

L-Soft international, Inc.



LISTSERV 17.0 Install Manual for Unix



Table of contents

Information about this document	4
Section 1 Things to consider before installation	5
1.1 Distribution file change from .tar.Z to tar.gz.....	5
1.2 LDAP support is required.....	5
1.3 Classic Distribution vs. Lite Distribution	6
1.3.1 LISTSERV Classic Distribution.....	6
1.3.2 LISTSERV Lite Distribution	6
1.4 For Sites Running Sendmail	6
1.4.1 Sendmail and restricted shells.....	7
Section 2 Installation overview	8
2.1 The Simplified Installation Option.....	8
2.2 The "Classic" Installation Option.....	8
Section 3 Installing LISTSERV	11
3.1 Creating the "LISTSERV" Username	11
3.1.1 Running LISTSERV under a userid other than 'listserv'	11
3.1.2 Where Should I Install LISTSERV?	11
3.2 Extracting Installation Materials from the "TAR" Files.....	12
3.3 Customizing the Makefile to Determine LISTSERV's Location.....	14
3.4 Building the Interface Utilities and LISTSERV Server.....	15
3.4.1 Using the Compiler	15
3.4.2 The LCMD and LCMDX utilities	15
3.4.3 Using the precompiled binaries	16
3.4.4 Adding DBMS Support.....	16
3.5 Installing the Web Interface CGI Binary	18
3.6 Moving Programs and Files to their Proper Directories	18
3.7 Configuring LISTSERV for Your System.....	18
3.8 Telling Your Mail System about LISTSERV.....	20
3.8.1 Telling Sendmail about LISTSERV	21
3.8.2 Telling Postfix about LISTSERV	22
3.8.3 Telling qmail about LISTSERV	23
3.9 Creating and Activating the License Key.....	24
3.10 Setting up LISTSERV Log Rotation and Location (optional but recommended)	24
Special Instructions for Ubuntu	26
Section 4 Starting LISTSERV to verify a successful installation	29
4.1 Register a LISTSERV personal password.....	30
4.2 Starting and Stopping LISTSERV in the Background	30
4.3 Starting LISTSERV Automatically.....	30

4.3.1 SysV.....	31
4.3.2 Systemd.....	31
Section 5 Registering the server	33
5.1 Automatic Registration for LISTSERV Lite Servers	34
Section 6 Installing the LISTSERV web interface	35
6.1 Linux and SELinux issues	37
Securing the LISTSERV web interface with HTTPS	38
Section 7 Installing F-Secure (Linux ONLY)	42
7.1 Recommended FSAV Version	43
7.2 Recommended F-Secure Hotfixes.....	43
7.3 F-Secure Linux Security Installation Instructions	43
7.4 F-Secure Anti-Virus Installation Instructions	44
Section 8 Upgrading your LISTSERV installation	48
Section 9 Additional Resources	51
9.1 Documentation	51
9.2 Mailing Lists	51
9.2.1 Talking to other LISTSERV evaluation kit users	51
9.3 Contacting L-Soft Support	51

Information about this document

This document describes the installation of **LISTSERV 17.0 for UNIX** with a build date of **June 8, 2019** or later.

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Section 1 Things to consider before installation

LISTSERV for Unix is available for the operating systems listed here: [LISTSERV Supported Operating Systems](#).

1.1 Distribution file change from .tar.Z to tar.gz

All LISTSERV for Unix distribution kits built since December, 2018, are compressed with gzip(1), and have extensions like .tar.gz and .bin.gz . This should not cause a problem for our customers as the compress(1) utility formerly used is nearly extinct and gzip(1) is readily available for our supported unix platforms. The main difference is that the distribution kits are significantly smaller due to the superior compression algorithm found in gzip(1).

1.2 LDAP support is required

LISTSERV requires that LDAP support be installed on your machine, whether or not you use LISTSERV's LDAP features. For Linux servers, this may not be an issue, as OpenLDAP is generally installed by most distributions by default. For other unix variants, your mileage may vary.



Note: The config.sh installer will try to identify whether or not your machine has LDAP support before allowing you to add any functionality that requires relinking.

If LDAP is not installed, you may see errors like this at run time:

```
[root@listserv listserv]# ./go bg
> Starting LISTSERV as a background process
[root@listserv listserv]# ./lsv: error while loading shared
libraries:
libldap-2.2.so.7: cannot open shared object file: No such file or
directory
```

In addition, attempting to re-link the 'lsv' executable manually (i.e., from the Makefile) without having LDAP support installed on the machine will result in compiler errors similar to the following:

```
ld: 0711-317 ERROR: Undefined symbol: .ldap_next_entry
ld: 0711-317 ERROR: Undefined symbol: .ldap_first_entry
ld: 0711-317 ERROR: Undefined symbol: .ldap_first_attribute
ld: 0711-317 ERROR: Undefined symbol: .ldap_next_attribute
ld: 0711-317 ERROR: Undefined symbol: .ldap_get_values_len
ld: 0711-317 ERROR: Undefined symbol: .ldap_value_free_len
ld: 0711-317 ERROR: Undefined symbol: .ldap_memfree
ld: 0711-317 ERROR: Undefined symbol: .ber_free
ld: 0711-317 ERROR: Undefined symbol: .ldap_msgfree
ld: 0711-317 ERROR: Undefined symbol: .ldap_search_s
ld: 0711-317 ERROR: Undefined symbol: .ldap_unbind
ld: 0711-317 ERROR: Undefined symbol: .ldap_initialize
ld: 0711-317 ERROR: Undefined symbol: .ldap_set_option
ld: 0711-317 ERROR: Undefined symbol: .ldap_bind_s
```

ld: 0711-317 ERROR: Undefined symbol: .ldap_err2string

and any resulting 'lsv' will not be executable.



Note: Under newer distributions of Linux, it may be necessary to relink LISTSERV with the default OpenLDAP libraries. We currently link against OpenLDAP version 2.4.

1.3 Classic Distribution vs. Lite Distribution



Note: Originally, LISTSERV distribution archives were distributed as tar.Z files. They are now distributed as tar.gz files, making them both smaller and easier to create since the unix 'compress' utility is long since deprecated.

1.3.1 LISTSERV Classic Distribution

LISTSERV Classic for UNIX(R) is distributed either as two compressed "tar" archive files (the original method of distribution) or as a single binary installation kit (used in the "simplified" installation), depending on your needs. The installation guide, which is the file you are currently reading, is also available independently of the archives.

In the original distribution scheme, one of the tar files (common.tar.gz) contains data files common to LISTSERV on all UNIX(R) platforms, including the Makefile, and the other ('uname'.tar.gz, where 'uname' corresponds to your OS-specific distribution) contains the compiled version of the LISTSERV server, object files for recompilation, and the 'wa' CGI for the web archive interface. In order to simplify the process of removing extraneous files created during the installation procedure, you should copy the tar files to a scratch directory, install LISTSERV, and then "rm -fr /tmp/scratch" (or whatever you name the staging area).

The "simplified" distribution is a single binary named 'uname'.tar.gz intended to be gunzipped and then run at the shell prompt. This installer asks a number of questions related to the installation and then installs LISTSERV accordingly.

1.3.2 LISTSERV Lite Distribution

LISTSERV Lite for UNIX(R) is distributed as a single binary installation kit named 'uname'-Lite.tar.gz, which is intended to be gunzipped and then run at the shell prompt. This installer asks a number of questions related to the installation and then installs LISTSERV accordingly.

1.4 For Sites Running Sendmail

For anti-spam and general security purposes, L-Soft strongly recommends that any Unix site running LISTSERV with Sendmail upgrade to at least Sendmail version 8.11.x, and if possible, later versions should be preferred. As of June 2019, it appears that the latest stable version is 8.15.2, released on 3 July 2015.



Note: By "Sendmail", we mean Eric Allman's Sendmail, not Postfix masquerading as Sendmail for compatibility.



Important: While L-Soft supports Sendmail as an MTA for use with LISTSERV, L-Soft does not provide support for the Sendmail product itself.

1.4.1 Sendmail and restricted shells

If you are running sendmail out of a restricted shell (for instance the smrsh shell), note that the lsv_amin mailer program that you will install below must be registered as a trusted application that may be executed by sendmail, or mail sent to LISTSERV and to lists will be rejected (typically with a sh: lsv_amin not available for sendmail programs error, although this may depend on how you have sendmail set up). Registering an application with the restricted shell typically involves placing symbolic links from /usr/adm/sm.bin/ to the programs which are authorized. If you need more information on restricted shells, please refer to the sendmail documentation.

Section 2 Installation overview

There are two ways to install LISTSERV for unix -- a simplified method which uses a shell-based installation program to help you configure the installation, and the “classic” method which consists of two .tar.gz files and a standard Makefile, which gives you complete control over the installation.

2.1 The Simplified Installation Option

A simplified installation procedure for LISTSERV for Unix platforms is available. A configuration script replaces the need to manually configure LISTSERV’s Makefile and go.user site configuration file.

The installation kit can be downloaded as a single compressed binary, shipped as ``uname`.bin.gz`. Simply uncompressing the kit (with `gunzip(1)`), setting its minimum permissions to 700 (owner `rx`), and running it from a scratch directory will allow you to install LISTSERV without having to unpack .tar.gz files, modify the Makefile, etc. While the old two-part kits will remain available for the foreseeable future for sites requiring more control over the installation, this new one-part kit is designed for first-time installers or those who simply wish to install LISTSERV with most of its default settings. It is thus necessarily limited in its scope and does not provide user control over every aspect of the installation, but rather, allows the installer to set several basic options and relies on Makefile defaults for the rest.

If it is desired to have complete control over all aspects of the LISTSERV installation, it will be necessary for installers to continue with the current document,

The simplified installation procedure can be viewed on the Web at <http://www.lsoft.com/manuals/17.0/unixinst-sim.html>

2.2 The “Classic” Installation Option

The “classic” method of installing LISTSERV involves downloading two archive files, one for your specific unix variant (named ``uname`.tar.gz`), and “common.tar.gz” which contains files common to all LISTSERV for Unix variants. These files can be downloaded from the regular L-Soft LISTSERV download page by scrolling to the bottom of the simplified unix kits section and clicking on the hyperlink to take you to the downloads for the standard, or “classic”, kits.

LISTSERV for UNIX is shipped with both:

- pre-compiled `lsv` and `lsv_amin` binaries which will run with the default settings; and
- an `lsv.o` object file and C source for `lsv_amin` that can be linked locally if you need to modify the Makefile or simply prefer to compile the server yourself.

The installation of LISTSERV consists of the following steps:

1. creating a “listserv” username,
2. extracting the files in the archive file(s) into a ‘scratch’ directory,
3. customizing the Makefile, including deciding what directories you want used for incoming mail, as well as for the LISTSERV program and data files,
4. depending on whether or not you are using the precompiled binaries:

- if you are using the precompiled binaries: renaming 'lsv_amin-precompiled' to 'lsv_amin'.
 - if you do not have a compiler, moving or deleting the 'lcmd.c' and 'jobview.c' files from the 'scratch' directory.
5. running "make install", which creates the necessary directories and copies the programs generated in the previous step to the proper places, and sets file and directory permissions so that lsv_amin and 'listserv' can have access to their files,
 6. modifying the "go.user" shell script to accurately describe your system,
 7. appending entries to your /etc/aliases file to handle mail sent to your LISTSERV username, and directing your sendmail daemon to use the new aliases,
 8. creating a "license.merge" file to make license key information available to your server,
 9. (Classic/Classic HPO, optional) subscribing to the LSTSRV-E forum to join others in discussing experiences with the evaluation copies of LISTSERV,
 10. (Lite Free Edition) subscribing to the LISTSERV-LITE forum to join others in discussing experiences with LISTSERV Lite,
 11. and finally (optional; Classic/Classic HPO only), registering your LISTSERV server so that other LISTSERV servers around the Internet will know about your server.

All of these steps are described in greater detail in the sections below. They should be performed in the order they are presented since some steps rely on the results of earlier steps. Once you've finished the above steps, you will be able to start your LISTSERV server and verify that it's working.

