

Veritas Storage Foundation™ Release Notes

Linux for IBM System p

5.0



Veritas Storage Foundation Release Notes

Copyright © 2007 Symantec Corporation. All rights reserved.

Storage Foundation 5.0

Symantec, the Symantec logo, Veritas, and Veritas Storage Foundation are trademarks or registered trademarks of Symantec Corporation or its affiliates in the U.S. and other countries. Other names may be trademarks of their respective owners.

The product described in this document is distributed under licenses restricting its use, copying, distribution, and decompilation/reverse engineering. No part of this document may be reproduced in any form by any means without prior written authorization of Symantec Corporation and its licensors, if any.

THIS DOCUMENTATION IS PROVIDED “AS IS” AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID, SYMANTEC CORPORATION SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.

The Licensed Software and Documentation are deemed to be “commercial computer software” and “commercial computer software documentation” as defined in FAR Sections 12.212 and DFARS Section 227.7202.

Symantec Corporation
20330 Stevens Creek Blvd.
Cupertino, CA 95014
www.symantec.com

Third-party legal notices

Third-party software may be recommended, distributed, embedded, or bundled with this Symantec product. Such third-party software is licensed separately by its copyright holder. All third-party copyrights associated with this product are listed in the accompanying release notes.

Linux is a registered trademark of Linus Torvalds.

Licensing and registration

Veritas Storage Foundation is a licensed product. See the *Veritas Storage Foundation Installation Guide* for license installation instructions.

Technical support

For technical assistance, visit

http://www.symantec.com/enterprise/support/assistance_care.jsp

and select phone or email support. Use the Knowledge Base search feature to access resources such as TechNotes, product alerts, software downloads, hardware compatibility lists, and our customer email notification service.

Contents

Chapter 1	Veritas Storage Foundation Release Notes	
	Storage Foundation product suites	9
	Product descriptions	10
	Veritas Volume Manager	10
	Veritas File System	10
	Veritas Storage Foundation for Databases	10
	Veritas Cluster Server	11
	System requirements	12
	Supported Linux operating systems	12
	Memory requirements	12
	Supported Sybase versions	12
	Software and hardware requirements	12
	VxVM licenses	13
	Importing VxVM disk groups and VxFS file systems	14
	Upgrading VxFS disk layout versions	14
	Upgrading VxVM disk group versions	14
	Known issues	16
	Veritas Storage Foundation known issues	16
	Veritas Volume Manager known issues	17
	Veritas File System known issues	38
	Software limitations	44
	Veritas Storage Foundation software limitations	44
	Veritas File System software limitations	44
	Documentation	46
	Veritas documentation disc	46
	Release Notes and installation guides	46
	Veritas Storage Foundation guides	47
Appendix A	Third-party Legal Notices	

Veritas Storage Foundation Release Notes

This document provides release information about the products in the Veritas Storage Foundation 5.0 Linux product line for the IBM System p™ platform featuring IBM POWER5™ technology:

- Veritas Storage Foundation (Basic, Standard, and Standard HA)
- Veritas Storage Foundation for Sybase (Standard)

Note: Veritas Storage Foundation QuickStart is not available in this release.

Each of these Symantec products is activated by a single license key. You must obtain a license key before installing the product. For information on obtaining a license key, see the *Veritas Storage Foundation Installation Guide*.

Note: For the latest information on updates, patches, and software issues regarding this release, see the following TechNote on the Symantec Technical Support website:

<http://support.veritas.com/docs/285834>

Review this entire document before installing your Veritas Storage Foundation product.

This document does not contain release information for Veritas Cluster Server (VCS).

See the *Veritas Cluster Server Release Notes*.

This release does not include the following products:

- Veritas Storage Foundation Enterprise
- Veritas Storage Foundation Enterprise HA
- Veritas Storage Foundation Standard for DB2
- Veritas Storage Foundation Enterprise for DB2
- Veritas Storage Foundation Enterprise HA for DB2
- Veritas Storage Foundation Standard for Oracle
- Veritas Storage Foundation Enterprise for Oracle
- Veritas Storage Foundation Enterprise HA for Oracle
- Veritas Storage Foundation Enterprise for Oracle RAC
- Veritas Storage Foundation Enterprise for Sybase
- Veritas Storage Foundation Enterprise HA for Sybase
- Veritas Storage Foundation Cluster File System
- Veritas Storage Foundation Cluster File System HA
- Veritas Volume Replicator

Support for these products will be provided in a future release on the IBM System p platform.

Storage Foundation product suites

The following table lists the Veritas products and optionally licensed features available with each Storage Foundation product suite.

Storage Foundation Version	Products and Features
Storage Foundation Basic	Veritas Volume Manager Veritas File System
Storage Foundation Standard	Veritas Volume Manager Veritas File System
Storage Foundation Standard HA	Veritas Volume Manager Veritas File System Veritas Cluster Server
Storage Foundation for Sybase Standard	Veritas Storage Foundation for Sybase Veritas Volume Manager Veritas File System Veritas Extension for Sybase Disk Manager Option

Product descriptions

Veritas Volume Manager

Veritas Volume Manager is a storage management tool that removes the physical limitations of disk storage so that you can configure, share, manage, and optimize storage I/O performance online without interrupting data availability. VxVM also provides easy-to-use, online storage management tools to reduce planned and unplanned downtime.

Veritas File System

Veritas File System provides high performance and online management capabilities to facilitate the creation and maintenance of file systems. File systems are a collection of directories organized into a structure that enable you to locate and store files.

The primary purposes of a file system are to:

- Provide shared access to data storage.
- Provide structured access to data.
- Control access to data.
- Provide a common, portable application interface.
- Enable the manageability of data storage.

Veritas Storage Foundation for Databases

Veritas Storage Foundation for Databases combine the strengths of the core Veritas products with database-specific enhancements to offer unrivaled performance, availability, and manageability for databases.

Note: Only the Veritas Storage Foundation for Sybase Standard product is available as a database edition in this release.

The database feature options are as follows.

Veritas Storage Checkpoint option

Veritas Storage Checkpoint technology lets you create a point-in-time image of a file system. Storage Checkpoints are treated like any other VxFS file system and can be created, mounted, unmounted, and removed.

This option is available with the Enterprise versions of Veritas Storage Foundation for DB2, Veritas Storage Foundation for Oracle, and Veritas Storage Foundation for Sybase.

Veritas Cluster Server

Veritas Cluster Server provides an open systems clustering solution that eliminates both planned and unplanned downtime, facilitates server consolidation and failover, and effectively manages a wide range of applications in heterogeneous environments.

System requirements

Supported Linux operating systems

The Veritas 5.0 release operates on the architectures and operating systems shown below. Veritas supports only those kernel binaries distributed by Red Hat and SUSE:

- Red Hat Enterprise Linux 4 (RHEL 4) with Update 3 or 4 (2.6.9-34, 42 kernels) on IBM System p servers (using IBM POWER5 processors). Later updates of RHEL4 are supported provided that Red Hat maintains kernel application binary interface (kABI) compatibility.
- SUSE Linux Enterprise Server 9 (SLES 9) with SP3 (2.6.5-7.244, 252, 276 kernels) on IBM System p servers (using IBM POWER5 processors).

Note: If your system is running an older version of either Red Hat Enterprise Linux or SUSE Linux Enterprise Server, you must upgrade it before attempting to install the Veritas Storage Foundation software. Consult the Red Hat or SUSE documentation for more information on upgrading your system.

Supported Linux operating system updates

Veritas products will operate on subsequent kernel and patch releases provided the operating systems maintain kernel ABI (application binary interface) compatibility.

Information about the latest supported Red Hat erratas and updates and SUSE service packs is available in the following TechNote. Read the following TechNote *before* installing any Veritas product.

<http://support.veritas.com/docs/285834>

Memory requirements

A minimum of 1 GB of memory is strongly recommended.

Supported Sybase versions

Sybase versions 12.5 and 15.0 are supported on Linux for IBM System p (ppc64).

Software and hardware requirements

The hardware compatibility list (HCL) contains the latest information about supported hardware and software and is updated regularly.

Note: Before installing or upgrading Veritas Volume Manager, review the current compatibility list to confirm the compatibility of your hardware and software.

The HCL is available at:

<http://support.veritas.com/docs/283161>

The hardware TechNote is available at:

<http://support.veritas.com/docs/283282>

If you do not find your hardware or software listed or if you have questions about the information in the compatibility list, contact Veritas Technical Services.

VxVM licenses

The following table shows the levels of licensing in Veritas Volume Manager and the features supported at each level:

VxVM License	Description of Supported Features
Full	Concatenation, spanning, volume resizing, multiple disk groups, co-existence with native volume manager, striping, mirroring, DRL logging for mirrors, striping plus mirroring, mirroring plus striping, RAID-5, RAID-5 logging, Smartsync, hot sparing, hot-relocation, online data migration, online relayout, volume snapshots, volume sets, Intelligent Storage Provisioning, FastResync with Instant Snapshots, Storage Expert, Device Discovery Layer (DDL), Dynamic Multipathing (DMP), and Veritas Enterprise Administrator (VEA).
Add-on Licenses	Features that augment the Full VxVM license such as clustering functionality (cluster-shareable disk groups and shared volumes) and Veritas Volume Replicator.

Note: You need a Full VxVM license to make effective use of add-on licenses to VxVM.

To see the license features that are enabled in VxVM, enter the following command:

```
# vxctl license
```

Importing VxVM disk groups and VxFS file systems

As this is the first release that supports IBM System p servers, no upgrade path is possible for such systems. It is possible to deport disk groups from releases of VxVM on other supported Linux systems, and to import these disk groups on VxVM 5.0 running on an IBM System p server. However, because of endian differences in byte order between the IBM POWER5 system architecture and the x86_32, x86_64 and some IA64 system architectures, it may not be possible for applications to access the data within volumes in these disk groups unless this data is converted.

See [“Upgrading VxFS disk layout versions”](#) on page 14.

See [“Upgrading VxVM disk group versions”](#) on page 14.

Upgrading VxFS disk layout versions

VxFS 5.0 file systems employ disk layout Version 7 by default. Veritas recommends upgrading any previously installed VxFS file system to the Version 7 disk layout to make use of the extended features available in the VxFS 5.0 release. You can do this only after installing VxFS 5.0.

Use the `vxupgrade` command to upgrade the disk layout on mounted file systems with Version 4 and 6 to Version 7.

See the `vxupgrade(1M)` manual page.

See the *Veritas Storage Foundation Installation Guide*.

Note: The `vxfsconvert` utility is not supported in this release on the IBM System p platform.

Upgrading VxVM disk group versions

All disk groups have a version number associated with them. Each VxVM release supports a specific set of disk group versions and can import and perform tasks on disk groups with those versions. Some new features and tasks work only on disk groups with the current disk group version, so you need to upgrade existing disk groups before you can perform the tasks.

The following table summarizes the disk group versions that correspond to each VxVM release on Linux from 3.2 to the present.

Veritas Volume Manager Release	Cluster Protocol Versions	Disk Group Version	Supported Disk Group Versions
3.5	n/a	90	90
4.0	50	110	90, 110
4.1	60	120	90, 110, 120
5.0	70	140	90, 110, 120, 140

If you want to take advantage of the new features in this release, you must upgrade the *Veritas Cluster Volume Manager* (CVM) protocol Version (70), and upgrade to the latest disk group version (140).

Use the following command to find the version of a disk group:

```
# vxdg list diskgroup
```

You can also determine the version by using the `vxprint(1M)` command with the `-l` option.

To upgrade a disk group to Version 140, use the following command:

```
# vxdg upgrade diskgroup
```

For shared disk groups, the latest disk group version is only supported by the latest cluster protocol version. To see the current cluster protocol version, type:

```
# vxdctl support
```

To upgrade the protocol version for the entire cluster, enter the following command on the master node:

```
# vxdctl upgrade
```

See the “Administering Cluster Functionality” chapter of the *Veritas Volume Manager Administrator’s Guide*.

Known issues

Veritas Storage Foundation known issues

The following sections contain information about known problems and issues in this release of Storage Foundation.

Software disc cannot be ejected during installation

During installation, if any of the products were configured and started, the software disc cannot be ejected. This may prevent installation from continuing in following circumstances:

- If the language pack disc needs be loaded so that the associated packages can be installed.
- A product was installed that did not require a system reboot to complete the installation.

This problem is not an issue if a product was installed or upgraded that required a system reboot to complete the installation.

To avoid this problem at install time

- 1 Specify the `-installonly` option to the `installer` script in addition to any other options.
- 2 Eject the software disc.
- 3 Run the `installer` script with the `-configure` option specified.

If a software disc cannot be ejected

- 1 Stop the event source daemon:

```
# /usr/sbin/vxddladm stop eventsource
```
- 2 Kill the `vxcached`, `vxrelocd` and `vxnotify` processes by using the `kill -9` command with their process IDs as reported by the `ps` command.
- 3 Eject the software disc.
- 4 Restart the VxVM daemon processes:

```
# /usr/sbin/vxddladm start eventsource  
# /etc/vx/bin/vxcached  
# /etc/vx/bin/vxrelocd
```

[622442]

Persistent network interface names on SUSE clusters

On SUSE systems, network interfaces can change their names following a reboot. To configure persistent network interface names, add a `PERSISTENT_NAME=ethX` entry to the `/etc/sysconfig/network/ifcfg-eth-id-mac_address` network interface configuration file for each interface on each node of the cluster, where `X` and `mac_address` correspond to the interface number and MAC address.

