

L-Soft international, Inc.



Installation Manual for
LISTSERV® for UNIX(R)
Version 16.5-2018a



This document describes the installation of **LISTSERV 16.5-2018a for UNIX** with a build date of **December 8, 2018** or later.

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Table of Contents

Section 1 Things to Consider Before Installation	1
1.1 Distribution file change from tar.Z to tar.gz.	1
1.2 LDAP Support is Required	1
1.3 Classic Distribution vs. Lite Distribution	2
1.3.1 LISTSERV Classic Distribution.	2
1.3.2 LISTSERV Lite Distribution.	2
1.4 For Sites Running Sendmail	2
1.4.1 Sendmail and restricted shells	3
Section 2 Installation Overview	4
2.1 The Simplified Installation Option.	6
Section 3 Installing LISTSERV	7
3.1 Creating the "LISTSERV" Username	7
3.1.1 Running LISTSERV under a userid other than 'listserv'	7
3.2 Extracting Installation Materials from the "TAR" Files	8
3.3 Customizing the Makefile to Determine LISTSERV's Location	9
3.4 Building the Interface Utilities and LISTSERV Server	10
3.4.1 Using the Compiler	10
3.4.2 The LCMD and LCMDX utilities	10
3.4.3 Using the precompiled binaries	11
3.4.4 Adding DBMS Support	12
3.5 Installing the Web Interface CGI Binary	13
3.6 Moving Programs and Files to their Proper Directories	13
3.7 Configuring LISTSERV for Your System	14
3.8 Telling Your Mail System about LISTSERV	16
3.8.1 Telling Sendmail about LISTSERV	16
3.8.2 Telling Postfix about LISTSERV	17
3.8.3 Telling qmail about LISTSERV	18
3.9 Creating and Activating the License Key	19
Section 4 Starting LISTSERV to Verify a Successful Installation	20
4.1 Register a LISTSERV personal password	21
4.2 Starting and Stopping LISTSERV in the Background	21
4.3 Starting LISTSERV Automatically	22
4.3.1 SysV	22
4.3.2 Systemd	22

Section 5 Registering the Server.	24
5.1 Automatic Registration for LISTSERV Lite Servers	25
Section 6 Installing the LISTSERV Web Interface.	26
Section 7 Installing F-Secure (Linux ONLY).	28
7.1 Recommended FSAV Versions for LISTSERV 16.5 and Following	29
7.2 Recommended F-Secure Hotfixes	29
7.3 F-Secure Linux Security Installation Instructions	29
7.4 F-Secure Anti-Virus Installation Instructions.	30
Section 8 Upgrading your LISTSERV Installation.	34
Section 9 Additional Resources	36
9.1 Documentation	36
9.2 Mailing Lists	36
9.2.1 Talking to other LISTSERV evaluation kit users	36
9.3 Contacting L-Soft Support	36

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

L-Soft has made a change to the compression type used for its kits. The old unix compress(1) method was used for many years but now is no longer shipped with most unix distributions. gzip(1) seems to be the compression utility of choice among most of our customers, so LISTSERV distribution files for unix will be provided as .tar.gz archives starting with the LISTSERV 16.5-2018a level set.

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 May 2018, it appears that the latest stable version is 8.15.2, released on 3 July 2015.



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

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) 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 LSVSPOOL 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 LSVSPOOL directory) to your sendmail aliases file. Then rebuild the aliases and send the appropriate signal to your sendmail daemon to load the new aliases.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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 requires lists, like INFO,

RELEASE or even THANKS commands might be best.

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 rwx), 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/16.5/unixinst-sim.html>

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.
3. 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`”.
4. 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.

3.2 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>

listview.c	unixinst-sim_files
lsv	unixinst-sim.htm
lsv_amin.c	wa
lsv_amin.h	

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

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

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 `lsv` 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 pool 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 THIS SECTION OF THE 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 LCMD and LCMDX 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 LSVPOOL 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.

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:

<code>lsv.o</code>	Main object file for linking ‘lsv’
<code>nooci.o</code>	Link with <code>lsv.o</code> to disable OCI (Oracle) support
<code>nocli.o</code>	Link with <code>lsv.o</code> to disable CLI (DB2) support
<code>nouodbc.o</code>	Link with <code>lsv.o</code> 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 -lodbc
```

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 `-lodbc` 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 ‘newaliases’.)

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 LSVSPOOL 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 LSVSPOOL 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
```

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 [LSTSRV-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

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 <http://www.qmail.org/> for the qmail home page). Some large LISTSERV sites are running with qmail and you can probably get help from their admins by joining and writing to the [LSTSRV-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
```

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.