If you are using Sendmail as your MTA:

1. Create a 'listserv' account on your system.
2. Make a temporary directory, say /tmp/lsvinst or whatever is convenient.
3. Copy the files, common.tar.gz and `uname`.tar.gz to that directory, uncompress and untar them.
4. Edit the Makefile (if necessary), changing the BINDIR, LSVROOT and LSVPOOL macros to point to the appropriate directories.
5. Enter "make mailer" to compile the sendmail interface, "lsv_amin", and enter "make lcmd" to build the command interface utility "lcmd". If you don't want to use the precompiled lsv binary, enter "make server" to make the LISTSERV server "lsv". You can make all three of them with "make all" if you prefer.
6. Copy the file go.user.sample to go.user, edit go.user, and set the environment variables as directed by the comments in the file.
7. Enter "make install" to create the LISTSERV work directory and spool directory, copy "lsv" and the data files in the "home" directory to wherever you defined LSVROOT, and also to copy "lsv_amin" to the BINDIR directory.
8. Add the lines,

- `listserv: "|/BBB/lsv_amin /SSS listserv"`
- `owner-listserv: "|/BBB/lsv_amin /SSS owner-listserv"`

(where `/BBB` is the `BINDIR` directory, and `/SSS` is the `LSVSPPOOL` directory) to your sendmail aliases file. Then rebuild the aliases and send the appropriate signal to your sendmail daemon to load the new aliases.

1. Delete all the files in `/tmp/lsvinst` (or whatever you called the work space in step 1). All the files needed to run LISTSERV have been copied to either `LSVROOT` or `BINDIR` already, so there's no need to keep anything that's left in the work directory.
2. Follow the instructions in the License Registration Form you received with your installation materials to install your License Access Key (LAK). If you are installing an evaluation copy of LISTSERV, this step is handled automatically by the "make install" command listed above.
3. Ensure that you have set file and directory permissions in such a way that `lsv_amin` and the 'listserv' user have read/write/execute authority where needed. This is the most common problem reported by evaluation kit users.
4. To start the LISTSERV server, change directories to `LSVROOT` and enter either "go" to run the server with output logged to the terminal, or "go bg" to run in the background with the log written to `listserv.log` in the `LSVROOT` directory.
5. Test the server by sending mail to "listserv" from any account other than "listserv" itself with some command in the body of the mail message. Since you haven't defined any mailing lists yet, commands that don't require lists, like `INFO`, `RELEASE` or even `THANKS` commands might be best.

Section 3 Installing LISTSERV

3.1 Creating the "LISTSERV" Username

LISTSERV requires exclusive access to the mail sent to one username. Unless you have a very good reason to do otherwise, the "listserv" username should be used for that purpose. Many people around the world are already familiar with LISTSERV, and will assume that mail sent to <listserv@your.host.name> will reach the server. The LISTSERV account is just an ordinary user, it doesn't need privileges, doesn't require access to restricted directories, and it doesn't need to have any particular UID or GID.

3.1.1 Running LISTSERV under a userid other than 'listserv'



Important: As noted above, this is NOT recommended.

If you do change the username under which LISTSERV runs, you must make sure that the following points are observed as you work through the installation:

1. You must set the LSVNAME macro in the Makefile to the username you have selected.
2. If you have a compiler, you must edit lsv_amin.c and change the line

```
#define LISTSERV "LISTSERV"
```

to

```
#define LISTSERV "USERNAME"
```

where *USERNAME* is the username you have selected.

1. You must ensure that the lsv_amin mailer, when run, is invoked `suid userid`, where "*userid*" is the username LISTSERV is running under. Otherwise mail sent to LISTSERV will be treated as if it were being sent to a list with the name "*userid*".
2. If you do not have a compiler and must use the precompiled lsv_amin executable, you will have to modify the aliases in /etc/aliases that are normally made by the 'make aliases' stage of the Makefile. For instance if you have decided to run LISTSERV under the username 'listmanager', you would have to make the aliases

```
listmanager: "|/usr/local/bin/lsv_amin -t listserv"
owner-listmanager: "|/usr/local/bin/lsv_amin -t owner-listserv"
```

In other words, lsv_amin will be invoked `suid listmanager` but will feed the userid 'listserv' to LISTSERV. Since you cannot change the name used internally by LISTSERV unless you have a compiler, this is required to keep mail to 'listmanager' and 'owner-listmanager' from being treated as list mail rather than administrative mail.

3.1.2 Where Should I Install LISTSERV?

L-Soft **STRONGLY RECOMMENDS** that LISTSERV be installed in the 'listserv' user's normal user space. Typically (and it depends on the operating system) this is something like /home/listserv or /export/home/listserv, but the bottom line is that it is usually a directory found in a partition reserved for user accounts.

Why do we strongly recommend this location? The user filesystem is usually a fairly good-sized partition, sometimes the largest on the machine. This will be important if your LISTSERV server is going to handle a large volume of mail and will be keeping good-sized list archive notebooks on hand. While we have customers who have successfully installed and run LISTSERV from what they consider more secure areas (typically under the root partition, e.g., in /opt/listserv or suchlike), often they find that they run out of space as the LISTSERV archives and logs increase in size. The root partition is usually not as large as the /home (or /export, depending on your OS) partition, because it isn't intended for storage of large files that don't tend to be rotated out over time (like console logs).

Another problem you may run into if installing LISTSERV somewhere where the 'listserv' user typically doesn't have permissions or ownership is possibly having to "fiddle" with the permissions and ownership of various files and directories to make things work. As we said years ago when LISTSERV was first ported to unix systems, the 'listserv' account is just a standard user account; it doesn't need any special or elevated permissions or ownership of files and directories to run properly. (This isn't as true of the web interface files, but we address that later in this document.) If LISTSERV is installed in the correct location for files that belong to the 'listserv' user, you shouldn't need to change anything in this regard, and things will just work.

If you are running SELinux under Linux, in "enforcing" mode, you will probably find that you need to adjust the security context of LISTSERV's files and directories, as well, if they are installed somewhere other than the default location.

Frankly, we feel that there is no particular advantage to installing LISTSERV under the root file system as opposed to under the file system reserved for user accounts. LISTSERV should be treated as a non-privileged user, albeit an automated one, and its files should be installed accordingly.

3.2 Extracting Installation Materials from the "TAR" Files



Important: The Makefile should be run from a temporary directory rather than the target directory. Otherwise some 'mv' commands will produce unexpected results.

For LISTSERV Classic, the two archive files you receive will be called common.tar.gz and either AIX.tar.gz, or SunOS.tar.gz, or Linux.tar.gz, etc... depending on the version of UNIX(R) you are using. The filename is taken from the string returned by the "uname" command on each UNIX(R) platform.



Note: For LISTSERV Lite, you will receive only one archive file, which will be called AIX.bin.gz, or SunOS.bin.gz, or Linux.bin.gz, etc., depending on the version of UNIX(R) you are using. Again, the filename is taken from the string returned by the "uname" command on each UNIX(R) platform. For standard LISTSERV Lite installations, you should refer to the [Simplified Installation Guide](#) as the instructions that follow do not normally apply to LISTSERV Lite.

It is possible to install LISTSERV Lite using the `uname`.tar.gz and common.tar.gz method in this chapter, and simply applying a LISTSERV Lite LAK to make LISTSERV come up as LISTSERV Lite. However, there is no particular value in doing so because there are no options available in LISTSERV Lite that would require the lsv binary to be relinked.

Some third-party FTP sites may change the name of the files slightly to adhere to system specific naming conventions. If you're used to dealing with gzipped tar files already, then just

extract the contents using whatever commands you prefer. If you'd like the sample commands listed below to work as shown, rename the files you received to `common.tar.gz` and ``uname`.tar.gz` before continuing. For example, if the system specific file you received is called `aix.tar-z`, you would enter the command `mv aix.tar-gz `uname`.tar.gz`. Copy or move the two files to a scratch directory first. (The advantage of using a work directory for the installation is that you can easily clean up afterwards.)

Once the files have been copied, "cd" to that directory and enter, `gunzip *.tar.gz` to restore them to their original state. Then enter the commands `tar xf common.tar` and `tar xf `uname`.tar` to unbundle the programs, data files, etc., needed to install LISTSERV. Afterwards you should find the following files and directories have been created in your current directory:

<code>go</code>	<code>lsv_amin-precompiled</code>
<code>go2</code>	<code>lsv-logger.pl</code>
<code>go.sys</code>	<code>lsv-logger.readme</code>
<code>go.user.sample</code>	<code>lsv.o</code>
<code>home</code>	<code>lsvstop</code>
<code>jobview.c</code>	<code>Makefile</code>
<code>lcmd.c</code>	<code>nocli.o</code>
<code>lcmdx.c</code>	<code>nooci.o</code>
<code>listserv-initd-script.sample</code>	<code>nouodbc.o</code>
<code>listserv-service-scripts.readme</code>	<code>unixinst_files</code>
<code>listserv-systemd-service.sample</code>	<code>unixinst.htm</code>
<code>listview.c</code>	<code>unixinst-sim_files</code>
<code>lsv</code>	<code>unixinst-sim.htm</code>
<code>lsv_amin.c</code>	<code>wa</code>
<code>lsv_amin.h</code>	

and the `./home` directory will contain the following files:

<code>aliases.names</code>	<code>linkswt2.file</code>	<code>listkwd.file</code>	<code>maestro.mailtpl</code>
<code>bitearn.nodes</code>	<code>listall.refcard</code>	<code>listlpun.memo</code>	<code>stdcmd.file</code>
<code>country.file</code>	<code>listcat.file</code>	<code>listmast.memo</code>	<code>syscfg.file</code>
<code>default.mailtpl</code>	<code>listdb.memo</code>	<code>listownr.memo</code>	<code>sysff.file</code>
<code>default.wwwtpl</code>	<code>listdev.memo</code>	<code>listpres.memo</code>	<code>system.catalog</code>
<code>errfac.file</code>	<code>listfaq.memo</code>	<code>listqs.memo</code>	<code>upload.cab</code>
<code>htmledit.bundle</code>	<code>listfile.memo</code>	<code>listserv.memo</code>	<code>upload.jar</code>
<code>intpeers.names</code>	<code>listjob.memo</code>	<code>lsvhelp.file</code>	
<code>license.merge</code>	<code>listkeyw.memo</code>	<code>lsvinfo.file</code>	

Sample commands for this step:

```
mkdir /tmp/scratch
cp common.tar.gz `uname`.tar.gz /tmp/scratch
cd /tmp/scratch
gunzip *.gz
tar xf common.tar
tar xf `uname`.tar
```

- or -

```
mkdir /tmp/scratch
cp common.tar.gz `uname`.tar.gz /tmp/scratch
```

```
cd /tmp/scratch
zcat common.tar.gz | tar xf -
zcat `uname`.tar.gz | tar xf -
```

3.3 Customizing the Makefile to Determine LISTSERV's Location

If you plan to use the precompiled `lsrv` binary, you may skip this section as it uses the defaults for these locations.

Before you can continue with the installation of LISTSERV, you need to choose where you want several things to be placed. The installation process needs the full path names of three directories. All of them are defined by macros in the Makefile (which was extracted from the `common.tar` archive in the preceding step).

The directory where the mail interface and command line interface programs should be installed is defined by the `BINDIR` macro. The Makefile is distributed with `BINDIR` set to `/usr/local/bin` by default. Whether you choose to use the default directory, or redefine it, the installation procedure assumes the directory already exists. If you choose a new directory, you will need to create it before running the final "make install". This directory is referenced only during the installation of the mail interface. Neither the mail interface program, the command line interface utility, nor the LISTSERV server process requires write access to this directory afterwards.

Incoming mail is written to the directory defined by the `LSVSPPOOL` macro in the Makefile. The default value is `$(LSVROOT)/spool`. Unlike the `BINDIR` directory, the LISTSERV spool directory is assumed to be a new directory. In fact, no other users or daemon processes should write to this directory since LISTSERV scans this directory for incoming mail. If the directory doesn't exist when the "make install" command is executed, it will be created, and the LISTSERV account will be made the owner.

The LISTSERV executable, as well as associated directories and data files will be installed in the directory pointed to by the `LSVROOT` macro in the Makefile. Any directory can be used, so long as LISTSERV has write access to it. When the final "make install" is run, the `LSVSPPOOL` directory, and several subdirectories, will be created if necessary. The LISTSERV account will be made the owner of those directories. The Makefile is distributed with the `LSVROOT` macro set to `/home/listserv`. If you choose the default setting, the directories `/home/listserv`, `/home/listserv/home`, and `/home/listserv/tmp` will be created as a result.

To use different directories, edit the Makefile and change the `BINDIR`, `LSVSPPOOL`, and/or `LSVROOT` macros.



Documented Restriction: Under unix, all files and directory paths accessed by LISTSERV MUST be in lower case. In other words, you cannot install LISTSERV under the `LSVROOT` path of `/home/users/LISTSERV`; instead, you must use the path `/home/users/listserv` instead (or in any case, a path that is in lower case).

Sample command for this step:

```
vi Makefile
```

3.4 Building the Interface Utilities and LISTSERV Server

BEFORE RELINKING LISTSERV BINARIES, PLEASE READ [SECTION 1.2, LDAP Support Is Required](#), OF THIS DOCUMENT.



Note: L-Soft does not recommend using the precompiled executables if you have a compiler. It is always preferable (and indeed, may be necessary) to compile and link with your own local libraries rather than to assume that ours are the same as yours. However, it is not always required to do so.

