



LifeKeeper for Linux

7.3

Release Notes

January 2012

This document and the information herein is the property of SIOS Technology Corp. (previously known as SteelEye® Technology, Inc.) and all unauthorized use and reproduction is prohibited. SIOS Technology Corp. makes no warranties with respect to the contents of this document and reserves the right to revise this publication and make changes to the products described herein without prior notification. It is the policy of SIOS Technology Corp. to improve products as new technology, components and software become available. SIOS Technology Corp., therefore, reserves the right to change specifications without prior notice.

LifeKeeper, SteelEye and SteelEye DataKeeper are registered trademarks of SIOS Technology Corp.

Other brand and product names used herein are for identification purposes only and may be trademarks of their respective companies.

To maintain the quality of our publications, we welcome your comments on the accuracy, clarity, organization, and value of this document.

Address correspondence to:
ip@us.sios.com

Copyright © 2012
By SIOS Technology Corp.
San Mateo, CA U.S.A.
All rights reserved

Table of Contents

- Release Notes - LifeKeeper for Linux 7.3..... 1
- Introduction..... 1
- LifeKeeper Product Description..... 1
- Components..... 2
 - LifeKeeper Core..... 2
- LifeKeeper Optional Recovery Software..... 3
- LifeKeeper Optional Support Software..... 5
- New Features of LifeKeeper Version 7..... 6
- System Requirements..... 7
 - LifeKeeper Product Requirements..... 7
- LifeKeeper Optional Recovery Software..... 9
- LifeKeeper Optional Support Software..... 12
- Client Platforms and Browsers..... 12
- Known Issues..... 13
 - Core..... 14
 - Data Replication..... 15

Release Notes - LifeKeeper for Linux 7.3

Version 7.3

Important!!

Read This Document Before Attempting To Install Or Use This Product!

This document contains last minute information that must be considered before, during and after installation.

Introduction

This release notes document is written for the person who installs, configures and/or administers the LifeKeeper for Linux product. The document contains important information not detailed in the formal LifeKeeper documentation set such as package versions, last-minute changes to instructions and procedures, product restrictions and troubleshooting hints and tips that were discovered through final product testing. It is important that you review this document before installing and configuring LifeKeeper software.

LifeKeeper Product Description

The LifeKeeper product includes fault detection and recovery software that provides high availability for file systems, network addresses, applications and processes running on Linux. LifeKeeper supports the configuration and switchover of a given application across multiple servers. The servers on which the application is configured are assigned priorities to determine the sequence in which the application will move from server to server in the event of multiple failures.

LifeKeeper for Linux provides switchover protection for a range of system resources. Automatic recovery is supported for the following resource types:

- Processes and Applications
- Shared Storage Devices
- Network Attached Storage Devices
- LVM Volume Groups and Logical Volumes
- File Systems (ext3, ext4, reiserfs, vxfs, xfs, and nfs)
- Communication Resources (TCP/IP)
- Database Applications (Oracle, Informix Dynamic Server, MySQL, DB2, SAP DB/MaxDB, PostgreSQL, EnterpriseDB Postgres Plus Advanced Server, EnterpriseDB Postgres Plus Standard Server, Sybase)
- Web Server Resources (Apache, Apache SSL)
- Samba Resources (file)

Components

- Data Replication (SDR)
- HP StorageWorks CLX
- SAP Application Environment Resources
- Software RAID (md) Resources
- WebSphere MQ Resources

LifeKeeper for Linux provides Disaster Recovery protection for the following resource types:

- Linux Multi-Site Cluster configurations in which data from a shared storage cluster is replicated to a disaster recovery site

Components

LifeKeeper Core

LifeKeeper for Linux is bundled and runs on 32-bit and 64-bit systems (x86, AMD64 and EM64T systems). The LifeKeeper Core Package Cluster includes the following installable packages:

