



## **LifeKeeper for Linux**

**v7.5**

**Release Notes**

**January 2012**

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# LifeKeeper for Linux Release Notes

## Version 7.5

### 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 and last-minute changes to instructions and procedures as well as a link to the Troubleshooting section for 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)
- DataKeeper for Linux
- HP StorageWorks CLX

## Components

- 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-7.5.0-3640.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-7.5.0-3640.i386.rpm	The LifeKeeper GUI package provides a graphical user interface for LifeKeeper administration and status monitoring.
LifeKeeper IP Recovery Kit	steeleye-lkIP-7.5.0-3640.noarch.rpm	The LifeKeeper IP Recovery Kit provides recovery software for automatic switchover of IP addresses.
LifeKeeper Raw I/O Recovery Kit	steeleye-lkRAW-7.5.0-3640.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-7.5.0-3640.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. ( <b>Note:</b> CCISS is not supported with RHEL6.)
LifeKeeper Man Pages	steeleye-lkMAN-7.5.0-3640.noarch.rpm	The LifeKeeper Man Page package provides reference manual pages for the LifeKeeper product.

**Note:** With the release of LifeKeeper 7.5, the steeleye-lkHLP rpm package is no longer included. The steeleye-lkHLP package contained online help material that could be launched from the LifeKeeper

GUI. Online help is now available from SIOS Technical Documentation (<http://docs.us.sios.com>). This documentation can be launched from the **Help menu** on the LifeKeeper GUI.

## 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-1kAPA-7.4.0-2.noarch.rpm	Apache Web Server 1.3 and 2.x
LifeKeeper SAP Recovery Kit	steeleye-1kSAP-7.4.0-8.noarch.rpm	SAP 7.0 Enhancement Package 1 and 2, SAP 7.1 and SAP 7.3
LifeKeeper SAP DB / MaxDB Recovery Kit	steeleye-1kSAPDB-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-1kDB2-5.2.1-1.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-1kORA-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-1kINF-6.1.0-1.noarch.rpm	Informix Dynamic Server 9.2, 9.3, 9.4, and 10 products
LifeKeeper MySQL Recovery Kit	steeleye-1kSQL-7.4.0-10.noarch.rpm	MySQL 3.23.x, 4.x, 5.x and MySQL Enterprise
LifeKeeper PostgreSQL Recovery Kit	steeleye-1kPGSQL-7.4.0-2.noarch.rpm	PostgreSQL v7.x, v8.x and v9.0.4 EnterpriseDB Postgres Plus Standard Server v8.4.x and

Package	Package Name	Protected Applications
		v9.0 EnterpriseDB Postgres Plus Advanced Server v8.3.x and v8.4.x
LifeKeeper Sybase ASE Recovery Kit	steeleye-lkSY-BASE-7.4.0-7.noarch.rpm	Sybase ASE 12.5.x and 15.5
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-7.4.0-2.noarch.rpm	Samba file shares
LifeKeeper NFS Server Recovery Kit	steeleye-lkNFS-7.5.0-3640.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-7.4.0-6.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-7.4.0-3.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  <b>Note:</b> 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.



Package	Package Name	Protected Applications
LifeKeeper IBM Subsystem Device Driver (SDD) Recovery Kit	steeleye-1kSDD-6.4.0-2.noarch.rpm	<p>IBM SDD multipath I/O devices</p> <p><b>Note:</b> 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.</p>
LifeKeeper Device Mapper Multipath (DMMP) Recovery Kit	steeleye-1kDMMP-7.3.0-2.noarch.rpm	<p>Linux dm-multipath I/O devices</p> <p><b>Note:</b> 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.</p>
Hitachi Dynamic Link Manager Software (HDLM) Recovery Kit	steeleye-1kHDLM-7.2.0-1.noarch.rpm	<p>Hitachi Dynamic Link Manager Software devices</p> <p><b>Note:</b> 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.</p>
LifeKeeper NEC iStorage StoragePathSavior (SPS) Recovery Kit	steeleye-1kSPS-6.4.1-1.noarch.rpm	<p>NEC iStorage StoragePathSavior version 3.3 or later multipath I/O devices</p> <p><b>Note:</b> This recovery kit is now included in the Multipath Storage Support ARK. The Multipath Storage Support ARK contains the following Recovery Kits: PowerPath</p>

