

Quest[®] NetVault[®] Backup Plug-in *for VMware* 12.0, Revision 1 Release Notes

May 2018

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These release notes provide information about the Quest[®] NetVault[®] Backup Plug-in *for VMware* release.

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About this release

Quest NetVault Backup (NetVault Backup) Plug-in *for VMware* (Plug-in *for VMware*) 12.0 is a major release, with new features and functionality. For complete product documentation, visit <https://support.quest.com/technical-documents>.

New features

New feature in Plug-in *for VMware* 12.0: Added support for distributed image-level backups and restores, which ensures that jobs run on any available VMware backup proxy. This load-balancing feature works with a mixture of physical and virtual machines as well as a mixture of operating systems. (DNVMWARE-1793)

Enhancements

The following is a list of enhancements implemented in Plug-in for VMware 12.0.

Table 1. General enhancements

Enhancement	Issue ID
Updated logs to include information when an image-level restore completes successfully and the virtual machine is assigned to a different resource pool.	DNVMWARE-496
Added support for using a custom port for a VMware ESXi or VMware vCenter Server. You can also continue to use the default port of 443.	DNVMWARE-1761
Updated the Virtual Disk Development Kit (VDDK) support to 6.7.	DNVMWARE-1841
Added support for catalog search.	DNVMWARE-1843

Resolved issues

The following is a list of issues addressed in this release.

Table 2. General resolved issues

Resolved issue	Issue ID
Corrected an issue that prevented a backup selection at a Resource Pool level from backing up virtual machines in the pool.	DNVMWARE-1043 (22030)
Corrected an issue for non-Changed Block Tracking (CBT) users that caused an “Invalid service instance content” message to appear during the backup process.	DNVMWARE-1296
Corrected an issue in which a backup job that included a significant number of files resulted in a stack overflow error during file-level indexing.	DNVMWARE-1437
Corrected an issue that caused the plug-in to stop working while opening a 2 terabyte (TB) disk using network block device (NBD) mode.	DNVMWARE-1581
Corrected an issue that caused the plug-in to stop working while reading an NTFS partition during a file-level backup.	DNVMWARE-1630
Corrected an issue that caused a “Failed to get the inventory information for server” message to appear during a restore job to recover a deleted virtual machine.	DNVMWARE-1655
Corrected an issue that prevented the plug-in from restoring a standalone VMware ESXi Server 6.5 virtual machine to VMware vCenter 6.0 or 6.5.	DNVMWARE-1698 (32475)
Corrected an issue that prevented the Quiesce VM for snapshot option from being saved in the Backup Preferences dialog box and applied to all backup jobs.	DNVMWARE-1703
Corrected an issue that made disks that were excluded from a backup available for restore.	DNVMWARE-1735
Corrected an issue that caused a backup job to stop responding when the targeted virtual machine was using VMware vCenter 5.5 Update 2. Also corrected the issue that prevented the cleanup process from releasing the lock.	DNVMWARE-1737, DNVMWARE-1745
Corrected an issue that caused the plug-in to stop working when multiple backup jobs ran simultaneously.	DNVMWARE-1781, DNVMWARE-1786
Corrected an issue that caused an out-of-bounds error to occur while reading disks of 2.7 TB or larger.	DNVMWARE-1782
Corrected an issue that prevented a restore job from completing and displayed “Unexpected element sharing” and “Failed to add VM to target server’s inventory” messages.	DNVMWARE-1792

Known issues

The following is a list of issues, including those issues attributed to third-party products, known to exist at the time of release.