Package	Package Name	Description
LifeKeeper Core	steeleye-lk-7.3.0-21.i386.rpm	The LifeKeeper package provides recovery software for failures associated with core system components such as memory, CPUs, the operating system, the SCSI disk subsystem and file systems.
LifeKeeper GUI	steeleye-lkGUI-7.3.0-21.i386.rpm	The LifeKeeper GUI package provides a graphical user interface for LifeKeeper administration and status monitoring.
LifeKeeper IP Recovery Kit	steeleye-lkIP-7.3.0-21.noarch.rpm	The LifeKeeper IP Recovery Kit provides recovery software for automatic switchover of IP addresses.
LifeKeeper Raw I/O Recovery Kit	steeleye-lkRAW-7.3.0-21.noarch.rpm	The LifeKeeper Raw I/O Recovery Kit provides support for applications that use raw i/o to bypass kernel buffering.
LifeKeeper CCISS Recovery Kit	steeleye-lkCCISS-7.2.0-5.i386.rpm (on the LK Installation Support CD)	The LifeKeeper CCISS Recovery Kit provides support for HP devices using the CCISS block driver. This includes ProLiant servers that use the Smart Array 5i, 6i, 532, and 642 controllers. (Note: CCISS is not supported with RHEL6.)
LifeKeeper Man Pages	steeleye-lkMAN-7.3.0-21.noarch.rpm	The LifeKeeper Man Page package provides reference manual pages for the LifeKeeper product.

LifeKeeper Optional Recovery Software

The following optional software provides resource definition and recovery software for the application versions listed:

Package	Package Name	Protected Applications
LifeKeeper Apache Web Server Recovery Kit	steeleye-lkAPA-6.2.0-1.noarch.rpm	Apache Web Server 1.3 and 2.x Apache Web Server 1.3 and 2.x
LifeKeeper SAP Recovery Kit	steeleye-lkSAP-6.2.0-5.noarch.rpm	SAP R/3 version 4.6C (Kernel 4.6D), SAP R/3 Enterprise 4.7 (Web AS 6.20), SAP NetWeaver 2004 (Web AS 6.40) and SAP NetWeaver 2004s (Web AS 7.00)
LifeKeeper SAP DB / MaxDB Recovery Kit	steeleye-lkSAPDB-7.2.0-3.noarch.rpm	SAP DB 7.3.0 Build 21 and higher (Requires Build 35 and higher for use with SAP) MaxDB v7.5.x, v7.6.x, v7.7.x and v7.8.x
LifeKeeper DB2 Recovery Kit	steeleye-lkDB2-5.2.1-1.noarch.rpm	IBM DB2 Universal Database v8.1, Enterprise Server Edition (ESE) and Workgroup Server Edition (WSE) IBM DB2 Express Edition v8.1 and Express Edition v9 IBM DB2 Universal Database v9, Enterprise Server Edition (ESE) and Workgroup Server Edition (WSE) IBM DB2 Express Edition v9.5 and Express Edition v9.7 IBM DB2 Universal Database v9.5 and v9.7, Enterprise Server Edition (ESE) and Workgroup Server Edition (WSE)
LifeKeeper Oracle Recovery Kit	steeleye-lkORA-7.2.0-15.noarch.rpm	Oracle 10g Standard Edition, Standard Edition One and Enterprise Edition, Oracle 11g Standard Edition, Standard Edition One and Enterprise Edition, Oracle 11g Release 2
LifeKeeper Informix Recovery Kit	steeleye-lkINF-6.1.0-1.noarch.rpm	Informix Dynamic Server 9.2, 9.3, 9.4, and 10 products
LifeKeeper MySQL Recovery Kit	steeleye-lkSQL-7.4.0-10.noarch.rpm	MySQL 3.23.x, 4.x, 5.x and MySQL Enterprise
LifeKeeper PostgreSQL Recovery Kit	steeleye-lkPGSQL-7.4.0-2.noarch.rpm	PostgreSQL v7.x, v8.x and v9.0.4 EnterpriseDB Postgres Plus Standard Server v8.4.x and v9.0 EnterpriseDB Postgres Plus Advanced Server v8.3.x and v8.4.x
LifeKeeper Sybase ASE Recovery Kit	steeleye-lkSYBASE-7.4.0-7.noarch.rpm	Sybase ASE 12.5.x and 15.5

