
AnalyzeAVW 3.0

Multidimensional Biomedical Image Display and Analysis Software

Installation of **AnalyzeAVW** Software from CD-ROM
for Silicon Graphics, Sun Microsystems, Digital Equipment Corporation,
IBM, Hewlett Packard, and PC(Intel)-based Linux workstations.

The following instructions explain how to install *AnalyzeAVW* on a workstation from CD-ROM.

Package Contents

- Mountable CD-ROM with *AnalyzeAVW* software, ancillary files, and image data.
- Installation Instructions (these sheets)

System Requirements

System Specific Disk Space Requirements

Manufacturer	Disk Space	Operating System
DEC Alpha	16 Mb	Digital UNIX 4.0+
Hewlett Packard	16 Mb	HP-UX 10.02+
IBM	16 Mb	AIX 4.2+
Silicon Graphics	33 Mb	IRIX 5.3+ and 6.2+
Sun Microsystems	14 Mb	Solaris 2.5+
PC (Intel) Linux	11 Mb	Red Hat 6.0+ or compatible

+later operating systems supported if compatible with the OS listed above.

Additional Disk Space Requirements

Section	Disk Space	Options
<i>AnalyzeAVW</i> root	24 Mb	Mandatory
<i>AnalyzeAVW</i> Tutorial Documents	42 Mb	Optional
<i>AnalyzeAVW</i> Tutorial Data	128 Mb	Optional
AVW Development Environment	27 Mb	Optional
Misc Source Files	41 Mb	Optional

System Preparation

- 1.) The disk space requirements and operating system levels for supported platforms are indicated in the above tables. The CD-ROM distribution of *AnalyzeAVW* contains software for all supported systems, so total disk space requirements for combinations of several components will need to be computed from these tables. The **setup** program will compute the total disk requirements and report the total prior to final installation. Be certain that the system on which you will be installing this software and data has adequate free disk space.
- 2.) The operating system version you are using is normally indicated in the system banner when you log into the system. If you are running an earlier version of the operating system than is indicated for your system type, *AnalyzeAVW* may not function.
- 3.) In the system on which *AnalyzeAVW* is being installed has a resident copy of a previous version of *AnalyzeAVW*, you may wish to uninstall the previous version (using the **setup** script supplied with the CD for that version) prior to installation of the new *AnalyzeAVW*. Otherwise, make sure to choose a new installation directory for this version.

CD-ROM Organization

The enclosed *AnalyzeAVW* CD-ROM contains two main components: the complete *AnalyzeAVW* distribution for all supported systems, including ancillary files and image data, and an interactive installation script for installation of the *AnalyzeAVW* software, including support for uninstallation of previously installed software. The CD-ROM contains a mountable file system (hsfs) that is mountable on the workstations supported by *AnalyzeAVW* (those which support the ISO 9660 format with Rock Ridge extensions). All files on the CD-ROM are uncompressed, including image data, and are organized with a standard UNIX directory/file structure. The main directory on the CD-ROM contains the following:

- **BIR**: complete *AnalyzeAVW* software distribution.
- **setup**: executable installation script.

The *AnalyzeAVW* distribution, located in the **BIR** directory, contains the complete distribution of *AnalyzeAVW* for all supported systems, ancillary files, and demonstration data organized in the following subdirectories and files:

- **AVW-3.0**: the AVW libraries and development environment.
 - **ALPHA**: shared libraries for DEC Alpha systems.
 - **COPYRIGHT**: copyright notice information for the AVW libraries.
 - **HP**: AVW shared libraries for Hewlett Packard systems.
 - **IBM**: AVW shared libraries for IBM systems.
 - **LicenseAgreement**: license agreement notice for the AVW libraries.
 - **Manuals**: PDF copies of the AVW Programmers Guide and AVW Reference Manual
 - **PC_LINUX**: AVW shared libraries for Intel-based PC's running the Linux OS.
 - **SGI5**: AVW shared libraries for Silicon Graphics systems (IRIX 5.3).
 - **SGI6**: AVW shared libraries for Silicon Graphics systems (IRIX 6.2+).
 - **SPARC**: AVW shared libraries for Sun Microsystems systems.
 - **app-defaults**: default settings for AVW functions.
 - **develop_env**: initialization script to support AVW-based software development.
 - **extras**: example programs to support AVW-based software development.
 - **include**: include files (.h) for AVW-based software development.
 - **man**: manual pages in standard 'man' format and html format for all AVW library functions.
- **AnalyzeAVW-3.0**: the *AnalyzeAVW* programs, tutorials, help documents and ancillary files.
 - **AnalyzeTutorials**: *AnalyzeAVW* Tutorial documentation in PDF format.
 - **BitMaps**: bitmap files used for *AnalyzeAVW* icons.
 - **COPYRIGHT**: copyright notice information for the *AnalyzeAVW* software system.
 - **HelpDocs**: HTML-based on-line help documentation for *AnalyzeAVW*.
 - **LicenseAgreement**: license agreement notice for the *AnalyzeAVW* software system.
 - **app-defaults**: default settings for individual *AnalyzeAVW* programs.
 - **bin**: the executable *AnalyzeAVW* programs.
 - **lib**: functions for specific routines and widgets which support *AnalyzeAVW*.
- **FLEXlm-7.0**: the FLEXlm license manager files for *AnalyzeAVW* system license administration.
- **Mesa-3.0**: a GL library used for viewing models on systems without GL support (public domain).
- **PublishSpool**: files to support the *AnalyzeAVW* printing mechanism.
- **SPM99-AAVW**: files to link *AnalyzeAVW* and SPM99 to allow direct image file sharing.
- **TCL-TK8.0**: interpreted language upon which *AnalyzeAVW* is built (public domain).
- **bin**: executable scripts for starting *AnalyzeAVW*.
- **ghost4.03**: an implementation of ghostscript used for printing support (public domain).
- **images**: *AnalyzeAVW* Tutorial image data and AVW 'extras' image data.

