache,
            MySQL and PHP programming environment -- LAMP. More specifically
            the vApp contains a Database server running MySQL and Web server
```

```
VM running Apache2 and PHP.

End-user License Agreements:

    EULA for LAMP.

Download Size: 604.07 MB

Deployment Sizes:
Flat disks: 16.00 GB
Sparse disks: Unknown
Networks:
Name: VM Network
Description: The VM Network network

Virtual Hardware:
Family: vmx-04
Disk Types: SCSI-lsillogic

Properties:
Key: db_ip
Label: IP address
Type: ip:VM Network
Description: The IP address of the database server.

Key: ws_ip
Label: IP address
Type: ip:VM Network
Description: The IP address of the Web server.

IP Allocation Policy:
Schemes: ovfenv dhcp
Protocols: IPv4
```

Using OVF Tool Machine Mode

6

Read the following topics next:

- [About Machine Mode](#)
- [Running Machine Output](#)
- [Example Output](#)

About Machine Mode

You can use the `--machineOutput` option to run OVF Tool from another program or script. With the `--machineOutput` option, OVF Tool provides output in the following format:

```
STATUS-CODE details <blank line>.
```

OVF Tool inserts a blank line to signal the end of an operation. Each response line is prefixed with a plus (+) to avoid confusion with the terminating blank line. The last status it sends is always `RESULT`. OVF Tool sends all output, including errors and warnings, to standard output (stdout) so clients can listen on only one stream.

Table 6-1. Machine Mode Status

| Status | Details | Description |
|----------------|------------------------------------------------|-------------------------------------------------------------------------------|
| PROBE | XML | Probe result with information about the source. |
| VALIDATEHOST | XML | Shows whether the VI target is compatible with the input arguments. |
| AUTHENTICATION | source/target/proxy server locator or fileName | Shows that authentication is required. |
| CERTIFICATE | Validate, Self-signed, or Failed validate | Signals that a certificate is present and shows the result of the validation. |
| MANIFEST | Validate or Failed validate | Signals that a manifest is present and shows the result of validation. |
| PROGRESS | Number (0-100) | Shows the percentage progress during upload and download. |

Table 6-1. Machine Mode Status (continued)

| Status | Details | Description |
|-----------|--------------------------------------------------------------|---------------------------------------------------------|
| TARGET_ID | Text, for example SugarCRM.ovf or vim.VirtualMachine:vm-415. | Shows the target ID after upload and download finishes. |
| RESULT | ERROR or SUCCESS | Always use as the last command sent. |

Running Machine Output

You can run the `--machineOutput` option in different modes: Probe, Validate host, Import, and Export.

Running machineOutput in Probe Mode

When you run the `machineOutput` option in probe mode, OVF Tool reports the following status sequence:

- 1 AUTHENTICATION (zero or more)
- 2 PROBE (exactly one)
- 3 RESULT (exactly one)

To run the `machineOutput` option in probe mode, you run the following command.

```
ovftool.exe --machineOutput source_locator
```

For an example, see [Output from Running machineOutput in Probe Mode](#).

Running machineOutput in Validate Host Mode

When you run `machineOutput` in validate host mode, OVF Tool reports the following status sequence:

- 1 AUTHENTICATION (zero or more)
- 2 VALIDATEHOST (exactly one)
- 3 PROGRESS (exactly one)
- 4 TARGET_ID (exactly one)
- 5 RESULT (exactly one)

To run the `machineOutput` option in validate host mode, you run the following command.

```
ovftool.exe --machineOutput --verifyOnly source_locator destination_locator
```

For an example, see [Output from Running machineOutput in Validate Host Mode](#).

Running machineOutput in Import to vSphere Mode

When you run the machineOutput option in import mode, OVF Tool reports the following status sequence:

- 1 AUTHENTICATION (zero or more)
- 2 MANIFEST (zero or one)
- 3 CERTIFICATE (zero or one)
- 4 PROGRESS (one or more)
- 5 TARGET_ID (exactly one)
- 6 RESULT (exactly one)

To use machine mode to upload an OVF to vSphere, you run the following command.

```
ovftool.exe --machineOutput \
            --acceptAllEulas \
            --I:morefArgs \
            --I:targetSessionTicket=<session ticket> \
            --net:<ovf netname>=vim.Network:<moref-id> \
            --datastore=vim.Datastore:<moref-id> \
            --vmFolder=vim.Folder:<moref-id> \
            --deploymentOption=<value> \
            --diskMode=<value> \
            --ipAllocationPolicy=<value> \
            --ipProtocol=<value> \
            --name=<value> (optional) \
            --overwrite (optional) \
            --powerOffTarget (optional) \
            --powerOn (optional) \
            --prop:<key>=<value> \
            <src URL or PATH> \
            vi://<servername>?moref=vim.ResourcePool:<moref-id>
```

For an example, see [Output from Running machineOutput in Import Mode](#).

Running the Machine Mode Export from vSphere Operation

When you run the machineOutput option in export mode, OVF Tool reports the following status sequence:

- 1 AUTHENTICATION (zero or more)
- 2 MANIFEST (zero or one)
- 3 CERTIFICATE (zero or one)
- 4 PROGRESS (one or more)
- 5 TARGET_ID (exactly one)
- 6 RESULT (exactly one)

To use machine mode to download an OVF from vSphere, you run the following command.

