Contents

Installation and Configuration of Sendmail and LifeKeeper on Compaq ProLiant Servers

Abstract: Internet messaging is an indispensable part of our lives. E-mail is now a mission critical business tool for communicating with customers and business partners – so much that many businesses would rather lose their phone service than their mail server.

Sendmail's scalable message store can accommodate hundreds to thousands of users on a single server with a very attractive user cost per seat. Its scalable architecture enables organizations to meet current needs cost-effectively, and then grow seamlessly with minimal user disruption and without system wide replacements or disruptive outages.

In conjunction with Sendmail's messaging solution, SteelEye's LifeKeeper high availability clustering product provides uptime protection for the resources running the mail store. This includes servers, disks, networks and application software.

This guide will provide the basic instructions for installing Sendmail and LifeKeeper using the Linux operating system on Compaq server hardware. For in-depth product configuration, contact Sendmail Professional Services via e-mail. The e-mail address is sales@sendmail.com.

Notice

This publication does not constitute an endorsement of the product or products that were tested. The configuration or configurations tested or described may or may not be the only available solution. This test is not a determination of product quality or correctness, nor does it ensure compliance with any federal, state or local requirements.

Compaq, the Compaq logo, ActiveAnswers, SmartStart, StorageWorks, and ProLiant are trademarks of Compaq Information Technologies Group, L.P. in the U.S. and/or other countries.

Intel and Itanium are trademarks of Intel Corporation in the U.S. and/or other countries.

All other product names mentioned herein may be trademarks of their respective companies.

Compaq shall not be liable for technical or editorial errors or omissions contained herein. The information is provided "as is" without warranty of any kind and is subject to change without notice. The warranties for Compaq products are set forth in the express limited warranty statements accompanying such products. Nothing herein should be construed as constituting an additional warranty.

©2002 Compaq Information Technologies Group, L.P.

Installation and Configuration of Sendmail and LifeKeeper on Compaq ProLiant Servers
Installation Guide prepared by Internet and E-Commerce Solutions

First Edition (April 2002)
Document Number 16JQ-0402A-WWEN

Introduction

The focus of this installation guide is on the SAMS (Sendmail Advanced Messaging Server) product with the SteelEye LifeKeeper recovery kit on Compaq *ProLiant*™ servers, including the *ProLiant* DL590/64 (Intel Itanium 64-bit architecture) server. The modular components, especially the partner and Open Source items, are typically delivered through Sendmail Professional Services division.

Availability Features

Clients

Desktops, Laptops & Handhelds

Mail Routing
- **MTA**
- **Content Management**
- **LDAP Directory Services**

Mail Access
- **IMAP/POP**
- **Webmail**
- **WAP (iPAQ/Palms/Phones)**

Mail Hosting
- **Mailbox data storage**
- **Account Management**
- **Shared Folders**

Figure 1: Mail Solution Using Compaq *ProLiant* Servers with Sendmail and LifeKeeper

This Sendmail solution fits very nicely into the Compaq Dynamic Internet Solutions Architecture (DISA) environment. This solution pictured above is a highly scalable, available and reliable mail solution utilizing Compaq *ProLiant* servers. Using SteelEye LifeKeeper at the Mail Hosting layer provides a cluster fail-over solution to protect the mailbox information and provide increased uptime in the event of hardware failure. Depending on your needs you can start with a few servers and expand as your business needs grow. This document covers the installation and base configuration of software for the Mail Hosting layer of Figure 1. For more information on DISA, go to: http://www.compaq.com/disa.