3.4.1 Using the Compiler

The program that handles incoming mail is called `lsv_amin` and is distributed in source form. The file `lsv_amin.c` is a standalone program that can be modified to suit your local mail system as needed. It should work as distributed with unmodified Sendmail systems, as well as with postfix and exim systems.

If you have decided to link the `lsv.o` file and make your own `lsv` binary, there should be no need to modify anything in the Makefile to perform this step.

Sample commands for this step:

```
vi Makefile
vi lsv_amin.c
```

3.4.2 The LCMDD and LCMDDX utilities

The `lcmd` utility is also distributed in source form. Once you've compiled and installed `lcmd`, it can be used locally to send commands to the LISTSERV server rather than having to use a mail program.



Note: `lcmd` works by opening a named pipe and creating a `.job` file in the `LSVSPool` directory, which LISTSERV then processes exactly as if it had received it as a piece of SMTP mail. Because `lcmd` is not a network-aware application, it must be invoked locally by a user logged into the LISTSERV machine.

Long-time users familiar with the BITNET version of LISTSERV will find `lcmd` works much like the VM "tell" and JNET "send" commands. The primary differences are that LISTSERV sends back mail in response to commands submitted with `lcmd`, and only your local LISTSERV server can be reached. In addition to providing a simple command line interface to LISTSERV, sending commands with `lcmd` obviates the need for password validation of protected commands. Since the origin of the command is determined by the username of the person running `lcmd`, not by parsing mail headers, password checking can be skipped by LISTSERV. The `lcmd.c` program should compile without modification. Site specific information needed by `lcmd` will be provided by the Makefile when building the program.

The `lcmdx` utility is also distributed in source form. Similar to `lcmd`, once you've compiled and installed `lcmdx`, users can use it to send commands to your LISTSERV server rather than having to use a mail program. `lcmdx` differs from `lcmd` in two important ways:

`lcmdx` is a TCP/IP application which interfaces directly with LISTSERV's TCPGUI API and communicates in real-time from the user's console with the LISTSERV command processor (much as could be done on BITNET with "TELL" commands). It can be run remotely as long as the TCPGUI port (usually 2306) is not firewalled or otherwise blocked from the remote user's location.

lcmdx requires a full login and appropriate LISTSERV administrator permissions for the user issuing the commands.

The `lcmdx.c` program should compile without modification.



Note: Although any command sent from lcmdx is authenticated against LISTSERV's internal security methods, it is NOT recommended to provide access to the utility to either general users or list owners. L-Soft recommends that use of the utility be restricted to LISTSERV administrators only (that is, the people listed in the `POSTMASTER=` setting in `go.user`).

Please be aware that lcmdx was originally intended as "demonstration" code, for use by sites wishing to develop their own custom applications for the LISTSERV TCPGUI API, and not as a full-fledged replacement for mailed commands, although it certainly can be used in that way.

If not already present in the `$LSVROOT` directory after installation, and assuming you have a compiler, the `lcmd` and `lcmdx` utilities can be compiled easily with the following commands:

```
make lcmd
make lcmdx
```

3.4.3 Using the precompiled binaries

If you do not have a compiler, or if you have just decided to use the precompiled binaries from the kit, you now need to rename the `lsv_amin-precompiled` binary to `lsv_amin`. This will prevent 'make' from trying to call 'cc'.



Note: There is no precompiled `lcmd` binary. This is because `lcmd` requires that the `LSVSPPOOL` directory specification be compiled into it, and there is no way to know ahead of time whether or not your site will be using the defaults. Therefore sites that elect to use the precompiled binaries will not be able to run 'make lcmd'.

Sample commands for this step:

```
mv lsv_amin-precompiled lsv_amin
```

If you do not have a compiler:

```
rm lcmd.c
rm jobview.c
```

3.4.4 Adding DBMS Support

(See the [Advanced Topics Manual](#) for LISTSERV for more information on DBMS support.)

LISTSERV for unix kits support Oracle, DB2, and MySQL (via unixODBC) in a single, universal kit. This kit contains both a precompiled 'lsv' executable (which does not support any database), and a set of object files allowing you to link a new 'lsv' that supports any combination of databases for which you have a run-time environment on the machine running LISTSERV. The following object files are included:

lsv.o	Main object file for linking 'lsv'
nooci.o	Link with lsv.o to disable OCI (Oracle) support
nocli.o	Link with lsv.o to disable CLI (DB2) support
nojdbc.o	Link with lsv.o to disable unixODBC (MySQL) support

If a particular database is not available for your operating system, the corresponding noxxx.o file will have been pre-linked into lsv.o and will not be included in the kit.



Note: You may relink LISTSERV with only the following combinations of DBMS support:

- OCI only
- CLI only
- unixODBC only
- OCI and CLI

LISTSERV cannot be relinked with support for both CLI and unixODBC at the same time. This is due to the fact that the two implementations are quite similar and share function namespace inside LISTSERV.

LISTSERV installation kits contain a Makefile that is set up to relink 'lsv' without any DBMS support by default. A new "OS-specific flags" section has been added where you can add or remove DBMS support simply by adding or removing the reference to the appropriate no*.o file. For instance, if you are running Solaris, the default flags line is

```
CFLAGS_Solaris=nooci.o nocli.o -lsocket -lnsl
```

If you want to relink 'lsv' with Oracle support, simply change this line to

```
CFLAGS_Solaris=nocli.o -lsocket -lnsl
```

If you want to relink 'lsv' with DB2 support, you would change the line to

```
CFLAGS_Solaris=nooci.o -lsocket -lnsl
```

Relinking 'lsv' with unixODBC support is not quite as intuitive. You would use the following flags line:

```
CFLAGS_Solaris=nooci.o -lsocket -lnsl -ljdbc
```

For unixODBC, you must leave CLI support enabled because CLI and unixODBC share internal function names in LISTSERV, as noted above. In addition, you must also link explicitly to the unixODBC library (the -ljdbc flag). Please see the [Advanced Topics Manual](#) for LISTSERV for more detailed information on configuring unixODBC support.

As noted in the Makefile, Solaris requires that -lsocket and -lnsl must be linked in all cases, so don't remove these references from CFLAGS_Solaris under any circumstances.

The other supported unices are configured in a similar manner.



Important: You should not relink with DBMS support unless you have the appropriate DBMS support (Oracle Net (formerly SQL*Net), DB2, unixODBC) installed on your machine. Without this support, the link option will fail.

3.5 Installing the Web Interface CGI Binary



Note: This procedure does not attempt to make any directories or files required by the web archive interface. You still need to follow the instructions [below](#) to fully install the interface.

While you will still want to review the [Installing the LISTSERV Web Interface](#) section, if you want the installation procedure to properly install and set ownership/permissions on the 'wa' executable, you need to provide the path to your cgi-bin directory in the Makefile macro CGIDIR and uncomment that line in the Makefile. By default this installation feature is commented out:

```
#CGIDIR=/var/www/cgi-bin
```

The example setting appears to be a common default for most current Apache versions, but it is your responsibility to ensure that you define the correct directory if you uncomment and use this feature. L-Soft does not recommend taking this default blindly as it may differ on your server.

If you do not uncomment this line, neither 'make install' or 'make update' will try to install 'wa', and you will have to copy it to your cgi-bin directory manually per the instructions [below](#).

3.6 Moving Programs and Files to their Proper Directories

The command, "make install" will copy the "lsv", "lsv_amin", and "lcmd" programs to the appropriate directories, as specified by the **BINDIR** and **LSVROOT** macros in the Makefile. In addition, several directories will be created and a number of data files copied to those directories. While there are scenarios in which you can complete this step from the LISTSERV account, in most cases you will need to become "root" to run the "make install" command.

SOLARIS SPECIFIC: When issuing the commands below be sure to follow them exactly. If you issue "su - root" instead of "su root" LISTSERV will be installed but will fail when you attempt to start it.

Sample commands for this step:

```
su root
make install
exit
```

3.7 Configuring LISTSERV for Your System

LISTSERV needs to know a variety of things about your system, and also how to communicate with the people that will be maintaining the software. All of the settings that you are likely to want to change are defined in the "go.user" shell script, which is created in the **LSVROOT** directory when you enter "make install". There are a number of environment variables that you can set to reflect things like the Internet domain name of the machine that will be running LISTSERV, the email address of the LISTSERV postmaster, etc... You'll need to edit the go.user file in the **LSVROOT** directory, and set each of the variables as appropriate. There are comments in the file explaining the purpose of each variable, and we will discuss the basic settings that must be made before you can start the software below.

After 'make install' finishes, it will tell you that you need to chdir into the ~listserv directory

and edit the `go.user` file before you can start the server. You will need to gather some information before you start.

What is the DNS hostname for the machine on which LISTSERV is going to be installed? This is something like `LISTSERV.YOURDOMAIN.COM`. It must be a fully-qualified domain name (FQDN) and it must map to an A or MX record in your domain's DNS service. While it is possible to use a bracketed IP (e.g., `[10.0.0.24]`) for testing purposes, as noted above the use of bracketed IPs in production is not supported and not recommended.

What are the email addresses for the LISTSERV maintainers (the person or persons who are authorized to create lists and operate/maintain the server)?

To configure the server, first open LISTSERV's `go.user` file with any text-based editor (emacs, vi, pico, etc.). There are four basic settings that must be configured before LISTSERV can be run.

Sample commands for this step:

```
cd /home/listserv
vi go.user
```

NODE

```
# -- The fully qualified domain name for this host.
NODE="LISTSERV.EXAMPLE.COM"
```

The NODE setting is the fully-qualified domain name as registered in DNS for the machine LISTSERV is running on. As noted above, it is possible to insert a square-bracketed dotted-decimal IP address in this box for testing purposes, but L-Soft neither recommends nor supports this in production. This is the host name that LISTSERV will always identify itself with when it sends mail out.

MYDOMAIN

```
# -- All possible domain names for this machine. SPACE SEPARATED!
MYDOMAIN=$NODE
```

It is usually best to leave this set to the default, ie, `$NODE`, but under some circumstances it may be necessary to deviate from the default.

MYDOMAIN does not refer to your corporate Internet domain. MYDOMAIN is the space-separated list of all possible host names your machine might be known as. In many cases the value of MYDOMAIN is the same as NODE, but for instance some machines running LISTSERV also run the enterprise's World Wide Web server, and may thus be identified in DNS as something like `WWW.EXAMPLE.COM`. If you have users who receive mail on this machine, you might also have a DNS record for `MAIL.EXAMPLE.COM` pointing to it. And of course we'll assume that NODE has been set above to something like `LISTSERV.MYCOMPANY.COM`. Using this as an example, you would set the MYDOMAIN setting to contain, in space-separated format, all of these names that mail might come in to LISTSERV under, with the NODE value coming first:

```
MYDOMAIN="$NODE WWW.MYCOMPANY.COM MAIL.MYCOMPANY.COM"
```

This way if someone accidentally writes to `LISTSERV@MAIL.EXAMPLE.COM`, LISTSERV will recognize `MAIL.EXAMPLE.COM` as equivalent to `LISTSERV.EXAMPLE.COM` and will

process the mail as if it had been addressed to `LISTSERV@LISTSERV.EXAMPLE.COM`. Otherwise the mail may bounce as LISTSERV has no other way to know what other names the machine might be known by in DNS.

POSTMASTER

```
# -- The email address(es) of the LISTSERV maintainer(s). SPACE
SEPARATED!
POSTMASTER="me@example.com"
```

This is a space-separated list of `userid@host.domain` type email addresses belonging to people who have authority to manage LISTSERV--specifically the people who are allowed to create lists, but also who have pretty much global authority on the server to look at lists, modify list headers, and so forth. There are some advanced options for this setting but for right now you will probably just want to insert your own email address so that you can test the server.

Please note carefully that the POSTMASTER should NEVER be `LISTSERV@` anywhere or `POSTMASTER@` anywhere. These userids are reserved and mean specific things to LISTSERV. If you need to use a generic name for a postmaster account, it is recommended that you use something like "listmaster" or "lstmaint" instead.

CREATEPW

```
# -- The password to be used when sending "put" commands to create
files
CREATEPW="luxfiat"
```

The password that will be used to create lists and perform certain management functions (such as administering LISTSERV's user password feature). Note that when using the web management features, you do not use the `CREATEPW=` value, but rather your own personal LISTSERV password, to validate your identity. See the main LISTSERV documentation for information on how to create a personal LISTSERV password.



Note: Setting a shared password value for `CREATEPW` is obsolete and deprecated. LISTSERV personal passwords are encrypted by default and are much more secure than the plain-text `CREATEPW` setting in the `go.user` file. Unless there is a compelling reason to set it differently, the `CREATEPW=` value should always be set to

```
CREATEPW="*NOPW*"
```

and LISTSERV will accept only individual administrators' personal passwords (as noted above) for the purpose of authenticating site-level functions.

