Engineering and Scientific Subroutine Library for AIX,
Version 4 Release 2

IBM

Installation Guide

Engineering and Scientific Subroutine Library for AIX,
Version 4 Release 2

Installation Guide

> **Note:**
>
> Before using this information and the product it supports, be sure to read the general information under "Notices" on page 13.

Contents

Introduction

This memo provides information needed to install:

Product:	Engineering and Scientific Subroutine Library for AIX® Version 4 Release 2 (program number 5765-F82)
On operating system:	AIX 5L™ Version 5.2 with the 5200-04 Recommended Maintenance Package, or later (program number 5765-E62)
	—*or*—
	AIX 5L Version 5.3, or later (program number 5765-G03)

The topics covered in this memo are listed in the table below.

Chapter 1. Installing ESSL Version 4 Release 2 on AIX

This chapter provides step-by-step instructions for installing:

Product: Engineering and Scientific Subroutine Library for AIX, Version 4 Release 2 (program number 5765-F82)

On operating system: AIX 5L Version 5.2 with the 5200-04 Recommended Maintenance Package, or later (program number 5765-E62)

—or—

AIX 5L Version 5.3, or later (program number 5765-G03)

Table 1 summarizes the required steps. When performing each step of the installation, enter all commands as shown because commands are case sensitive.

Table 1. Overview of Installation on AIX

Step:	Page:
Step 1. Plan the Installation	1
Step 2. Determine Which ESSL Filesets To Install	2
Step 3. Log in to the AIX Root and Install ESSL	4
Step 4. Run the Installation Verification Programs (IVPs)	6

Step 1. Plan the Installation

Plan your installation according to the requirements listed in following tables:
- Table 2
- Table 3 on page 2

Table 2. Software Products Required for Use with ESSL for AIX

For Compiling	For Linking, Loading, or Running
IBM® XL Fortran Enterprise Edition Version 9.1 for AIX (program number 5724-I08)	IBM XL Fortran Enterprise Edition Run-Time Environment Version 9.1 for AIX [1]
–or–	**–and–**
IBM XL C/C++ Enterprise Edition Version 7.0 for AIX (program number 5724-I11)	C libraries[2]
–or–	
IBM XL C Enterprise Edition for AIX, Version 7.0 (program number 5724-I10)	
Notes:	
1. IBM XL Fortran Enterprise Edition Run-Time Environment Version 9.1 for AIX is automatically shipped with the compiler. It is also available for downloading from the following Web site: http://www.ibm.com/software/awdtools/fortran	
2. The AIX product includes the C and math libraries in the Application Development Toolkit.	

Table 3. ESSL Disk Space Requirements and Installation Materials

Disk space	essl.rte (package):	
	essl.rte.common	2.0 M
	essl.rte.rs1	24.0 M
	essl.rte.rs2	0.1 M
	essl.rte.smp	29.0 M
	essl.rte.up	0.1 M
	essl.rte.mp	0.1 M
	essl.msg.en_US	0.1 M
	essl.msg.En_US	0.1 M
	essl.man.en_US	2.0 M
	essl.loc.license	0.2 M
Installation materials	CD-ROM, ESSL feature LCD4-6648-01	

Step 2. Determine Which ESSL Filesets To Install

ESSL is packaged on the medium in such a way that groups of files (filesets) forming a logical unit of the product can be individually installed, allowing you to install only those files that you need. The ESSL filesets are described in Table 4.

Based on your needs, decide which ESSL filesets to install.

Table 4. ESSL Product Filesets

Fileset/Package Name	Description	Other Filesets or Software Required
essl.rte	This package contains the following individual filesets: essl.rte.common essl.rte.rs1 essl.rte.rs2 essl.rte.smp (See the descriptions for these filesets below.)	(See the requirements for these individual filesets below.)
essl.rte.common	Contains common files and programs that are used by both the serial and SMP libraries.	**essl.rte.rs1** and **essl.rte.up** *–or–* **essl.rte.smp** and **essl.rte.mp**
essl.rte.rs1	Contains the serial library and control files, with appropriate links to the serial library.	**essl.rte.common** must be installed beforehand or at the same time **XLF Run-time Environment** must be installed beforehand or at the same time

Table 4. ESSL Product Filesets (continued)