Table 3. General known issues

Known issue	Issue ID
When restoring data to an alternate datastore, the plug-in does not verify whether the datastore is available. Verify that the datastore is valid and has sufficient disk space to accommodate the virtual machine.	DNVMWARE-18 (1714)
Raw Device Mapping (RDM) disks in virtual compatibility mode are restored to flat “.vmdk” files and not to the original RDM. The alternative is to omit these disks during a restore.	DNVMWARE-332 (2371)
The configuration setting [Custom:MountOperationTimeoutSecs], which is stored in the vmware.cfg file, determines how long the plug-in process waits for the mount daemon to respond to a request. The default value is set to 600 seconds during a fresh install and 300 seconds during an upgrade. If the mount daemon is unable to complete a request within the specified interval, the virtual machine is left in a mounted state. If you have many backups running simultaneously or your server is running under heavy load, modify the value for the [Custom:MountOperationTimeoutSecs] setting to avoid this issue.	DNVMWARE-505 (3131)
Virtual Disk Development Kit (VDDK) does not support non-UTF8 locales. On Linux-based clients that use non-UTF8 locales, the plug-in reports the error “Child Process died unexpectedly” and exits abnormally.	DNVMWARE-584 (3340)
When you use the NetVault Backup Plug-in <i>for Consolidation</i> , the image-level backups of virtual machines are displayed on the Create Selection Set page, but you cannot consolidate these savesets.	NVBU-3785 (6598, NVG-5474)
When you browse a localized virtual machine from an X11 or Motif GUI, the encoding of the name can cause the display to be scrambled or to not display at all.	DNVMWARE-664 (13679, VMW-157)
You cannot back up virtual machine templates using the Plug-in <i>for VMware</i> . Workaround: Convert the template to a virtual machine.	DNVMWARE-713 (13728, VMW-202)
To avoid file fragmentation, the Plug-in <i>for VMware</i> preallocates disk space before restoring files to disk. On Linux-based systems, files that are larger than 50 MB in size are not pre-allocated full disk space. Such files are handled similar to sparse files and allocated disk space as needed during restore. If the disk does not have sufficient space to fully restore files that are larger than 50 MB in size, the job fails when the disk runs out of space.	DNVMWARE-961 (21755)
The file-level indexing process does not generate indexes for symlinks.	DNVMWARE-977 (21793)
The file-level indexing process does not treat hard links in any special way and generates index entries for them as if they are separate entities. When you restore a saveset that includes a hard link, the plug-in stops responding.	DNVMWARE-978 (21794)
When using the NBD transport mode with VMware vSphere 5.1, a large Read Block Size may prevent multiple backup processes from running at the same time. Workaround: Use SAN or SCSI HotAdd transport modes or decrease Read Block Size .	DNVMWARE-1430 (28815)
When restoring NTFS sparse files, if the actual allocated size of a data run is smaller than the total size of the data run, the restored file might be corrupted.	DNVMWARE-1456 (29043)
If the Diagnose Virtual Machine method is unable to return any result within the timeout interval (five minutes), the Web Service process displays the following message: “Error: The remote machine: <Name of the NetVault Backup Server> is unavailable” You can close this dialog box to continue the current operation. In the background, the Diagnose Virtual Machine method runs the cleanup process to remove any snapshot that it has created.	DNVMWARE-1528 (29795)

Table 3. General known issues

Known issue	Issue ID
Backups that have Active Block Mapping (ABM) enabled might stop working when memory is exceeded.	DNVMWARE-1584
Backing up a virtual machine succeeds if the Virtual Machine Disk (VMDK) fails to open and the Exclude data disks option is selected.	DNVMWARE-1696
The plug-in is unable to restore a virtual machine protected by VMware vSphere Fault Tolerance (vSphere FT) to an alternate VMware vCenter Server.	DNVMWARE-1691 (32398)
Installing an update of the plug-in puts the VMware Vstor2 MntApi driver into an inconsistent state.	DNVMWARE-1697 (32473)
Workarounds:	
If you are using a Windows-based proxy server, restart the server after you remove a VDDK. If you try to install or remove the VMware Vstor2 MntApi driver without restarting the server, you might encounter an error. For more information, see http://pubs.vmware.com/Release_Notes/en/developer/vddk/65/vsphere-vddk-65-release-notes.html .	
Before installing the latest version of the plug-in, complete the following steps:	
<ol style="list-style-type: none"> 1 Remove the existing version of the plug-in. 2 Check the status of VMware Vstor2 MntApi driver. 3 If the driver is present, delete it. 4 Install the latest version of the plug-in. 	
Support of virtual-machine encryption became available starting with vSphere 6.5; however, the plug-in does not support backup and restore of encrypted disks.	DNVMWARE-1773
Clearing subnodes to exclude them from a backup job for a primary node causes the job to fail. If you select the main node, such as Datacenter, and then clear one or more of the subnodes, such as a node for a specific virtual machine or folder, the backup job fails and displays a “No virtual machines selected for backup” error message.	DNVMWARE-1832
Restoring a virtual machine from a VMware vCenter Server 6.7 to an alternate vCenter Server 6.0, vCenter Server 6.5, VMware ESXi Server 6.0, or ESXi Server 6.5 fails. Although the hardware version is compatible, the following error is displayed: “Failed to add virtual machine to target server’s inventory.”	DNVMWARE-1858, DNVMWARE-1859, DNVMWARE-1860
Restoring a virtual machine on a VMware Virtual Volumes (VVOL) datastore uses the storage policy associated with the VVOL instead of using the storage policy associated with the backup.	DNVMWARE-1871