Package	Package Name	Protected Applications
LifeKeeper Postfix Recovery Kit	steeleye- lkPOSTFIX- 6.2.0- 2.noarch.rpm	Postfix provided with the supported Linux distributions
LifeKeeper Samba Recovery Kit	steeleye-lkSMB- 5.1.1- 1.noarch.rpm	Samba file shares
LifeKeeper NFS Server Recovery Kit	steeleye-lkNFS- 7.0.0- 1.noarch.rpm	NFS exported file systems on Linux distributions with a kernel version of 2.6 or later
LifeKeeper Network Attached Storage Recovery Kit	steeleye-lkNAS- 5.0.0- 1.noarch.rpm	Mounted NFS file systems from an NFS server or Network Attached Storage (NAS) device
LifeKeeper Logical Volume Manager (LVM) Recovery Kit	steeleye-lkLVM- 7.3.0- 4.noarch.rpm	LVM version 1 or 2 volume groups and logical volumes
LifeKeeper Software RAID (md) Recovery Kit	steeleye-lkMD- 7.2.0- 3.noarch.rpm	Software RAID devices based on md
LifeKeeper PowerPath Recovery Kit	steeleye- lkPPATH-6.4.0- 2.noarch.rpm	EMC PowerPath multipath I/O devices Note: This recovery kit is now included in the Multipath Storage Support ARK. The Multipath Storage Support ARK contains the following Recovery Kits: PowerPath RK, IBM Subsystem Device Driver (SDD) RK, Device Mapper Multipath (DMMP) RK, Hitachi Dynamic Link Manager (HDLM) RK and the NEC iStorage StoragePathSavior (SPS) RK. All five of these recovery kits are shipped together as five separate rpms. It is only necessary to install the specific recovery kit rpm that is required and supported by the shared storage model being used with LifeKeeper.
LifeKeeper IBM Subsystem Device Driver (SDD) Recovery Kit	steeleye-lkSDD- 6.4.0- 2.noarch.rpm	IBM SDD multipath I/O devices Note: This recovery kit is now included in the Multipath Storage Support ARK. The Multipath Storage Support ARK contains the following Recovery Kits: PowerPath RK, IBM Subsystem Device Driver (SDD) RK, Device Mapper Multipath (DMMP) RK, Hitachi Dynamic Link Manager (HDLM) RK and the NEC iStorage StoragePathSavior (SPS) RK. All five of these recovery kits are shipped together as five separate rpms. It is only necessary to install the specific recovery kit rpm that is required and supported by the shared storage model being used with LifeKeeper.
LifeKeeper Device Mapper Multipath (DMMP) Recovery Kit	steeleye- lkDMMP-7.3.0- 2.noarch.rpm	Linux dm-multipath I/O devices Note: This recovery kit is now included in the Multipath Storage Support ARK. The Multipath Storage Support ARK contains the following Recovery Kits: PowerPath RK, IBM Subsystem Device Driver (SDD) RK, Device Mapper Multipath (DMMP) RK, Hitachi Dynamic Link Manager (HDLM) RK and the NEC iStorage StoragePathSavior (SPS) RK. All five of these recovery kits are shipped together as five separate rpms. It is only necessary to install the specific recovery kit rpm that is required and supported by the shared storage model being used with LifeKeeper.
Hitachi Dynamic Link Manager	steeleye- lkHDLM-7.2.0- 1.noarch.rpm	Hitachi Dynamic Link Manager Software devices