3.8 Telling Your Mail System about LISTSERV

For Sendmail, see the [Telling Sendmail about LISTSERV](#) section.

For Postfix, see both the [Sendmail](#) section and the [Telling Postfix about LISTSERV](#) section.

For qmail, see the [Telling qmail about LISTSERV](#) section.

3.8.1 Telling Sendmail about LISTSERV



Note: The file you need to edit in this step, and the commands you need to issue, will require root privileges. Also, while the procedure for manually modifying the sendmail aliases file is described below, you can also enter "make aliases" to have the installation program complete this step automatically. The automated procedure assumes that your sendmail stores aliases in the file `/etc/aliases`, that the "newaliases" command will rebuild the aliases database, and finally that "kill -HUP `cat /etc/sendmail.pid`" will cause Sendmail to read in the updated alias list. (On some systems this last item is not required as it is taken care of when you run 'newalises'.)

LISTSERV accepts and responds to several email addresses. Even before you setup mailing lists, mail sent to `listserv` and `owner-listserv` should be handed to LISTSERV. The link between LISTSERV and your mail system is the `lsv_amin` program. If you are running Sendmail, the best way to route incoming mail to `lsv_amin` is by adding entries to your "aliases" file. Refer to the manual pages for sendmail on your system if you are not sure where the alias file is stored. On many systems the file will be called `/etc/aliases`. Once you have located the file, add the following lines,

```
listserv: "|/BBB/lsv_amin /SSS listserv"
owner-listserv: "|/BBB/lsv_amin /SSS owner-listserv"
```

to the file, replacing `/BBB` with the directory where the `lsv_amin` program was installed (the `BINDIR` macro in the Makefile), and replacing `/SSS` with the LISTSERV spool directory (the `LSVSPPOOL` macro from the Makefile). Other than that, the lines should look exactly like the examples above. The double quotes should be entered into the alias file.

For example, if you changed `BINDIR` to `/usr/lbin`, and kept the default `LSVSPPOOL` directory, the new lines in `/etc/aliases` would look like the following.

```
listserv: "|/usr/lbin/lsv_amin /home/listserv/spool listserv"
owner-listserv: "|/usr/lbin/lsv_amin /home/listserv/spool owner-
listserv"
```

After updating the alias file, you will need to issue two Sendmail commands. First enter "newaliases" to compile the alias file into the format the sendmail daemon expects. Then on some systems you may also need to direct the sendmail daemon currently running on your system to read the newly compiled list of aliases. Refer to the manual pages for sendmail if you are unsure of how to do so. The command, "kill -HUP `cat /etc/sendmail.pid`" will work on AIX and SunOS systems. If you are running a syslog daemon, sendmail will log the fact that it has loaded the new aliases file. You can check the syslog output after issuing the command to make sure your changes are in place.

Sample commands for this step:

```
su root
cd /etc
vi aliases
newaliases
exit
```



Note: While L-Soft supports Sendmail as an MTA for use with LISTSERV, L-Soft does not provide support for the Sendmail product itself.

3.8.2 Telling Postfix about LISTSERV

LISTSERV can be used with Postfix, which was designed as an alternative to sendmail. Postfix has a number of advantages, not the least of which is that it is much simpler to configure than sendmail.

In general, the instructions for interfacing LISTSERV with sendmail are all you need to follow for Postfix. Modern versions of Postfix typically use the same `/etc/aliases` file as sendmail. If your local installation is configured differently, you will have to modify the ALIASES macro in LISTSERV's Makefile to point to the appropriate aliases file, which can be found by issuing the command

```
postconf alias_maps
```

at the unix command line. Otherwise, LISTSERV is happy to work with Postfix as a replacement for sendmail.

If you plan to use LISTSERV's address probing feature with Postfix (the default is to do so when sending mail-merge jobs, for instance, or when you have configured a list for Auto-Delete), you must configure Postfix to direct all mail received for unknown recipients to LISTSERV. This is because bouncing address probes come back to specially-formatted addresses -- for instance,

```
owner-mylist-l*someuser**EXAMPLE*-COM@LISTSERV.MYORG.COM
```

These addresses positively identify to LISTSERV:

- which list or mail-merge job originated the message that bounced; and
- which recipient is the bouncing address.

In order to direct these mails to LISTSERV, you need to modify Postfix's `master.cf` and `main.cf` files. Typically these are found in `/etc/postfix`, but your installation may vary.

In the `master.cf` file, add a service called "lsvamin" as follows (we are assuming a default installation of LISTSERV for our file locations):

```
# LISTSERV redirection
lsvamin  unix  -      n      n      -      -      pipe
 flags=F user=listserv argv=/usr/local/bin/lsv_amin
/home/listserv/spool ${user}
```

Then, in the `main.cf` file, add:

```
fallback_transport=lsvamin
local_recipient_maps=
```

Stop and restart Postfix, if it is already running. Finally, in `/etc/aliases`, you will also have to add at least one LISTSERV alias:

```
listserv: "|/usr/local/bin/lsv_amin /home/listserv/spool listserv"
```

and then run ``newaliases``. If you don't do this, mail sent to the 'listserv' user will end up in the unix mailbox, and never get to LISTSERV's command processor.

If you prefer to create a [Postfix virtual host](#) instead, add the lsvamin service to master.cf as outlined above, and then add the following in main.cf:

```
virtual_mailbox_domains = your.virtual.domain.com
virtual_transport = lsvamin
```

(Replace `your.virtual.domain.com` with the actual name of the virtual domain you will be creating.)

In either case, it should be noted that all mail addressed to unknown recipients will be shunted to LISTSERV, which can cause LISTSERV postmasters to see significantly more bounce mail than they would otherwise.

For more advanced help with postfix, please see <http://www.postfix.com/documentation.html>. Some large LISTSERV sites are running with postfix and you can probably get help from their admins by joining and writing to the [LISTSERV-L mailing list](#).



Note: While L-Soft supports Postfix as an MTA for use with LISTSERV, L-Soft does not provide support for the Postfix product itself.

3.8.3 Telling qmail about LISTSERV



Note: To all intents and purposes, qmail is obsolete. It does not appear to have been updated for a number of years. This section remains in our documentation for historical purposes only and may be removed in a future version.

LISTSERV can be used with qmail. However, L-Soft does not have any test machines running with qmail so the procedure as outlined is based on correspondence with customers who have made this combination work rather than based on tests run on our own systems.

Assuming defaults for everything else, you should include a file called

```
/home/listserv/.qmail
```

that has the following statement in it (all on one line without wrapping):

```
|/var/qmail/bin/preline /usr/local/bin/lsv_amin -s
/home/listserv/spool -t listserv
```

You must also create another file called `~alias/.qmail-default` with the following line in it (again, all one line without wrapping):

```
|/var/qmail/bin/preline /usr/local/bin/lsv_amin -s
/home/listserv/spool -t $LOCAL
```

(Note that `~alias` is a link to `/var/qmail/alias`.) This entry "generalizes" the aliases that under sendmail would have to go into `/etc/aliases`.

For more advanced help with qmail you should contact the appropriate qmail support lists and newsgroups (see <https://cr.yip.to/qmail.html> for the current qmail home page).

It is unknown how many LISTSERV sites continue to run qmail, but it is doubtful the number is very high. You may be able to get help from their admins by joining and writing to the [LISTSERV-L mailing list](#).



Note: While L-Soft supports qmail as an MTA for use with LISTSERV, L-Soft does not provide support for the qmail product itself.

3.9 Creating and Activating the License Key



Note: This step is handled automatically for evaluation kits. The necessary file, called "license.merge", is provided in the common.tar archive and the "make install" command will copy it to the proper directory.

Before you can start up LISTSERV, you will need to install a License Activation Key (LAK) for 'LISTSERV-xxx' (xxx = LINUX, AIX, SOLARIS, etc...). In order to offer the same range of services to all LISTSERV sites, regardless of the operating system used, we had to develop our own "license key" scheme. Using system supplied license managers where available and L-Soft LAKs elsewhere would have required us to develop multiple authorization schemes, and would also complicate the task of issuing license keys to customers.

Since the LAK manager is part of LISTSERV, installing the LAK is done last, after all the programs have been built and moved to their proper directories. The process is quite simple, you just create a file called license.merge in the `$LSVROOT/home` directory and start the LISTSERV server to compile the information. The instructions for doing so are described in the License Registration Form that came with your installation materials.

Note that the license.merge file you create in `$LSVROOT/home` MUST be owned by the 'listserv' user and the 'listserv' user MUST have full control over it. Unless you are logged in as the 'listserv' user when creating the license.merge file, we recommend issuing the following commands at the unix command line after saving the file:

```
chown listserv:listserv license.merge
chmod 700 license.merge
```

3.10 Setting up LISTSERV Log Rotation and Location (optional but recommended)

LISTSERV console logging under unix is accomplished by running the server in the background. The 'go' script contains code to redirect standard output to a file when it is executed with the 'bg' command line option (that is, 'go bg'). By default, standard output is redirected to a file in the `$LSVROOT` directory called 'listserv.log', which is never rotated unless LISTSERV is stopped, the file is somehow renamed (the 'go' script code doesn't do this for you), and LISTSERV is restarted and begins writing to a fresh copy of 'listserv.log'. This is non-optimal for debugging, as the listserv.log files can grow very large if LISTSERV isn't restarted on a regular basis, and there might be days or weeks worth of log entries in the file to search through if you have a problem that needs to be debugged.



Documented Restriction: Logs will be redirected to a file only when LISTSERV is started and runs in the background. When LISTSERV is running in the foreground, standard output is NOT redirected and no log file will be written.



Note: The old way of rotating logs required a cron job to stop and restart LISTSERV at least once daily so that the log was renamed. Typically this would be done at around 3AM (not at midnight, since LISTSERV does a lot of housekeeping at midnight and should not be stopped in the middle of that).

L-Soft DOES NOT recommend the old way, and DOES recommend that sites still using the old method should switch to using the current method as

described below.

For many years, L-Soft has shipped a perl script called 'lsv-logger.pl' in the unix installation kits. lsv-logger.pl is a log rotation script that rotates the LISTSERV log file under unix automatically at midnight, *without* needing to stop/restart LISTSERV. It also makes the log file naming consistent with the Windows version of LISTSERV. (Caveat: Be sure the server's clock is set accurately.)

Perl must be installed on the machine. Perl version 5.6.1 or later is recommended.

Basic support for lsv_logger is already present in LISTSERV's 'go' script. Assuming lsv_logger.pl was installed along with LISTSERV, which it normally is by default, it should already be present in the LSVROOT directory, and the ownership and permissions should already be set for you, e.g.,

```
-rwx-----. 1 listserv root          827 Jun 11 2019 lsv-logger.pl
```

Should it be preferred to keep the dated logs in the LSVROOT directory, simply uncomment the LOG_PATH variable in go.user, and specify "." as the LOG_PATH value. However, L-Soft strongly recommends that the logs be kept in a standardized location, e.g., somewhere under /var/log, and preferably in their own directory under that path, rather than in the LSVROOT directory.

To activate log rotation and write logs to a directory other than LSVROOT, simply follow these instructions:

Create the directory where you want the logs to be written, and give 'listserv' both ownership and rwx privileges in it. Depending on where you decide to create the directory, these steps may require root (or sudo) access. Sample unix shell commands (not LISTSERV commands) for creating the directory and setting appropriate permissions are

```
cd /var/log
mkdir listserv
chown listserv:listserv listserv
chmod 700 listserv
```

Check it with:

```
ls -ld /var/log/listserv
```

Should look like:

```
drwx-----. 2 listserv listserv 35 Mar  3 11:28 /var/log/listserv
```

Next, open go.user in a text editor, find and uncomment the LOG_PATH variable, and set it to contain the path to the directory you just created, e.g.,

```
LOG_PATH="/var/log/listserv"
```

Save and close go.user . When you next start or restart LISTSERV, it will begin writing its dated logs in the directory specified in LOG_PATH.

Special Instructions for Ubuntu

LISTSERV for Linux is developed primarily under Red Hat Enterprise Linux (RHEL) and its "debranded" counterpart, CentOS. The Ubuntu distribution of Linux poses some interesting challenges, in that its designers have chosen different options for various programs needed by LISTSERV.

L-Soft engineers installed a non-GUI copy of Ubuntu Server 18.04 LTS on a Microsoft Windows Server 2016 Hyper-V virtual machine, Generation 1 VM, with 2GB RAM and 2 virtual processors. This is probably overkill if the machine is intended for low-volume mailing and no DBMS connections, etc. (If you are running on modern, dedicated hardware rather than in a virtual machine environment, you are probably already starting with 4GB or more of RAM and at least 8 CPU cores, so you may not have to worry about this.)