Table 4. Third-party known issues

Known issue	Issue ID
When backing up a powered on virtual machine through a VMware vCenter Server, the plug-in may fail to back up the “.nvram”, “.vmx”, and “.log” files. For more information, see http://kb.vmware.com/kb/1019286 .	
When a snapshot is created on a virtual machine that uses thin-provisioned disks, VMware vSphere (the client and the underlying disk library) identifies the disk as thick. For more information, see http://kb.vmware.com/kb/1020137 .	
At the time of enabling CBT for a virtual machine, no snapshots must exist on it. For more information, see http://kb.vmware.com/kb/1033816 .	
If an ESXi 5.x host is managed by a vCenter Server, the virtual machines should not be restored when connected directly to the ESXi host. This restriction is due to a feature introduced in vSphere 5. For more information, see http://www.vmware.com/support/developer/vddk/VDDK-500-ReleaseNotes.html#knownissues .	

Table 4. Third-party known issues

Known issue	Issue ID
<p>To prevent the migration of a virtual machine while its disks are being accessed for a backup or restore, the plug-in uses VDDK APIs to lock and unlock a virtual machine. This functionality is disabled by default. To enable it, see the user's guide for the plug-in. Currently, the locking functionality has the following known issues:</p> <ul style="list-style-type: none"> • Locking a virtual machine may not always succeed even though API indicates success. This issue is under review with VMware. You can usually ignore this failure. • Unlocking is known to fail occasionally. This issue has been documented in the VDDK 5 release notes. For details, review the “EndAccess sometimes does not reenale migration after PrepareForAccess” section in the VDDK 5.0 Release Notes. • If the plug-in exits unexpectedly after locking a virtual machine, the virtual machine may be left in a locked state so that it is disabled for migration. <p>For information about removing the lock and enabling migration for the virtual machine, see http://kb.vmware.com/kb/2008957.</p>	
<p>VDDK 5 issues:</p> <ul style="list-style-type: none"> • Backup fails on a Linux-based client if any other virtual machine is in a powered on state on the same datastore. • Backup fails on a Linux-based client if parallel backup jobs (performed from different clients) access the same datastore. 	
<p>On a Windows 2012 virtual machine, data corruption may occur during or after a network copy operation. For more information, see http://kb.vmware.com/kb/2058692.</p>	
<p>If the size of a virtual drive is 2 terabytes (TB) or a multiple of 2 TB, the disk is always opened in NBD mode instead of SAN. This issue only affects virtual machines that use hardware version 10 (vmx-10).</p> <p>Workaround: Increase or decrease the size of the virtual drive (for example, to 2.01 TB, 3.99 TB).</p>	<p>DNVMWARE-1373 (27742)</p>
<p>When a virtual machine is cloned outside the vCenter Server, it may have the same UUID as the original virtual machine. If this cloned virtual machine is selected for a backup, the plug-in may back up the original virtual machine instead of the clone. To correct this issue, you must change the UUID of the cloned virtual machine. For more information about changing the UUID of a virtual machine, see http://kb.vmware.com/kb/1002403.</p>	<p>DNVMWARE-1443 (28921)</p>
<p>To back up virtual machines that are protected by VMware vSphere Fault Tolerance (vSphere FT) with plug-in version 11.2 or later, your environment must use VMware ESXi 6.0 build number 4192238 or later. If you use an ESXi host with an unsupported build, vSphere FT protection might become disabled during the snapshot process. This issue occurs because of an issue in earlier versions of the VMware ESXi host. This issue is more likely to occur when the virtual machine uses Windows 2008 or later as the guest OS <i>and</i> it uses the VMware Tools VSS provider to take quiesced snapshots. For more information, see VMware KB article 2145664.</p>	<p>DNVMWARE-1623, DNVMWARE-1671 (31423, 32123)</p>
<p>If you use VMware Virtual Volumes (VVols) with a storage array that does not support thick-provisioned disks by default, you might receive the following error message: Error creating disk Error creating VVol Object. This may be due to insufficient available space on the datastore or the datastore's inability to support the selected provisioning type.</p> <p>Workaround: To allow VVols to create thick-provisioned disks, enable thick provisioning on the storage array. For more information, see http://pubs.vmware.com/Release_Notes/en/horizon-6-view/horizon-62-view-release-notes.html.</p>	<p>DNVMWARE-1712 (32714)</p>
<p>CentOS and Red Hat Enterprise Linux (RHEL) 6.x:</p> <p>If you are using either of these operating systems and versions and the Fallback Transport Mode is set to none, a VMware issue prevents the backup proxy from opening in HotAdd Transport Mode and causes it to open in network block device (NBD) mode instead.</p>	<p>DNVMWARE-1777</p>

