



VMware ESX 3 Server

Patch Management for ESX Server 3

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The VMware ESX 3 Server software maintenance tool, **esxupdate**, is a utility that efficiently updates VMware ESX Server hosts. Use it to install software updates, enforce software update policies, and track installed software. The benefits of this mechanism include smaller distribution downloads, atomic updates, ability to automate update deployment, selectability by update classification, and automatic dependency resolution.

This paper addresses the following topics:

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Introduction

The process of applying software updates to an ESX Server system has become complex and time-consuming. Each new update introduces changes into the existing system, and it is crucial to apply only the required updates in order to stay current with security fixes and minimize the changes to your software environment while doing so.

Release 3.0 of the ESX Server system introduces a new software update model to address the challenges outlined above. This update model facilitates selective application of software updates specific to a particular environment. It also provides the flexibility of staying current with security and critical updates and allowing non-critical updates to be applied at a later time.

Definitions

The most up-to-date and detailed information regarding VMware support policies can be found at: <http://www.vmware.com/support/policies/>. All information contained in this technical paper is superseded by the information contained with that website.

Major Releases or Upgrades: A major release will normally include all the bug fixes provided by releases for the previous version. In addition, it will contain fixes for critical and serious bugs discovered since the last release, and as many fixes for non-critical bugs as is feasible within our development schedules. As appropriate, bugs identified and not fixed in the release will be documented in the Release Notes. Major Releases also provide functional enhancements. Our Product Managers are alerted to all product enhancement requests, and are responsible for setting the priorities by which requested new features are implemented (also subject to



technical feasibility). The version for a major releases is identified by a change in the "x" position to the product version number, e.g., VMware Workstation 4.0 will be a new major release from VMware Workstation 3.x. Your license key for version 3.x will not work with version 4.0. Customers on full Support and Subscription are entitled to major releases as a feature of their support service. VMware Infrastructure customers, with licenses supported under Limited Support and Subscription variants of Platinum and Gold Support, must purchase major releases separately.

Minor Releases or Updates: Minor Releases are released regularly to provide fixes for bugs identified in current releases, and may include some minor enhancements. These minor releases go through full QA testing. Such minor releases are cumulative, so you only need to install the latest minor release to benefit from all the available bug fixes. They are usually limited to high severity bug fixes. The number in the "y" position changes in the versioning of a minor release e.g., VMware Workstation 3.1 is a minor release for VMware Workstation 3.0, and contains a number of bug fixes and support for Japanese localization and some other features. The licensing scheme typically remains the same for minor releases, e.g., your license key for 3.0 works with 3.1.

Maintenance Releases or Updates: A maintenance release is provided on an as needed basis, for example when a bug or a set of bugs are affecting a number of customers severely and one cannot wait for the next product update. Maintenance releases go through full quality assurance (QA) testing, and are scheduled on an as needed basis. A maintenance release is identified by a change in the "z" position of the product version, e.g., VMware GSX Server 1.0.3 for Linux is a maintenance release that supersedes VMware GSX Server 1.0.2 for Linux.

Patch: Software *patches* are typically issued to address one or more security fixes or critical fixes. VMware strongly recommends that you evaluate and apply these updates to your environment as soon as possible.

Software bundle: A collection of software packages distributed in a format compatible with the `esxupdate` tool. A bundle consists of an XML file called the "descriptor" and one or more RPM (Redhat Package Manager) packages.

Software Update Classification

Updates fall into three categories:

- **Security:** The patches that belong to this category fix one or more potential security vulnerabilities in the product. They should be implemented immediately to prevent the vulnerabilities from being exploited.
- **Critical:** The patches that belong to this category fix flaws in the product that can potentially cause data loss or severe service disruptions. They should be implemented immediately.
- **General fixes:** The patches that belong to this category can be fixes for minor flaws (e.g. usability issues) that potentially affect a small subset of customers or new driver updates and new small non-intrusive enhancements. These optional patches should be evaluated to determine their applicability or necessity to a particular customer before they are applied.

Recommended Updating Practices

The recommended strategy for updating software includes these practices:

- Determine whether an update is necessary for your environment. Security fixes and critical fixes are typically the most essential.



- Analyze the risk factor of applying the update.
- Minimize the change to your software environment whenever possible.
- Apply only those updates that address known issues in your environment.
- Keep your environment as current as possible.

The Maintenance Tool – *esxupdate*

The **esxupdate** maintenance tool is a command of the VMware ESX Server software that applies software updates to ESX Server hosts. You can also use it to enforce software update policies and to track installed software. Run **esxupdate** from the ESX service console while you are logged on as user **root**.