Package	Package Name	Protected Applications
		RK, IBM Subsystem Device Driver (SDD) RK, Device Mapper Multipath (DMMP) RK, Hitachi Dynamic Link Manager (HDL) 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 DataKeeper	steeleye-ikDR-7.5.0-3640.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
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. ( <a href="http://us.sios.com/company/contact-us/">http://us.sios.com/company/contact-us/</a> ) to purchase this license.	Provides disaster recovery protection for shared storage clusters

## New Features of LifeKeeper Version 7

Product	Feature
<b>New in This Release (LifeKeeper Version 7 Update 5)</b>	
LifeKeeper Core	CentOS 6 support.
	General maintenance.
	Red Hat EL 4, CentOS 4, Oracle EL 4, and Asianux are not supported in LifeKeeper 7.5.
	Temporal Recovery Logic - Local recovery attempt limits can be set providing improved application availability.
	Multi-Level Policies - Recovery options can be specified at the server and resource levels allowing clients to define the most appropriate recovery strategy for each application.
	Notification Only/Maintenance Mode - Allows users to temporarily disable monitoring of one or more resources preventing LifeKeeper from attempting to recover a resource that is undergoing maintenance.
	vSTONITH - Virtual STONITH support for node fencing in VMware vSphere 4 and 5 environments.
SteelEye DataKeeper for Linux	Product name change from SteelEye Data Replication. General maintenance.
LifeKeeper NFS Server Recovery Kit	General maintenance.
<b>New in LifeKeeper Version 7 Update 4</b>	
LifeKeeper Core	Red Hat Enterprise Linux v6 Update 1 support.

Product	Feature
	IPv6 support. SUSE SLES 10 SP4 support. General maintenance.
SAP Recovery Kit	Support of all releases of SAP (7.0, 7.0 EHP1, 7.1 and 7.3) (with Oracle Database initially), utilizing the new SAPHost API. Enhancements such as new Protection Level and Recovery Level options and UI redesign. General maintenance.
NAS Recovery Kit	NFSv4 support. General maintenance.
IP Recovery Kit	IPv6 support. General maintenance.
LVM Recovery Kit	Support for LVM tags. General maintenance.
NFS Recovery Kit	Support for NFS v4 pseudo file system export providing clients with seamless access to all exported objects on the server. General maintenance.
MySQL Recovery Kit	Support for mysqld Groups ( <code>mysqld_multi</code> ) allowing administrators to install and use multiple versions of MySQL on the same system managed via a single <i>my.cnf</i> file. General maintenance.
Installation Support	NFS v4 support. General maintenance.
SteelEye DataKeeper	IPv6 support. General maintenance.
<b>New in LifeKeeper Version 7 Update 3</b>	

Product	Feature
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 ( <code>mysqld_multi</code> ) allowing administrators to install and use multiple versions of MySQL on the same system managed via a single <code>my.cnf</code> file.
LVM Volume Groups and Logical Volumes	General maintenance. RHEL 6 support.
SteelEye DataKeeper	General maintenance. RHEL 6 support.
DMMP Recovery Kit	General maintenance.
<b>New in LifeKeeper Version 7 Update 2</b>	
LifeKeeper Core	SUSE SLES 11 SP1 Support.
	General maintenance.
LifeKeeper Oracle Recovery Kit	Support for user specified Oracle username and password.
	General maintenance.