Fileset/Package Name	Description	Other Filesets or Software Required
essl.rte.rs2	Contains control files with appropriate links to the serial library.	**essl.rte.common** must be installed beforehand or at the same time **XLF Run-time Environment** must be installed beforehand or at the same time **essl.rte.rs1** will be installed automatically if the option "automatic installation of prerequisites" is selected
essl.rte.smp	Contains the SMP library and control files, with appropriate links to the SMP library.	**essl.rte.common** must be installed beforehand or at the same time **XLF Run-time Environment** must be installed beforehand or at the same time
essl.msg.en_US	Contains the en_US version of the message catalog; it is installed automatically for locale en_US when **essl.rte** is selected. is selected.	N/A
essl.msg.En_US	Contains the En_US version of the message catalog; it is installed automatically for locale En_US when **essl.rte** is selected.	N/A
essl.man.en_US	Contains manpages that describe each of the ESSL subroutines. **Note:** These manpages will be installed in the /usr/share/man/man3 directory. The manpages provided by LAPACK are installed in the /usr/share/man/manl directory. By default, ESSL manpages will be displayed rather than BLAS or LAPACK manpages with the same names. If you want to access the BLAS or LAPACK manpages, you must set the MANPATH environment variable. See the documentation for the **man** command.	N/A
essl.loc.license	Contains the electronic license agreement files.	N/A
essl.rte.up	Contains control files.	**essl.rte.rs1** must be installed beforehand or at the same time
essl.rte.mp	Contains control files.	**essl.rte.smp** must be installed beforehand or at the same time
"List of ESSL Product Files," on page 11 lists the individual files in each fileset.		

Step 3. Log in to the AIX Root and Install ESSL

There are two variations of this step:

- "Install on one node (that is, operating system image) at a time" on page 4
- "Install on multiple nodes (that is, operating system images) at once" on page 5

Follow the variation that is appropriate for your installation.

Notes:

1. The XLF Run-time Environment is a prerequisite to installation of ESSL.
2. No application programs that are using ESSL Libraries should be in progress when executing this step.

Install on one node (that is, operating system image) at a time

Follow the steps below to install ESSL on one node at a time:

1. Log in to the AIX root.
2. Put the CD in the drive.
3. Enter **smit** on the AIX command line and navigate to the "Install and Update from LATEST Available Software" panel. (Sample navigation steps to this panel are provided below. If you need more information about the **smit** command, use the help facility within SMIT.)

   a. On the "System Management" panel, select the first option, **Software Installation and Maintenance**, and press **Enter**.

   b. On the "Software Installation and Maintenance" panel, select the first option, **Install and Update Software**, and press **Enter**.

   c. On the "Install and Update Software" panel, select the first option, **Install and Update from LATEST Available Software**, and press **Enter**.

      Attention: If you are migrating from ESSL 3.3 or earlier, it is essential that you *do not* select the second option, Update Installed Software to Latest Level (Update All), as this option will not properly update all files from that release.

4. On the "Install and Update from LATEST Available Software" panel, do one of the following:

   - Press **F4** or click on **LIST**, then select the appropriate input device and press **Enter**;

     —*or*—

   - Type the name of the directory that contains the ESSL filesets, then press **Enter**.

5. When the "Install and Update from LATEST Available Software" panel is displayed again, select the ESSL filesets you want to install by doing one of the following:

   - Select the default value of **[all_latest]**.

     Note: If you choose this option, a message fileset will automatically be selected for installation based on your setting for locale. If you want to choose a different message fileset, follow the directions for selecting specific filesets from a list (described below).

     —*or*—

   - Select specific filesets from a list by doing the following:

     a. Press **F4** to list the available filesets (described in Table 4 on page 2).

     b. Press **F7** to select the ones you want to install.

Notes:

1) If you require the messages for a locale other than your own, you can select the appropriate message fileset at this time.

2) If you want to install all the run-time libraries, select **essl.rte**

  c. After selecting the filesets you want to install, press **Enter**.

    The "Install and Update from LATEST Available Software" panel is displayed again, listing the selected fileset names.

    —*or*—

  • Type the names of the ESSL filesets you want to install in the "SOFTWARE to install" field;

6. Move the cursor to the **ACCEPT new license agreements?** option and use the **Tab** key to change the default value to **yes**.

   Note: When you install ESSL, you must specify that you are accepting the license agreement (or, alternatively, the license agreement must have been previously accepted) in order for the installation process to continue.
.

7. Fill in the other fields as appropriate for your situation, then press **Enter**.

   Messages are displayed as the installation of each fileset is successfully completed.

Note: For details about the contents of each package or fileset, see Table 4 on page 2.

Install on multiple nodes (that is, operating system images) at once

If you are installing ESSL on several nodes at once, do the following:

1. Copy the packages that contain the filesets to the hard disk of one node. To do this:

  a. Put the CD-ROM into the appropriate drive.

  b. Type the following, then press **Enter**:

    smit bffcreate

    The system displays the "Copy Software to Hard Disk for Future Installation" panel.

  c. In the "INPUT device / directory for software" field, specify the device where the CD-ROM is located, then press **Enter**.

  d. On the next panel, in the "SOFTWARE package to copy" field, type the name(s) of the package or fileset(s) you want to install, or select them from the list that appears when you click on LIST.