DBMS security issue

The Symantec Shared DBMS feature creates the following configuration files:

- `/etc/vxdbms/VERITAS_DBMS3_hostname/conf/databases.conf`
- `/etc/vxdbms/VERITAS_DBMS3_hostname/conf/databases1.conf`
- `/etc/vxdbms/VERITAS_DBMS3_hostname/conf/registration.dat`

These configuration files are created or modified by `vxdbms_start_db.pl`, `vxdbms_start-server.pl`, and `vxdbms_register.pl` respectively.

The files are writable by everyone if the file mode creation mask is insufficiently restrictive. Symantec strongly recommends that you restrict the default file mode creation permissions (using the `umask` command) for root and administrator accounts to avoid a potential security issue. Specifically, change the `group|world` write and execute permissions in the default `umask`. At its least restrictive, the default `umask` for root should be `022`. Symantec recommends setting to `077`.

Veritas Volume Manager known issues

The following sections contain information about known problems and issues in this release of VxVM.

Installation issues

Veritas Volume Manager fails to start on an unsupported kernel

If you attempt to install the Veritas software on an unsupported kernel, an error such as the following is displayed:

```
ERROR: No appropriate modules found. Error in loading module
"vxdump".
```

This message is also listed in the log file, `/etc/vx/.cpi_vm_rpm_msg`. You must upgrade your system to a supported kernel version.

Support for hardware RAID controllers

Veritas Volume Manager 5.0 for Linux does not currently support most hardware RAID controllers unless they present SCSI device interfaces (with names of the form `/dev/sdx`). The PERC (for example, on the Dell 1650), MegaRAID (for example, on the Dell 2650), and ServeRAID (for example, on x440 systems) controllers are supported. Compaq array controllers that require the Smart2 and CCISS drivers (which present device paths such as `/dev/ida/c#d#p#` and `/dev/cciss/c#d#p#`) are supported for normal use.

EFI disk support

Disks with an Extensible Firmware Interface (EFI) are supported for general-purpose usage. Such disks are usually formatted with a GUID Partition Table (GPT) that supports up to 128 partitions and disk sizes greater than 2TB.

The following features are *not* supported:

- Formatting of EFI disks as Cross-platform Data Sharing (CDS) compatible disks.
- Encapsulation of EFI root disks.

Avoiding overwriting of non-boot disks

To avoid the possibility of non-boot disks that contain portions of the operating system being overwritten by the VxVM initialization routines, use `vxdiskadm` option 17 selection 2 (suppress a path from VxVM's view) to hide such disks from VxVM.

Supported disk labels

VxVM can recognize and manipulate disks that have a `sun` or an `msdos` disk label. Root disk encapsulation is only supported for disks with `msdos` labels (see “[Rootability issues](#)” on page 19 for details).

Disks under devfs control

Veritas Volume Manager 5.0 for Linux does not support disks under `devfs` control.

Migration from LVM

The `vxvmconvert` utility is provided to help you migrate from Sistina LVM and LVM2 volumes to VxVM volumes. For more information, see Appendix B “Migrating from Sistina LVM to Veritas Volume Manager” in the *Veritas Volume Manager Administrator's Guide*. The version of LVM2 that can be used with the LVM converter is 2.00.33 or later.

Removing a disk from VxVM control

After evacuating any data, you can remove a disk from Veritas Volume Manager control by using the low-level `vxdiskunsetup` command to remove the VM metadata partition from the disk:

```
# /usr/lib/vxvm/bin/vxdiskunsetup sdX
```

Caution: This operation can result in data loss if used incorrectly. Ensure that you have evacuated or backed up any data on the disk.

Rootability issues

Encapsulation and mirroring of the root disk (rootability) is not supported in this release on the IBM System p platform.

Utility issues

LVM conversion fails or produces error messages under RHEL4

If the `vxvmconvert` command is run on a Red Hat Enterprise Linux 4 Update 3 system, it fails to convert an LVM volume with 5 or more extents to a VxVM volume. This is due to an underlying bug in the LVM `pvmove` command. The workaround is to upgrade the system to RHEL4 Update 4. [896683]

Global Device Naming

The Global Device Naming (GDN) option to the `vxddladm` command should only be used with the Storage Foundation Volume Server software. [608621]

Current naming scheme

There is no option in the `vxddladm` command to display the current naming scheme. The naming scheme that is in operation can be deduced from the output to the `vxdisk list` command. [611320]

vxdiskadm displays error V-5-1-9764 when excluding devices

The `vxdiskadm` operation displays error V-5-1-9764 if a vendor and product ID combination are specified to exclude devices from multipathing. This error is harmless and can be ignored. The error is not seen if controller or device names are specified instead. [587435]

Specifying an enclosure to the vxmpadm getportids command

The `enclosure` attribute should be used to specify an enclosure name to the `vxmpadm getportids` command, instead of the `enclr` attribute that is shown in the *Veritas Volume Manager Administrator's Guide* and the `vxmpadm(1M)` manual page.

Disk group is disabled if private region sizes differ

A disk group is disabled if the `vxvg init` command is used to create it from a set of disks that have pre-existing private regions that differ in size. This may occur if the disks previously belonged to disk groups in older releases of VxVM.

The workaround is to reinitialize the disks before creating the disk group (for example, by using the `vxdisk -f init` command), or to use the `vxvg adddisk` command to add the disks to the disk group after it has been created. [592180]

Maximum size of a VxVM volume

VxVM supports volume lengths up to 256TB. However, any 32-bit legacy applications that use system calls such as `seek`, `lseek`, `read` and `write` are limited to a maximum offset that is determined by the operating system. This value is usually $2^{31}-1$ bytes (1 byte less than 2 terabytes).

Resizing volumes with detached remote plexes

If a volume in a Remote Mirror configuration has detached plexes at a remote site, you can use the following procedure to resize it:

- 1 Turn off the `allsites` attribute for the volume:

```
# vxvol -g diskgroup set allsites=off volume
```
- 2 Remove the detached plexes:

```
# vxassist -g diskgroup remove mirror volume \  
plexnames=plex1,plex2,...
```
- 3 Use the `vxresize` command to resize the volume.

When the remote site comes back up:

- 1 Replace the removed plexes using storage at the remote site:

```
# vxassist -g diskgroup mirror volume nmirror=N \  
site:remote_site_name
```
- 2 Turn on the `allsites` attribute for the volume:

```
# vxvol -g diskgroup set allsites=on volume
```

NFS cannot handle minor numbers greater than 255

The NFS implementation in Linux does not support minor numbers greater than 255 unless a patch is applied (see the description of Red HAT Bugzilla Bug 143897 or SUSE Bugzilla Bug 64552 for details). Without the patch, volume devices with large minor numbers cannot be remotely mounted via NFS. The workaround is to use the `vxvg` command to change the base minor number of the disk group that contains the volumes, as shown here:

```
# vxvg -g diskgroup remminor 2
```

Resizing layered volumes during resynchronization

Due to the current implementation to handle the resize of layered volumes, it is recommended that you do not grow or shrink layered volumes (stripe-mirror, concat-mirror, and so on) during resynchronization. This limitation does not apply to ISP layered volumes.

Internally, Veritas Volume Manager converts the layout of layered volumes and updates the configuration database before it shrinks or grows their sizes. This causes any ongoing operation, such as the resynchronization, to fail.

If the system reboots before the `grow` or `shrink` of a layered volume completes, the volume is left with an intermediate layout. In such a case, use the `vxassist convert` to restore the volume to its original layout.

After a layered volume is resized, the volume names, the plex names, and the subdisk names associated with the subvolumes, are changed.

Interpreting output from `vxassist snapprint`

The output from the `vxassist snapprint` command for Persistent FastResync and Non-Persistent FastResync differs as follows:

- Persistent FastResync maintains separate tracking maps for the original volume and its snapshot volumes. The “%DIRTY” value output by `vxassist snapprint` shows information based only on what has been written to an individual volume.
- Non-Persistent FastResync keeps information about changed regions in the same map for both the original and its snapshot volumes. Even if writes are only made to the snapshot volume, `vxassist snapprint` shows the same “%DIRTY” value for the original volume.

Unsupported utilities

The `vxdiskconfig` and `vxsparecheck` utilities are not supported on the Linux platform.

Using `vxdbg free` with a non-existent disk group name

Using `vxdbg free` with a non-existent disk group name does not print an appropriate error message; it only prints a header. [11286]

Invalid region and partition configurations

The `vxdisksetup` utility allows you to specify some region/partition configurations that are invalid. Specifically, overlapping private and public regions can be specified, but can cause failures or data corruption when the disk is actually used. You must check that the partitioning of the disk does not cause overlapping public and private partitions when the default partitioning is

overridden from the command line. This problem will be addressed in a future release. [13418]

Simultaneous creation of a mirror and a log using vxassist

The `vxassist` command does not add a mirror and a log when processing a command such as the following:

```
# vxassist mirror volume layout=log ...
```

The mirror is added, but the log is silently omitted. If a log and a mirror are to be added, add the mirror and the log in two separate `vxassist` invocations, as follows:

```
# vxassist mirror volume ...  
# vxassist addlog volume ...
```

This problem will be addressed in a future release. [13488]

Resizing a mirrored volume with plexes of different types

Resizing a mirrored volume with plexes of different types is not supported. This is documented in the `vxassist(1M)` and `vxresize(1M)` manual pages. [45668]

Relayout of a volume turns it into a layered volume

The `vxassist relayout` process can change a non-layered volume's layout to layered. For example, you might end up with a stripe-mirror volume instead of a mirror-stripe volume.

If the final layout is not what you intended, there are two solutions:

- If the task is not complete, stop the relayout and reverse it by using the following command:

```
# /usr/sbin/vxrelayout -g dg_name -t task_id reverse vol_name
```
- If the task has completed, you can relayout the volume back to the original layout.

[56184]

Specifying subdisk alignment when resizing a volume

When relayout is performed on a volume, Veritas Volume Manager does not grow subdisks such that they end on cylinder boundaries. If you subsequently increase the size of the volume, its subdisks are not grown using contiguous disk space unless you specify the attribute `layout=nodiskalign` to `vxassist`, as shown here:

```
# vxassist growby volume length layout=nodiskalign
```

Note: Specifying `layout=nodiskalign` permanently enforces this layout policy.

[57225]

Unsupported input to vxdiskadm

The `vxdiskadm` utility does not support all as input to `option 1`. To obtain a list of all devices, use the `vxconfigd` command. [85344]

Option delimiter for arguments with a leading dash

The special option “--” (two dashes) must be inserted before an argument that is not an option but that contains a leading dash. For example:

```
# vxresize -g diskgroup volume -- -size  
[89051]
```

Specifying /opt/VRTS/bin in the PATH

The path to Veritas binaries, `/opt/VRTS/bin`, should be specified at the end of the `PATH` environment variable. Otherwise, the VxFS versions of commands such as `mount` and `cp` are found instead of the standard system versions of these commands. [107758]

Relayout fails for a volume with snapshot plexes

The `SNAPATT`, `SNAPDONE`, `SNAPTMP` or `SNAPDIS` plex states are not supported for the relayout of volume configurations such as `stripe-mirror`. Relayout of such volumes fails if any of their plexes are in these states.

Workaround: For a plex in the `SNAPDONE` state, change the state of the plex to `ACTIVE` before performing the relayout:

```
# vxplex [-g diskgroup] convert state=ACTIVE plexname
```

For plexes in the `SNAPATT` or `SNAPTMP` states, either allow time for them to be synchronized and placed in the `SNAPDONE` state. You can then use the `vxplex convert` command to convert them to the `ACTIVE` state. Alternatively, you can use the `vxassist snapabort` command to remove the snapshot plexes. For snapshot plexes in the `SNAPDIS` state, dissociate and remove the plex from the volume using this command:

```
# vxplex [-g diskgroup] -o rm dis plexname
```

[126930]

Using vxvol and vxmend with layered volumes

The `vxvol` and `vxmend` commands do not handle layered volumes very well. When `vxmend` is executed on the top level volume to change the state of a volume, it is executed only on the top level volume; the change is not propagated to the lower level volumes. As a result, the volume states can become inconsistent and a subsequent `vxvol init` command might fail.

The `vxvol` command also exhibits the same problem. When a `vxvol init` command is executed on the top level volume, the change is not propagated to the volumes corresponding to its subvolumes.

Workaround: When executing the `vxvol` or `vxmend` command on a layered volume, first issue the command to the lower level volumes in a bottom-up fashion; then execute the command on the top-level volume.

In this example, a volume, `vol`, has two subvolumes, `vol-L01` and `vol-L02`. The state of the volumes is first set to `empty`, and then the initialization commands are executed:

```
# vxmend -o force -g mydg fix empty vol
# vxmend -o force -g mydg fix empty vol-L01
# vxmend -o force -g mydg fix empty vol-L02
# vxvol -g mydg init zero vol
# vxvol -g mydg init zero vol-L01
# vxvol -g mydg init zero vol-L02
```

[134932]

Warning message from vxassist when creating concatenated mirror volumes

You may see the following warning message when creating a concatenated mirror (`concat-mirror`) volume with the maximum size:

```
VxVM vxassist Warning V-5-1-364 dm:volume_name: No disk space
matches specification
```

As long as the volumes have been successfully created, you can safely ignore the message. [137344]

Device and DMP issues

Array paths remain disabled after re-enabling a switch port

The operating system may not restore the paths to a usable state after re-enabling a switch port. This problem has been seen with the Emulex HBA and the Emulex `lpfc` driver running on both Red Hat Enterprise Linux and SUSE Linux Enterprise Server systems.