Product	Feature
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	<p>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 communication failures between nodes when those failures do not affect the overall access to, and performance of, the in-service node.</p>
LifeKeeper Recovery Kit for XP Cluster Extension	<p>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.</p>
<b>New in LifeKeeper Version 7 Update 1</b>	
SteelEye DataKeeper	<p>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.</p> <p>Multi-Site Upgrade Migrate feature.</p> <p>General maintenance.</p>
<b>New in LifeKeeper Version 7</b>	
WebSphere MQ Resources	<p>Support for WebSphere MQ V7.0.</p> <p>General maintenance.</p>
LifeKeeper Core	<p>Multi-Site Upgrade Migrate feature.</p> <p>General maintenance.</p> <p>SUSE SLES 10 SP3 Support.</p>
LifeKeeper NFS Server Recovery	General maintenance.

Product	Feature
Kit	
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.

**Note:** LifeKeeper on a Linux server will not inter-operate with LifeKeeper for Windows.

Description	Requirement
Linux Operating System*	<p>Red Hat Enterprise Linux 5 and Red Hat Enterprise Linux 5 Advanced Platform *</p> <p>Red Hat Enterprise Linux 6 and Red Hat Enterprise Linux 6, Update 2</p> <p>SUSE LINUX Enterprise Server (SLES) 10 and SLES 11*</p> <p>Oracle Enterprise Linux 5</p> <p>The Community ENTerprise Operating System (CentOS) 5</p> <p>The Community ENTerprise Operating System (CentOS) 6</p>
Virtual Environments	<p>LifeKeeper for Linux is architected to be hypervisor-independent as long as the guest operating system running within the virtual machine is one of the supported versions listed above. The following virtual environments are examples of where SteelEye Protection Suite for Linux has been deployed:</p> <ul style="list-style-type: none"> <li>• Citrix XenServer</li> <li>• KVM</li> <li>• Microsoft Virtual Server 2005 R2</li> <li>• Oracle Virtual Machine (OVM)</li> <li>• VMware ESX Server 3.x</li> <li>• VMware vSphere 4.x</li> <li>• VMware vSphere 5.x</li> <li>• VMware Server 1.0</li> </ul> <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, VMWare Server 1.0 and Citrix XenServer virtual machine is supported with the following cluster storage options: NAS and SteelEye DataKeeper. 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 DataKeeper in a virtual machine environment is exactly the same as in a physical machine environment.</p> <p>Fibre channel SAN and shared SCSI cluster configurations</p>



	are not supported with LifeKeeper for Linux running in a Microsoft Virtual Server 2005 R2, VMWare Server 1.0, KVM and Citrix XenServer virtual machine.
Korn Shell	pdksh-5.2.14 (or later)
Memory	The minimum memory requirement for a system supporting LifeKeeper is 512 MB. This is the minimum amount required by LifeKeeper supported Linux distributions. System memory should be sized for the applications that will be running on the LifeKeeper protected system as well. Refer to Application Configuration for further information.
Disk Space	The LifeKeeper Core Package Cluster requires the following disk space:  /opt – approx 100000 (1024-byte) disk blocks on 32-bit systems  /opt – approx 100000 (1024-byte) disk blocks on 64-bit systems  / - approx 110000 (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
LifeKeeper Apache Web Server Recovery Kit	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 Recovery Kit	SAP 7.0 Enhancement Package 1 and 2, SAP 7.1 and SAP 7.3 LifeKeeper v7.3.0 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>
LifeKeeper Oracle Recovery Kit	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>
LifeKeeper DB2 Recovery Kit	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 v 8.1 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>
LifeKeeper Informix Recovery Kit	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>
LifeKeeper MySQL Recovery Kit	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>
LifeKeeper PostgreSQL Recovery Kit	PostgreSQL v7.x, v8.x and v9.0.4 EnterpriseDB Postgres Plus Standard Server v8.4.x and v9.0	Approximately 185 (1024-byte) disk blocks in <i>/opt</i>