You can use the **esxupdate** tool to investigate the contents of a bundle, to query the history of applied bundles on an ESX Server system, or to install a bundle.

Use the **info** command to get a description of the update bundle, and to list the RPMs in a bundle.

The **query** command lists the installed software, both the base and each incremental update, in the order of installation time.

The activity of the tool is recorded in a log file:

```
/var/log/vmware/esxupdate.log
```

Update Workflow

The install command performs the following steps:

1. Validate the update bundle.
2. Check for pre-requisites (correct ESX version, virtual machines powered off, and so on).
3. Check for software dependencies.
4. Update **esxupdate**, if an update is available.
5. Extract the RPMs from the bundle.
6. Install the RPMs.
7. Reboot the ESX Server if necessary.

Update Information

An update bundle—an XML descriptor file, a header directory, and a directory of one or more RPMs—is ordinarily delivered as a tarball, with a name of the form:

```
<updatename>.tar.gz
```

(where the **updatename** is of the form **ESX-*dddddd***). You must untar this file into a convenient location in the service console file system or under an NFS mount:

```
mkdir /var/updates
mv <updatename>.tar.gz /var/updates
cd /var/updates
tar -xvzf <updatename>.tar.gz
cd <updatename>
```

To get information about this bundle, use the **info** command:

```
esxupdate info
```

If the current working directory is not the directory containing the update, you must specify the path in the command:



```
esxupdate -r file:/var/updates/<updatename> info
```

For a detailed list of all RPMs available in this bundle, include the `-l` option:

```
esxupdate -l info
```

or

```
esxupdate -l -r file:/var/updates/<updatename> info
```

Update Installation

The update command verifies the bundle and its dependencies and installs the RPMs. After the update is complete, the ESX Server system reboots, if necessary. Some updates require that all virtual machines on the host be powered off or moved elsewhere using VMotion. If this is the case, `esxupdate` does not proceed with update installation and displays an error message on the console. Virtual machines must manually be powered off, or moved by means of VMotion, before proceeding with an update.

Installing an Update

From within the update directory, run the command by entering

```
esxupdate update
```

If you want to run `esxupdate` from a different directory, you must specify the bundle path in the command:

```
esxupdate -r file:/var/updates/<updatename> update
```

Specifying Update Terminal Verbosity

You can specify the verbosity of `esxupdate` terminal output by using the `-v` option as shown below.

```
esxupdate -v 10 -r file:/var/updates/<updatename> update
```

A verbosity value of 10 produces the most detailed reporting. The other values for controlling verbosity of `esxupdate` terminal output are:

```
10=debug
20=info
30=warning
40=error
```

The complete log file is found in

```
/var/log/vmware/esxupdate.log
```

Each execution appends to that file. If you want to scan the log file for just summary information, use

```
grep summary /var/log/vmware/esxupdate.log
```

Installing Successive Updates Without Rebooting

Not all updates require a reboot of the ESX Server host, but when a reboot is required, it might be convenient to apply more than one update in succession before rebooting. The release notes of each update will specify if a reboot of your ESX Server host is required. For updates where a restart of the host is required, the ESX Server host reboot can be prevented by using the `--noreboot` option. For example, a patch from the `file:/var/updates/` directory can be applied without rebooting the server as follows:

```
esxupdate --noreboot -r file:///var/updates/<updatename> update
```

If the final update in your sequence does includes a reboot simply do not use the `--reboot` option on the final update, and all the changes you have applied will take effect. If the final



patch does not include a reboot, you might have to manually reboot your ESX Server host for the changes to take effect.

Querying Currently Installed Updates

You can use the `esxupdate` tool to query the database of installed ESX software for information. It has the ability to list all the RPMs in a particular bundle.

Listing All Installed Updates

To get a list of all installed updates, execute this command in the ESX Server console:

```
esxupdate query
```

Example output for this command when no bundles have been installed is shown below:

```
Installed patches / ISOs:
----- Name ----- --- Install Date --- --- Summary ---
      3.0.0-24265      01:59:33 05/11/06
```

The value in the **Name** column reports the release number and build number of the ESX Server software.

The output shown below is with a new update installed:

```
Installed patches / ISOs:
----- Name ----- --- Install Date --- --- Summary ---
      3.0.0-24596      16:38:21 05/22/06
      esx-200603      18:23:06 05/25/06 Legato Networker dependency fix
```

The value "200603" in the **Name** column identifies the knowledge base number of the bundle.

The value in the **Summary** column gives a brief description of the update.