The suggested workaround is to increase the SCSI timeout value to 60 seconds by running the “Adjusting Time-Out for Array Behavior” script (`set_target_timeout.sh`), which is available from the Emulex web site:

http://www.emulex.com/ts/downloads/linuxfc/linux_tools.html

[861508]

Fabric Monitoring

The Fabric Monitoring feature controls whether the Event Source daemon (`vxesd`) uses the Storage Networking Industry Association (SNIA) HBA API. This API allows DMP to improve the performance of failover by collecting information about the SAN topology and by monitoring fabric events. Note that the vendor-provided ASL must also support the use of the SNIA HBA API.

Fabric monitoring may be turned on or off by using the following `vxddladm` commands:

```
# vxddladm settune monitor_fabric=on
# vxddladm settune monitor_fabric=off
```

The current setting of `monitor_fabric` can be displayed by using the following command:

```
# vxddladm gettune monitor_fabric
```

The default setting of `monitor_fabric` is on. [784343]

Default I/O policy

The default I/O policy for Active/Active (A/A) arrays has been changed from `balanced` to `minimumq`. The default I/O policy for Asymmetric Active/Active (A/A-A) and Active/Passive (A/P) arrays has been changed from `singleactive` to `round-robin`.

QLogic HBA driver

The default API for the QLogic SNIA HBA that is supplied with Linux SUSE SP3 does not work correctly with DMP. You can download an updated driver from the QLogic website. [528448]

Re-initializing disks previously under VxVM control

If disks were previously under Veritas Volume Manager control and were used on the same host system, and the proper uninstallation procedures were *not* followed, the disk groups they represent are imported automatically after installation. If you no longer want to use these disk groups, use the `destroy` option of the `vxvg(1M)` command to remove them. Alternately, you can use `vxdiskunsetup(1M)` to remove the disks from Veritas Volume Manager control.

Caution: These operations can result in data loss. Ensure that you have evacuated or backed up any data on the disks.

Disk space required for configuration database

Disks with insufficient space (less than 65536 disk blocks) for VxVM to allocate an on-disk configuration database copy cannot be encapsulated. The database requires at least the same space as is allocated for other disks in the same disk group. This size defaults to 65536 blocks. To work around this, relocate the data on the last partition of the disk to a volume on a different disk, and free the space by reducing the partition size to 0.

The space for this database must be allocated from the beginning or the end of the disk.

Workaround: There is no workaround to the problem of insufficient space on a disk to store private VxVM information. VxVM requires at least a small region of private storage (65536 blocks) for proper disk identification.

Effect of disk errors on VxVM startup

Startup of VxVM can be severely impacted by disk errors that result in I/O operations taking a long time to fail.

Support for RAM disks and other devices

RAM disks and other devices with a sector size greater than 512 bytes cannot be used with VxVM. [130230]

Paths remain in disabled state

Paths that previously failed to Active/Active arrays, and which are now available again, may not be automatically re-enabled by the DMP restore daemon. Use the `vxdtl enable` command to re-enable such paths. [222849]

Overriding dependency on VRTSvxvm for old ASL packages

ASLs from previous releases have a dependency on the `VRTSvxvm` package. In the 5.0 release, the `VRTSvxvm` package has been split into the `VRTSvxvm-common` and `VRTSvxvm-platform` packages. To avoid an error message about a dependency on the `VRTSvxvm` package, specify the `--nodeps` option to the `rpm` command when installing such ASLs.

External disks are not visible after rebooting

If your external disks are not visible after a system reboot, it is likely that the driver for your host adapter is loaded after VxVM scans for attached storage at boot time. You are likely to experience this problem with QLogic and Emulex host adapters where the drivers are loaded by `kudzu` (on Red Hat) or `coldplug` (on SUSE) startup scripts.

Possible reasons for a host adapter to be loaded after VxVM startup include:

- The host adapter was added to a system after the operating system was installed.
- The host adapter driver was removed from the `initrd` (initial RAM disk) configuration.
- The host adapter was not detected correctly during installation.

If a host adapter driver is loaded after VxVM startup, scanning for the attached disks should make them visible to VxVM:

```
# vxdisk scandisks
```

The following command should now display the disks:

```
# vxdisk list
```

To allow VxVM to discover the attached storage at boot time, the host adapter driver must be loaded in the `initrd`. The procedures for doing this on Red Hat and SUSE systems are described below:

To add a host adapter driver to the `initrd` on a Red Hat system:

- 1 Use the `lsmod` command to identify the drivers for your host adapters:

```
# lsmod
```

Possible drivers include `qla2200` or `qla2300` for QLogic host adapters, or `lpfcdd` for Emulex host adapters.

- 2 Edit the module configuration file, `/etc/modprobe.conf`, and add an `alias` line for the host adapter to the end of the file, as shown in this example:

```
alias eth0 tg3
alias scsi_hostadapter mptbase
alias scsi_hostadapter1 mptscsih
alias scsi_hostadapter2 HBA_driver
```

where *HBA_driver* is the name of the host adapter driver.

- 3 If your system's root disk is encapsulated, use the following command to rebuild the `initrd` image:

```
# /usr/lib/vxvm/bin/vxinitrd /boot/VxVM_initrd.img `uname -r`
```

where the `uname -r` command is used to determine the version of the kernel for which the image is being created.

If your system's root disk is not encapsulated, use the following command to rebuild the `initrd` image:

```
# mkinitrd -f /boot/initrd-`uname -r`.img `uname -r`
```

- 4 Reboot the system:

```
# shutdown -now
```

When the system has rebooted, use the following command to check that the disks on the host adapter have been discovered by VxVM:

```
# vxdisk list
```

To add a host adapter driver to the `initrd` on a SUSE system:

- 1 Use the `lsmod` command to identify the drivers for your host adapters:

```
# lsmod
```

Possible drivers include `qla2200` or `qla2300` for QLogic host adapters, or `lpfcdd` for Emulex host adapters.

- 2 Edit the kernel configuration file, `/etc/sysconf/kernel`, and add the name of the host adapter driver to the list defined for the `INITRD_MODULES` parameter, as shown in this example:

```
INITRD_MODULES="aacraid HBA_driver reiserfs"
```

where *HBA_driver* is the name of the host adapter driver.

The name of the host adapter driver must come after the name of the driver that is used by the system's internal disks (`aacraid` in this example).

- 3 If your system's root disk is encapsulated, use the following command to rebuild the `initrd` image:

```
# /usr/lib/vxvm/bin/vxinitrd /boot/VxVM_initrd.img `uname -r`
```

where the `uname -r` command is used to determine the version of the kernel for which the image is being created.

If your system's root disk is not encapsulated, use the following command to rebuild the `initrd` image:

```
# mkinitrd
```

- 4 Reboot the system:

```
# shutdown -now
```

When the system has rebooted, use the following command to check that the disks on the host adapter have been discovered by VxVM:

```
# vxdisk list
```

Sporadic DMP error messages

Error messages such as the following may be displayed on the console when two or more paths are under heavy load:

```
SCSI error : <1 0 0 3> return code = 0x20000
end_request: I/O error, dev sdr, sector 126320
end_request: I/O error, dev sdr, sector 126328
```

The messages occur because DMP sets the FAILFAST flag on I/O requests. The Linux kernel is prevented from retrying an I/O request after it is delayed by a fabric event, and as a consequence, it reports this as a SCSI error. Such error messages can be ignored as this is the expected behavior, and DMP retries the I/O request on behalf of the kernel. [315361]

Hot-relocation issues

Data layout and performance after relocation

Hot-relocation does not guarantee the same layout of data or performance after relocation. It is therefore possible that a single subdisk that existed before relocation may be split into two or more subdisks on separate disks after relocation (if there is not enough contiguous space on a single disk to accommodate that subdisk). [14894]

Notification of disk information on disk failure

When a disk failure occurs, the hot-relocation feature notifies the system administrator of the failure and any relocation attempts through electronic mail messages. These messages typically include information about the device offset

and disk access name affected by the failure. However, if a disk fails completely or a disk is turned off, the disk access name and device offset information is not included in the mail messages. This is because VxVM no longer has access to this information. [14895]

Cluster Functionality Issues

Domain controller mode in CVM clusters

The slave nodes in a CVM cluster only have access to I/O objects. If non-I/O related information (for example, volume tags) are to be made available on a slave node, a command must be shipped to the Storage Agent on the master node for execution. The results are then communicated back to the slave node.

The domain controller mode of VEA allows all nodes of a CVM cluster to be placed in the same domain with a central authentication server. This allows commands to be executed on any node within the domain if the executing process has sufficient rights.

Provided domain controller mode is configured, non-I/O related information is accessible via VEA on any node in a CVM cluster.

However, even if domain controller mode is enabled in a CVM cluster, ISP commands must be run on the master node. ISP commands that are run on a slave node are not redirected to the Storage Agent on the master node. Such commands fail if they require access to non-I/O related information that is unavailable on a slave node. [603213]

Node rejoin causes I/O failures with A/PF arrays

A cluster node should not be rejoined to a cluster if both the primary and secondary paths are enabled to an A/PF array, but all the other nodes are using only the secondary paths. This is because the joining node does not have any knowledge of the cluster configuration before the join takes place, and it attempts to use the primary path for I/O. As a result, the other cluster nodes can experience I/O failures and leave the cluster.

Workaround:

- 1 Before joining the node to the cluster, disconnect the cable that corresponds to the primary path between the node and the A/PF array.
- 2 Check that the node has joined the cluster by using the following command:

```
# vxclustadm nidmap
```

The output from this command should show an entry for the node.
- 3 Reconnect the cable that corresponds to the primary path between the node and the array.

- 4 Use the following command to trigger cluster-wide failback:

```
# vxdisk scandisks
```

All the nodes should now be using the primary path. [579536]

Volume persists in SYNC state

If a node leaves the cluster while a plex is being attached to a volume, the volume can remain in the SYNC state indefinitely. To avoid this, after the plex attach completes, resynchronize the volume manually with the following command:

```
# vxvol -f resync volume
```

[20448]

Support for RAID-5 Volumes in cluster-shareable disk groups

VxVM does not currently support RAID-5 volumes in cluster-shareable disk groups. Creating or using RAID-5 volumes on shared disks may cause a system panic.

File systems supported in cluster-shareable disk groups

The use of file systems other than Veritas Storage Foundation Cluster File System (SFCFS) on volumes in cluster-shareable disk groups can cause system deadlocks.

Reliability of information about cluster-shareable disk groups

If the `vxconfigd` program is stopped on both the master and slave nodes and then restarted on the slaves first, VxVM output and VEA displays are not reliable until the `vxconfigd` program is started on the master and the slave is reconnected (which can take about 30 seconds). In particular, shared disk groups are marked “disabled” and no information about them is available during this time. The `vxconfigd` program must first be started on the master.

Error message when a node attempts to rejoin a cluster

When a node terminates from the cluster, open volume devices in shared disk groups on which I/O is not active are not removed until the volumes are closed. If this node later joins the cluster as the master while these volumes are still open, the presence of these volumes does not cause a problem. However, if the node tries to rejoin the cluster as a slave, this can fail with the following error message:

```
VxVM vxconfigd WARNING V-5-1-3031 Cannot assign minor number
```

This message is accompanied by the console message:

```
VxVM vxconfigd WARNING V-5-2192 minor number ### disk group  
group in use
```

Remote Mirror issues

Handling intermittently failing paths in a Campus Cluster

The `dmp_health_time` and `dmp_path_age` tunables control how DMP handles intermittently failing paths. The default values in VxVM 5.0 MP1 of `dmp_health_time` and `dmp_path_age` are 60 and 300 seconds respectively. The value of `dmp_health_time` represents the minimum time in seconds for which a path must stay healthy. If a path changes state between enabled and disabled on a shorter time scale than this, DMP marks the path as intermittently failing and disables I/O on the path. I/O is not re-enabled on an intermittently failing path until `dmp_path_age` seconds have elapsed without further outage. If the value of `dmp_health_time` is set to 0, DMP is prevented from detecting intermittently failing paths.

In remote mirror configurations, a site is reattached when its disks come back online. Recovery is then initiated for the plexes of a volume that are configured at that site. Depending on the configuration, recovery of the plexes can take a considerable time and consume considerable resources. To minimize the frequency of having to perform a site reattachment operation, it is recommended that you use the `vxdmpadm settune` command to configure a value smaller than 60 seconds for `dmp_health_time`, and a value larger than 300 seconds for `dmp_path_age`.

Setting site consistency on a volume

The `vxvol` command cannot be used to set site consistency on a volume unless sites and site consistency have first been set up for the disk group. [530484]

Adding a remote mirror

Adding a remote mirror to a new site for a site-consistent volume does not also create a DRL log plex or a DCO plex at that site. The workaround is to use the `vxassist addlog` command to add a DRL log plex, or the `vxsnap` command to add a version 20 DCO plex at the specified site (`site=sitename`). [533208]

Replacing a disk in a site-consistent disk group

If the `vxdiskadm` command is used to replace a disk in site-consistent disk group, the new disk is expected to be tagged with the same site name as the disk that is being replaced. If the sites do not match, `vxdiskadm` cannot complete the replacement without disabling site-consistency on the volume.

To avoid this, tag the replacement disk with same site name as the disk that is being replaced:

```
# vxdisk settag replacement_disk site=sitename
```

After tagging the replacement disk, you can use `vxdiskadm` to replace the failed disk. [536853]

Snapshot Issues

Space-optimized instant snapshots of large volumes

With the default size of the paging module (1.5MB), the creation of a space-optimized instant snapshot of a volume that is larger than 252MB fails. The workaround is to use the `vxtune` command to increase the amount of memory that is available to the paging module as shown here:

```
# vxtune volpagemod_max_memsz size
```

The value that should be used for `size` is determined by the region size and the number of volumes for which space-optimized instant snapshots are taken:

```
size_in_KB = 6 * (total_volume_size_in_GB) * (64/region_size_in_KB)
```

For example, a single 1TB volume requires around 6MB of paging memory if the region size is 64KB. If there were 10 such volumes, 60MB of paging memory would be required. [533799]

Mount operation can cause inconsistencies in snapshots

Inconsistencies can arise in point-in-time copies if any of the following snapshot operations are performed on a volume while a file system in the volume is being mounted: `vxassist snapshot`, `vxplex snapshot`, `vxsnap make`, `vxsnap refresh`, or `vxsnap restore`.