Package	Package Name	Protected Applications
Software (HDLM) Recovery Kit		Note: This recovery kit is now included in the Multipath Storage Support ARK. The Multipath Storage Support ARK contains the following Recovery Kits: PowerPath RK, IBM Subsystem Device Driver (SDD) RK, Device Mapper Multipath (DMMP) RK, Hitachi Dynamic Link Manager (HDLM) RK and the NEC iStorage StoragePathSavior (SPS) RK. All five of these recovery kits are shipped together as five separate rpms. It is only necessary to install the specific recovery kit rpm that is required and supported by the shared storage model being used with LifeKeeper.
LifeKeeper NEC iStorage StoragePathSavior (SPS) Recovery Kit	steeleye-ikSPS-6.4.1-1.noarch.rpm	NEC iStorage StoragePathSavior version 3.3 or later multipath I/O devices Note: This recovery kit is now included in the Multipath Storage Support ARK. The Multipath Storage Support ARK contains the following Recovery Kits: PowerPath RK, IBM Subsystem Device Driver (SDD) RK, Device Mapper Multipath (DMMP) RK, Hitachi Dynamic Link Manager (HDLM) RK and the NEC iStorage StoragePathSavior (SPS) RK. All five of these recovery kits are shipped together as five separate rpms. It is only necessary to install the specific recovery kit rpm that is required and supported by the shared storage model being used with LifeKeeper.
SteelEye Data Replication	steeleye-ikDR-7.3.0-7.noarch.rpm	Data Replication (synchronous or asynchronous mirrors, with intent logging)
LifeKeeper WebSphere MQ Recovery Kit	steeleye-ikMQS-7.0.0-5.noarch.rpm	WebSphere MQ versions 5.3, 5.3 Express Edition, 6.0, or 7.0 queue managers including the command server, the listener and the persistent queue manager data
LifeKeeper Extender	steeleye-ikEXTENDER-5.0.1-1.noarch.rpm	Provides sample code and a tool for creating a basic application Recovery Kit. Documentation includes an overview of the Recovery Kit architecture and a detailed description of Recovery Kit components and APIs
LifeKeeper Quorum/Witness Package	steeleye-ikQWK-7.2.0-7.noarch.rpm	Allows a node to get a “second opinion” on the status of a failing node. Acts as an intermediary to determine which servers are part of the cluster. When determining when to fail over, the Witness Server allows resources to be brought in service on a backup server only in cases where it verifies the primary server has failed and is no longer part of the cluster.
LifeKeeper Recovery Kit for XP Cluster Extension	steeleye-ikXPCLX-7.2.0-16.noarch.rpm	Supports HP StorageWorks XP Continuous Access Software by providing protection for applications running on servers attached to XP storage arrays.

LifeKeeper Optional Support Software

The following software enables the LifeKeeper Multi-Site Migration:

Package	Package Name	Protected Applications
LifeKeeper Multi-Site	steeleye-ikDR-7.3.0-7.noarch.rpm This software requires a special license to enable this feature. Contact SIOS Technology Corp. to purchase this license.	Provides disaster recovery protection for shared storage clusters

New Features of LifeKeeper Version 7

Product	Feature
New in This Release (LifeKeeper Version 7 Update 3)	
LifeKeeper Core	VMware vSphere 4.1 support.
	Red Hat Enterprise Linux v6 support.
	Enhanced support for STONITH using IPMI.
	Expanded I/O fencing options for cases where reservations are not available.
	Support for subscription-based, time-limited licensing with expiration notification and an automatic license renewal option.
	Full support for both hardware and software watchdog timers to provide additional protection against server failure. (Due to SUSE not providing a watchdog rpm, this has not been tested on SLES.)
	General maintenance.
MySQL Recovery Kit	Support for mysqld Groups (mysqld_multi) allowing administrators to install and use multiple versions of MySQL on the same system managed via a single my.cnf file.
LVM Recovery Kit	General maintenance.
	RHEL 6 support.
SteelEye Data Replication	General maintenance.
	RHEL 6 support.
DMMP Recovery Kit	General maintenance.
New in LifeKeeper Version 7 Update 2	
LifeKeeper Core	SUSE SLES 11 SP1 Support.
	General maintenance.
Oracle Recovery Kit	Support for user specified Oracle username and password.
	General maintenance.
DMMP Recovery Kit	General maintenance.
Installation Support	General maintenance.
HDLM Recovery Kit	General maintenance.
MaxDB Recovery Kit	MaxDB 7.7 and 7.8 Support.
MD Recovery Kit	General maintenance.
Quorum/Witness Package	Providing an even higher level of protection, the Quorum/Witness Package allows system failover to occur with a greater degree of confidence. A quorum/witness node allows local site failovers and failovers to nodes across a WAN to be done with a greatly reduced risk of “split-brain” situations, only allowing resources to be brought in service in cases where the witness server(s) also concurs regarding the status of the failing node. This will prevent failovers from happening due to simple