Several directories and files form the *AnalyzeAVW* root which must be installed on the host system in order to run *AnalyzeAVW*. Other directories and files are optionally installed by the interactive **setup** program.

The CD-ROM installation script **setup** facilitates the copying of user-specified components of the *AnalyzeAVW* distribution to the local workstation disk. The **setup** process will further uninstall existing copies of *AnalyzeAVW* and all associated files.

Installation

To begin the installation procedure for the *AnalyzeAVW* package, login as *root* on the system that has the target disk mounted that will store the *AnalyzeAVW* software. It is assumed that the system has a CD-ROM drive attached to it. For the rest of these instructions, this system will be referred to as *host*.

Mounting the CD-ROM

Each of the different systems provide various mechanisms for mounting the CD-ROM on a directory for that system. Often this mount needs to be done manually, specifying the CD-ROM device and a directory on which to do the mount. Some systems will automatically mount the CD-ROM on a specific directory when the CD-ROM is inserted into the drive, often invoking a file manager window in association with the inserted CD-ROM. Check with your systems administrator or workstation documentation for information on mounting a CD-ROM on your system.

Once mounted, the information on the CD-ROM can be accessed in the directory on which the CD-ROM is mounted. Change to this directory and proceed with the remainder of the installation process.

Running *setup*

The **setup** script on the *AnalyzeAVW* CD-ROM facilitates easy installation of all *AnalyzeAVW* components. To invoke the setup script, change to the mounted directory for the CD-ROM and in a shell window, execute the following command:

```
❑ ./setup
```

The interactive installation script provides all information necessary to install the *AnalyzeAVW* components. The initial option list is displayed once the script is executed:

```
Welcome to the AnalyzeAVW 3.0 setup script.
```

```
What would you like to do ?
```

```
a - Install AnalyzeAVW  
u - Uninstall AnalyzeAVW  
i - Information  
q - quit
```

```
Choice (a, u, i, q) [i] ?
```

For additional information on the installation procedure, select the **'i'** option.

AnalyzeAVW Software Installation (option **'a'**)

To install the *AnalyzeAVW* software, select the **'a'** option. Using this installation process, you will load selected directories and files onto a new directory that will be automatically created for storing the *AnalyzeAVW* package.

For each of the supported system types, you will have a choice to either not install that version or install the version to your disk, with the system type upon which you are running automatically selected for installation:

```
For each of the following questions, select the installation type:
```

```
y = Yes, install this option to disk  
n = No, do not install this option to disk  
l = Install this option as a link to CDROM(Not available for all options)
```

```
NOTE: Normally only one of the following system targets will be specified.  
The choices will be: DEC Alpha, HP, IBM, SGI, Sun, PC Linux. The system  
type upon which you are running this installation will default to [y].
```

The *AnalyzeAVW* root and each optional system type is then presented for selection of the installation process:

```
Install:
DEC Alpha Version (y n) [n] ?
HP Version (y n) [n] ?
IBM Version (y n) [n] ?
SGI Version (y n) [y] ?
Sun Version (y n) [n] ?
PC Linux Version (y n) [n] ?
```

Any combination of full installation and no action can be selected.

Following the system types, selection of the *AnalyzeAVW Tutorials* and tutorial image data is similarly provided:

NOTE: Online tutorials, with step by step instructions, are available for many of the AnalyzeAVW modules. These tutorials are very useful, but the tutorial data requires considerable disk space (128Mb).

```
Install Tutorials (y n l) [y]?
Tutorial Data (y n l) [y]?
```

Next, the ancillary *AnalyzeAVW* and *AVW* files can be installed if desired:

NOTE: The following options will have no effect on the ability to run the AnalyzeAVW software. They include:
Options which allow development with the AVW libraries.
Copies of pre-compiled source for packages used by AnalyzeAVW.

```
AVW Development Files (man pages, include, examples) (y n l) [n] ?
Misc Source (TCL-TK, Mesa) (y n l) [n] ?
```

The next entry specifies the location on the workstation in which a new directory called **BIR** will be created and to which all files will be copied:

```
Please enter the directory where you wish AnalyzeAVW to be installed. The
install script will automatically append /BIR. [ /home ] ?
```

The **BIR** directory will be created if it doesn't exist:

```
The directory /home/BIR does not exist.
Create it (y n) [y] ?
```

If the directory does exist, you will be asked if you wish to use that specific directory:

```
The directory /home/BIR already exists.
Use /home/BIR (y n) [n] ?
```

If the directory is write protected, an error will be reported and the prompt for directory entry will be redisplayed.