When we started the Ubuntu installation, we took all the defaults offered at install time, other than manually configuring the eth0 Internet connection and setting the initial user. We did not change the default disk partitioning.

After the Ubuntu installation completed and the machine was rebooted, we found that the following packages were required to be installed for use with LISTSERV:

Apache web server:	<code>sudo apt-get install apache2</code>
Postfix mail server:	<code>sudo apt-get install postfix</code>
GCC Gnu C compiler:	<code>sudo apt-get install gcc</code>
OpenLDAP development libraries:	<code>sudo apt-get install libldap2-dev</code>
The "Make" utility:	<code>sudo apt-get install make</code>

Apache

Unlike the default in Red Hat Enterprise Linux (RHEL) and CentOS, Apache is not installed as "httpd". It is installed as "apache2". Thus, the base configuration file is found in `/etc/apache2`, and it is called `apache2.conf`.

Apache is not set up to serve CGI by default, nor does it serve CGI from the expected `/var/www/cgi-bin` directory as in RHEL/CentOS. The Ubuntu designers have chosen to place the `cgi-bin` directory under `/usr/lib/cgi-bin`. When running the LISTSERV installation kit, be on the lookout for being asked where to place the WA cgi; you will have to change the directory specified to `/usr/lib/cgi-bin`.

In order to make Apache serve the CGI, you will also need to add a symbolic link as follows:

```
me@ubu:~$ cd /etc/apache2/mods-enabled
me@ubu:~$ sudo ln -s ../mods-available/cgi.load
```

and then restart Apache:

```
me@ubu:~$ sudo apachectl restart
```

Otherwise you will simply get a 404 when you attempt to reach the WA interface.

Postfix

When you install Postfix, you will be asked what type of installation you want to make. We

recommend starting with "Internet Site" so you don't have to reconfigure it later. (You may have to tweak Postfix for other reasons, but it is simplest to start with a site that will accept inbound and outbound mail from the Internet without having to go through the extensive Postfix configuration file to set that up.)

OpenSSH

OpenSSH is actually already installed when you finish the base Ubuntu Server installation, but we recommend that you disable the ability to log in as 'root'. This is done by finding the "PermitRootLogin" configuration variable in `/etc/ssh/sshd_config` and changing its value to "no":

```
PermitRootLogin no
```

Then save the file and restart sshd with

```
me@ubu:~$ sudo systemctl restart sshd
```

Ubuntu's "Uncomplicated Firewall" (ufw)

Ubuntu Server 18.04 LTS has a firewall utility that is not enabled by default. You enable it with

```
me@ubu:~$ sudo ufw enable
```

after which you can do the following:

```
me@ubu:~$ sudo ufw allow Apache
me@ubu:~$ sudo ufw allow Postfix
me@ubu:~$ sudo ufw allow OpenSSH
```

You can then query it to see if that all took:

```
me@ubu:~$ sudo ufw status
```

which should result in something like this:

```
me@ubu:~$ sudo ufw status
Status: active
To Action From
--
Apache ALLOW Anywhere
OpenSSH ALLOW Anywhere
Postfix ALLOW Anywhere
Apache (v6) ALLOW Anywhere (v6)
OpenSSH (v6) ALLOW Anywhere (v6)
Postfix (v6) ALLOW Anywhere (v6)
```

Install LISTSERV from the Linux-RH7x64.bin.gz download kit

If you have completed the above tasks, this should be a fairly straightforward installation, although you will want to note the following:

When you reach the question

```

What is the path to your CGI directory? (The web interface will be
installed there.)
[/var/www/cgi-bin]

```

you must change the path to `/usr/lib/cgi-bin` , as noted above.

See the [LISTSERV 17.0 Simplified Install Manual for Unix](#) for installation instructions for LISTSERV.

Setting up LISTSERV as a SystemD service under Ubuntu

Again, this differs from the instructions for RHEL/CentOS because Ubuntu keeps the unit files in a different place.

First, copy the sample service definition found in `/home/listserv/listserv-systemd-service.sample` to `/lib/systemd/system/listserv.service` , and change its permissions to 644.

```

me@ubu:~$ sudo cp /home/listserv/listserv-systemd-service.sample
/lib/systemd/system/listserv.service
me@ubu:~$ sudo chmod 644 /lib/systemd/system/listserv.service

```

Then enable the service:

```

me@ubu:~$ systemctl enable listserv.service

```

You should then be able to start, restart, stop, and query the status of LISTSERV with the following commands:

```

me@ubu:~$ systemctl start listserv.service
me@ubu:~$ systemctl restart listserv.service
me@ubu:~$ systemctl stop listserv.service
me@ubu:~$ systemctl status listserv.service

```

Section 4 Starting LISTSERV to verify a successful installation

Once you've finished the LISTSERV installation, you're ready to start LISTSERV and verify its successful installation. To do so, change your current directory to `LSVROOT` (as defined in the Makefile) and enter `./go`. LISTSERV will print some startup messages, then since this is the first time your server has been run, LISTSERV will generate a number of files needed to route mail. Presuming that you have already installed your product and maintenance licenses, you should see messages similar the ones below.

```
10 Jun 2019 10:59:33 LISTSERV(R) for unix version 17.0 starting...
10 Jun 2019 10:59:33 Copyright Eric Thomas 1986-2019
10 Jun 2019 10:59:33 Build date: 10 Jun 2019
10 Jun 2019 10:59:33
10 Jun 2019 10:59:33 SIGNUP files are being compressed...
10 Jun 2019 10:59:33 -> No entry removed.
10 Jun 2019 10:59:33 The network tables are outdated and must be
rebuilt.
* Network tables generation process started - be patient...
Currently processed 500 nodes.
Currently processed 1000 nodes.
```

etc...

And once the table generation steps have finished you will see something like this:

```
* Step 6 complete - link weights file successfully compiled.
*
* Network tables generation completed successfully.
10 Jun 2019 10:59:39 Nearest backbone host is
LISTSERV@PEACH.EASE.LSOFT.COM
10 Jun 2019 10:59:39 Nearest NJE host is LISTSERV@PSUVM
10 Jun 2019 10:59:39 Building list indexes...
10 Jun 2019 10:59:39 License activated: SERIAL=MYCORP-1, UNITS=0
10 Jun 2019 10:59:39 This license will expire on 26 Nov 2019
10 Jun 2019 10:59:39 Your maintenance contract will expire on 26 Nov
2019
10 Jun 2019 10:59:39 Cleaning up upload directory...
10 Jun 2019 10:59:39 -> No file deleted
10 Jun 2019 10:59:39 Initialization complete
10 Jun 2019 10:59:39 You can enter commands via the keyboard at any
time
```

which confirms that you've successfully installed the LISTSERV server. To issue LISTSERV commands, press Ctrl-C and you will be prompted to enter a command. You can verify that your customized version of `go.user` was used with the `RELEASE` command. It will display, among other things, the address(es) of the LISTSERV postmaster(s) you entered in `go.user`. If not, then stop the server and make certain that LISTSERV owns the `go.user` file, and that execute permission is set for the file. To stop LISTSERV, hit Ctrl-C then enter `stop`.

Once you've verified that your LISTSERV server starts and accepts commands, you should check to make sure the mail interface is working properly. If you stopped LISTSERV, then restart it. After restarting LISTSERV, login to a different username and send mail to the

LISTSERV account on your machine. Include one or more LISTSERV commands in the body of the mail message. Since you have yet to define any mailing lists to your server, commands like RELEASE, INFO and THANKS would be good choices. The mail interface notifies the server immediately upon arrival of new mail. So unless your system is heavily used when you try sending the message, a response should arrive within a few moments. If you don't receive mail back from LISTSERV, check for syslog entries generated by the mail interface, `lsv_amin`. Also, check to see if there are any errors on the terminal/window where you're running LISTSERV. If you started the server with "go bg" check the file "listserv.log" for error messages.

4.1 Register a *LISTSERV* personal password

Before going any further, start LISTSERV (if it isn't already running) and create a password for your POSTMASTER address. To do this, send email to the `LISTSERV@hostname` address for the server, with the following command in the body (not the subject) of the message:

```
PW ADD password
```

You will be sent an OK confirmation request with instructions on how to confirm the password registration, after which your password will be live and can be used.



Note: This is also a good test of whether mail is actually being passed successfully to and from server.

4.2 Starting and Stopping *LISTSERV* in the Background

Running LISTSERV in the foreground is primarily useful for debugging purposes only. When running in production, LISTSERV should be run in the background, which also causes a 'listserv.log' file to be generated by redirection of standard output.

To start LISTSERV in the background, cd into the `LSVROOT` directory and issue './go bg' at the shell prompt.

To stop LISTSERV when it is running in the background, do one of the following:

- Send mail to LISTSERV from an account listed in the POSTMASTER go.user variable with the command

```
STOP PW=password
```

in the body (not the subject) of the message. This command is validated with the personal password assigned to your POSTMASTER email address (see the previous section).

- At the shell prompt, issue the following command:

```
kill -TERM $(cat /home/listserv/spool/listserv.PID)
```

This causes a STOP command to be generated internally by LISTSERV and LISTSERV shuts down gracefully. (Note that if you have installed LISTSERV in a directory tree other than the default, you will have to change the path to the PID file appropriately.)

4.3 Starting *LISTSERV* Automatically

There are a couple of different systems for registering LISTSERV as a "service" under unix.

4.3.1 SysV

L-Soft ships a sample SysV init script with LISTSERV, which is found in `LSVROOT/listserv-initd-script.sample` after the installation. This file may be copied into the `init.d` directory (usually, `/etc/init.d`) and registered as a boot-time service with `chkconfig`. Presuming you have renamed the script to simply “`listserv`” before copying it into `/etc/init.d`, you would register it with

```
chkconfig --add listserv
```

If necessary (and it shouldn't be) you can then activate the boot-time startup with

```
chkconfig listserv on
```

You can then start and stop LISTSERV with the usual service commands:

```
service start listserv
service stop listserv
service restart listserv
```

4.3.2 Systemd

Systemd uses scripts called “unit files” for service definition. Generally, these files are named `*.service`, and custom service files are stored in `/etc/systemd/system`.

L-Soft ships a sample systemd unit file with LISTSERV, which is found in `LSVROOT/listserv-systemd-service.sample` after the installation. This file may be copied into the `/etc/systemd/system` directory and registered as a boot-time service with `systemctl`. Presuming you have renamed the script to “`listserv.service`” before copying it into `/etc/systemd/system`, you would register it with

```
systemctl enable listserv.service
```

and start LISTSERV with

```
systemctl start listserv.service
```

, stop it with

```
systemctl stop listserv.service
```

and so forth.

There is also a “`systemctl status`” command that can give you information about how LISTSERV is interacting with the system:

```
[root@hadesx listserv]# systemctl status listserv
● listserv.service - LISTSERV
   Loaded: loaded (/usr/lib/systemd/system/listserv.service;
   enabled; vendor preset: disabled)
   Active: active (running) since Wed 2018-05-16 19:27:23 EDT; 18h
   ago
   Main PID: 1694 (go)
   CGroup: /system.slice/listserv.service
           └─1694 /bin/sh /home/listserv/go bg
```

```

May 16 19:27:23 hadesx.colorado.lsoft.com systemd[1]: Started LISTSERV.
May 16 19:27:23 hadesx.colorado.lsoft.com systemd[1]: Starting
LISTSERV...
May 16 19:27:26 hadesx.colorado.lsoft.com su[1706]: (to listserv) root
on none
May 16 19:27:28 hadesx.colorado.lsoft.com go[1694]: > Starting LISTSERV
as a bac...s
Hint: Some lines were ellipsized, use -l to show in full.
[root@hadesx listserv]#

```

Note that, depending on your particular needs, you might want to add `postfix.target` (or the service target for whatever mail server you are running) to the `After` parameter under `[Unit]` in the `listserv.service` file. The default is simply

```

[Unit]
Description=LISTSERV
After=network.target

```

To add another service target to the file, simply add it to the space-separated list, for instance:

```

[Unit]
Description=LISTSERV
After=network.target postfix.target

```

Other than the fact that mail won't flow until the mail server is started, this is entirely at the discretion of the local administrator(s).

After editing the `listserv.service` file and saving it, issue the following command at the unix prompt to reload the `systemctl` daemon:

```
systemctl daemon-reload
```

IMPORTANT: Finally, the `listserv.service` file shipped with LISTSERV depends on the existence of a shell script named `lsvstop`, which should be found in the `LSVROOT` directory (in a default installation, it will be located at `/home/listserv/lsvstop`). The file should be owned by 'listserv' and have at minimum permissions 700. This file contains the following code:

```

#!/bin/sh -
/bin/echo Stopping LISTSERV...
/bin/kill -TERM $(cat /home/listserv/spool/listserv.PID)

```

If LISTSERV is installed in a path other than the default (`/home/listserv`), the path to `listserv.PID` (highlighted above in yellow) will have to be altered appropriately, or the `systemctl stop listserv.service` command will not work.