System requirements

Before installing Plug-in for VMware, ensure that your system meets the requirements outlined in the following table and in the *Quest NetVault Backup Compatibility Guide* available at <https://support.quest.com/technical-documents>.

Table 5. System requirements

Requirement	Details
Operating systems	For a list of supported OS distributions and versions, see the VDDK 6.7 Release Notes .
NetVault Backup versions	The Plug-in for VMware 12.0 requires NetVault Backup 11.4.5 or later. For complete supported-platform information, see the <i>Quest NetVault Backup Compatibility Guide</i> available at https://support.quest.com/technical-documents .

- i** | **NOTE:** To use the Virtual Disk Development Kit (VDDK) with OEM ESXi, you require VMware ESXi Foundation, Standard, or Enterprise license. This license can be obtained from OEM or VMware directly.

Upgrade and compatibility

Plug-in for VMware 12.0 requires NetVault Backup 11.4.5 or later. For complete supported-platform information, see the *Quest NetVault Backup Compatibility Guide*.

- **Cannot browse mounted virtual machines after upgrading NetVault Backup:** After installing the plug-in, if you upgrade the NetVault Backup software, you must reinstall the plug-in on that machine. Otherwise, you cannot open the **Drives** node of a mounted virtual machine for any new file-level backups.
- **Restart the NetVault Backup Service if “nvvmwmount.exe” was running during upgrade:** If the mount process “nvvmwmount.exe” was running during an upgrade from 2.x, restart the NetVault Backup Service on the client.

Product licensing

To obtain the license key for your NetVault Backup Server environment, determine the NetVault Machine ID of your main NetVault Backup Server. Also identify the machine IDs of any clients running application plug-ins, such as Oracle, MySQL, PostgreSQL, SQL Server, and Exchange.

You can use the NetVault Configuration Wizard to install the product license keys. Alternatively, you can install the license keys from the Manage Clients page.

- [Obtaining a machine ID](#)
- [Installing a license key using the configuration wizard](#)
- [Installing a license key from the Manage Clients page](#)

Obtaining a machine ID

- 1 Start the NetVault Backup WebUI.
- 2 In the Navigation pane, click **Manage Clients**.

- 3 In the **NetVault Backup Clients** list, select the applicable machine, and click **Manage**.
- 4 On the **View Client** page, note the machine ID exactly as it is displayed in the **Client Summary** table.

Installing a license key using the configuration wizard

- 1 In the Navigation pane, click **Guided Configuration**.
- 2 On the **NetVault Configuration Wizard** page, click **Install Licenses**.
- 3 In the **NetVault Backup Clients** list, select the applicable machine, and click **Next**.
- 4 In the **Enter the license key string** box, type or copy and paste the license key, and click **Apply**.
After the key is applied successfully, a message is displayed.