Product	Feature
	communication failures between nodes when those failures do not affect the overall access to, and performance of, the in-service node.
LifeKeeper Recovery Kit for HP XP Cluster Extension	The LifeKeeper Recovery Kit for HP XP Cluster Extension provides clustering support for file systems that are being replicated by XP Continuous Access and provides protection for applications running on servers attached to XP storage arrays, ensuring that consistent and concurrent data copies on these arrays can be accessed by the applications when needed.
New in LifeKeeper Version 7 Update 1	
SteelEye Data Replication	Bitmap Merge functionality for SLES 11 environments. This feature allows read/write access on the target server and it eliminates the full resyncs after a failover. Multi-Site Upgrade Migrate feature. General maintenance.
New in LifeKeeper Version 7	
WebSphere MQ Recovery Kit	Support for WebSphere MQ V7.0. General maintenance.
LifeKeeper Core	Multi-Site Upgrade Migrate feature. General maintenance. SUSE SLES 10 SP3 Support.
NFS Recovery Kit	General maintenance.
PostgreSQL Recovery Kit	Improved integration with Enterprise DB Postgres Plus Advanced Server. General maintenance.

System Requirements

LifeKeeper Product Requirements

LifeKeeper for Linux is supported on any Linux platform that satisfies the minimum requirements included in the table below.

Description	Requirement
Linux Operating System*	Red Hat Enterprise Linux 4.0 (AS and ES) * Red Hat Enterprise Linux 5 and Red Hat Enterprise Linux 5 Advanced Platform * Red Hat Enterprise Linux 6 SUSE LINUX Enterprise Server (SLES) 10 and SLES 11* Asianux 2.0 Oracle Enterprise Linux 4 Update 5 or later Oracle Enterprise Linux 5 The Community ENTERprise Operating System (CentOS) 4 Update 5 or later The Community ENTERprise Operating System (CentOS) 5
Virtual Environments	<p>LifeKeeper for Linux is supported running virtual machines of the following virtualization technologies as long as the guest operating system running within the virtual machines is one of the supported versions listed above.</p> <ul style="list-style-type: none"> • VMware ESX Server 3.0 • VMware ESX Server 3.5 • VMware vSphere 4 and 4.1 • Microsoft Virtual Server 2005 R2 • VMWare Server • Citrix XenServer <p>Please refer to the document <i>LifeKeeper for Linux in VMware ESX Server Virtual Machines, Configuration Guidelines</i> for more detailed configuration requirements and limitations.</p> <p>LifeKeeper for Linux running in a Microsoft Virtual Server 2005 R2 virtual machine is supported with the following cluster storage options: NAS and SteelEye Data Replication. All of these storage options can be used in virtual-to-virtual, virtual-to-physical, and physical-to-virtual failover configurations. The configuration of NAS and data replication in a Microsoft Virtual Server 2005 R2 environment is exactly the same as in a physical machine environment.</p> <p>Fibre channel SAN and shared SCSI cluster configurations are not supported with LifeKeeper for Linux running in a Microsoft Virtual Server 2005 R2 virtual machine.</p> <p>Currently, shared storage clusters are not supported. Clusters created with SteelEye Data Replication or network attached storage should operate correctly.</p>
Korn Shell	pdksh-5.2.14 (or later)
Memory	The minimum memory requirement for a system supporting LifeKeeper is 128 MB. Additional memory (beyond that required for LifeKeeper) is required to run user applications. Refer to Application Configuration for further information.
Disk Space	The LifeKeeper Core Package Cluster requires the following disk space: /opt – approx 44000 (1024-byte) disk blocks on 32-bit systems /opt – approx 89000 (1024-byte) disk blocks on 64-bit systems / - approx 135000 (1024-byte) disk blocks

* Refer to “Kernel Updates” under Linux Configuration.