Section 5 Registering the server



Note: This section does not apply to evaluation kits or to LISTSERV Lite or Shareware kits. Evaluation copies of LISTSERV should not be registered because they are (presumably) temporary servers running test lists, whose existence should not be broadcast. LISTSERV Lite and Shareware kits are automatically registered via a different process.

Once the server is ready for production use (that is, once you have purchased and installed a permanent License Activation Key, and once you have arranged for LISTSERV to be started automatically when the system boots), you should consider registering it with L-Soft. Registering the server is necessary to broadcast its existence to the other LISTSERV servers and to receive automatic, periodic updates of LISTSERV's networking tables. Once you have registered, your server will also be sent periodic updates about the public lists hosted by other LISTSERV sites, and, similarly, other LISTSERV sites will receive information about the public lists you are hosting. Registration also makes it possible to assign the most efficient DISTRIBUTE routing path for your server.

Please note the following requirements for registration:

L-Soft registers only sites that have unlimited (UNITS=0) licenses or sites licensed for DISTRIBUTE-only use, which are running version 1.8d or higher of LISTSERV Classic or LISTSERV Classic HPO. (However, from a practical standpoint, a site seeking an entirely new LISTSERV registration must be running the current release version of LISTSERV, which at the time this is being written is 17.0.)

In order to qualify for registration, a LISTSERV site must also:

- Be running in NETWORKED runmode. If you have RUNMODE=STANDALONE or RUNMODE=TABLELESS in SITE.CFG, you must remove the RUNMODE line (or change it to RUNMODE=NETWORKED) and stop and restart the server before registering.
- Be readily accessible via the Internet by email from outside users.
- Have a name that is unlikely to change any time soon. For instance, LISTSERV.EXAMPLE.ORG, LISTS.EXAMPLE.EDU, and LSV.EXAMPLE.COM are completely acceptable (although we strongly suggest using "LISTSERV" rather than "LISTS" or "LSV", simply because that is what most users are familiar with), whereas something like A8B703A.CC.EXAMPLE.EDU is not. If you are running a test server that you plan to rename later when it goes into production, do not register the server until it is running under its final name. Note also that a hostname containing "LISTSERVE", "LISTSERVER", or any other misspelling of "LISTSERV" is not acceptable.
- Have an A or MX record in DNS corresponding to the value you place in the NODE section (an A record is recommended at minimum).

L-Soft does not register sites running evaluation kits, LISTSERV Lite, or LISTSERV shareware. Requests to register such sites will be discarded.

L-Soft cannot register intranet sites since by definition such sites are not accessible via the Internet. Registration requires that your LISTSERV site be readily accessible via email by outside users.

If your LISTSERV Classic site does not meet the above criteria, there are other options for

keeping your LISTSERV networking tables current (which is the most important reason for registering the software). See <http://www.lsoft.com/table-updates.html> for more information.

You may submit an online registration form at <http://www.lsoft.com/regform.html> . If there are special considerations for your site that are not covered by the standard form, or if you are unable to access the web site, you can contact registrar@lsoft.com to obtain a registration form. When contacting the site registrar, please tell us what operating system LISTSERV is running under so that we can send you the proper form.

5.1 Automatic Registration for LISTSERV Lite Servers

LISTSERV Lite servers are registered automatically when you start the software for the first time. This auto-registration is not optional for Free Edition servers, but may be disabled for non-Free Edition Lite servers by specifying STANDALONE runmode (see "RUNMODE=" in the [Site Configuration Keyword Reference](#) document for LISTSERV).

The auto-registration allows you to take part in the global List of Lists and CataList services maintained by L-Soft. Registrations are verified on a regular basis by a central L-Soft server, which sends out several informational commands that return non-privileged information about your server (anyone can issue these commands). Since these registrations are maintained by regular communication with your server, please note that, should you decommission the server, registration verifications will continue to be mailed to your server for several days until the central server decides that your server is actually gone, and not simply unable to receive mail for some reason. Please note carefully that it is not possible for L-Soft to stop these registration queries manually even if you write to us and tell us that the server has been shut down permanently. They will stop after several days without a response.

Section 6 Installing the LISTSERV web interface



Note: These are the “manual” instructions for installing the web interface. If you are using the .bin.gz installer kit, the kit can install these files and make the appropriate permissions changes for you.



IMPORTANT: The directories indicated in the section below are the usual defaults for Apache running under unix. If you use them, the web interface usually will work properly without much adjustment required (permissions, ownership, umask, SELinux security contexts, etc.).

If you choose to install LISTSERV's web interface in a location other than under the default Apache DocumentRoot, and/or to install the "wa" cgi in a place other than the default Apache CGI directory, **you** are responsible for ensuring that the appropriate permissions, ownership, umask, SELinux security context, and so forth, are properly set such that "wa" can be executed by the Apache (httpd) process, and the files LISTSERV needs for the web interface can be created and read from wherever you have decided to install them.

L-Soft support generally is unable to assist with troubleshooting problems encountered when not using the Apache default directories. Apache is not L-Soft's product and our assistance in troubleshooting the web interface in such instances is limited to recommending that file and directory permissions and so forth (as noted above) have been thoroughly checked to ensure the following:

- Apache can execute "wa" when it is installed in the directory pointed to by WWW_ARCHIVE_CGI
- Apache can read the files in the directory pointed to by WWW_ARCHIVE_DIR
- LISTSERV itself (the 'listserv' user) has read/write access and ownership on all files it installs under the WWW_ARCHIVE_DIR location



Note: The disk location of the cgi-bin directory may be dependent on your unix OS (and even for Linux, may differ between distributions). Be sure to determine the correct location before continuing. For instance, RHEL/CentOS distributions of Linux generally place cgi-bin under /var/www/, whereas Ubuntu seems to place it under /usr/lib. If you are unsure about this location, please consult your web server documentation and/or your operating system documentation.

1. Copy the 'wa' executable from your source scratch directory to the CGI script directory for your web server. You can call it something else, but a short name will help keep the HTML documents small! Note that you need to make 'wa' run suid listserv in order to allow it to access LISTSERV archive files (the correct permissions for 'wa' MUST be 4755 and it MUST be owned by 'listserv'). (See above for instructions on how to do this automatically at install time.) For instance,

```
-rwsr-xr-x. 1 listserv listserv 1226904 Jun 10 2019 wa
```

2. If your system is running SELinux, you will likely as not have to tell it to allow CGI to run. To determine whether or not the feature is enabled, issue the following command at a unix command prompt:

```
getsebool httpd_enable_cgi
```

If the response is "httpd_enable_cgi --> off", you will have to turn it on by issuing the command

```
setsebool -P httpd_enable_cgi=1
```

and you can run the getsebool command again to see if it succeeded. If it did, the response will be "httpd_enable_cgi --> on".

3. Create a subdirectory under your web server's DocumentRoot to contain the various files LISTSERV will be creating. You should not use the DocumentRoot itself, as LISTSERV will create quite a few files! The suggested name for this subdirectory is 'archives'. This directory MUST be rwx accessible by the 'listserv' user, which should be set as the owner. The group is typically 'root', and the group and other users MAY have rx access. For instance,

```
drwxr-xr-x. 9 listserv root 4096 Apr 22 11:00 archives
```

You must also create a subdirectory under the 'archives' directory called 'upload', again, rwx accessible by the 'listserv' user. LISTSERV and WA use this directory for virus scanning, among other things. If this directory is not created, or is not created with the proper permissions, the posting section of the interface will not work. In this case, the group usually needs to be 'apache', which also needs rwx permissions so that it can write files uploaded via the 'wa' CGI. Other users do not need access to this directory. For instance,

```
drwxrwx---. 2 listserv apache 4096 Apr 21 13 16:11 upload
```

4. Create a world-readable file called `/etc/lsv-wa.config` with the following two statements:

```
PATH xxx  
URL yyy
```

where 'xxx' is the absolute path to the "archives" directory you've just created and 'yyy' is the URL to this directory (preferably relative). For instance:

```
PATH /var/www/html/archives  
URL /archives
```

5. Modify LISTSERV's configuration (go.user) file to add two variables, as follows:
 - `WWW_ARCHIVE_CGI` is the relative URL that leads to the CGI script you have just installed. Typically this will be something like `'/cgi-bin/wa'`. This is a relative URL, not an OS path name.
 - `WWW_ARCHIVE_DIR` is the full path name to the directory you created in step 4.
 - You must also export the variables. So the entire group of settings will look like this in go.user:

```
WWW_ARCHIVE_CGI="/cgi-bin/wa"
WWW_ARCHIVE_DIR="/var/www/html/archives"
export WWW_ARCHIVE_CGI
export WWW_ARCHIVE_DIR
```

6. For each list that you want accessible through the web interface, you must create a subdirectory in the directory you created in step 4, named like the list. For instance, if you create `'archives/xyz-l'`, the list XYZ-L will be accessible through the interface. Note that only lists with public archives are ever made accessible, for security reasons.
7. Finally, restart LISTSERV. It should create a file accessible with the URL `http://localhost/archives/index.html`, and from there you should be able to access all the postings.

Complete information on installing the Web Archive Interface is also found in the [Site Manager's Operations Manual](#).

6.1 Linux and SELinux issues

(This section is RedHat/CentOS specific, but might be applicable to other Linux distributions if they use SELinux.)

If you are starting from scratch with a brand new Linux machine, you are probably going to have to change some of the SELinux firewall settings, which are generally not permissive by default for the web server.

As indicated above, there is at least one SELinux Boolean value that needs to be changed before you can use CGI. There may be other SELinux settings that need to be tweaked before you will be able to reach the web interface. Unfortunately, if SELinux is blocking you, Apache usually doesn't make that clear and simply tells you you don't have access.

Unfortunately, you may find yourself in a position where you can reach the web interface but can't do anything, like log in or create a password. That probably means you have to configure the SELinux security thing to allow httpd to connect to the network first:

```
sudo setsebool -P httpd_can_network_connect 1
```

You have to do this because the firewall is normally set to be restrictive/enforcing by default. So in order for httpd to communicate with LISTSERV, it has to be able to connect to the network. The default is to disallow this (0) so we must set it manually to 1.

If you later experience problems with WA writing to the "upload" directory, you may also need

to execute

```
sudo semanage fcontext -a -t httpd_sys_rw_content_t
'/var/www/html/archives/upload'
sudo restorecon -v '/var/www/html/archives/upload'
```

It looks like this:

```
[you@yourserver cgi-bin]$ sudo semanage fcontext -a -t
httpd_sys_rw_content_t '/var/www/html/archives/upload'

[you@yourserver cgi-bin]$ sudo restorecon -v
'/var/www/html/archives/upload'

restorecon reset /var/www/html/archives/upload context
unconfined_u:object_r:httpd_sys_content_t:s0-
>unconfined_u:object_r:httpd_sys_rw_content_t:s0
```

There is a utility called "sealert" that you can use to help puzzle out SELinux problems (which are logged in the `/var/log/audit/audit.log` file). You install "sealert" as part of the `setroubleshoot-server` package:

```
sudo yum install setroubleshoot-server
```

This installs a bunch of dependencies along with it; just accept them and it will install. You can then run the utility against the audit log:

```
sudo sealert -a /var/log/audit/audit.log
```

and it prints a nice little report that helps explain what's going on and how to fix it.



Important: L-Soft neither provides or supports "sealert" or any other SELinux utility. We have found "sealert" useful in diagnosing problems with our own Linux machines, but your use of any third party utility or utilities such as are installed by `setroubleshoot-server` is strictly at your own risk.

Securing the LISTSERV web interface with HTTPS

Per Wikipedia, "Hypertext Transfer Protocol Secure (HTTPS) is an extension of the Hypertext Transfer Protocol (HTTP). It is used for secure communication over a computer network, and is widely used on the Internet. In HTTPS, the communication protocol is encrypted using Transport Layer Security (TLS) or, formerly, Secure Sockets Layer (SSL). The protocol is therefore also referred to as HTTP over TLS, or HTTP over SSL."

(<https://en.wikipedia.org/wiki/HTTPS> , accessed 23 Jul 2020)

Many, if not most LISTSERV sites will want to secure their LISTSERV web interface using the HTTPS protocol.