Product	Requirement(s)	Disk Space Required
	EnterpriseDB Postgres Plus Advanced Server v8.3.x and v8.4.x LifeKeeper v6.2.0 or later Core Package Cluster	
LifeKeeper Sybase ASE Recovery Kit	Sybase ASE 12.5.x and 15.5	Approximately 200 (1024-byte) disk blocks in <i>/opt</i>
LifeKeeper SAP DB / MaxDB Recovery Kit	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> .
LifeKeeper Postfix Recovery Kit	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>
LifeKeeper Samba Recovery Kit	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>
LifeKeeper NFS Server Recovery Kit	Linux kernel version 2.6 or later LifeKeeper 7.4.0 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>
LifeKeeper Network Attached Storage Recovery Kit	LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 90 (1024-byte) disk blocks in <i>/opt</i>
LifeKeeper Logical Volume Manager (LVM) Recovery Kit	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>
LifeKeeper Software RAID (md) Recovery Kit	LifeKeeper v6.0.0 or later Core Package Cluster	Approximately 145 (1024-byte) disk blocks in <i>/opt</i>

Product	Requirement(s)	Disk Space Required
EMC PowerPath	<p>A 2.6 based Linux kernel and distribution</p> <p><b>PowerPath Kit v6.4.0-2:</b> PowerPath for Linux v5.3 or later</p> <p><b>Prior to the PowerPath Kit v6.4.0-2:</b> PowerPath for Linux v4.4.x, 4.5.x, 5.0.x, or 5.1.x</p> <p>The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES</p> <p>LifeKeeper v6.0.0 or later Core Package Cluster</p>	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>
IBM Subsystem Device Driver (SDD)	<p>A 2.6 based Linux kernel and distribution</p> <p>IBM SDD driver v1.6.0.1-8 or later</p> <p>The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES</p> <p>LifeKeeper v6.0.0 or later Core Package Cluster</p>	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>
Device Mapper Multipath (DMMPk)	<p>A 2.6 based Linux kernel and distribution multipath tools 0.4.5 or later</p> <p>The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES</p> <p>LifeKeeper v6.0.0 or later Core Package Cluster</p>	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)	<p>iStorage StoragePathSavior for Linux Version 3.3 or later</p> <p>RHEL4 (AS/ES) Update4, RHEL4.5(AS/ES),RHEL4.6(AS/ES) <b>NOTE:</b> The following kernels are supported with RHEL4.5 errata: kernel-2.6.9-55.0.12.EL</p> <p>RHEL5</p> <p>SPS driver package (for RHEL4 or RHEL5)</p> <p>sps-L, sps-S, or sps-E The sg3_utils rpm is required on Red Hat and the scsi rpm is required on SLES.</p> <p>LifeKeeper v6.0.0 or later Core Package Cluster</p>	Approximately 155 (1024-byte) disk blocks in <i>/opt</i>
DataKeeper for Linux	<p>LifeKeeper v7.5.0 or later Core Package Cluster</p> <p>Linux kernel version 2.6 (2.6.16 or later for intent logging and asynchronous write support)</p>	Approximately 1850 (1024-byte) disk blocks in <i>/opt</i>

Product	Requirement(s)	Disk Space Required
WebSphere MQ Resources	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>
Quorum/Witness Package	LifeKeeper v7.2.0 or later Core Package Cluster	Approximately 104 (1024-byte) disk blocks in <i>/opt</i>
HP StorageWorks CLX	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 (JRE) 6. The currently supported configurations are Firefox, Internet Explorer and Chrome on Linux, Windows 2000, Windows Server 2003, Windows 2008 R2, Windows XP, Windows 7 or Windows Vista with 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.

## Storage and Adapter Options

For a list of the disk array storage models and adapters currently supported by LifeKeeper in shared storage configurations as well as their type of certification, see the Storage and Adapter Options topic. Details about driver versions and other configuration requirements for these arrays and adapters are listed in the Storage and Adapter Configuration topic.

## Known Issues

See Known Issues and Restrictions in the Troubleshooting section of LifeKeeper for Linux Technical Documentation.