Using snapshots as root disks

It is recommended that you do not use snapshots of the root volume as a bootable volume. (A snapshot can be taken to preserve the data of the root volume, but the snapshot will not be bootable. The data from the snapshot would have to be restored to the original root volume before the system could be booted with the preserved data.)

Warning message when taking a snapshot of an SFCFS file system

When taking a snapshot of a volume containing an SFCFS file system, the following warning message may appear:

```
Plex plex detached from volume vol
```

Workaround: No action is required. This behavior is normal and is *not* the result of an error condition.

File system check of a snapshot

Normally, a file system would have no work to do when a snapshot is taken. However, if an SFCFS file system is not mounted, it is likely that the `fsck` of the snapshot will take longer than is usually necessary, depending on the I/O activity at the time of the snapshot.

Workaround: When taking a snapshot of an SFCFS file system, you should ensure that at least one of the volumes defined in the command line is mounted on the cluster master.

Intelligent storage provisioning issues

Number of columns in a RAID-5 ISP volume

If an ISP volume is created with the RAID-5 capability, the parameters `ncols` and `nmaxcols` refer only to the number of data columns, and do not include the parity column. For this reason, the actual number of columns that are created in such a volume is always one more than the number specified.

Creating application volumes

To create application volumes successfully, the appropriate licenses must be present on your system. Vendors of disk arrays may also provide capabilities that require special licenses for certain features of their hardware. [137185]

Miscellaneous issues

Disks with write-back caches

Disk drives configured to use a write-back cache, or disk arrays configured with volatile write-back cache, exhibit data integrity problems. The problems occur after a power failure, SCSI bus reset, or other event in which the disk has cached data, but has not yet written it to non-volatile storage. Contact the disk drive or disk array manufacturer to determine whether your system disk drives use a write-back cache, and if the configuration can be changed to disable write-back caching.

`man` command may display garbled output on Red Hat systems

The `man` command may display manual pages with garbled characters on Red Hat systems. To correct the problem, set the value of the `LC_ALL` environment variable in your shell to “C” as shown in this example:

```
# LC_ALL=C
# export LC_ALL
```

See incident 82099 on the Red Hat support website for more information.

Block 0 on a disk must not be overwritten

Since the disk label is stored in block 0 of a disk, block 0 must not be used (that is, no application should write any information in block 0). Special protection has been built into Veritas Volume Manager to protect block 0 from being overwritten.

Auto-import of disk groups

If a disk that failed while a disk group was imported returns to life after the group has been deported, the disk group is auto-imported the next time that the

system boots. This contradicts the normal rule that only disk groups that are (non-temporarily) imported at the time of a crash are auto-imported.

If it is important that a disk group *not* be auto-imported when the system is rebooted. It should be imported temporarily when the intention is to deport a disk group (for example, in HA configurations). Use the `-t` flag to `vxchg import`. [13741]

Volumes not started following a reboot

During very fast boots on a system with many volumes, `vxconfigd` may not be able to auto-import all of the disk groups by the time `vxrecover -s` is run to start the volumes. As a result, some volumes may not be started when an application starts after reboot.

Workaround: Check the volumes before starting the application or place a sleep (`sleep sec`) before the last invocation of `vxrecover`. [14450]

Forcibly starting a volume

The `vxrecover` command starts a volume only if it has at least one plex that is in the ACTIVE or CLEAN state and is not marked STALE, IOFAIL, REMOVED, or NODAREC. If such a plex is not found, VxVM assumes that the volume no longer contains valid up-to-date data, so the volume is not started automatically. A plex can be marked STALE or IOFAIL as a result of a disk failure or an I/O failure.

Workaround: Force the volume to start by entering the following command:

```
# vxvol -f start volume
```

Try to determine what caused the problem before you run this command. It is likely that the volume needs to be restored from backup, and it is also possible that the disk needs to be replaced. [14915]

Veritas Enterprise Administrator issues

Note: Refer to the *Veritas Storage Foundation Installation Guide* for information on how to set up and start the VEA server and client.

Remote Mirror (campus cluster)

There is no option to create site-based snapshots. [541104]

Volume tags not displayed

On Microsoft Windows systems, existing volume tags are not displayed when adding a new volume tag. [602953]

Search does not return any objects for non-Administrator users

A search that is performed by a user in a non-Administrator group should return an access-denied error and not an empty list of objects. The workaround is to add the user to the Administrator group. [840452]

Storage Agent dumps core if there are many LUNs

Configurations with more than 10240 LUNs can cause the Storage Agent to dump core in the directory `/var/vx/isis`. [584092]

Workaround

- 1 Rename the Device Discovery Layer (DDL) library file:

```
# mv /opt/VRTSddlpr/lib/ddl.so /opt/VRTSddlpr/lib/ddl.so.orig
```

This prevents the DDL provider from loading, but has the effect of making enclosure, path and controller objects no longer available in the VEA client GUI.

- 2 Restart the Storage Agent:

```
# /opt/VRTSobc/pal33/bin/vxpal -a StorageAgent
```

Minimum version of VxVM

To use the VEA client GUI to administer Veritas Volume Manager systems other than VxVM 5.0 systems on Linux, you must upgrade VxVM on the remote systems to the following releases:

Platform	Release
AIX	VxVM 3.2.2 or later
HP-UX	VxVM 3.5 Update 2 or later
Linux on x86	VxVM 3.2 Update 1 or later
Linux on IA64	VxVM 3.2 Update 6 or later
Solaris	VxVM 3.5 MP2 or later

Minimum version of VxFS

To use the VEA client GUI to administer VxFS file systems other than VxFS 5.0 file systems on Linux, you must upgrade VxFS on the remote systems to the following releases:

Platform	Release
AIX	Any
HP-UX	VxFS 3.5 or later
Linux	Any
Solaris	VxFS 3.5 or later

Disk group creation failure with duplicate disk ID

VEA fails to create a disk group with a duplicate disk ID, and gives no other options.

Using the online help

Selecting a hyper link from the last item in a list of items may result in the display of text prior to the required text. It may then be necessary to scroll through the displayed help text to find the desired text.

Starting a volume in VEA

Select **Actions > Recover Volume** to start a volume. There is no **Start Volume** action. [87907]

Disabling wizards

In VxVM releases prior to VxVM 4.0, you could disable the wizards for certain functions by deselecting the “Enable Wizard Mode.” In this release of VxVM, you can no longer disable wizards. [135667]

Entering comments in dialog boxes

Comments may only be entered using the ASCII character set, and not the character set that corresponds to the current locale. [147509]

Java exceptions in the annotate disks dialog

A Java exception may occur when selecting a disk category from the **Annotate Disks** dialog. Close the exception window and ignore the error. To avoid seeing the error, first select **Tools>Refresh** to update the displayed list of objects. [229438]

Veritas Volume Manager Web GUI issues

Mirroring volumes across targets

Attempting to mirror volumes across targets fails. Such operations are not supported on the Linux operating system platform. [573809]

Maximum volume size

The maximum size for a volume is shown as 0 gigabytes if less than 1 gigabyte of storage is available in the disk group. [573897]

All Active Alerts view

The **All Active Alerts** view shows an incorrect number of active alerts. [601167]

Incorrect error message when importing a disk group

An incorrect error message such as the following may be displayed when importing a disk group:

```
<!--td align="center" height="287" valign="midd
```

The workaround is to refresh the page. [607096]

Create disk group wizard

The create disk group wizard shows internal disks as being available for the creation of shared disk groups. [574717]

Solaris x64 hosts cannot be managed

The Web GUI cannot be used to manage Solaris x64 for Opteron hosts that are running the Storage Foundation 4.1 software. [615554]

Error when creating a volume set

An error such as the following may be seen when attempting to create a volume set that includes a newly created volume:

```
Error: 0xcfff0021 Facility: 0xffff Severity: 0x3 Error number:  
0x21 Object Not Found.
```

The workaround is to refresh the page. [615960]

Veritas File System known issues

The following sections contain information about known problems and issues in this release of VxFS.

Dynamic Storage Tiering

A point patch will be provided to address a problem with the Dynamic Storage Tiering (DST) feature. DST is not supported unless this point patch is installed.

See the following TechNote for information on the point patch:

<http://support.veritas.com/docs/285834>

[884116]

vxfsconvert utility

The `vxfsconvert` utility is not supported in this release on the IBM System p platform.

Block device support in Veritas File System

VxFS 5.0 supports the creation of VxFS file systems directly on both partitioned and non-partitioned block devices, such as SCSI or IDE disks, without requiring a VxVM volume. For example:

```
# mkfs -t vxfs /dev/sdc1
# mount -t vxfs /dev/sdc1 /mnt
# fsck -t vxfs /dev/sdc1
```

Similarly, all local mount features of VxFS, such as clones and file system snapshots, do not require the creation of a VxVM volume.

Size requirement for first volume in a volume set

The first volume (index 0) in a volume set must be larger than the sum of the total volume set size divided by 4000, the size of the VxFS intent log, and 1MB.

Nested non-shared mount

If you want to unmount all the file systems where the parent file system is disabled for any reason, you will need to force unmount on the parent first then by a regular unmount of the child.

Files and directories

To maximize VxFS performance for file systems with disk layout Version 6 or earlier, do not exceed 100,000 files in the same directory. Use multiple directories instead. This issue does not apply for disk layout Version 7, which supports large directories.

Ioctl's are not supported on the File Change Log file

Ioctl's are not supported on the File Change Log file. Therefore, running commands such as `fsapadm`, `setext`, `fiostat`, and `fsmap` on the FCL file is not supported since these commands use an internal ioctl to implement their functionality.

Commands must be large-file aware to operate correctly on file systems larger than one terabyte

For utilities to operate correctly on large-file systems, they must be large file aware. This applies even if commands are invoked on small files in a large file system.

See the *Veritas File System Administrator's Guide*.

Some disk quota operations do not function on NFS

When VxFS file systems are exported via NFS, quotas on the file system apply to users when accessing the file system from NFS clients. However, neither the Solaris nor the VxFS quota commands on the NFS client can be used to query or edit quotas. The VxFS quota commands can be used on the server to query or edit quotas.

100% full file system cannot be resized

In some circumstances, the `fsadm` and `fsvoladm` commands cannot resize a 100% full file system due to lack of space for updating structural information. Check VxFS file systems on a regular basis and increase their size if they approach 100% capacity. This problem can also occur if the file system is very busy. Free up space or reduce activity on the file system and try the resize again.

Non-standard command behavior when using access control lists

The output of the `ls -l` command on VxFS file systems shows `mask/CLASS_OBJ` in place of group permissions if ACLs are in use on a file or a directory. You can determine the effective group permissions by using the `getfacl` command.

The `chmod` command changes mask/CLASS_OBJ instead of the group permissions if ACLs are in use on a file or a directory. GROUP_OBJ is not changed by `chmod`, and because effective group permissions are determined by GROUP_OBJ and CLASS_OBJ, the default group may not receive the permissions specified by `chmod`. Because `ls -l` shows mask only (which is changed by `chmod`), it only appears that the group permissions are changed as specified in `chmod`.

Cross-platform Data Sharing

Cross-platform Data Sharing (CDS) is not supported in this release.

HSM/DMAPI not supported

HSM/DMAPI is not supported in this release.

MetaDevices not supported

MetaDevices are not supported in this release.

On Red Hat systems, manual pages display garbled output

Manual pages invoked on Red Hat systems display garbled characters. To correct the problem, set the LC_ALL environment variable:

```
LC_ALL=C
```

See incident 82099 on the Red Hat support website for more information.

A VxFS File System can be corrupted if a full fsck is performed without -t vxfs

Performing a full `fsck` without specifying the `-t vxfs` option can corrupt a VxFS file system, because the default file system type used by `fsck` is `ext2`.

Swap files not supported

Swap files are not supported for VxFS on Linux. Do not create or use swap files on a VxFS file system.

df_vxfs(1M) manual page installation location

The VxFS manual pages are installed in the `/opt/VRTS/man` directory. The `df_vxfs(1M)` manual page is in the `/opt/VRTS/bin` directory. Both of these directories must be added to the `MANPATH` environment variable.

Limitations with generic mount(8) command

There are known limitations with the handling of mount options when the mounted file system is also bound using the `--bind` option of the generic `mount(8)` command. In this case, it is not possible to change the mount options of any bound instances, and the only way to change the mount options on the original mount point is to supply both the `-t vxfs` option and the block device with the `-o remount,options` option on the command line. However, any existing mount options are reset to their default values. Subsequent attempts to change mount options on the original mount point may fail until any existing bound instances are unmounted.

Reboot of node with VxFS File System on volume in shared disk group hangs

If a node in a cluster that has a VxFS file system on a volume in a shared disk group mounted outside of VCS control is rebooted, the reboot process hangs at `hastop` in `/etc/init.d/vcs`.

Do not use vxassist and fsadm_vxfs when resizing both the volume and the File System

Use the `vxresize` command when resizing both the volume and the file system. The `vxresize` command guarantees that the file system will shrink or grow along with the volume. Do not use the `vxassist` and `fsadm_vxfs` commands for this purpose.

See the `vxresize(1M)` manual page.

See the *Veritas Volume Manager Administrator's Guide*.

This is especially important with Linux 2.6 kernels, on which using the `vxassist` and `fsadm_vxfs` commands leaves the block device inode size in the VxFS layer incorrect.