There are two major and one optional components to making this change:

1. Obtain and install a digital certificate on the web server running on your LISTSERV host machine, and ensure that your web server can be reached using the HTTPS protocol
2. Configure LISTSERV and WA to serve HTTPS links

3. (Optional) Enable HSTS for LISTSERV

Component One: Obtain and install the digital certificate

The first component must be accomplished by the customer without assistance from L-Soft. It involves obtaining a digital certificate which is in turn installed on the LISTSERV machine's web server, following which the web server must be configured to enable the HTTPS protocol. *Because there are several different approaches to this, we recommend careful research before starting this process.* Google (whose search engine has for several years given HTTPS sites preferred weighting) has [a help page at this link](#) which explains the process in some detail, although it does not provide specifics for different web servers.

Once your web server has been properly configured to use the HTTPS protocol, test it by navigating to a test page on your server using HTTPS. (Most web servers provide a test page in the document root by default when they are installed.) Ensure that you get the lock character in the address bar that indicates that you have connected securely. For instance (see circled in red):



You may also test to ensure that your server certificate is correctly installed by using the SSL Checker found [here](#). If you want a more in-depth scan run of your server and its security protocols, you can try the SSL Server Test found [here](#). (The latter test is extremely in-depth and will take a couple of minutes to run.)

If all is well, you may then proceed to the second major component, which is configuring LISTSERV itself to serve HTTPS links via WA.

Component Two: Configure LISTSERV and WA to serve HTTPS links

First, you'll need to change the WWW_ARCHIVE_CGI variable in your SITE.CFG file (Windows) or go.user file (unix) to use HTTPS. This means you'll need to specify the full URL that points to WA.EXE (Windows) or wa (unix) instead of providing just a relative link. For example, you may have (for Windows)

```
WWW_ARCHIVE_CGI=/scripts/wa.exe
```

In that case, you would need to change the setting to

```
WWW_ARCHIVE_CGI= https://listserv.yourhost.com/scripts/wa.exe
```

For unix, you will probably have

```
WWW_ARCHIVE_CGI=/cgi-bin/wa
```

In that case, you would need to change the setting to

```
WWW_ARCHIVE_CGI= https://listserv.yourhost.com/cgi-bin/wa
```

Note that the hostname (highlighted in yellow) will be the same as the value in the NODE= site configuration setting.

For both Windows and unix servers, you'll need to restart LISTSERV after making this change.



Note: While it is possible to change the value of `WWW_ARCHIVE_CGI` using the web administration interface, we recommend that this change be made manually in the top-level site configuration file, as explained above.

For LISTSERV 17.0 and later, it is no longer necessary to edit the SKIN template to enable HTTPS, as the template has been revised to detect whether or not you are using https.

Optional Component: Enable HSTS in LISTSERV

Again, from Wikipedia: "HTTP Strict Transport Security (HSTS) is a web security policy mechanism that helps to protect websites against man-in-the-middle attacks such as protocol downgrade attacks and cookie hijacking. It allows web servers to declare that web browsers (or other complying user agents) should automatically interact with it using only HTTPS connections, which provide Transport Layer Security (TLS/SSL), unlike the insecure HTTP used alone. . . . The protection only applies after a user has visited the site at least once, and the way this protection works is that a user entering or selecting a URL to the site that specifies http, will automatically upgrade to https, without making an http request, which prevents the http man in the middle attack from occurring."

(https://en.wikipedia.org/wiki/HTTP_Strict_Transport_Security, accessed 23 Jul 2020)

The LISTSERV web interface can enable HTTP Strict Transport Security (HSTS), which directs browsers to only connect to the web interface using secure HTTPS connections. Unencrypted HTTP connections are automatically replaced with HTTPS connections at the browser level, preventing the transmission of unencrypted data to the server. The use of HSTS is also required for many US federal agencies by US BOD 18-01.

The LISTSERV site configuration variable, `WWW_HSTS_MAX_AGE`, when set to a non-zero value, causes WA to output the header "Strict-Transport-Security: max-age=x", where "x" is the non-zero variable setting. For example:

Unix:

```
WWW_HSTS_MAX_AGE=31536000
export WWW_HSTS_MAX_AGE
```

Windows:

```
WWW_HSTS_MAX_AGE=31536000
```

(The number "31536000" is the number of seconds in one year, and is the recommended value. The HSTS timeout in the web server's "Strict-Transport-Security: max-age" parameter is always declared in seconds.)

Again, this feature is intended primarily to address the US DHS directive BOD 18-01, but will enhance security for any LISTSERV site which uses the HTTPS protocol in the LISTSERV web interface.



Notes: WA functions named `DEBUG-*` (e.g., `DEBUG-SHOW-VERSION`) may not load the configuration file, and therefore might not output the Strict-Transport-Security: header.

Also note that if you already have the webserver configured for HSTS, the webserver HSTS value may override the setting provided by WA.

With HSTS enabled site-wide in IIS, you may find that:

- The "archives" directory no longer works correctly if it is implemented as an IIS virtual directory

- Some images served by WA.EXE may be broken

WWW_HSTS_MAX_AGE can be used to solve this problem rather than enabling site-wide HSTS in IIS.

Section 7 Installing F-Secure (Linux ONLY)

Please note that this feature is not available under LISTSERV Lite.

Please note that the anti-virus scanning software is available only for versions of Windows and Linux which are currently supported by L-Soft, and that this feature is available only for LISTSERV Classic or LISTSERV Classic HPO sites running those operating systems. A current, unexpired L-Soft maintenance contract is also required.

LISTSERV Version 17.0 supports on-the-fly anti-virus scanning of all messages sent to mailing lists that run under LISTSERV Classic or LISTSERV Classic HPO on supported Windows and Linux servers, including inline uuencoded binaries and MIME attachments in those messages. This is a value-added feature which, in addition to a regularly-licensed LISTSERV Classic or LISTSERV Classic-HPO installation, requires the following:

1. For sites with perpetual (“EXP=NEVER”) LAKs: An unexpired “maintenance” LAK, meaning that you must purchase maintenance (which includes automatic anti-virus signature updates for the term of the LAK) for LISTSERV in order to use the feature. This LAK will come from your sales representative automatically when a perpetual LISTSERV LAK is purchased with maintenance and must be renewed yearly.
2. For all sites: A separate F-Secure Anti-Virus key that should be sent to you by your sales representative along with your LISTSERV LAK.

The table below indicates the web sites for F-Secure downloads.

Linux- x64:

NOTICE: Use of F-Secure Linux Security 11.10 and later requires, at minimum, LISTSERV version 15.0. LISTSERV version 17.0 or later is STRONGLY RECOMENDED*.

Issue a SHOW VERSION command to LISTSERV to ascertain your product level BEFORE upgrading or installing FSAV. The current LISTSERV for Linux kits can be downloaded at <http://www.lsoft.com/download/listserv.asp#unix> .

Also: PLEASE read the “Supported Platforms and Languages” section of the [FSLs product download page](#) before attempting to install FSLs on your Linux server. Most, but not all, major Linux distributions are supported.

Installation kits:

For use with LISTSERV 15.0 and later:

F-Secure Linux Security (FSLs) 11.10

<https://ftp.lsoft.com/F-Secure/fsls-11.10.68-rtm.tar.gz>

Manuals:

F-Secure Linux Security 11.x documentation:

[F-Secure Linux Security Admin Guide](#)

*We recommend upgrading LISTSERV to at least version 17.0 (the current released version) because of an incompatibility with earlier versions of LISTSERV that is present in current versions of the F-Secure products. The incompatibility may result in occasional spurious reports from LISTSERV of out-of-date anti-virus signatures. We took account of this incompatibility starting in LISTSERV version 16.0-2017a. To ensure that you have at least LISTSERV version 17.0, issue a SHOW LICENSE to your LISTSERV server. The build date reported should be 8 Jun 2019 or later.

It should be noted that earlier versions of LISTSERV do not support, or do not completely support, the DMARC anti-spam standards currently in place with many large ISPs world-wide. For this reason also, we strongly recommend upgrading older versions of LISTSERV to the latest generally-available version, at time of writing, 17.0.

In order to use LISTSERV's Anti-Virus features, F-Secure® Anti-Virus must be installed on the same server as LISTSERV®. If you already have F-Secure Anti-Virus installed on the server, you should make sure that you are running the version supported by LISTSERV, or higher:

- For Linux-x86_64: version 11.10

7.1 Recommended FSAV Version

L-Soft strongly recommends that all Linux-x86_64 LISTSERV sites running LISTSERV 17.0 or later upgrade to F-Secure Linux Security version 11.10 with all hotfixes for that version released to date.

The FSAV for Linux Servers (FSLs) license key provided by L-Soft is for a single stand-alone server only, installed in “command-line-only” mode.

The FSAV key provided by L-Soft is valid only as long as your paid maintenance contract for LISTSERV is up-to-date. If you discontinue LISTSERV maintenance, you must uninstall F Secure Linux Security, or purchase a separate key from F-Secure (although remember, without current LISTSERV maintenance, LISTSERV's anti-virus feature will not be activated).

7.2 Recommended F-Secure Hotfixes

Given our own experience and that of customers who have reported problems to support, L-Soft strongly recommends that all currently-available hotfixes for FSAV be installed.

If available, hotfixes for both Windows and Linux can be downloaded from the [F-Secure WebClub](#) product page for the particular product in question. Please check the F-Secure website regularly for any hotfixes that may be provided.

7.3 F-Secure Linux Security Installation Instructions

L-Soft is pleased to offer its Linux customers the ability to integrate F-Secure Linux Security (FSLs) 11.x into their LISTSERV 17.0 or later environment. (At this writing, the current version of FSLs is 11.10.)



Important: Please be aware that L-Soft provides a license for the “command-line” version of F-Secure Linux Security. The “command-line” version does not include the real-time protection, integrity checking, web user interface or central management features provided in the full version.

Before starting to install FSLs 11.x, make sure that you have your FSLs installation key from your sales representative. The FSLs key is normally sent with your LISTSERV LAK(s) but may be obtained separately if you have not previously received it.

Please note that the support department does not have access to, nor can it provide, either LISTSERV LAKs or FSLs keys. They must be obtained from your sales representative.

IMPORTANT: Required LISTSERV Version

F-Secure Linux Security 11.x and later works with LISTSERV 15.0 and later. However, we strongly recommend upgrading any older installation of LISTSERV with the current generally-available version, which at time of writing was LISTSERV 17.0.

THIS IS AN ABSOLUTE REQUIREMENT. FSLs 11.x WILL NOT WORK AT ALL WITH LISTSERV VERSIONS THAT REPORT AS BEING EARLIER THAN VERSION 15.0, AND MAY NOT UPDATE ANTI-VIRUS SIGNATURES PROPERLY WITH VERSIONS EARLIER THAN VERSION 16.0-2017a.

Please visit the [LISTSERV documentation page](#) to read the LISTSERV release notes.

Please visit the [LISTSERV product download page](#) to download the current LISTSERV kit.

IMPORTANT: Running 32-bit FSLs under 64-bit Linux

When installing F-Secure Linux Security 11.x under a 64-bit Linux operating system, please be aware that you must also install the Linux 32-bit compatibility packages appropriate for your Linux distribution. This is because FSLs is a 32-bit application and, as such, will not be able to use 64-bit common libraries.

In some cases 32-bit compatibility packages may be installed by default. Should you have any question about the 32-bit compatibility packages, please contact your OS vendor. L-Soft is unable to assist in the installation of these packages.

Please read [F-Secure's pre-installation checklist for 64-bit systems](#) before installing.

7.4 F-Secure Anti-Virus Installation Instructions

This procedure assumes that you are installing FSLs 11.10, the version current when this document was updated. However, these instructions should work with any 11.x version.

1. Login as (or 'su' to) 'root' and download the FSLs installation kit from the URL indicated in the table above. We recommend creating a scratch directory somewhere in your filesystem and downloading the file to that location.

Note that you can download FSLs 11.x directly from the F-Secure website, but the manufacturer's kit does not include the L-Soft-supplied fsavd-config.sh file used in step 8.

1. Expand the downloaded archive:

```
zcat fsls-11.10.68-rtm.tar.gz | tar xvf -
```

This leaves the following files in the directory fsls-11.10.68-rtm :

```
fsavd-config.sh
fsav_linux_1110_mib.jar
fsls-11.10.68
```

The file called `fsls-11.10.68-rtm` should have execute permission. (If it does not, `chmod` it appropriately.)

2. Execute (still as root) the following command:

```
./fsls-11.10.68-rtm --command-line-only
```

It is very important that the `--command-line-only` flag be appended to this command! If it is not, you will install an evaluation copy of the full version of the product, for which you are not licensed. You will then have to uninstall the product and reinstall it in command-line mode.

- The installation script will first ask you to view and accept the F-Secure license agreement.

```
[home]root:~/fsls-11.10.68-rtm# ./fsls-11.10.68-rtm --command-
line-only
F-Secure Linux Security installation
Copyright (c) 1999-2016 F-Secure Corporation. All Rights Reserved.
```

Preparing...