LifeKeeper Optional Recovery Software

The following table shows the software and disk space requirements for the optional LifeKeeper recovery software.

See Application Configuration for additional requirements and/or restrictions that may apply to applications under LifeKeeper protection.

Product	Requirement(s)	Disk Space Required
Apache Web Server	Apache Web Server 1.3.14 and 2.x LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 175 (1024-byte) disk blocks in <i>/opt</i>
SAP	SAP R/3 Enterprise 4.7 (Web AS 6.20), NetWeaver '04 (Web AS 6.40), or NetWeaver 2004s (Web AS 7.00) LifeKeeper v6.0.0 or later Core Package Cluster LifeKeeper NFS Server Recovery Kit v5.1.0 or later LifeKeeper Network Attached Storage Recovery Kit v5.0.0 or later	Approximately 200 (1024-byte) disk blocks in <i>/opt</i>
Oracle	Oracle 10g Standard Edition, Standard Edition One, or Enterprise Edition Oracle 11g Standard Edition, Standard Edition One, Enterprise Edition Oracle 11g Release 2 LifeKeeper v6.2.0 or later Core Package Cluster	Approximately 450 (1024-byte) disk blocks in <i>/opt</i>
DB2	IBM DB2 Enterprise Server Edition (ESE) v8.1 or later or v9 IBM DB2 Workgroup Server Edition (WSE) v8.1 or later or v9 IBM DB2 Express Edition v8.1 or later or v9 LifeKeeper v6.0.0 or later Core Package Cluster LifeKeeper NFS Server Recovery Kit v5.1.0 or later (for DB2 EEE and DB2 ESE with multiple partitions only)	Approximately 180 (1024-byte) disk blocks in <i>/opt</i>
Informix	Informix Dynamic Server 9.2, 9.3, 9.4 and Informix Dynamic Server 10 LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 175 (1024-byte) disk blocks in <i>/opt</i>
MySQL	MySQL 3.23.x, 4.x, 5.x and MySQL Enterprise LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 120 (1024-byte) disk blocks in <i>/opt</i>
PostgreSQL	PostgreSQL v7.x, v8.x and v9.0.4 EnterpriseDB Postgres Plus Standard Server v8.4.x and v9.0 EnterpriseDB Postgres Plus Advanced Server v8.3.x and v8.4.x LifeKeeper v6.2.0 or later Core Package Cluster	Approximately 185 (1024-byte) disk blocks in <i>/opt</i>
Sybase ASE	Sybase ASE 12.5.x and 15.5	Approximately 200

Product	Requirement(s)	Disk Space Required
		(1024-byte) disk blocks in <i>/opt</i>
SAP DB / MaxDB	SAP DB 7.3.0 Build 21 for standalone use SAP DB 7.3.0 Build 35 for use with SAP MaxDB 7.5.x, MaxDB 7.6.x, MaxDB 7.7.x or MaxDB 7.8.x LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 170 (1024-byte) disk blocks in <i>/opt</i> .
Postfix	Postfix software provided with the supported Linux distributions installed and configured on each server. The same version of Postfix should be installed on each server. LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 115 (1024-byte) disk blocks in <i>/opt</i>
Samba	Standard Samba file services provided with the supported Linux distributions LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 235 (1024-byte) disk blocks in <i>/opt</i>
NFS Server	Linux kernel version 2.6 or later LifeKeeper 7.0.0 or later Core Package Cluster The NFS Server and client packages must be installed on SLES systems.	Approximately 160 (1024-byte) disk blocks in <i>/opt</i>
Network Attached Storage	LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 90 (1024-byte) disk blocks in <i>/opt</i>
Logical Volume Manager (LVM)	Linux Logical Volume Manager (LVM) version 1 or 2 LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 140 (1024-byte) disk blocks in <i>/opt</i>
Software RAID (md)	LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 145 (1024-byte) disk blocks in <i>/opt</i>
EMC PowerPath	A 2.6 based Linux kernel and distribution PowerPath Kit v6.4.0-2: PowerPath for Linux v5.3 or later Prior to the PowerPath Kit v6.4.0-2: PowerPath for Linux v4.4.x, 4.5.x, 5.0.x, or 5.1.x The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>
IBM Subsystem Device Driver (SDD)	A 2.6 based Linux kernel and distribution IBM SDD driver v1.6.0.1-8 or later The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>