Linux I/O scheduler for database workloads

Symantec recommends using the Linux `deadline` I/O scheduler for database workloads on both Red Hat and SUSE distributions.

To configure a system to use this scheduler, include the `elevator=deadline` parameter in the boot arguments of the GRUB or LILO configuration file. The location of the appropriate configuration file depends on the system's architecture and Linux distribution:

Configuration File	Architecture and Distribution
<code>/boot/grub/menu.lst</code>	RHEL4 and SLES9 x86_64

For the GRUB configuration files (x86 and x86_64), add the `elevator=deadline` parameter to the kernel command. For example, change:

```
title RHEL AS 4 smp
  root (hd1,1)
  kernel /boot/vmlinuz-2.6.9-11.ELsmp ro root=/dev/sdb2
  initrd /boot/initrd-2.6.9-11.ELsmp.img
```

To:

```
title RHEL AS 4 smp
  root (hd1,1)
  kernel /boot/vmlinuz-2.6.9-11.ELsmp ro root=/dev/sdb2
    elevator=deadline
  initrd /boot/initrd-2.6.9-11.ELsmp.img
```

A setting for the `elevator` parameter is always included by SUSE in its and GRUB configuration files. In this case, change the parameter from `elevator=cfq` to `elevator=deadline`.

Reboot the system once the appropriate file has been modified.

See the operating system documentation for more information on I/O schedulers.

Occasional failure of a full fsck

A full `fsck` may fail to repair a file system after repairing the link count on an inode. For example:

```
# fsck -t vxfs -o full /dev/vx/dsk/testdg/vol100 fsck 1.34
(25-Jul-2003)
UX:vxfs fsck.vxfs: WARNING: V-3-20836: file system had I/O
error(s)
on meta-data.

log replay in progress
pass0 - checking structural files
.
.
.
fileset 1000 primary-illist inode 13831 link count is 10 should
be 9
adjust? (ynq)y

file system check failure, aborting ...
```

If this occurs, restart the full `fsck` operation. The `fsck` command may need to be run several times for the repair to complete, with each instantiation repairing more of the file system.

VxFS Web GUI online help known issues

The following known issues were reported for this release:

- For the **Mount Storage Checkpoint** operation, you must select an existing Storage Checkpoint from the drop-down list. You cannot manually enter a Storage Checkpoint name.
- The **Creating a new file system on a volume set** task can only be performed on VxFS file systems.

fcl_keeptime cannot be set to the default value after being modified to a non-default value

After the value for *fcl_keeptime* has been modified to a non-default value through the `vxtunefs` command, you cannot reset the value back to the default value of 0.

Issue with full volume 0 on a multi-volume file system

Certain file system metadata that is only in the file system must be allocated from volume 0. If volume 0 is full, operations such as upgrading the file system's disk layout version and creating a Storage Checkpoint can fail. These operations can be retried after freeing space on volume 0.

du reports more blocks than an file's actual size

The `du -k` command sometimes reports more blocks than the actual data size after a file is created. Symantec recommends using other commands, such as `vxquota -v` or `ls -ls`, to obtain accurate file size information.

Software limitations

The following sections describe Veritas Storage Foundation software limitations that exist in this release.

Veritas Storage Foundation software limitations

Multiple Veritas products installed on the same system can cause problems when upgrading or uninstalling

If you have more than one Veritas product installed on the same system, uninstalling or upgrading any one of those products can cause the other products to stop operating correctly. This limitation applies to Veritas Storage Foundation, Veritas Storage Foundation for Databases, Veritas Storage Foundation Cluster File System, Veritas Volume Manager, Veritas Storage Foundation for Oracle RAC, and Veritas Cluster Server. Before uninstalling or upgrading such a system, call Customer Support for guidelines. [840486]

Veritas File System software limitations

Veritas File System Web GUI online help known issues

The following known issues were reported for this release:

- For the **Mount Storage Checkpoint** operation, you must select an existing Storage Checkpoint from the drop-down list. You cannot manually enter a Storage Checkpoint name.
- The **Creating a new file system on a volume set** task can only be performed on VxFS file systems.
- For the **Remount Storage Checkpoint** operation, the **More info** link on the second wizard page does not function properly for cluster file systems.
- For the **Unmount Storage Checkpoint** operation, the **More info** link on the second wizard page does not function properly for cluster file systems.

Quick I/O, ODM, mount -o cio, and the VX_CONCURRENT advisory are mutually exclusive

The VX_CONCURRENT advisory cannot be set on a file that is actively open by Quick I/O or ODM. A file that has the VX_CONCURRENT advisory set may not be concurrently opened by Quick I/O or ODM. Quick I/O and ODM access are not allowed for any files on a file system that is mounted with the `-o cio` mount option.

Volume management support

The Veritas File System (VxFS) is only supported on Veritas Volume Manager (VxVM) volumes.

sendfile support

The current version of VxFS does not support the `sendfile()` system call. In order to use Apache with VxFS, use the Apache configuration option `EnableSendFile Off`.

Security-enhanced Linux

VxFS includes Security-Enhanced Linux (SE Linux) support for evaluation purposes only. VxFS conforms to the requirements of the SE Linux API. However, security policy files are not available for the Veritas product stack.

Documentation

After the installation procedure is complete, documents are available online under the `/opt/VRTS/docs` directory. Documents are provided as Adobe Portable Document Format (PDF) files and in a searchable HTML-based format. To view or print PDF documents, you must have the Adobe Acrobat Reader installed.

Installing documentation and manual pages is optional.

Veritas documentation disc

The Veritas documentation disc provides searchable, HTML documentation for each product in this release. Printable PDF documents are also included on the disc.

All documentation is organized by product groups.

Release Notes and installation guides

Release notes and installation guides are not installed by any packages. Veritas recommends that you copy them from the software disc to the `/opt/VRTS/docs` directory on your system after product installation so that they are available for future reference.

Release notes for component products in all versions of the Veritas Storage Foundation are located under the `storage_foundation/release_notes` directory of the Veritas Storage Foundation disc or the `cluster_server/release_notes` directory of the Veritas Cluster Server disc.

Installation guides in all versions of the Veritas Storage Foundation are located under the `storage_foundation/docs` directory of the Veritas Storage Foundation disc or the `cluster_server/docs` directory of the Veritas Cluster Server disc.

It is important that you read the relevant component product release notes before installing any version of Veritas Storage Foundation:

- *Veritas Cluster Server Release Notes* (`vcs_notes.pdf`)

Veritas Storage Foundation guides

The following manuals, along with the online help, comprise the Veritas Storage Foundation documentation set:

Table 1-1 Guides in Veritas Storage Foundation Documentation Set

Guide Title	Filename
<i>Veritas Storage Foundation and High Availability Getting Started Guide</i>	getting_started.pdf
<i>Veritas Storage Foundation Release Notes (this document)</i>	sf_notes.pdf
<i>Veritas Storage Foundation Installation Guide</i>	sf_install.pdf
<i>Veritas Storage Foundation for DB2 Administrator's Guide</i>	sf_db2_admin.pdf
<i>Veritas Storage Foundation for Oracle Administrator's Guide</i>	sf_ora_admin.pdf
<i>Veritas Storage Foundation Intelligent Storage Provisioning Administrator's Guide</i>	sf_isp_admin.pdf
<i>Veritas Storage Foundation Intelligent Storage Provisioning Solutions Guide</i>	sf_isp_solutions.pdf
<i>Veritas Storage Foundation Cross-Platform Data Sharing Administrator's Guide</i>	sf_cds_admin.pdf
<i>Veritas Enterprise Administrator User's Guide</i>	veax6x_users.pdf
<i>Veritas Volume Manager Administrator's Guide</i>	vxvm_admin.pdf
<i>Veritas Volume Manager Troubleshooting Guide</i>	vxvm_tshoot.pdf
<i>Veritas FlashSnap Point-In-Time Copy Solutions Administrator's Guide</i>	flashsnap_admin.pdf
<i>Veritas File System Administrator's Guide</i>	vxfs_admin.pdf
<i>Veritas File System Programmer's Reference Guide</i>	vxfs_ref.pdf

Veritas Cluster Server Documentation

The following Veritas Cluster Server documentation is available with all Veritas Storage Foundation HA product suites:

Table 1-2 Guides in Veritas Cluster Server Documentation Set

Guide Title	Filename
<i>Veritas Cluster Server Release Notes</i>	<code>vcs_notes.pdf</code>
<i>Veritas Cluster Server Installation Guide</i>	<code>vcs_install.pdf</code>
<i>Veritas Cluster Server User's Guide</i>	<code>vcs_users.pdf</code>
<i>Veritas Cluster Server Agent Developer's Guide</i>	<code>vcs_agent_dev.pdf</code>
<i>Veritas Cluster Server Bundled Agents Reference Guide</i>	<code>vcs_bundled_agents.pdf</code>
<i>Veritas Cluster Server High Availability for VMware ESX Virtual Machines Application Note</i>	<code>vm_esx_server.pdf</code>
<i>VCS Enterprise Agent for Oracle Installation and Configuration Guide</i>	<code>vcs_oracle_install.pdf</code>
<i>VCS Enterprise Agent for DB2 Installation and Configuration Guide</i>	<code>vcs_db2_install.pdf</code>
<i>VCS Enterprise Agent for EMC SRDF Installation and Configuration Guide</i>	<code>vcs_srdf_install.pdf</code>
<i>VCS Enterprise Agent for Hitachi TrueCopy Installation and Configuration Guide</i>	<code>vcs_truecopy_install.pdf</code>

Third-party Legal Notices

Certain third-party software may be distributed, embedded, or bundled with this Symantec product, or recommended for use in conjunction with Symantec product installation and operation. Such third-party software is separately licensed by its copyright holder. This appendix contains the license agreements that govern the use of third-party software and its copyright holder's proprietary notices. Use of the third-party software must be in accordance with its license terms. Symantec makes no representation or warranty of any kind regarding such third-party software. Symantec offers no support for such third-party software and shall have no liability associated with its use.

ACE (The Adaptive Communication Environment)

TAO

Douglas C. Schmidt and his research group at Washington University and University of California, Irvine and Vanderbilt University.

ACE™ is copyrighted by Douglas C. Schmidt and his research group at Washington University, University of California, Irvine, and Vanderbilt University Copyright (c) 1993-2003, all rights reserved.

TAO™ is copyrighted by Douglas C. Schmidt and his research group at Washington University, University of California, Irvine, and Vanderbilt University Copyright (c) 1993-2003, all rights reserved.

Copyright and Licensing Information for ACE™, TAO™, CIAO™, and CoSMIC™.

ACE™, TAO™, CIAO™, and CoSMIC™ (henceforth referred to as "DOC software") are copyrighted by Douglas C. Schmidt and his research group at Washington University, University of California, Irvine, and Vanderbilt University, Copyright (c) 1993-2005, all rights reserved. Since DOC software is open-source, free software, you are free to use, modify, copy, and distribute--perpetually and irrevocably--the DOC software source code and object code produced from the source, as well as copy and distribute modified versions of this software. You must, however, include this copyright statement along with code built using DOC software.

You can use DOC software in proprietary software and are under no obligation to redistribute any of your source code that is built using DOC software. Note, however, that you may not do anything to the DOC software code, such as copyrighting it yourself or claiming authorship of the DOC software code, that will prevent DOC software from being distributed freely using an open-source development model. You needn't inform anyone that you're using DOC software in your software, though we encourage you to let us know so we can promote your project in the DOC software success stories.

DOC software is provided as is with no warranties of any kind, including the warranties of design, merchantability, and fitness for a particular purpose, noninfringement, or arising from a course of dealing, usage or trade practice. Moreover, DOC software is provided with no support and without any obligation on the part of Washington University, UC Irvine, Vanderbilt University, their employees, or students to assist in its use, correction, modification, or enhancement. A number of companies around the world provide commercial support for DOC software, however. DOC software is Y2K-compliant, as long as the underlying OS platform is Y2K-compliant.

Washington University, UC Irvine, Vanderbilt University, their employees, and students shall have no liability with respect to the infringement of copyrights, trade secrets or any patents by DOC software or any part thereof. Moreover, in no event will Washington University, UC Irvine, or Vanderbilt

University, their employees, or students be liable for any lost revenue or profits or other special, indirect and consequential damages.

The ACE, TAO, CIAO, and CoSMIC web sites are maintained by the DOC Group at the Institute for Software Integrated Systems (ISIS) and the Center for Distributed Object Computing of Washington University, St. Louis for the development of open-source software as part of the open-source software community. By submitting comments, suggestions, code, code snippets, techniques (including that of usage), and algorithms, submitters acknowledge that they have the right to do so, that any such submissions are given freely and unreservedly, and that they waive any claims to copyright or ownership. In addition, submitters acknowledge that any such submission might become part of the copyright maintained on the overall body of code, which comprises the DOC software. By making a submission, submitter agree to these terms. Furthermore, submitters acknowledge that the incorporation or modification of such submissions is entirely at the discretion of the moderators of the open-source DOC software projects or their designees.

The names ACE™, TAO™, CIAO™, and CoSMIC™, Washington University, UC Irvine, and Vanderbilt University, may not be used to endorse or promote products or services derived from this source without express written permission from Washington University, UC Irvine, or Vanderbilt University. Further, products or services derived from this source may not be called ACE™, TAO™, CIAO™, and CoSMIC™ nor may the name Washington University, UC Irvine, or Vanderbilt University appear in their names, without express written permission from Washington University, UC Irvine, and Vanderbilt University.