```
7 May 2018 10:59:33 LISTSERV(R) for unix version 16.5
starting...
7 May 2018 10:59:33 Copyright Eric Thomas 1986-2018
7 May 2018 10:59:33 Build date: 7 May 2018
7 May 2018 10:59:33
7 May 2018 10:59:33 SIGNUP files are being compressed...
7 May 2018 10:59:33 -> No entry removed.
7 May 2018 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.
7 May 2018 10:59:39 Nearest backbone host is LISTSERV@PEACH.
EASE.LSOFT.COM
7 May 2018 10:59:39 Nearest NJE host is LISTSERV@PSUVM
7 May 2018 10:59:39 Building list indexes...
7 May 2018 10:59:39 License activated: SERIAL=MYCORP-1, UNITS=0
7 May 2018 10:59:39 This license will expire on 30 Nov 2018
7 May 2018 10:59:39 Your maintenance contract will expire on 30
Nov 2018
7 May 2018 10:59:39 Cleaning up upload directory...
7 May 2018 10:59:39 -> No file deleted
7 May 2018 10:59:39 Initialization complete
7 May 2018 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 the 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 16.5.)

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.

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 should be owned by ‘listserv’). (See above for instructions on how to do this automatically at install time.)

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 on your web server to contain the various files LISTSERV will be creating. You should not use your main directory as LISTSERV will create quite a few files! The suggested name is ‘archives’. This directory must be `rwX` accessible by the ‘listserv’ user.

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.

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 directory you’ve just created and ‘yyy’ is the URL to this directory (preferably relative). For instance:

```
PATH /usr/local/etc/httpd/htdocs/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` or `/scripts/wa`. This is a URL, not an OS path name.
 - `WWW_ARCHIVE_DIR` is the full path name to the directory you created in step 4.

- Under unix, don't forget to export! Add

```
export WWW_ARCHIVE_CGI
export WWW_ARCHIVE_DIR
```

at the end of your go.user file before you save it.
- 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 contained in the [Site Manager's Operations Manual](#).

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 16.5 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 16.5 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
<ftp://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 16.5-2018a (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 16.5-2018, issue a **SHOW LICENSE** to your LISTSERV server. The build date reported should be 10 Dec 2018 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, 16.5-2018a*

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 Versions for LISTSERV 16.5 and Following

L-Soft strongly recommends that all such Linux-x86_64 LISTSERV sites 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 16.5 or later environment. (At this writing, the current version of FSLs is 11.10.)

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 16.5-2018a.

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.

For 64-bit Linux versions

If 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.

2. 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.)

3. 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.

4. 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
```

5. 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#
```

6. 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.
7. 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.

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

```
8 May 2017 12:38:39 F-Secure Anti-Virus 11.10 activated, explicit file scan.
```

9. 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.

10. 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



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: LISTSERV 16.5-2018a requires a version 16.5 LAK!

You must obtain and install a LISTSERV version 16.5 product LAK prior to upgrading your server, or LISTSERV will not start after the upgrade.

IMPORTANT: Install your LISTSERV 16.5 product LAK before upgrading! A valid product LAK (License Activation Key) with "REL=16.5" must be installed before upgrading or LISTSERV will not start after the upgrade.

If you have not received a LISTSERV 16.5 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 16.5 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:          16.5
Serial number:    XYZ-1
Build date:       8 Dec 2018
```

Your license key will be valid for the 16.5-2018a upgrade if your current product LAK is for version **16.5 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 16.0 to 16.5), 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 for your platform from [the LISTSERV evaluation kit download page](#). 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 can get the current LISTSERV Lite kit from the [LISTSERV Lite download page](#).)

4. Stop LISTSERV. If you have LISTSERV set up to respawn itself, be sure to bring LISTSERV to a complete stop.
5. Back up the entire LISTSERV directory hierarchy (just in case).
6. Follow the instructions in this document to install the new version over the old. Your current configuration, lists, and other settings will be preserved.
7. Restart LISTSERV and send a command to make sure the installation was successful.

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`. This is very important as the common files also change from version to version.

LISTSERV Lite installations should always be updated from the standard ".bin" kits.

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.stm> 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.

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