Installing a license key from the Manage Clients page

- 1 In the Navigation pane, click **Manage Clients**.
- 2 In the **NetVault Backup Clients** list, select the applicable machine, and click **Manage**.
- 3 On the **View Client** page, click **Install License**.
- 4 In the **Install License** dialog box, type or copy and paste the license key, and click **Apply**.
After the key is applied successfully, a message is displayed.
- 5 To dismiss the dialog box, click **Close**.

Upgrade and installation instructions

The standard method for upgrading the plug-in is to install the latest version over the previous version of the plug-in. For installation instructions, see the *Quest NetVault Backup Plug-in for VMware User's Guide*.

To use the plug-in for file-level backup operations when upgrading the hybrid version of the plug-in on Windows, complete the following tasks in the given order:

- 1 Verify that no virtual machine is mounted for a file-level browse or backup operation.
If any virtual is mounted in a browse session, unmount it, or if it is mounted for a backup, wait until the backup completes.
- 2 From the NetVault Backup Process Viewer, check if any instance of **NetVault VM mount daemon** or **NetVault VM mount CLI** is running on the client.
Alternatively, use the Windows Task Manager to see if any instance of **nvvmwmount.exe** is running. If so, restart the NetVault Backup Service.
- 3 Verify that the Working Directory configured for the plug-in does not contain any subfolders named after the display names of virtual machines.

If the directory includes any mount folder, manually remove the folder. For more information, see the user's guide. If you fail to complete the cleanup routine, a subsequent mount operation fails with the error "A stale mount was found."

- 4 To ensure that a "Driver not found" error does not occur during the upgrade, follow the steps outlined in [Upgrade procedure](#).

Upgrade procedure

VDDK uses a kernel-mode driver for mounting a virtual machine during file-level backup and browse operations. The Plug-in *for VMware* automatically starts a service for the driver when you install the plug-in, but it does not verify whether the service is running when you perform an upgrade or a reinstallation.

If this service is not running on the client, the plug-in fails to complete the mount request and reports the error "Driver not found."

To upgrade the hybrid version of the plug-in on Windows:

- 1 Open a command prompt window.
- 2 Stop the service, if it is running:

```
sc stop vstor2-mntapi20-shared
```
- 3 Delete the service:

```
sc delete vstor2-mntapi20-shared
```
- 4 Verify that the service has been deleted:

```
sc query vstor2-mntapi20-shared
```

If the service is stuck in a "stopping" state, restart the machine.
- 5 Install the plug-in.

For information about installing the plug-in, see the *Quest NetVault Backup Plug-in for VMware User's Guide*.

More resources

Additional information is available from the following:

- [Online product documentation](#)
- [NetVault community](#)

Globalization

This section contains information about installing and operating this product in non-English configurations, such as those needed by customers outside of North America. This section does not replace the materials about supported platforms and configurations found elsewhere in the product documentation.

This release supports any single-byte or multi-byte character set. It supports simultaneous operation with multilingual data. This release is targeted to support operations in the following regions: North America, Western Europe and Latin America, Central and Eastern Europe, Far-East Asia, Japan.

The release is localized to the following languages: Chinese (Simplified), French, German, Japanese, Korean.

About us

We are more than just a name

We are on a quest to make your information technology work harder for you. That is why we build community-driven software solutions that help you spend less time on IT administration and more time on business innovation. We help you modernize your data center, get you to the cloud quicker and provide the expertise, security and accessibility you need to grow your data-driven business. Combined with Quest's invitation to the global community to be a part of its innovation, and our firm commitment to ensuring customer satisfaction, we continue to deliver solutions that have a real impact on our customers today and leave a legacy we are proud of. We are challenging the status quo by transforming into a new software company. And as your partner, we work tirelessly to make sure your information technology is designed for you and by you. This is our mission, and we are in this together. Welcome to a new Quest. You are invited to Join the Innovation™.

Our brand, our vision. Together.

Our logo reflects our story: innovation, community and support. An important part of this story begins with the letter Q. It is a perfect circle, representing our commitment to technological precision and strength. The space in the Q itself symbolizes our need to add the missing piece—you—to the community, to the new Quest.

Contacting Quest

For sales or other inquiries, visit www.quest.com.

Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.
- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
- Chat with support engineers online.
- View services to assist you with your product.