Listing Details of Updates

To get information about a particular update, run the following command

```
esxupdate info <updatename>
```

For a detailed list of all the RPMs installed in a particular update, use the `-l` option:

```
esxupdate -l info <updatename>
```

```
Product       : VMware ESX Server
Vendor        : VMware, Inc. (support@vmware.com)
Release:      : esx-200603
Release Date  : Tue May  2 05:30:24 PDT 2006
Summary       : Legato Networker dependency fix
Description   :
```

```
    This patch satisfies the dependencies for installing Legato Networker
    Client in the service console.
```

```
Repository URL: file:/root/updates/esx-200603
Install start  : 18:22:43 05/25/06
Install finish: 18:23:06 05/25/06
RPMs installed:
  VMware-esx-X11-3.0.0-23456
  pdksh-5.2.14-21
```

Using Depots to Update Multiple ESX Servers

The centralized depot reduces the burden of maintaining multiple copies of update bundles for multiple server deployment. The `esxupdate` tool supports three types of remote depot.

- NFS



- HTTP
- FTP

Using an NFS Update Depot

An NFS server running in a standalone Linux machine or on an ESX Server system could function as a centralized depot. Other ESX Server systems can then mount the NFS volume and use it as a depot.

To set up an NFS server, edit the `/etc/exports` file, add the following lines, and restart the NFS service:

```
/data/updates *(ro)
```

The preceding example assumes that the bundles have been untarred into the `/data/updates` directory in the NFS server. You can customize this path.

Mount the NFS share on the local ESX Server machine using the `mount` command. In this example, the NFS share is mounted under `/data/updates`.

Querying Bundles

To query for update information, run the following command at the ESX Server command prompt:

```
esxupdate -r file:/data/updates/<updatename> info
```

For a detailed list of all RPMs available in this bundle in addition to the above information, include the `-l` option:

```
esxupdate -l -r file:/data/<updates>/updatename info
```

Installing Bundles

Execute the `esxupdate` command pointing to the mounted NFS depot:

```
esxupdate -r file:/data/updates/<updatename> update
```

To change the verbosity of `esxupdate` logs, use the `-v` option:

```
esxupdate -v 10 -r file:/data/updates/<updatename> update
```

Using an HTTP Update Depot

You can set up a central server running Apache or IIS to serve untarred updates to all ESX Server systems through HTTP. The examples given below are for setting up Apache to serve updates. The `DocumentRoot` directive must point to the correct path. Set `/var/www/html/esx3` as the update depot:

```
DocumentRoot "/var/www/html"

<Directory /var/www/html/esx3>
    Options +Indexes
</Directory>
```

Other Apache directives and configuration can be left at their default values. Restart Apache after applying these changes.

Querying Bundles

On the ESX Server, reconfigure the firewall to allow outgoing connections.

```
esxcfg-firewall --AllowOutgoing
```

The preceding command sets up ESX Server to make an HTTP connection to the update depot.

To query for update information:

```
esxupdate -r http://<http server hostname>/<updatename> info
```



For a detailed list of all RPMs available in this depot, include the `-l` option in the preceding commands:

```
esxupdate -l -r http://<http server hostname>/<updatename> info
```

Installing Updates

Execute `esxupdate` command pointing to the HTTP update depot as shown below.

```
esxupdate -r http://<http server hostname>/<updatename> update
```

To change the verbosity of `esxupdate` logs, use the `-v` option:

```
esxupdate -v 10 -r http://<http server hostname>/<updatename> update
```

Using an FTP Update Depot

You can set up an FTP server to serve ESX Server software updates. You must point the `esxupdate` tool to this FTP server in order to install updates.

Querying Bundles

On the ESX Server reconfigure the firewall to allow outgoing connections.

```
esxcfg-firewall --AllowOutgoing
```

The preceding command sets up the ESX Server system to make an FTP connection to the update depot. To query for update information, enter:

```
esxupdate -r ftp://<FTP server hostname>/<updatename> info
```

For a detailed list of all RPMs available in this depot, include the `-l` option in the preceding commands.

```
esxupdate -l -r ftp://<FTP server hostname>/<updatename> info
```

Installing Updates

Execute `esxupdate` and point to the FTP update depot:

```
esxupdate -r ftp://<FTP server hostname>/<updatename> update
```

To change the verbosity of `esxupdate` logs, use the `-v` option:

```
esxupdate -v 10 -r ftp://<FTP server hostname>/<updatename> update
```

Conclusion

The new update classification and the `esxupdate` tool offer a more flexible way of updating and maintaining ESX Server systems. Fixes are more granular and the update mechanism is more modular, which minimizes the changes introduced to a software environment.