```
ovftool.exe --machineOutput \
  --I:sourceSessionTicket=<session ticket> \
  -tt <OVA or OVF> \
  -n=<name> \
  --overwrite (optional) \
  --powerOffSource (optional) \
  --chunkSize=<value> (optional) \
  --compress=<value> (optional) \
  vi://<servername>?moref=<type>:<moref-id> \
  <directory>
```

The type value is either vim.VirtualMachine or vim.VirtualVApp.

When you specify --machineOutput, OVF Tool monitors STDIN, and cancels the operation if it reads the ABORT\n line in stdin.

For an example, see [Output from Running machineOutput in Export Mode](#).

Example Output

You can run the OVF Tool machine mode --machineOutput option in probe mode, validate host mode, or import mode. In import and validate Host modes, --machineOutput is meant for third party program to use silently without any interactive prompt appearing in the standalone OVF tool command console. If your OVF file contains EULA information, you should add this option --acceptAllEulas so that the program doesn't pause to wait for acceptance of the license agreement. This section contains the following topics:

- [Output from Running machineOutput in Probe Mode](#)
- [Output from Running machineOutput in Validate Host Mode](#)
- [Output from Running machineOutput in Import Mode](#)
- [Output from Running machineOutput in Export Mode](#)

Output from Running machineOutput in Probe Mode

The following example shows the output of a --machineOutput PROBE operation on a file named LAMP.ovf.

Example: Output from Running machineOutput in Probe Mode

```
ovftool --machineOutput LAMP.ovf
PROBE
+ <probeResult>
+ <virtualApp>
+ true
+ </virtualApp>
+ <productInfo>
+ <name>
+ LAMP running PHP-Fusion
```

```

+ </name>
+ <productUrl>
+ http://example.com/ovf/1.0/LAMP/readme.txt
+ </productUrl>
+ <version>
+ 0.1
+ </version>
+ <fullVersion>
+
+ </fullVersion>
+ <vendor>
+ VMware
+ </vendor>
+ <vendorUrl>
+
+ </vendorUrl>
+ </productInfo>
+ <annotation>
+ This vApp offers the programming environment stack: Linux, Apache, MySQL and PHP
programming
environment -- LAMP. More specifically the vApp contains a Database server running MySQL and
Web
server VM running Apache2 and PHP.
+ </annotation>
+ <eulas>
+ <eula>
+
+   Eula for OVF
+
+ </eula>
+ </eulas>
+ <sizes>
+ <download>
+ 633412608
+ </download>
+ <flat>
+ 17179869184
+ </flat>
+ <sparse>
+ Unknown
+ </sparse>
+ </sizes>
+ <networks>
+ <network>
+ <name>
+ VM Network
+ </name>
+ <description>
+ The VM Network network
+ </description>
+ </network>
+ </networks>
+ <properties>
+ <property>
+ <classId>

```

```

+
+ </classId>
+ <key>
+ db_ip
+ </key>
+ <instanceId>
+
+ </instanceId>
+ <category>
+
+ </category>
+ <label>
+ IP address
+ </label>
+ <type>
+ ip:VM Network
+ </type>
+ <description>
+ The IP address of the database server.
+ </description>
+ <value>
+
+ </value>
+ </property>
+ <property>
+ <classId>
+
+ </classId>
+ <key>
+ ws_ip
+ </key>
+ <instanceId>
+
+ </instanceId>
+ <category>
+
+ </category>
+ <label>
+ IP address
+ </label>
+ <type>
+ ip:VM Network
+ </type>
+ <description>
+ The IP address of the Web server.
+ </description>
+ <value>
+
+ </value>
+ </property>
+ </properties>
+ <deploymentOptions>
+ </deploymentOptions>
+ <ipAllocationSchemes>
+ ovfenv,dhcp

```

```
+ </ipAllocationSchemes>
+ <ipProtocols>
+ IPv4
+ </ipProtocols>
+ </probeResult>
```

```
RESULT
+ SUCCESS
```

Output from Running machineOutput in Validate Host Mode

The following example shows the output of a `--machineOutput VALIDATEHOST` operation on file `LAMP.ovf`.

Example: Output from Running machineOutput in Validate Host Mode

```
ovftool --machineOutput --acceptAllEulas --verifyOnly LAMP.ovf vi://
myuser:mypassword@myvc.example.com/dc/host/myhost.example.com
```

```
ovftool --machineOutput --acceptAllEulas --verifyOnly LAMP.ovf vi://
myuser:mypassword@myvc.example.com/dc/host/myhost.example.com
VALIDATEHOST
+ <supportedDiskProvisioning>
+ <type>
+ monolithicFlat
+ </type>
+ <type>
+ thin
+ </type>
+ <type>
+ thick
+ </type>
+ <type>
+ flat
+ </type>
+ <type>
+ eagerZeroedThick
+ </type>
+ </supportedDiskProvisioning>

PROGRESS
+ 0

TARGET_ID
+

RESULT
+ SUCCESS
```

Output from Running machineOutput in Import Mode

The following example shows the output of a `--machineOutput` import operation on a file named `LAMP.ovf`.

Example: Output from Running machineOutput in Import Mode

```
ovftool --machineOutput --acceptAllEulas LAMP.ovf vi://
myuser:mypassword@myvc.example.com/dc/host/myhost.example.com
```

```
PROGRESS
+ 0
+ 1
+ 2
+ 3
....
+ 98
+ 99
+ 100

TARGET_ID
+ vim.VirtualApp:resgroup-v61

RESULT
+ SUCCESS
```

Output from Running machineOutput in Export Mode

The following example shows the output of a `--machineOutput` export operation on a file named `LAMP.ovf`.

Example: Output from Running machineOutput in Export Mode

```
ovftool -o --machineOutput --acceptAllEulas vi://
myuser:mypassword@myvc.example.com/dc/vm/LAMP /tmp/LAMP.ovf
```

```
PROGRESS
+ 0
+ 1
+ 2
+ 3
...
+ 98
+ 99
+ 100

TARGET_ID
+ /tmp/LAMP.ovf

RESULT
+ SUCCESS
```