Configuration Data

Software Requirements

Requirements for Scalable SAMS in a 2-node cluster, (scalable to 16 nodes with Sendmail Proxy):

Software certification:

- Compaq *SmartStart*™ version 5 or most current version for the hardware

- SuSE Linux Enterprise Server 7

- SteelEye LifeKeeper version 4 with SAMS (Sendmail recovery kit)

- IBM Java 1.3.1

- Public Korn Shell

- Sendmail Inc. Messaging Solutions consists of the Core Sendmail Advanced Messaging Server (SAMS) 1.2.2 for Linux with several modular components:

  – Sendmail Advanced Message Server (IMAP/POP)[1]

  – Sendmail Switch MTA for routing and content management[2]

  – Sendmail Mobile Message Server for Web and WAP Mobile access[3]

  – Sendmail Proxy Server for scaling SAMS on multi-servers[4]

Note: This paper focuses on the SAMS product.

---

[1] Can utilize custom resource kits for high availability fault tolerance
[2] Has ability built-in for balancing and fault tolerance
[3] Has ability built-in for balancing and fault tolerance
[4] Can utilize custom resource kits for high availability fault tolerance

Hardware Configurations

This section lists the hardware needed for each node for three sample configurations.

For up to 10,000 users with 40% concurrency (IMAP)

- *ProLiant* DL380 server (2 nodes for cluster failover)
- Dual CPUs
- 4 to 6 GB Memory
- Dual internal drives 9 GB minimum mirrored
- Dual network interface
- Compaq 64bit/66MHz Fibre Host Bus Adapter

For up to 25,000 users with 40% concurrency (IMAP)

- *ProLiant* DL580 server (2 nodes for cluster failover)
- Dual CPUs minimum and 4 recommended for high concurrent IMAP use
- 6 GB Memory minimum
- Dual internal drives 9 GB minimum mirrored
- Dual network interface
- Compaq 64bit/66MHz Fibre Host Bus Adapter

For up to 100,000 users with 40% concurrency (IMAP)

- *ProLiant* DL590/64 server (2 nodes for cluster failover)
- Dual CPUs
- 32 GB memory minimum, 64 GB for high concurrent IMAP use
- Dual internal drives 9 GB minimum mirrored
- Dual network interface

Compaq 64bit/66MHz Fibre Host Bus Adapter

Reference Configuration

Compaq reference [Sendmail Messaging Server](#) consists of the following components:

- 1 *ProLiant* DL320 Firewall Product
- 2 *ProLiant* DL360 server for Sendmail Switch (Inbound/Outbound)
- 2 *ProLiant* DL360 server for Open LDAP (primary/secondary)
- 1 *ProLiant* DL360 server for Sendmail Proxy Server
- 2 *ProLiant* DL380 servers for Sendmail Mobile Message Server
- 2 *ProLiant* DL580 servers for Sendmail Advanced Message Server (SAMS)
- Compaq *StorageWorks*™ RA4100 Storage system
- Compaq 64bit/66MHz Fibre Host Bus Adapter
- SuSE Linux Enterprise Server 7
- Reiser Journaling File System
- Compaq Insight Management tools

Hardware Installation

Install a Compaq 64bit/66MHz Fibre Host Bus Adapter in each system. Connect the servers and the RA4100 unit to the fibre switch. Depending on the *ProLiant* server you are configuring, a second Network Interface Card may need to be installed.

Software Installation

Base System Installation

Follow these steps to install the base Linux configurations.

Node 1 Base Installation

1. Boot the system with the Compaq *SmartStart* CD to configure the system. Choose Manual installation from the menu, and select Linux for the operating system.

    Configure both the internal storage, and the RA4100 using the *Array Configuration Utility* during *SmartStart* configuration.

    The reference platform used for this paper was configured as:
    Internal Storage – Two 18GB drives RAID 1
    RA4100 – 10 - 9GB drives configured as (1) RAID 0+1 logical partition

2. When *SmartStart* is complete, boot the system with the SuSE Linux Enterprise Edition (SLES) 7 CD. Select the proper language, keyboard, and time zone settings.

    Select custom partitioning.