If you have any suggestions, additions, comments, or questions, please let me know.
Douglas C. Schmidt

Apache Commons-Collections

Apache Commons-dbc

Apache Common Logging

Apache Jakarta Commons

Apache Lucene

Apache Portable Runtime

Apache Snmp4j - The Object Oriented SNMP API for Java

Apache Spring Framework

Apache Struts

Apache Tomcat

Xerces C++

Apache Software Foundation

Portions of this program contain components from the Apache Software Foundation. These components are made available under the Apache License 2.0, a copy of which is provided herein.

Apache License, Version 2.0, January 2004 <http://www.apache.org/licenses>

TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

“Object” form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

“Work” shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

“Derivative Works” shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

“Contribution” shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, “submitted” means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as “Not a Contribution.”

“Contributor” shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.

3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, sell, offer to sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:

- a. You must give any other recipients of the Work or Derivative Works a copy of this License; and
- b. You must cause any modified files to carry prominent notices stating that You changed the files; and
- c. You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
- d. If the Work includes a “NOTICE” text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.

6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an “AS IS” BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A

PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.

8. **Limitation of Liability.** In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.

9. **Accepting Warranty or Additional Liability.** While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

APPENDIX: How to apply the Apache License to your work

To apply the Apache License to your work, attach the following boilerplate notice, with the fields enclosed by brackets “[]” replaced with your own identifying information. (Don't include the brackets!) The text should be enclosed in the appropriate comment syntax for the file format. We also recommend that a file or class name and description of purpose be included on the same “printed page” as the copyright notice for easier identification within third-party archives.

Copyright [yyyy] [name of copyright owner]

Licensed under the Apache License, Version 2.0 (the “License”); you may not use this file except in compliance with the License. You may obtain a copy of the License at

<http://www.apache.org/licenses/LICENSE-2.0>

Unless required by applicable law or agreed to in writing, software distributed under the License is distributed on an “AS IS” BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied. See the License for the specific language governing permissions and limitations under the License.

BSD dump and restore programs

The Regents of the University of California.

Source redistribution must retain the entire BSD copyright and license terms (exact text below).

Binary redistribution must include the entire BSD copyright and license terms in documentation and/or other materials provided with the distribution. Advertising materials must contain the following acknowledgement: This product includes software developed by the University of California, Berkeley and its contributors.

Exact text to include: COPYRIGHT:

All of the documentation and software included in the 4.BSD and 4.4BSD-Lite Releases is copyrighted by The Regents of the University of California.

Copyright 1979, 1980, 1983, 1986, 1988, 1989, 1991, 1992, 1993, 1994 The Regents of the University of California. All rights reserved.

LICENSE:

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

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 acknowledgement: This product includes software developed by the University of California, Berkeley and its contributors.
4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS “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 REGENTS 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.

Digital Encryption Standard (DES) - MIT

MIT and Dennis Ferguson

Copyright (c) 1990 Dennis Ferguson. All rights reserved.

Commercial use is permitted only if products which are derived from or include this software are made available for purchase and/or use in Canada. Otherwise, redistribution and use in source and binary forms are permitted.

Copyright 1985, 1986, 1987, 1988, 1990 by the Massachusetts Institute of Technology.

All Rights Reserved.

Export of this software from the United States of America may require a specific license from the United States Government. It is the responsibility of any person or organization contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of M.I.T. not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. M.I.T. makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

DomAPI Library

Nebiru Software Inc. (dba DomAPI)

Copyright Nebiru Software, 2001-2005

DomAPI is distributed under click-wrap terms. Please note the specific restrictions implemented by Management regarding modifications to DomAPI.

DOMAPI DHTML LIBRARY

LICENSE AGREEMENT

rev. 04092002-0503 - Architect Edition

DEFINITIONS

"Library" refers to the complete source code of the DomAPI distribution. Any included graphics or binary executables are excluded from this license agreement.

"Company" refers to Nebiru Software Inc. DBA DomAPI, as distributors of the Library.

"User" refers to yourself or any individuals in your employ who make use of the Library.

"Work that uses the Library" is any plug-in, extension or component to the Library that is developed by a third party, Plug-ins, extensions and components developed by the Company become part of the Library and fall under its definition. Plug-ins, extensions and components developed by third parties remain the intellectual property of that party.

Third parties may elect to allow their work to be included in the official DomAPI distribution. When this occurs, the work remains the property of the original third party and is used by the Company under permission. Such permission exists for the lifetime of the Library and cannot be repealed. At no time whatsoever can an included third party's license override any portion the DomAPI DHTML Library License Agreement. DomAPI reserves the right to remove third party works from itself at will.

"Product that uses the Library" is any product that makes use of the Library by linking to it, but is itself not a plug-in, extension or component to the Library.

"Purpose" of the Library covered under this license is to function as a DHTML Application Layer to HTML, XHTML and XML based applications.

The intent of this license agreement is to grant the User the maximum rights available when using the Library, while at the same time maintaining control over the distribution and evolution of the Library. Company seeks in no way to limit your rights when using the Library, but only to maintain control over its direction.

TERMS AND CONDITIONS

1. You may freely copy and distribute verbatim copies of the Library's complete source code as you receive it, to any system within your private or public network providing you keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library. The terms of distribution are as follows:

a) You may freely make use of the Library on your websites or on a distributed medium (such as a CD-ROM) to be used solely for Purpose as defined above.

b) ALL copyright notices within the libraries source files MUST BE LEFT INTACT.

2. You may freely modify your copy of the Library or any portion of it. YOU MAY NOT REDISTRIBUTE your modified version of the Library, NOR MAKE IT AVAILABLE FOR DOWNLOAD except for use in your pages and/or application.

3. YOU MAY NOT PRODUCE SPIN-OFFS or a public work based on the Libraries source code. Company is to maintain full rights of the core Library. This constraint does not extend to “work that uses the Library”, of which you are free to develop and distribute as your own work.

4. While you may freely create and distribute a “work that uses the Library”, you may not under any circumstances include any portion of the Library with this work. Users of your “work that uses the Library” must always get the official distribution of the DomAPI library from Company.

This is done to satisfy sections 1 and 2. This does apply to a “product that uses the Library”, the distribution of which is covered in section 5.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being linked with it, is called a “work that uses the Library”. Such a work, in isolation, is called a “product that uses the Library”. You may distribute the Library with a “product that uses the Library” so long as you include a copy of this license in your electronic materials along with the appropriate copyright notices. Please note that section 2 still applies to this distribution.

It is not the intent of section 4 and section 5 to contest your rights to work written entirely by you; rather, the intent is solely to exercise the right to control the point of distribution of the Library.

You are not required to give notice in your applications that the Library is used in it.

6. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void,

and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

7. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

NO WARRANTY

8. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

9. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

Expat XML Parsing Library

Author: James Clark.

Copyright (c) 1998, 1999, 2000 Thai Open Source Software Center Ltd.

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the “Software”), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED “AS IS”, WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Global.h

MD5c.c

MD5.h

Certain portions of this Symantec product contain components derived from the RSA DataSecurity, Inc. MD5 Message-Digest Algorithm.

Copyright (C) 1991-2, RSA Data Security, Inc. Created 1991. All rights reserved.

Global.h, MD5c.c, and MD5.h are governed by the same license terms set forth below:

License to copy and use this software is granted provided that it is identified as the "RSA Data Security, Inc. MD5 Message-Digest Algorithm" in all material mentioning or referencing this software or this function.

License is also granted to make and use derivative works provided that such works are identified as "derived from the RSA Data Security, Inc. MD5 Message-Digest Algorithm" in all material mentioning or referencing the derived work.

RSA Data Security, Inc. makes no representations concerning either the merchantability of this software or the suitability of this software for any particular purpose. It is provided "as is" without express or implied warranty of any kind.

These notices must be retained in any copies of any part of this documentation and/or software.

ICU

IBM

Copyright (c) 1995-2003 International Business Machines Corporation and others. All rights reserved.

ICU License - ICU 1.8.1 and later

COPYRIGHT AND PERMISSION NOTICE

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, provided that the above copyright notice(s) and this permission notice appear in all copies of the Software and that both the above copyright notice(s) and this permission notice appear in supporting documentation.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE BE LIABLE FOR ANY CLAIM, OR ANY SPECIAL INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

Except as contained in this notice, the name of a copyright holder shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Software without prior written authorization of the copyright holder.

All trademarks and registered trademarks mentioned herein are the property of their respective owners.

JacORB

Jacorb.org

GNU LIBRARY GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1991 Free Software Foundation, Inc. 675 Mass Ave, Cambridge, MA 02139, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Library General Public License, applies to some specially designated Free Software Foundation software, and to any other libraries whose authors decide to use it. You can use it for your libraries, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library, or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link a program with the library, you must provide complete object files to the recipients so that they can relink them with the library, after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

Our method of protecting your rights has two steps: (1) copyright the library, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the library.

Also, for each distributor's protection, we want to make certain that everyone understands that there is no warranty for this free library. If the library is modified by someone else and passed on, we want its recipients to know that what they have is not the original version, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that companies distributing free software will individually obtain patent licenses, thus in effect transforming the program into proprietary software. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

GNU LIBRARY GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Library General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library. You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions: a) The modified work must itself be a software library. b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change. c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License. d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful. (For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a “work that uses the Library”. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a “work that uses the Library” with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a “work that uses the library”. The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a “work that uses the Library” uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not.

Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a “work that uses the Library” with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things: a) Accompany the work with the complete corresponding machine-readable source

code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable “work that uses the Library”, as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.) b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution. c) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place. d) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the “work that uses the Library” must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things: a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above. b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Library General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and “any later version”, you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. END OF TERMS AND CONDITIONS

Appendix: How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the “copyright” line and a pointer to where the full notice is found. Copyright (C) <year> <name of author>

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Library General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Library General Public License for more details.

You should have received a copy of the GNU Library General Public License along with this library; if not, write to the Free Software Foundation, Inc., 675 Mass Ave, Cambridge, MA 02139, USA.

Also add information on how to contact you by electronic and paper mail.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a “copyright disclaimer” for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library ‘Frob’ (a library for tweaking knobs) written by James Random Hacker.

<signature of Ty Coon>, 1 April 1990 Ty Coon, President of Vice

Java Development Kit (JDK)

Java 2 Runtime Environment

Java Access Bridge

Java Development Kit Copyright 2005 Sun Microsystems, Inc.,

Java 2 Runtime Environment © 2005 Sun Microsystems, Inc. All rights reserved

Java Access Bridge Copyright (c) 2004 Sun Microsystems, Inc. All rights reserved

Sun Microsystems, Inc. Binary Code License Agreement

SUN MICROSYSTEMS, INC. (“SUN”) IS WILLING TO LICENSE THE SOFTWARE IDENTIFIED BELOW TO YOU ONLY UPON THE CONDITION THAT YOU ACCEPT ALL OF THE TERMS CONTAINED IN THIS BINARY CODE LICENSE AGREEMENT AND SUPPLEMENTAL LICENSE TERMS (COLLECTIVELY “AGREEMENT”). PLEASE READ THE AGREEMENT CAREFULLY. BY DOWNLOADING OR INSTALLING THIS SOFTWARE, YOU ACCEPT THE TERMS OF THE AGREEMENT. INDICATE ACCEPTANCE BY SELECTING THE “ACCEPT” BUTTON AT THE BOTTOM OF THE AGREEMENT. IF YOU ARE NOT

WILLING TO BE BOUND BY ALL THE TERMS, SELECT THE "DECLINE" BUTTON AT THE BOTTOM OF THE AGREEMENT AND THE DOWNLOAD OR INSTALL PROCESS WILL NOT CONTINUE.

1. DEFINITIONS. "Software" means the identified above in binary form, any other machine readable materials (including, but not limited to, libraries, source files, header files, and data files), any updates or error corrections provided by Sun, and any user manuals, programming guides and other documentation provided to you by Sun under this Agreement. "Programs" mean Java applets and applications intended to run on the Java 2 Platform Standard Edition (J2SE platform) platform on Java-enabled general purpose desktop computers and servers.

2. LICENSE TO USE. Subject to the terms and conditions of this Agreement, including, but not limited to the Java Technology Restrictions of the Supplemental License Terms, Sun grants you a non-exclusive, non-transferable, limited license without license fees to reproduce and use internally Software complete and unmodified for the sole purpose of running Programs. Additional licenses for developers and/or publishers are granted in the Supplemental License Terms.

3. RESTRICTIONS. Software is confidential and copyrighted. Title to Software and all associated intellectual property rights is retained by Sun and/or its licensors. Unless enforcement is prohibited by applicable law, you may not modify, decompile, or reverse engineer Software. You acknowledge that Licensed Software is not designed or intended for use in the design, construction, operation or maintenance of any nuclear facility. Sun Microsystems, Inc. disclaims any express or implied warranty of fitness for such uses. No right, title or interest in or to any trademark, service mark, logo or trade name of Sun or its licensors is granted under this Agreement. Additional restrictions for developers and/or publishers licenses are set forth in the Supplemental License Terms.

4. LIMITED WARRANTY. Sun warrants to you that for a period of ninety (90) days from the date of purchase, as evidenced by a copy of the receipt, the media on which Software is furnished (if any) will be free of defects in materials and workmanship under normal use. Except for the foregoing, Software is provided "AS IS". Your exclusive remedy and Sun's entire liability under this limited warranty will be at Sun's option to replace Software media or refund the fee paid for Software. Any implied warranties on the Software are limited to 90 days. Some states do not allow limitations on duration of an implied warranty, so the above may not apply to you. This limited warranty gives you specific legal rights. You may have others, which vary from state to state.