    Note: For details about the contents of each package or fileset, see Table 4 on page 2.

  e. In the "DIRECTORY for storing software package" field, type the name of the hard-disk directory in which you want to store the filesets.

    Note: Do not specify a directory that already contains ESSL 3.3 or earlier filesets.

  f. Type information in the other fields on the panel as appropriate for your situation. When you have finished filling in the panel, press the Enter key.

The packages are copied to your hard disk and are placed in the directory that you specified on the SMIT panel.

2. Install the filesets from the hard disk to the various nodes. If available, use the **dsh** and **installp** commands to do this, specifying the name(s) of the ESSL package or fileset(s) you want to install and the directory in which you previously installed them on the hard disk, as shown in the example below.

Example: If you previously copied the essl.rte package to the /usr/sys/essl_dir directory on the hard disk, you would enter the command:

```
dsh -av installp -acgNQqXY -d /usr/sys/essl_dir all
```

Note: The **Y** flag in this command indicates that you are accepting the license agreement. The license agreement must be accepted in order for the installation process to continue.

Messages are displayed as the installation of each fileset is successfully completed.

Step 4. Run the Installation Verification Programs (IVPs)

To test that the ESSL libraries have been properly installed, you must execute the installation verification programs corresponding to the libraries you have installed and the language from which you will be calling ESSL.

There are two variations of this step:
- "Run the 32-Bit IVP" on page 6
- "Run the 64-Bit IVP" on page 7

Run the 32-Bit IVP

To run the 32-bit IVP, do the following:

1. Use the **cd** command to change to a writable directory.
2. Type the following command and press **Enter**:

   /usr/lpp/essl.rte.common/custom/esslivp *language library*

   where:

   language   is the language you want to verify. It can have any of the following values:

fortran	The XL Fortran compiler does not have to be on your system to use this value.
c	The C compiler must already be on your system to use this value; see Table 2 on page 1.
C++	The C++ compiler must already be on your system to use this value; see Table 2 on page 1.

   library   is the ESSL library you are testing. It can have any of the following values:

essl	Test the serial library.
esslsmp	Test the SMP library.
esslp2	Test the link to the serial library; provided for migration purposes.

esslp2_r	Test the link to the serial library; provided for migration purposes.
essl_r	Test the link to the serial library; provided for migration purposes.

Run the 64-Bit IVP

Note: You can run the 64-bit IVP only if you have 64-bit hardware.

To run the 64-bit IVP, do the following:
1. Use the **cd** command to change to a writable directory.
2. Type the following command and press **Enter**:

   /usr/lpp/essl.rte.common/custom/esslivp64 *language library*

   where:

language	is the language you want to verify. It can have any of the following values:

fortran	The XL Fortran compiler does not have to be on your system to use this value.
c	The C compiler must already be on your system to use this value; see Table 2 on page 1.
C++	The C++ compiler must already be on your system to use this value; see Table 2 on page 1.

library	is the ESSL library you are testing. It can have any of the following values:

essl	Test the serial library.
esslsmp	Test the SMP library.
essl_r	Test the link to the serial library; provided for migration purposes.

Chapter 2. Locating and Obtaining ESSL Documentation

Software Products for Displaying ESSL Online Information

The software products needed to display ESSL online information are listed in Table 5.

Table 5. Software needed to display various formats of ESSL online information

Format of online information	Software needed
HTML	HTML document browser (such as Microsoft® Internet Explorer)
PDF	Adobe Acrobat Reader, which is shipped with the AIX Bonus Pack and is also freely available for downloading from the Adobe web site at: `http://www.adobe.com`
Manpages	No additional software needed. To display a specific manpage, use the AIX **man** command as follows: **man** *subroutine-name* **Note:** These manpages will be installed in the /usr/share/man/man3 directory. The manpages provided by LAPACK are installed in the /usr/share/man/manl directory. By default, ESSL manpages will be displayed rather than BLAS or LAPACK manpages with the same names. If you want to access the BLAS or LAPACK manpages, you must set the MANPATH environment variable. See the documentation for the **man** command.

ESSL Internet Resources

ESSL documentation, as well as other related information, can be displayed or downloaded from the Internet at the URLs listed in Table 6.

Table 6. Online resources for ESSL-related information

Web Site	Type of Information Provided	File Formats Available	
		PDF	HTML
IBM @server Cluster Resource Center: `http://publib.boulder.ibm.com/clresctr`	Documentation for several releases of pSeries™ and clustered-server software products	Yes	Yes
IBM Publications Center: `http://w3.ehone.ibm.com/public/applications/publications/cgibin/pbi.cgi`	Documentation for IBM products	Yes	No

Appendix. List of ESSL Product Files

Table 7 lists the files created in the file system after installing each ESSL fileset. If you have any files with the same full path name that are not related to ESSL, they must be renamed before installing that fileset.