    The following is the internal storage layout used for the reference platform:
    /boot   64MB   ext2 file system
    swap   512MB   (swap should be same size as installed memory)
    /   Remainder   reiser file system

3. For LifeKeeper to function correctly, the pd korn shell (pdksh) needs to be installed. This shell is not installed by default. From the **Software Selection** screen, leave default system selected:

    –   Click **detailed selection**.

    –   Click **select single packages**.

    –   Scroll the **group selection** window and select **System Environment/Shells**.

    –   Select **pdksh**.

4. To retain access to the Compaq F10 configuration function during POST, LILO needs to be installed in the first sector of the boot partition. From the **System Boot Configuration** menu:

    –   Select **Custom installation**.

    –   Click **Do Not Use LILO**.

    –   Click **Use the 'linear' option**.

    –   Click **Activate partition**.

5. Create a user account and set the root password when prompted.

6. When the install is finished, click OK to boot the system, and press the eject button on the CD-ROM drive.

7. When the system boots, configure the monitor for X Windows and then configure the network cards. The reference system used for testing was configured as follows:

    – lknode1.this.net

    – eth0 192.168.1.1 / 255.255.255.192

    – eth1 10.1.1.1 / 255.255.255.0

Node 2 Base Installation

For node 2, follow the steps for node 1 with the exception of shared storage configuration. The shared storage was configured during node 1 setup so there is no need to re-configure the RA4100.

The reference system for node 2 used the following network information.

    – lknode2.this.net

    – eth0 192.168.1.2 / 255.255.255.192

    – eth1 10.1.1.2 /255.255.255.0

Base System Configuration

Once both nodes have the base Linux system installed, perform the following steps.

Node 1 Configuration

1. From within KDE, open a terminal session.

    Modify the file /etc/rc.config and add an entry for the INITRD_MODULES section.
    ```
    lknode1: # vi /etc/rc.config
    ```

    The original INITRD_MODULES line is "cpqarray reiserfs". Add cpqfc to the line after cpqarray. So the line reads:

    ```
    INITRD_MODULES="cpqarray cpqfc reiserfs"
    ```

2. Save the file and run **SuSEconfig**.
    ```
    lknode1: # SuSEconfig
    ```

3. A new **initrd** file needs to be made using the following commands:
    ```
    lknode1: # mk_initrd
    lknode1: # lilo
    ```

4. Load the fibre driver by using the **insmod** command.
    ```
    lknode1: # insmod cpqfc
    ```

5. Run **yast**.
    ```
    lknode1: # yast
    ```

6. Select **Installation settings - Configure hard disk partitions**.
    Select **/dev/sda**.
    Create one partition using the entire disk.

7. Select **target partitions/file system** from the **yast** menu.
   Highlight **sda1**. Change the file system type to **reiser** and set the mount point to **/array** by selecting **<Other entry>** from the mount point selection screen.

   Answer yes to the questions about modifying the **fstab** file.

Node 2 Configuration

1. From within KDE, open a terminal session.

   Modify the rc.config file for the INITRD_MODULES entry.
   ```
   lknode2: # vi /etc/rc.config.
   ```

   The original INITRD_MODULES line is "cpqarray reiserfs". Add cpqfc to the line after cpqarray so the line reads:

   ```
   INITRD_MODULES="cpqarray cpqfc reiserfs"
   ```

2. Save the file. And run **SuSEconfig**.
   ```
   lknode2: # SuSEconfig
   ```

3. A new **initrd** file needs to be made using the following commands:
   ```
   lknode2: # mk_initrd
   lknode2: # lilo
   ```

4. Manually load the fibre driver by using the **insmod** command.
   ```
   lknode2 # insmod cpqfc
   ```

Installing Sendmail and LifeKeeper

Install the software on node 1, and then install the software on node 2.

1. Follow the SteelEye installation instructions for installing the LifeKeeper packages. Once LifeKeeper has been installed, follow the installation instructions from Sendmail to install the Sendmail Switch and SAMS product.