5. DISCLAIMER OF WARRANTY. DISCLAIMER OF WARRANTY. UNLESS SPECIFIED IN THIS AGREEMENT, ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT THESE DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

6. LIMITATION OF LIABILITY. TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL SUN OR ITS LICENSORS BE LIABLE FOR ANY LOST REVENUE, PROFIT OR DATA, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, HOWEVER CAUSED REGARDLESS OF THE THEORY OF LIABILITY, ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE SOFTWARE, EVEN IF SUN HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. In no event will Sun's liability to you, whether in contract, tort (including negligence), or otherwise, exceed the amount paid by you for Software under this Agreement. The foregoing limitations will apply even if the above stated warranty fails of its essential purpose. Some states do not allow the exclusion of incidental or consequential damages, so some of the terms above may not be applicable to you.

7. TERMINATION. This Agreement is effective until terminated. You may terminate this Agreement at any time by destroying all copies of Software. This Agreement will terminate immediately without notice from Sun if you fail to comply with any provision of this Agreement. Either party may terminate this Agreement immediately should any Software become, or in either party's opinion be likely to become, the subject of a claim of infringement of any intellectual property right. Upon Termination, you must destroy all copies of Software.

8. EXPORT REGULATIONS. All Software and technical data delivered under this Agreement are subject to US export control laws and may be subject to export or import regulations in other countries. You agree to comply strictly with all such laws and regulations and acknowledge that you have the responsibility to obtain such licenses to export, re-export, or import as may be required after delivery to you.

9. TRADEMARKS AND LOGOS. You acknowledge and agree as between you and Sun that Sun owns the SUN, SOLARIS, JAVA, JINI, FORTE, and iPLANET trademarks and all SUN, SOLARIS, JAVA, JINI, FORTE, and iPLANET-related trademarks, service marks, logos and other brand designations ("Sun Marks"), and you agree to comply with the Sun Trademark and Logo Usage Requirements currently located at <http://www.sun.com/policies/trademarks>. Any use you make of the Sun Marks inures to Sun's benefit.

10. U.S. GOVERNMENT RESTRICTED RIGHTS. If Software is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), then the Government's rights in Software and accompanying documentation will be only as set forth in this Agreement; this is in accordance with 48 CFR 227.7201 through 227.7202-4 (for Department of Defense (DOD) acquisitions) and with 48 CFR 2.101 and 12.212 (for non-DOD acquisitions).

11. GOVERNING LAW. Any action related to this Agreement will be governed by California law and controlling U.S. federal law. No choice of law rules of any jurisdiction will apply.

12. SEVERABILITY. If any provision of this Agreement is held to be unenforceable, this Agreement will remain in effect with the provision omitted, unless omission would frustrate the intent of the parties, in which case this Agreement will immediately terminate.

13. INTEGRATION. This Agreement is the entire agreement between you and Sun relating to its subject matter. It supersedes all prior or contemporaneous oral or written communications, proposals, representations and warranties and prevails over any conflicting or additional terms of any quote, order, acknowledgment, or other communication between the parties relating to its subject matter during the term of this Agreement. No modification of this Agreement will be binding, unless in writing and signed by an authorized representative of each party.

SUPPLEMENTAL LICENSE TERMS

These Supplemental License Terms add to or modify the terms of the Binary Code License Agreement. Capitalized terms not defined in these Supplemental Terms shall have the same meanings ascribed to them in the Binary Code License Agreement. These Supplemental Terms shall supersede any inconsistent or conflicting terms in the Binary Code License Agreement, or in any license contained within the Software.

A. Software Internal Use and Development License Grant. Subject to the terms and conditions of this Agreement and restrictions and exceptions set forth in the Software "README" file, including, but not limited to the Java Technology Restrictions of these Supplemental Terms, Sun grants you a non-exclusive, non-transferable, limited license without fees to reproduce internally and use internally the Software complete and unmodified for the purpose of designing, developing, and testing your Programs.

B. License to Distribute Software. Subject to the terms and conditions of this Agreement and restrictions and exceptions set forth in the Software README file, including, but not limited to the Java Technology Restrictions of these Supplemental Terms, Sun grants you a non-exclusive, non-transferable, limited license without fees to reproduce and distribute the Software, provided that (i) you distribute the Software complete and unmodified and only bundled as part of, and for the sole purpose of running, your Programs, (ii) the Programs add significant and primary functionality to the Software, (iii) you do not distribute additional software intended to replace any component(s) of the Software, (iv) you do not remove or alter any proprietary legends or notices contained in the Software, (v) you only distribute the Software subject to a license agreement that protects Sun's interests consistent with the terms contained in this Agreement, and (vi) you agree to defend and indemnify Sun and its licensors from and against any damages, costs, liabilities, settlement amounts and/or expenses (including attorneys' fees) incurred in connection with any claim, lawsuit or action by any third party that arises or results from the use or distribution of any and all Programs and/or Software.

C. Java Technology Restrictions. You may not create, modify, or change the behavior of, or authorize your licensees to create, modify, or change the behavior of, classes, interfaces, or subpackages that are in any way identified as "java", "javax", "sun" or similar convention as specified by Sun in any naming convention designation.

D. Source Code. Software may contain source code that, unless expressly licensed for other purposes, is provided solely for reference purposes pursuant to the terms of this Agreement. Source code may not be redistributed unless expressly provided for in this Agreement.

E. Third Party Code. Additional copyright notices and license terms applicable to portions of the Software are set forth in the THIRDPARTYLICENSEREADME.txt file. In addition to any terms and conditions of any third party opensource/freeware license identified in the THIRDPARTYLICENSEREADME.txt file, the disclaimer of warranty and limitation of liability provisions in paragraphs 5 and 6 of the Binary Code License Agreement shall apply to all Software in this distribution.

For inquiries please contact: Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. (LFI#141623/Form ID#011801)

JavaTip87: Automate the Hourglass Cursor

Kyle Davis

Portions of this code taken from an article available as of 2/02/02 on the JavaWorld Internet site, entitled Javatip87: Automate the HourGlass Cursor" by Kyle Davis.

JFreeChart

JFree.org

This software incorporates JFreeChart. Copyright 2000-2004 by

Object Refinery Limited and Contributors

GNU LESSER GENERAL PUBLIC LICENSE

Version 2.1, February 1999

Copyright (C) 1991, 1999 Free Software Foundation, Inc. 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed. [This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The “Library”, below, refers to any such software library or work which has been distributed under these terms. A “work based on the Library” means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term “modification”.)

“Source code” for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library. You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a “work that uses the Library”. Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a “work that uses the Library” with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a “work that uses the library”. The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a “work that uses the Library” uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a “work that uses the Library” with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer’s own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable “work that uses the Library”, as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user’s computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the “work that uses the Library” must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you wish to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

How to Apply These Terms to Your New Libraries

If you develop a new library, and you want it to be of the greatest possible use to the public, we recommend making it free software that everyone can redistribute and change. You can do so by permitting redistribution under these terms (or, alternatively, under the terms of the ordinary General Public License).

To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

one line to give the library's name and an idea of what it does.

Copyright (C) year name of author

This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2.1 of the License, or (at your option) any later version.

This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details. You should have received a copy of the GNU Lesser General Public License along with this library; if not, write to the Free Software Foundation, Inc., 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Also add information on how to contact you by electronic and paper mail. You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

Yoyodyne, Inc., hereby disclaims all copyright interest in the library `Frob' (a library for tweaking knobs) written by James Random Hacker.

signature of Ty Coon, 1 April 1990

Ty Coon, President of Vice

Kerberos

Massachusetts Institute of Technology.

Copyright © 1985 - 2002 by the Massachusetts Institute of Technology.

Copyright, OpenVision Technologies, Inc., 1996, All Rights Reserved.

Copyright 2000 by Zero-Knowledge Systems, Inc.

Copyright (c) 2001, Dr. Brian Gladman <brg@gladman.uk.net>, Worcester, UK. All rights reserved.

Copyright © 1983 Regents of the University of California. All rights reserved.

Copyright © 1985-2002 by the Massachusetts Institute of Technology.

Export of software employing encryption from the United States of America may require a specific license from the United States Government. It is the responsibility of any person or organization contemplating export to obtain such a license before exporting.

WITHIN THAT CONSTRAINT, permission to use, copy, modify, and distribute this software and its documentation for any purpose and without fee is hereby granted, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of M.I.T. not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. Furthermore if you modify this software you must label your software as modified software and not distribute it in such a fashion that it might be confused with the original MIT software. M.I.T. makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

The following copyright and permission notice applies to the OpenVision Kerberos Administration system located in kadmin/create, kadmin/dbutil, kadmin/passwd, kadmin/server, lib/kadm5, and portions of lib/rpc:

Copyright, OpenVision Technologies, Inc., 1996, All Rights Reserved

WARNING: Retrieving the OpenVision Kerberos Administration system source code, as described below, indicates your acceptance of the following terms. If you do not agree to the following terms, do not retrieve the OpenVision Kerberos administration system.

You may freely use and distribute the Source Code and Object Code compiled from it, with or without modification, but this Source Code is provided to you "AS IS" EXCLUSIVE OF ANY WARRANTY, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, WHETHER EXPRESS OR IMPLIED. IN NO EVENT WILL OPENVISION HAVE ANY LIABILITY FOR ANY LOST PROFITS, LOSS OF DATA OR COSTS OF PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, OR FOR ANY SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES ARISING OUT OF THIS AGREEMENT, INCLUDING, WITHOUT LIMITATION, THOSE RESULTING FROM THE USE OF THE SOURCE CODE, OR THE FAILURE OF THE SOURCE CODE TO PERFORM, OR FOR ANY OTHER REASON.

OpenVision retains all copyrights in the donated Source Code. OpenVision also retains copyright to derivative works of the Source Code, whether created by OpenVision or by a third party. The OpenVision copyright notice must be preserved if derivative works are made based on the donated Source Code.

OpenVision Technologies, Inc. has donated this Kerberos Administration system to MIT for inclusion in the standard Kerberos 5 distribution. This donation underscores our commitment to continuing Kerberos technology development and our gratitude for the valuable work which has been performed by MIT and the Kerberos community.

The implementation of the Yarrow pseudo-random number generator in `src/lib/crypto/yarrow` has the following copyright:

Copyright 2000 by Zero-Knowledge Systems, Inc.

Permission to use, copy, modify, distribute, and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation, and that the name of Zero-Knowledge Systems, Inc. not be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. Zero-Knowledge Systems, Inc. makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

ZERO-KNOWLEDGE SYSTEMS, INC. DISCLAIMS ALL WARRANTIES WITH REGARD TO THIS SOFTWARE, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, IN NO EVENT SHALL ZERO-KNOWLEDGE SYSTEMS, INC. BE LIABLE FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR ANY DAMAGES WHATSOEVER RESULTING FROM LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR OTHER TORTUOUS ACTION, ARISING OUT OF OR IN CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.

The implementation of the AES encryption algorithm in `src/lib/crypto/aes` has the following copyright:

Copyright (c) 2001, Dr. Brian Gladman <brg@gladman.uk.net>, Worcester, UK. All rights reserved.

LICENSE TERMS

The free distribution and use of this software in both source and binary form is allowed (with or without changes) provided that:

1. distributions of this source code include the above copyright notice, this list of conditions and the following disclaimer;
2. distributions in binary form include the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other associated materials;
3. the copyright holder's name is not used to endorse products built using this software without specific written permission.

DISCLAIMER

This software is provided "as is" with no explicit or implied warranties in respect of any properties, including, but not limited to, correctness and fitness for purpose.

Kerberos V5 includes documentation and software developed at the University of California at Berkeley, which includes this copyright notice:

Copyright © 1983 Regents of the University of California.

All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

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 acknowledgement:

This product includes software developed by the University of California, Berkeley and its contributors.

4. Neither the name of the University nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission.

Permission is granted to make and distribute verbatim copies of this manual provided the copyright notices and this permission notice are preserved on all copies.

Permission is granted to copy and distribute modified versions of this manual under the conditions for verbatim copying, provided also that the entire resulting derived work is distributed under the terms of a permission notice identical to this one.

Permission is granted to copy and distribute translations of this manual into another language, under the above conditions for modified versions.

Libstdc++ (GNU Standard C++ Library)

The Code: Runtime GPL

The source code of `libstdc++-v3` is distributed under version 2 of the GNU General Public License, with the so-called "runtime exception," as follows (or see any header or implementation file):

As a special exception, you may use this file as part of a free software library without restriction. Specifically, if other files instantiate templates or use macros or inline functions from this file, or you compile this file and link it with other files to produce an executable, this file does not by itself cause the resulting executable to be covered by the GNU General Public License. This exception does not however invalidate any other reasons why the executable file might be covered by the GNU General Public License.

GNU GENERAL PUBLIC LICENSE

Version 2, June 1991

Copyright (C) 1989, 1991 Free Software Foundation, Inc.

59 Temple Place, Suite 330, Boston, MA 02111-1307 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU GENERAL PUBLIC LICENSE

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

- a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
- b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
- c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it. Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and “any later version”, you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

OpenLDAP

The OpenLDAP Foundation.

Copyright 1999-2003 The OpenLDAP Foundation, Redwood City, California, USA. All Rights Reserved.

“The OpenLDAP Public License Version 2.8, 17 August 2003

Redistribution and use of this software and associated documentation (“Software”), with or without modification, are permitted provided that the following conditions are met:

1. Redistributions in source form must retain copyright statements and notices,
2. Redistributions in binary form must reproduce applicable copyright statements and notices, this list of conditions, and the following disclaimer in the documentation and/or other materials provided with the distribution, and
3. Redistributions must contain a verbatim copy of this document.

The OpenLDAP Foundation may revise this license from time to time. Each revision is distinguished by a version number. You may use this Software under terms of this license revision or under the terms of any subsequent revision of the license.