Product	Requirement(s)	Disk Space Required
Device Mapper Multipath (DMMP)	A 2.6 based Linux kernel and distribution multipath tools 0.4.5 or later The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 175 (1024-byte) disk blocks in <i>/opt</i>
Hitachi Dynamic Link Manager Software (HDLM)	Please see <i>Hitachi Dynamic Link Manager Software Multipath I/O Configurations and Linux Distribution Requirements</i> .	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>
NEC iStorage Storage Path Savior (SPS)	iStorage StoragePathSavior for Linux Version 3.3 or later RHEL4 (AS/ES) Update4, RHEL4.5(AS/ES),RHEL4.6(AS/ES) NOTE: The following kernels are supported with RHEL4.5 errata: kernel-2.6.9-55.0.12.EL RHEL5 SPS driver package (for RHEL4 or RHEL5) sps-L, sps-S, or sps-E The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES. LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>
SteelEye Data Replication	LifeKeeper v7.0.0 or later Core Package Cluster Linux kernel version 2.6 (2.6.16 or later for intent logging and asynchronous write support)	Approximately 1850 (1024-byte) disk blocks in <i>/opt</i>
WebSphere MQ	WebSphere MQ versions 5.3, 5.3 Express Edition, 6.0, and 7.0 LifeKeeper v6.3.0 or later Core Package Cluster	Approximately 400 (1024-byte) disk blocks in <i>/opt</i>
LifeKeeper Extender	LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 185 (1024-byte) disk blocks in <i>/opt</i>
LifeKeeper Quorum/Witness Package	LifeKeeper v7.2.0 or later Core Package Cluster	Approximately 104 (1024-byte) disk blocks in <i>/opt</i>
LifeKeeper Recovery Kit for XP Cluster Extension	Two HP XP Disk Arrays HP StorageWorks XP RAID Manager HP StorageWorks XP Cluster Extension HP StorageWorks XP Continuous Access Software SLES 10 SP3, SLES 11 or Red Hat Enterprise Linux 5.4 or 5.5 Device Mapper Multipath (DMMP) LifeKeeper DMMP Recovery Kit LifeKeeper v7.2.0 or later Core Package Cluster	Approximately 64 (1024-byte) disk blocks in <i>/opt</i>

LifeKeeper Optional Support Software

The following table shows the software and disk space requirements for the optional LifeKeeper Support Software:

Product	Requirement(s)	Disk Space Required
LifeKeeper Multi-Site	LifeKeeper v7.0.0 or later Core Package Cluster Linux kernel version 2.6 (2.6.16 or later for intent logging and asynchronous write support) This software requires a special license to enable this feature. Contact SIOS Technology Corp. to purchase this license	Approximately 1800 (1024-byte) disk blocks in/ <i>opt</i>

Client Platforms and Browsers

The LifeKeeper web client can run on any platform that provides support for Java Runtime Environment J2RE 1.4 or later. The currently supported configurations are Firefox 1.5, 2 or 3 and Internet Explorer 6, 7 or 8 on Linux, Windows 2000, Windows Server 2003, Windows 2008 R2, Windows XP, Windows 7 or Windows Vista with J2RE 1.4, JRE 5 or JRE 6. Other recent platforms and browsers will likely work with the LifeKeeper web client, but they have not been tested by SIOS Technology Corp.