2. Once LifeKeeper and Sendmail have been installed, run the installer programs for the Sendmail software. This needs to be performed on both nodes.

   ```
   lknode1:/cdrom # /usr/local/sendmail/smadmin-2.2/sbin/installer
   ```

   ```
   lknode1:/cdrom # /usr/local/sendmail/smserver-1.2/sbin/installer
   ```

   Refer to the Sendmail documentation for detailed configuration information.

Note: During Sendmail configuration, when prompted for the system name use the virtual host name. The virtual host name and IP address will need to be entered into your DNS server.

---

3. For the SAMS recovery kit to function properly, two directories from Sendmail need to be moved to the shared storage.

   On node 1, move the store directory from /var/md and the mqueue directory from /var/spool to the shared storage.

```
lknode1:/ # mkdir /array/var
lknode1:/ # mkdir /array/var/md
lknode1:/ # mkdir /array/var/spool
lknode1:/ # cd /var/md
lknode1:/ # mv store /array/var/md
lknode1:/ # ln –s /array/var/md/store store
lknode1:/ # cd /var/spool
lknode1:/ # mv mqueue /array/var/spool
lknode1:/ # ln –s /array/var/spool/mqueue mqueue
```

Node 2 will be configured properly by LifeKeeper when the SAMS hierarchy is created.

4. Run the following commands on each node. This will initialize LifeKeeper and from this point forward the processes will load during a normal boot.
    ```
    lknode1:/ # /opt/LifeKeeper/bin/lkstart
    lknode1:/ # /opt/LifeKeeper/bin/lkGUIserver start
    ```

5. Shutdown both systems. Power up node 1. Once node 1 is booting, power up node 2.

    Once both systems have booted, log on to node 1 as root and open a terminal session. Issue the following command:
    ```
    lknode1:/ # /opt/LifeKeeper/bin/lkGUIapp
    ```

    This will launch the LifeKeeper console. Login into LifeKeeper as root.

    – From the menu, select **Edit** – **Server** – **Create Comm Path…**

    – Enter the remote servers name and specify which interface to use for the heartbeat signal.

    – Use the interface you assigned the private IP address space too.

    Create IP Resource Hierarchy.

    – From the menu select **Edit – Resource – Create Resource Hierarchy**.

    – Select **IP** from the recovery kit drop down box.

    – Use the default settings.

    – You will need to specify the IP Resource (IP address that will be used for the virtual interface).

    – Once node 1 is configured click Accept Defaults for node 2 and the hierarchy will be created on node 2.

    Create File Share Resource Hierarchy.

    – From the menu select **Edit – Resource – Create Resource Hierarchy**.

    – Select **File System** from the recovery kit drop down box.

    – Use the default settings.

    – Once node 1 is configured click **Accept Defaults** for node 2.

    Create SAMS Share Resource Hierarchy.

    – From the menu select **Edit – Resource – Create Resource Hierarchy**.

    – Select **SAMS** from the recovery kit drop down box.

    – Use the default settings.

– Once node 1 is configured click **Accept Defaults** for node 2.