THIS SOFTWARE IS PROVIDED BY THE OPENLDAP FOUNDATION AND ITS CONTRIBUTORS “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 OPENLDAP FOUNDATION, ITS CONTRIBUTORS, OR THE AUTHOR(S) OR OWNER(S) OF THE SOFTWARE 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.

The names of the authors and copyright holders must not be used in advertising or otherwise to promote the sale, use or other dealing in this Software without specific, written prior permission. Title to copyright in this Software shall at all times remain with copyright holders.

OpenLDAP is a registered trademark of the OpenLDAP Foundation.

Copyright 1999-2003 The OpenLDAP Foundation, Redwood City, California, USA. All Rights Reserved. Permission to copy and distribute verbatim copies of this document is granted.

OpenSSL

The OpenSSL Project

Copyright (c) 1998-2003 The OpenSSL Project. All rights reserved.

This is a copy of the current LICENSE file inside the CVS repository.

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.

OpenSSL License

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

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/>)"

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.

This product includes cryptographic software written by Eric Young (ey@cryptsoft.com). This product includes software written by Tim Hudson (tjh@cryptsoft.com).

Original SSLeay License

Copyright (C) 1995-1998 Eric Young (ey@cryptsoft.com) All rights reserved.

This package is an SSL implementation written by Eric Young (ey@cryptsoft.com).

The implementation was written so as to conform with Netscapes SSL.

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).

Copyright remains Eric Young's, and as such any Copyright notices in the code are not to be removed. If this package is used in a product, Eric Young should be given attribution as the author of the parts of the library used. This can be in the form of a textual message at program startup or in documentation (online or textual) provided with the package.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the 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 acknowledgement:

"This product includes cryptographic software written by Eric Young (ey@cryptsoft.com)"

The word 'cryptographic' can be left out if the routines from the library being used are not cryptographic related:-).

4. If you include any Windows specific code (or a derivative thereof) from the apps directory (application code) you must include an acknowledgement:

"This product includes software written by Tim Hudson (tjh@cryptsoft.com)"

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.

The license and distribution terms for any publicly available version or derivative of this code cannot be changed. i.e. this code cannot simply be copied and put under another distribution license [including the GNU Public License.]

Perl

Algorithm-Diff-1.1901

Archive-Tar-1.24

Compress-Zlib-1.41

Crypt-CBC-2.17

File-Spec-0.90

IO-String-1.06

IO-Tty-1.02

libnet-1.19

List-Compare-0.31

Log dispatch perl module

Logfile rotate perl module

Module-Build-0.2611

MIME-Base64-3.07

HTML-Tagset-3.10

HTML-Parser-3.50

Net-DNS-0.49

Net-DNS-SEC-0.12

Net-Netmask-1.9011

Net-Telnet-3.03

Params validate perl module

Proc-Background-1.08

Test-Plan-0.02

Test-Simple-0.60

Time-Date-1.16

Time zone info

URI-1.35

XML-Parser-2.34

Perl Copyright (c) 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, by Larry Wall and others. All rights reserved.

Algorithm-Diff-1.1901 Copyright 1998 M-J.Dominus. (mjd-perl-diff@plover.com).

Archive-Tar-1.24 Copyright © 2002 Jos Boumans <kane@cpan.prg>. All rights reserved

Compress-Zlib-1.41 Copyright © 1995-2005 Paul Marquess. All rights reserved.

Crypt-CBC-2.17

File-Spec-0.90 Copyright © 1998 Kenneth Albanowski. All rights reserved. Copyright © 1999, 2000 Barrie Slaymaker. All rights reserved. Copyright © 2003 Ken Williams. All rights reserved
 HTML-Parser-3.50 Copyright © 1995-2006 Gisle Aas. All rights reserved. Copyright © 1999-2000 Michael A. Chase. All rights reserved.
 HTML-Tagset-3.10 Copyright 1999, 2000 Sean M. Burke <sburke@cpan.org>; Copyright 1995-2000 Gisle Aas; all rights reserved.
 IO-String-1.06 Copyright 1998-2003 Gisle Aas. <gisle@aas.no>
 IO-Tty-1.02 Copyright graham Barr; Copyright Nick Ing-Simmons; Copyright Roland Giersig; Copyright Tatu Ylonen, Markus Friedl, and Todd C. Miller.
 libnet-1.19 © 1996-2004 Graham Barr. All rights reserved.
 List-Compare-0.31 Copyright © 2002-04 James E. Keenan. United States. All rights reserved.
 Log dispatch perl module Copyright (c) Dave Rolsky, autarch@urth.org.
 Logfile rotate perl module Copyright (c) 1997-99 Paul Gampe. All rights reserved.
 Module-Build-0.2611
 MIME-Base64-3.07 Copyright 1995-1999, 2001-04 Gisle Aas <gisle@ActiveState.com>
 Net-DNS-0.49 Copyright © 1997-2002 Michael Fuhr. Portions Copyright © 2002-2004 Chris Reinhardt. Portion Copyright © 2005 Olaf Kolkman (RIPE NCC) All rights reserved.
 Net-DNS-SEC-0.12 Copyright © 2001, 2002, 2003, 2004 RIPE NCC. Author Olaf M. Kolkman <net-dns-sec@ripe.net> All Rights Reserved
 Net-Netmask-1.9011 Copyright © 1998-2003 David Muir Sharnoff.
 Net-Telnet-3.03 Copyright © 1997, 2000, 2002 Jay Rogers. All rights reserved.
 Params validate perl module Copyright (c) 2000-2004 Dave Rolsky All rights reserved.
 Proc-Background-1.08 Copyright © 1998-2002 Blair Zajac. All rights reserved.
 Test-Plan-0.02 Copyright © 2005, Geoffrey Young All rights reserved.
 Test-Simple-0.60
 Time-Date-1.16 Copyright 1996-2000 Graham Barr. All rights reserved.
 Time zone info Copyright (c) 2002 Scott Penrose <scottp@dd.com.au> - <http://linux.dd.com.au/>
 URI-1.35 Copyright 1998-2003 Gisle Aas. Copyright 1998 Graham Barr
 XML-Parser-2.34 Copyright © 1998-2000 Larry Wall and Clark Cooper. All rights reserved.

Above listed modules are governed by the same license terms set forth below:

This library is free software; you can redistribute it and/or modify it under the same terms as Perl itself.
 The Artistic License
 August 15, 1997

Preamble

The intent of this document is to state the conditions under which a Package may be copied, such that the Copyright Holder maintains some semblance of artistic control over the development of the package, while giving the users of the package the right to use and distribute the Package in a more-or-less customary fashion, plus the right to make reasonable modifications.

Definitions:

“Package” refers to the collection of files distributed by the Copyright Holder, and derivatives of that collection of files created through textual modification.

“Standard Version” refers to such a Package if it has not been modified, or has been modified in accordance with the wishes of the Copyright Holder as specified below.

“Copyright Holder” is whoever is named in the copyright or copyrights for the package.

“You” is you, if you're thinking about copying or distributing this Package.

“Reasonable copying fee” is whatever you can justify on the basis of media cost, duplication charges, time of people involved, and so on. (You will not be required to justify it to the Copyright Holder, but only to the computing community at large as a market that must bear the fee.)

“Freely Available” means that no fee is charged for the item itself, though there may be fees involved in handling the item. It also means that recipients of the item may redistribute it under the same conditions they received it.

1. You may make and give away verbatim copies of the source form of the Standard Version of this Package without restriction, provided that you duplicate all of the original copyright notices and associated disclaimers.
2. You may apply bug fixes, portability fixes and other modifications derived from the Public Domain or from the Copyright Holder. A Package modified in such a way shall still be considered the Standard Version.

3. You may otherwise modify your copy of this Package in any way, provided that you insert a prominent notice in each changed file stating how and when you changed that file, and provided that you do at least ONE of the following:
- a) place your modifications in the Public Domain or otherwise make them Freely Available, such as by posting said modifications to Usenet or an equivalent medium, or placing the modifications on a major archive site such as uunet.uu.net, or by allowing the Copyright Holder to include your modifications in the Standard Version of the Package.
 - b) use the modified Package only within your corporation or organization.
 - c) rename any non-standard executables so the names do not conflict with standard executables, which must also be provided, and provide a separate manual page for each non-standard executable that clearly documents how it differs from the Standard Version.
 - d) make other distribution arrangements with the Copyright Holder.
4. You may distribute the programs of this Package in object code or executable form, provided that you do at least ONE of the following:
- a) distribute a Standard Version of the executables and library files, together with instructions (in the manual page or equivalent) on where to get the Standard Version.
 - b) accompany the distribution with the machine-readable source of the Package with your modifications.
 - c) give non-standard executables non-standard names, and clearly document the differences in manual pages (or equivalent), together with instructions on where to get the Standard Version.
 - d) make other distribution arrangements with the Copyright Holder.
5. You may charge a reasonable copying fee for any distribution of this Package. You may charge any fee you choose for support of this Package. You may not charge a fee for this Package itself. However, you may distribute this Package in aggregate with other (possibly commercial) programs as part of a larger (possibly commercial) software distribution provided that you do not advertise this Package as a product of your own. You may embed this Package's interpreter within an executable of yours (by linking); this shall be construed as a mere form of aggregation, provided that the complete Standard Version of the interpreter is so embedded.
6. The scripts and library files supplied as input to or produced as output from the programs of this Package do not automatically fall under the copyright of this Package, but belong to whoever generated them, and may be sold commercially, and may be aggregated with this Package. If such scripts or library files are aggregated with this Package via the so-called "undump" or "unexec" methods of producing a binary executable image, then distribution of such an image shall neither be construed as a distribution of this Package nor shall it fall under the restrictions of Paragraphs 3 and 4, provided that you do not represent such an executable image as a Standard Version of this Package.
7. C subroutines (or comparably compiled subroutines in other languages) supplied by you and linked into this Package in order to emulate subroutines and variables of the language defined by this Package shall not be considered part of this Package, but are the equivalent of input as in Paragraph 6, provided these subroutines do not change the language in any way that would cause it to fail the regression tests for the language.
8. Aggregation of this Package with a commercial distribution is always permitted provided that the use of this Package is embedded; that is, when no overt attempt is made to make this Package's interfaces visible to the end user of the commercial distribution. Such use shall not be construed as a distribution of this Package.
9. The name of the Copyright Holder may not be used to endorse or promote products derived from this software without specific prior written permission.
10. THIS PACKAGE IS PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
- The End.

Sockets++ library

University of Texas

Copyright 1992, 1993, 1994 Gnanasekaran Swaminathan Permission is granted to use at your own risk and distribute this software in source and binary forms provided the above copyright notice and this paragraph are preserved on all copies. This software is provided "as is" with no express or implied warranty.

SQLite

SQLite.org.

The original author of SQLite has dedicated the code to the public domain. Anyone is free to copy, modify, publish, use, compile, sell, or distribute the original SQLite code, either in source code form or as a compiled binary, for any purpose, commercial or non-commercial, and by any means.

STL Port

Boris Fomitchev

Copyright 1999,2000 Boris Fomitchev

Boris Fomitchev grants Licensee a nonexclusive, non-transferable, royalty-free license to use STLport and its documentation without fee.

By downloading, using, or copying STLport or any portion thereof, Licensee agrees to abide by the intellectual property laws and all other applicable laws of the United States of America, and to all of the terms and conditions of this Agreement.

Licensee shall maintain the following copyright and permission notices on STLport sources and its documentation unchanged:

Copyright 1999,2000 Boris Fomitchev

This material is provided "as is", with absolutely no warranty expressed or implied. Any use is at your own risk. Permission to use or copy this software for any purpose is hereby granted without fee, provided the above notices are retained on all copies. Permission to modify the code and to distribute modified code is granted, provided the above notices are retained, and a notice that the code was modified is included with the above copyright notice.

The Licensee may distribute binaries compiled with STLport (whether original or modified) without any royalties or restrictions. The Licensee may distribute original or modified STLport sources, provided that:

- The conditions indicated in the above permission notice are met;
- The following copyright notices are retained when present, and conditions provided in accompanying permission notices are met:

Copyright 1994 Hewlett-Packard Company

Copyright 1996,97 Silicon Graphics Computer Systems, Inc.

Copyright 1997 Moscow Center for SPARC

Permission to use, copy, modify, distribute and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Hewlett-Packard Company makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

Permission to use, copy, modify, distribute and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Silicon Graphics makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty. Permission to use, copy, modify, distribute and sell this software and its documentation for any purpose is hereby granted without fee, provided that the above copyright notice appear in all copies and that both that copyright notice and this permission notice appear in supporting documentation. Moscow Center for SPARC Technology makes no representations about the suitability of this software for any purpose. It is provided "as is" without express or implied warranty.

Sysdep.c

Sysdep.h

UUID.c

UUID.h

Copyright (c) 1990–1993, 1996 Open Software Foundation, Inc., Copyright (c) 1989 by Hewlett-Packard Company, Palo Alto, Ca. & Digital Equipment Corporation, Maynard, Mass. Copyright (c) 1998 Microsoft.

Sysdep.c, Sysdep.h, UUID.c, and UUID.h are governed by the same license terms set forth below:

To anyone who acknowledges that this file is provided "AS IS" without any express or implied warranty: permission to use, copy, modify, and distribute this file for any purpose is hereby granted without fee, provided that the above copyright notices and this notice appears in all source code copies, and that none of the names of Open Software Foundation, Inc., Hewlett-Packard Company, or Digital Equipment Corporation be used in advertising or publicity pertaining to distribution of the software without specific, written prior permission. Neither Open Software Foundation, Inc., Hewlett-Packard Company, Microsoft, nor Digital Equipment Corporation makes any representations about the suitability of this software for any purpose.