You must accept following F-Secure license agreement
to install F-Secure Linux Security.
Press enter to view license agreement.

Simply press enter and then use the space bar to page down. At the end of the license agreement you will be asked:

Do you accept this license agreement?

Type "y" or "Y" or some form of "yes" to continue.

After accepting the license agreement, the product will install and create a default configuration.

The license agreement text is available at /opt/f-secure/fsav/LICENSE.

Installing RPM packages, please wait...

Running configuration

.....

You will then be asked to provide the F-Secure license key (and please note that the key shown is only for illustration; it is not a valid key). Type in the key and then hit return.

Keycode for F-Secure Linux Security

To install the licensed version of the product, please enter the
keycode you have received with your purchase or press enter to
install the fully functional 30-day
evaluation version.

keycode: 1234-5678-90AB-CDEF-GHIJ

- The remainder of the installation looks like the following.

Keycode accepted.
Configuring

Note: The Virus Definition Databases are now being updated to the
newest
versions in the background. You can check the date of the current
the

databases by typing `'fsav --version'`.

```
[home]root:~/fsls-11.10.68-rtm#
```

5. There is no need to install a cron entry to update the virus signatures. An F-Secure automatic update agent is provided as part of the installation and will download the new signatures in the background as they become available.
6. After installation, there are two minor change that **MUST** be made to the default FSLs configuration. The default behavior of FSLs is first to try to disinfect, and then to try to rename the file upon detection. Because LISTSERV expects the anti-virus scanner only to report when it detects a virus, and not otherwise change or delete the file, this behavior must be changed. The change is made by opening the FSLs configuration file, normally found at `/etc/opt/f-secure/fssp/fssp.conf`, in a text editor, and changing the values of two variables in the file as follows:

```
odsFilePrimaryActionOnInfection 1
odsFileSecondaryActionOnInfection 0
```

Then save the file.

Please note carefully that this element of the installation is required. If you skip it, FSLs will end up disinfecting or renaming infected files, and LISTSERV will not receive the return code that tells it to reject the message. There is no need for FSLs to delete or rename the file. LISTSERV itself will delete the file when it receives the correct return code.

7. After restarting LISTSERV, you should see an entry similar to the following in the log:

```
8 May 2019 12:38:39 F-Secure Anti-Virus 11.10 activated, explicit
file scan.
```

8. Finally, run (as 'root') the `fsavd-config.sh` script (provided by L-Soft) which installs a modified 'fsavd' daemon startup script into `/etc/init.d`, registers it as a system "service", and starts it. This script allows you to ensure that the fsavd daemon starts when your machine is rebooted, and that it runs under the 'listserv' UID. This is required in order for LISTSERV to be able to "see" FSAV when it starts up.

Note that you may have to issue the shell command `chmod u+x fsavd-config.sh` to make the shell script executable.

If you downloaded FSLs 11.10 from the F-Secure website, you will not have this file. It can be downloaded from <http://ftp.lsoft.com/f-secure/tools/fsavd-config.sh> if needed.

`fsavd-config.sh` makes one change to the fsavd startup script, altering

```
fsavuser=fsav
```

to

```
fsavuser=listserv
```

Please note carefully that this element of the installation is required. If you skip it, LISTSERV will not see FSAV at startup and LISTSERV's AV scanning feature will be disabled. It should be noted that this will NOT affect how fsavd reacts to requests from other users. F-Secure normally recommend that the fsavd daemon should run under a non-privileged UID to begin with.

9. If you have installed LISTSERV to start under a different UID (not common), you will have to manually change the fsavuser= line in `/etc/init.d/fsavd` to the correct UID value and then stop and restart the 'fsavd' daemon. You can stop and restart the daemon from the shell prompt with `"/sbin/service fsavd restart"`.

Section 8 Upgrading your LISTSERV installation

The following describes the prerequisites for upgrading your LISTSERV installation to a newer version. Please read this section carefully, and do not hesitate to contact the support department if you have questions.

**IMPORTANT: LISTSERV 17.0 requires a version 17.0 Product LAK!
This release also requires valid Maintenance expiring on 8 Jun 2019 or later!**

You must obtain and install a LISTSERV version 17.0 product LAK and (for sites with perpetual licensing) an appropriate maintenance LAK, or LISTSERV will not start after the upgrade.

IMPORTANT: LISTSERV 16.x web interface customizations and branding are NOT COMPATIBLE with LISTSERV 17.0!

Before upgrading to LISTSERV 17.0, please be sure to back up your LISTSERV installation.

PLEASE read the [LISTSERV 17.0 What's New](#) document before upgrading!

LISTSERV 17.0 is a major upgrade to the traditional LISTSERV web interface, bringing it in line with present day standards with responsive templates designed to display on both desktops and hand-held devices. While there is a backward-compatible interface mode that allows both the server interface and individual list interfaces to fall back to the non-responsive 16.x "look and feel," customizations made to the 16.x web templates are **not compatible** with the 17.0 web interface and will have to be retooled to fit into the new responsive interface. If your LISTSERV server has heavily-customized or branded templates, **L-Soft strongly recommends that this retooling be done in a test environment before upgrading your production server.**

Before installing any upgraded files, the LISTSERV installer scripts for both Windows and unix will copy SITE.WWWTPL (if it exists) to SITE165.WWWTPL. This is a requirement for the "compatibility mode" previously mentioned, and preserves any customizations made to the 16.x web templates for use by that mode.

LISTSERV sites that normally upgrade using manual methods rather than using the installer kits **MUST** perform the SITE.WWWTPL -> SITE165.WWWTPL operation manually. Unix LISTSERV sites performing this manual operation **MUST** ensure that the resulting site165.wwwtpl file is named in lower case, is owned by 'listserv', and has the same permission settings as site.wwwtpl.



IMPORTANT: Because of non-backward-compatible changes made in LISTSERV 16.0 to the format of LISTSERV's SIGNUP files which allow UTF-8 characters to be used in passwords, and the addition of non-reversible subscriber password encryption, L-Soft **STRONGLY RECOMMENDS** that, prior to upgrading, a full backup be made of your LISTSERV installation if you are upgrading from a version earlier than 16.0.

IMPORTANT: Install your LISTSERV 17.0 product LAK before upgrading!

A valid product LAK (License Activation Key) with "REL=17.0" must be installed before upgrading or LISTSERV will not start after the upgrade.

If you have not received a LISTSERV 17.0 product LAK, please contact your sales representative or SALES@LSOFT.COM **before** upgrading!

If your product LAK has EXP=NEVER, you will also need to install an appropriate LISTSERV maintenance LAK.

To find out if you can upgrade to LISTSERV 17.0 with your current LAKs, please issue a SHOW LICENSE command to LISTSERV and examine the response. It will be similar to this:

```
License type:      Permanent
Expiration date:  None - perpetual license
Maintenance until: 26 Nov 2019, serial number MNT-XYZ-1
Capacity:         Unlimited
Version:          17.0
Serial number:    XYZ-1
Build date:       8 Jun 2019
```

Your license key will be valid for the 17.0 upgrade if your current product LAK is for version **17.0 or higher** and your maintenance is **not expired**.

Upgrading LISTSERV is almost as simple as installing it. Simply follow these steps:

1. If you are upgrading from one full version of LISTSERV to another (for instance, from 16.5 to 17.0), you should have received a new LAK from your sales representative. If you do not have a LAK for the version you are upgrading to, **stop right here** and contact your L-Soft sales representative. If you are not sure what version you are currently licensed for, send a "SHOW LICENSE" command to LISTSERV.
2. If you have received a new LAK, install it onto your old installation, following the instructions that come with the LAK. Send LISTSERV a "SHOW LICENSE" command after restarting LISTSERV to ensure that the new LAK has been installed properly. Do not proceed further until this step has been correctly completed.
3. Get the current Unix evaluation kit from [the LISTSERV evaluation kit download page](#) and install it over your existing installation. Your current configuration, lists, and other settings will be preserved. Note that evaluation kits are production code limited only by an evaluation LAK, which your production LAK will override.

(If you are upgrading a LISTSERV Lite installation, you should get the current LISTSERV Lite kit from the [LISTSERV Lite download page](#).)

4. Back up the entire LISTSERV directory hierarchy (just in case).
5. Stop LISTSERV. If you have LISTSERV set up to respawn itself (rare), be sure to bring LISTSERV to a complete stop before proceeding.
6. Follow the instructions in this document (or, if you are using the .bin.gz kit, those found in the [Simplified Installation document](#)) to install the new version over the old. Your current configuration, lists, and other settings will be preserved (simply choose "n" when prompted to set variables in the go.user file).

- Restart LISTSERV and send a command to the server to make sure the installation was successful (e.g., SHOW LICENSE).



Note: Please be aware that a LISTSERV upgrade is effectively a new installation over the top of the old installation. The installer does not do any version checking for files that are considered to be LISTSERV's core files to determine whether or not they need to be replaced. Therefore there is effectively no difference between a fresh install and an upgrade install.



Note: The standard LISTSERV Classic and Lite kits for unix are binary installers that are designed to simplify the installation process. If upgrading a LISTSERV Classic installation, or going from LISTSERV Lite to LISTSERV Classic, you may choose to download the old 'tar.gz' installation kits instead. If so, be sure to download `common.tar.gz` as well as the ``uname`.tar.gz` kit for your unix. This is very important as the common files also change from version to version.



IMPORTANT: LISTSERV Lite installations should always be updated from the ".bin" kits provided specifically for LISTSERV Lite.

Section 9 Additional Resources

9.1 Documentation

All of L-Soft's formal documentation for LISTSERV is available at <http://www.lsoft.com/manuals>.

9.2 Mailing Lists

There are several mailing lists dedicated to the support of LISTSERV.

LSTSRV-L@PEACH.EASE.LSOFT.COM	for LISTSERV maintainers and interested list owners
LSTOWN-L@PEACH.EASE.LSOFT.COM	for LISTSERV list owners
LSTSRV-E@PEACH.EASE.LSOFT.COM	for LISTSERV evaluation kit users
LISTSERV-LITE@PEACH.EASE.LSOFT.COM	for LISTSERV Lite users
LISTSERV-DEVELOPERS@PEACH.EASE.LSOFT.COM	for third-party developers using features documented in the Advanced Topics Guide

To subscribe to any of these lists, send mail to LISTSERV@PEACH.EASE.LSOFT.COM with the following command in the body of the message:

SUBSCRIBE *listname* Your Name

9.2.1 Talking to other LISTSERV evaluation kit users

A discussion group for sites that have installed evaluation copies of LISTSERV has been created to facilitate communication between LISTSERV maintainers, list owners and L-Soft support staff. The list is called LSTSRV-E, and you can subscribe by sending mail to LISTSERV@LISTSERV.NET, with the command "SUB LSTSRV-E Your Name" in the body of the mail message. If you have any questions, comments, helpful hints, etc., please post them to LSTSRV-E for distribution to other people participating in the evaluation. Don't forget to mention which version of UNIX(R) you are using when posting. The purpose of the list is to share your experience and problems with other users of evaluation kits. Because there are so many versions and brands of unix, the kits haven't been tested equally on all possible platforms. Knowing which kit you are using will streamline the process of finding an answer to your questions.

9.3 Contacting L-Soft Support

At <http://www.lsoft.com/manuals/lsv-faq/> we've attempted to document a few of the most frequently-asked questions pertaining to installing and running a LISTSERV server. Before writing to our support department for problem resolution, please take a moment to read through the online FAQ and see if your problem is answered there.

L-Soft recognizes that the FAQ pages are not going to solve every problem you may face. We are always willing to help diagnose and correct problems you may be having with your registered LISTSERV® server. To that end, please note the following when you write to L-Soft with a problem report:

1. Please make the subject line of your report indicative of the problem, and in particular the product with which you are having a problem. A subject like "Problem posting to moderated LISTSERV list" is much more useful to us than "Help me please!"
2. Include any appropriate log entries. LISTSERV keeps logs of everything it does when you are running it in the background (i.e., with '`./go bg`', and without a log excerpt it is often impossible to determine what caused a given error.
3. If LISTSERV dumps core, please run the debugger on the core file (see [FAQ 1.3](#) in the LISTSERV maintainer's support FAQ) and include the results.
4. Always send a copy of your site configuration file (with the passwords XXX'ed out).
5. Send along anything else that you think might be helpful in diagnosing the problem.

If you are running an evaluation version of our software, please join the evaluation users' list, LSTSRV-E@PEACH.EASE.LSOFT.COM, and send your trouble reports there.

If you are running LISTSERV Lite, please join the LISTSERV-LITE mailing list, LISTSERV-LITE@PEACH.EASE.LSOFT.COM, and send your trouble reports there.