When the process is complete you should have a screen similar to below.
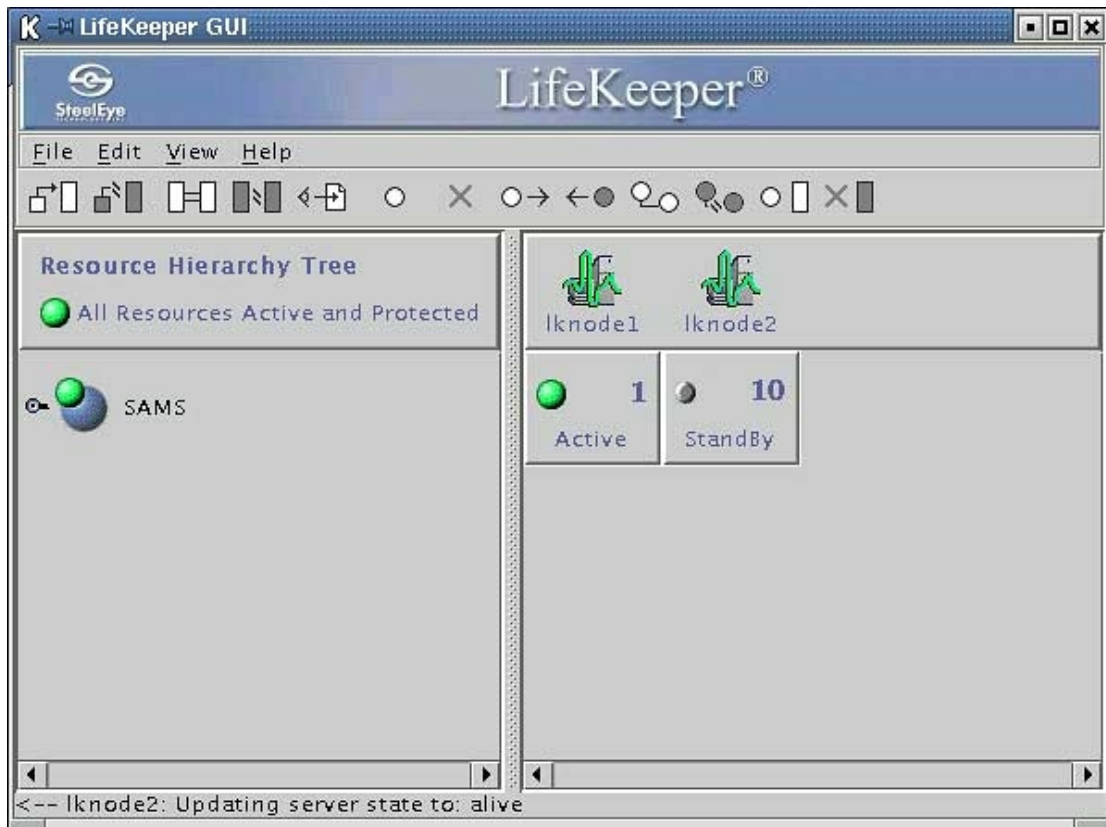

Figure 2: SAMS Share Resource Hierarchy – Collapsed View

If you expand the hierarchy tree you should have a screen similar to the one shown below.

Figure 3: SAMS Share Resource Hierarchy – Expanded View

Guidelines for Testing the Installation

Once the systems are configured and the SAMS hierarchy is functional from within LifeKeeper, system failover should be tested. To test failover, run the LifeKeeper console GUI on node 2. The console screen should show node 1 as active and node 2 in standby. Right click node 2 and select *In Service*. A popup will appear as the scripts are run to switch node 2 into service as the active system. Once node 2 is active, right click node 1 and select In Service. Again, a popup will appear as the scripts run to make node 1 active. Once node 1 is active, turn the power off on node 1. This will initiate a failure and node 2 should go active. There will be a slight pause before node 2 takes over. This is normal as it takes a few seconds for node 2 to see that the heartbeat signal for node 1 is gone.

Reference

- DISA information:
  http://activeanswers.compaq.com/ActiveAnswers/Render/1,1027,1573-6-100-225-1,00.htm

- Compaq Solution for Linux Clusters for *ProLiant*:
  http://www.compaq.com/solutions/enterprise/ha_linux_clusters_index.html

- Compaq Linux Home:
  http://www.compaq.com/linux

- Compaq *ProLiant* Servers:
  http://www.compaq.com/products/servers/platforms/index.html

- Compaq *StorageWorks* RA4100:
  http://www.compaq.com/products/storageworks/RA4100san/index.html

- SteelEye Homepage:
  http://www.steeleye.com/

- Sendmail Homepage:
  http://www.sendmail.com/

- SuSE Linux Homepage:
  http://www.suse.com/