Table 7. ESSL Product Files, Symbolic Links, and Installation Control Files

File or Directory Name	Description	Fileset
/usr/include/essl.h	ESSL Header file for C and C++	essl.rte.common
All ordinary files in /usr/lpp/essl.rte	Installation control files for essl.rte package	essl.rte.common essl.rte.rs1 essl.rte.smp
All files in /usr/lpp/essl.rte/deinstl	De-installation control files for the essl.rte package.	essl.rte.common essl.rte.rs1 essl.rte.smp
All ordinary files in /usr/lpp/essl.rte.common	Installation control files	essl.rte.common
/usr/lpp/essl.rte.common/ITLM/ESSLX040200.SYS	ITLM inventory signature file	essl.rte.common
/usr/lpp/essl.rte.common/READMES/essl.rte.common.README	Readme for current release	essl.rte.common
/usr/lpp/essl.rte.common/custom/esslivp	Shell script to run ESSL Installation Verification Program (IVP)	essl.rte.common
/usr/lpp/essl.rte.common/custom/esslivp64	Shell script to run ESSL 64-bit Installation Verification Program (IVP)	essl.rte.common
/usr/lpp/essl.rte.common/custom/esvivp.o	Fortran IVP	essl.rte.common
/usr/lpp/essl.rte.common/custom/esvivp64.o	Fortran 64-bit IVP	essl.rte.common
/usr/lpp/essl.rte.common/custom/esvcivp.c	C IVP	essl.rte.common
/usr/lpp/essl.rte.common/custom/esvcivp.C	C++ IVP	essl.rte.common
/usr/lib/nls/msg/C/essl.cat	Message catalog for default locale	essl.rte.common
All ordinary files in /usr/lpp/essl.rte.rs1	Installation control files	essl.rte.rs1
/usr/lpp/essl.rte.rs1/READMES/essl.rte.rs1.README	Readme for current release	essl.rte.rs1
All files in /usr/lpp/essl.rte.rs1/lib	Serial library	essl.rte.rs1
/usr/lib/libessl.a	Serial library	essl.rte.rs1
All ordinary files in /usr/lpp/essl.rte.rs2	Installation control files	essl.rte.rs2
/usr/lpp/essl.rte.rs2/READMES/essl.rte.rs2.README	Readme for current release	essl.rte.rs2
All files in /usr/lpp/essl.rte.rs2/lib	Serial library	essl.rte.rs2
All ordinary files in /usr/lpp/essl.rte.smp	Installation control files	essl.rte.smp
/usr/lpp/essl.rte.smp/READMES/essl.rte.smp.README	Readme for current release	essl.rte.smp

Table 7. ESSL Product Files, Symbolic Links, and Installation Control Files (continued)

File or Directory Name	Description	Fileset
All files in /usr/lpp/essl.rte.smp/lib	SMP library	essl.rte.smp
/usr/lib/libesslsmp.a	SMP library	essl.rte.smp
All ordinary files in /usr/lpp/essl.rte.up	Installation control files	essl.rte.up
/usr/lpp/essl.rte.up/READMES/essl.rte.up.README	Readme for current release	essl.rte.up
All files in /usr/lpp/essl.rte.up/deinstl	De-installation control files	essl.rte.up
All ordinary files in /usr/lpp/essl.rte.mp	Installation control files	essl.rte.mp
/usr/lpp/essl.rte.mp/READMES/essl.rte.mp.README	Readme for current release	essl.rte.mp
All files in /usr/lpp/essl.rte.mp/deinstl	De-installation control files	essl.rte.mp
/usr/lib/nls/msg/en_US/essl.cat	Message catalog for locale en_US	essl.msg.en_US
All files in /usr/lpp/essl.msg.en_US/deinstl	De-installation control files	essl.msg.en_US
/usr/lib/nls/msg/En_US/essl.cat	Message catalog for locale En_US	essl.msg.en_US
All files in /usr/lpp/essl.msg.En_US/deinstl	De-installation control files	essl.msg.En_US
All files in /usr/lpp/essl.man.en_US	Installation control files	essl.man.en_US
All files in /usr/lpp/essl.man.en_US/deinstl	De-installation control files	essl.man.en_US
All files in /usr/share/man/man3	Manpages	essl.man.en_US
/usr/swlag/<locale>/essl.la	Electronic license agreement fileset for <locale>	essl.loc.license

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Installation Guide

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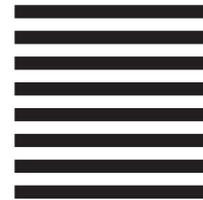IBM®

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