You should specify all the hostnames and addresses in your cluster in the client machine's local hosts file (usually */etc/hosts* or *C:\windows\system32\drivers\etc\hosts*). This minimizes the client connection time and allows the client to connect even in the event of a Domain Name Server (DNS) failure.

Known Issues

Core

Bug 749	<p>Usage message printf -t and -i unknown option errors during restores and removes displayed after upgrade</p> <p>This issue occurs when a distribution update overwrites the pdksh that the LifeKeeper product requires with the standard ksh product.</p> <p>Solution: Re-install the pdksh package from the LifeKeeper Installation support ISO image or media.</p>
Bug 1481	<p>GUI does not work with default RHEL6 64-bit</p> <p>There is a compatibility issue against Red Hat Enterprise Linux 6 64-bit</p> <p>Solution: Install the following packages, which are contained in the installation media of the OS, prior to installing LifeKeeper. If these are not installed <u>prior</u> to installing LifeKeeper, the install will not finish correctly.</p> <pre>libXau-1.0.5-1.el6.i686.rpm libxcb-1.5-1.el6.i686.rpm libX11-1.3-2.el6.i686.rpm libXext-1.1-3.el6.i686.rpm libXi-1.3-3.el6.i686.rpm libXtst-1.0.99.2-3.el6.i686.rpm</pre>
Bug 1533	<p>The multipathd daemon will log errors in the error log when the nbd driver is loaded as it tries to scan the new devices</p> <p>Solution: To avoid these errors in the log, add devnode "^nbd" to the blacklist in /etc/multipath.conf.</p>
Bug 1589	<p>RHEL6: LifeKeeper core gets in a state where it cannot stop or start</p> <p>When running LifeKeeper with RHEL 6, the LifeKeeper core gets into a state where LifeKeeper cannot be stopped or started.</p> <p>Workaround: If LifeKeeper gets into this state (where lkstart reports that "LifeKeeper should already be running" but "ps" or "lctest" shows no daemons are running), execute the following commands:</p> <pre>initctl stop lifekeeper rm /etc/init/lifekeeper.conf rm /etc/init/lk-logmgr.conf rm /etc/init/lk-logmgr-kill.conf rm /etc/init/lkstart.conf lkstart</pre>
Bug 1579	<p>Mount point choice list shows duplicate values for each entry</p> <p>When attempting to create the resource hierarchy, the mount point selection window shows duplicates.</p> <p>Workaround: Select either of the mount points in the list to create the resource hierarchy. The duplicate entries will not affect the hierarchy creation.</p>

Data Replication

<p>Bug 1563</p>	<p>32-bit zlib packages should be installed to RHEL 6 (64-bit) for Set Compression Level</p> <p>When using SDR with RHEL 6 (64-bit), the following error may appear:</p> <p>Could not start balance on Target when Compression Level is set on RHEL 6 (64-bit)</p> <p>Solution: To resolve the issue, please install the 32-bit zlib packages from RHEL 6 when using RHEL 6 (64-bit).</p>
<p>Bug 1534</p>	<p>Mirrors automatically started during boot</p> <p>On some systems (for example those running RHEL 6), there is an AUTO entry in the configuration file (/etc/mdadm.conf) that will automatically start mirrors during boot (example: AUTO +imsm +1.x -all).</p> <p>Solution: Since LifeKeeper requires that mirrors not be automatically started, this entry will need to be edited to make sure that LifeKeeper mirrors will not be automatically started during boot. The previous example (AUTO +imsm +1.x -all) is telling the system to automatically start mirrors created using imsm metadata and 1.x metadata minus all others. This entry should be changed to "AUTO -all", telling the system to automatically start everything "minus" all; therefore, nothing will be automatically started. Important: If system critical resources (such as root) are using MD, make sure that those mirrors are started by other means while the LifeKeeper protected mirrors are not.</p>