Third-party contributions

This product contains the following third-party components. For third-party license information, go to <https://www.quest.com/legal/license-agreements.aspx>. Source code for components marked with an asterisk (*) is available at <https://opensource.quest.com>.

Table 6. List of third-party contributions

Component	License or acknowledgment
libcurl 7.46.0	MIT/X derivate N/A © 1996–2010, Daniel Stenberg. All rights reserved.
OpenSSL 1.0.1j	<p>OpenSSL 1.0</p> <p>© 1998–2015 The OpenSSL Project. All rights reserved.</p> <p>LICENSE ISSUES</p> <p>The OpenSSL toolkit stays under a dual license, i.e. both the conditions of the OpenSSL License and the original SSLeay license apply to the toolkit. See below for the actual license texts. Actually both licenses are BSD-style Open Source licenses. In case of any license issues related to OpenSSL please contact openssl-core@openssl.org.</p> <p>OpenSSL License</p> <p>© 1998-2007 The OpenSSL Project. All rights reserved.</p> <p>Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ol style="list-style-type: none"> 1 Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. 2 Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. 3 All advertising materials mentioning features or use of this software must display the following acknowledgment: This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/). 4 The names “OpenSSL Toolkit” and “OpenSSL Project” must not be used to endorse or promote products derived from this software without prior written permission. For written permission, please contact openssl-core@openssl.org. 5 Products derived from this software may not be called “OpenSSL” nor may “OpenSSL” appear in their names without prior written permission of the OpenSSL Project. 6 Redistributions of any form whatsoever must retain the following acknowledgment: This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/). <p>THIS SOFTWARE IS PROVIDED BY THE OpenSSL PROJECT “AS IS” AND ANY EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE OpenSSL PROJECT OR ITS CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p> <p>This product includes cryptographic software written by Eric Young (ey@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).</p>

Table 6. List of third-party contributions

Component	License or acknowledgment
OpenSSL 1.0.1j (continued)	<p data-bbox="403 275 670 304">Original SSLeay License</p> <p data-bbox="403 315 895 344">© 1995-1998 Eric Young (eay@cryptsoft.com)</p> <p data-bbox="403 356 603 385">All rights reserved.</p> <p data-bbox="403 396 1294 425">This package is an SSL implementation written by Eric Young (eay@cryptsoft.com).</p> <p data-bbox="403 436 1155 465">The implementation was written so as to conform with Netscapes SSL.</p> <p data-bbox="403 477 1391 611">This library is free for commercial and non-commercial use as long as the following conditions are adhered to. The following conditions apply to all code found in this distribution, be it the RC4, RSA, lhash, DES, etc., code; not just the SSL code. The SSL documentation included with this distribution is covered by the same copyright terms except that the holder is Tim Hudson (tjh@cryptsoft.com).</p> <p data-bbox="403 622 1391 678">Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed.</p> <p data-bbox="403 689 1391 745">If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used.</p> <p data-bbox="403 757 1391 813">This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.</p> <p data-bbox="403 824 1391 880">Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:</p> <ol data-bbox="443 902 1391 1350" style="list-style-type: none"> <li data-bbox="443 902 1391 958">1 Redistributions of source code must retain the copyright notice, this list of conditions and the following disclaimer. <li data-bbox="443 969 1391 1048">2 Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. <li data-bbox="443 1070 1391 1126">3 All advertising materials mentioning features or use of this software must display the following acknowledgement: <div data-bbox="483 1149 1190 1205" style="margin-left: 20px;">This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).</div> <div data-bbox="483 1227 1391 1283" style="margin-left: 20px;">The word "cryptographic" can be left out if the routines from the library being used are not cryptographic related :-).</div> <li data-bbox="443 1305 1391 1350">4 If you include any Windows-specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement: <div data-bbox="483 1373 1273 1402" style="margin-left: 20px;">This product includes software written by Tim Hudson (tjh@cryptsoft.com).</div> <p data-bbox="403 1413 1391 1731">THIS SOFTWARE IS PROVIDED BY ERIC YOUNG "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE AUTHOR OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.</p> <p data-bbox="403 1753 1391 1821">The licence and distribution terms for any publically available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution licence [including the GNU Public Licence.]</p>

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Legend

-  **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.

-  **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

-  **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.