Once the directory has been established, the script will report all components that will be installed and their size:

```
Installation Information
=====
CD = /CDROM
Install Directory = /home/BIR

Install AnalyzeAVW root
Install SGI Version
Install Tutorials
Install Tutorial Data

Required Space = 227 Mb
Install (y n) [n] ?
```

Selecting '**n**' will cause the script to exit. Selecting '**y**' will proceed with the installation, which may take several minutes depending on the size of the install. As the installation proceeds, messages will be displayed to indicate the current item being processed to show the status of the installation:

```
Installing AnalyzeAVW root... done.  
Installing SGI... done.  
Installing Tutorials... done.  
Installing Tutorial Data... done.
```

Editing the default path in the Analyze script.

The Analyze Tutorials were distributed in .PDF format. It is assumed That an Acrobat Reader has been previously installed. See the \$BIR/AnalyzeAVW-3.0/AnalyzeTutorials/Adobe directory for more information.

To complete installation, the AnalyzeAVW.dat file must be copied from email or entered from fax or hardcopy to the \$BIR/FLEXlm-7.0/licenses directory.

Once the license file exists, the license server must be started using the \$BIR/FLEXlm-7.0/\$TARGET/bin/lmgrd command either at the command prompt or by inclusion in the boot startup script for the system.

To run AnalyzeAVW:

```
cd /home/BIR/bin  
./Analyze
```

AnalyzeAVW Installation Complete.

Note that the **Analyze** script in \$BIR/bin is altered to reflect the location of *AnalyzeAVW* on the workstation disk. This path is used to establish the correct \$BIR environment variable when these scripts are used to invoke *AnalyzeAVW*.(See the **Analyze** script in \$BIR/bin for an example of all environment variable defaults).

Note also that if links are created to the CD-ROM, the CD-ROM must always be present and mounted at the same location for the links to find the proper directories on the CD-ROM.

To complete the installation prior to running *AnalyzeAVW*, the *AnalyzeAVW* license manager files must be altered to reflect the proper license information for this system(s), and the FLEXlm license management software must be set up on a server to provide license administration to client workstations, as discussed in the next section on **AnalyzeAVW License Manager Installation**.

AnalyzeAVW Software Uninstall (option 'u')

To remove a previously installed version of *AnalyzeAVW* (BIR directory), select the '**u**' option. This will delete the entire *AnalyzeAVW* software package from your workstation disk.

AnalyzeAVW License Manager Installation

The *AnalyzeAVW* software system uses the **FLEXlm** license management software system from GLOBEtrouter Software for system validation and runtime license administration. **FLEXlm** uses a client/server mechanism, with a given license server providing licenses to systems that request a license when *AnalyzeAVW* is invoked. Prior to running *AnalyzeAVW*, both the **FLEXlm** server and each *AnalyzeAVW* client must be configured and the **FLEXlm** server daemon started on the server for licenses to be available to *AnalyzeAVW*. Two types of licenses may be provided, both of which are served from the **FLEXlm** license server: node locked licenses and floating licenses. Node locked licenses will provide a license via the server for a specific system, while floating licenses will exist on the server as a pool of licenses from which clients can request a license.

The FLEXlm License File and License Administration

The **FLEXlm** license manager software is located in the **\$BIR/FLEXlm-7.0** directory. This directory contains a subdirectory called **licenses** within which the **AnalyzeAVW.dat** license file must reside. The contents of this file must reflect the proper information for the **FLEXlm** license server and client systems in order to run *AnalyzeAVW*. Prior to starting the license manager process and running *AnalyzeAVW*, the **AnalyzeAVW.dat** file provided to you (usually via email) should be copied into this **licenses** directory on all systems that will be running *AnalyzeAVW*.

The FLEXlm Server Information

The **AnalyzeAVW.dat** license file contains information about the server that will be running the license manager and either information for each node locked client or for the number of floating licenses that will be available from the server. The first line of this file specifies the server information for license management:

```
SERVER servername 12345678
```

The system established as the **FLEXlm** server will provide license administration to the clients, either node locked or floating. In a single workstation configuration, this server will most likely be the same as the client, i.e., *servername* and *server id* (12345678) would be the same as the client *hostname* and *client id* (12345678). In a multiple workstation, networked environment a single system can act as the **FLEXlm** server with multiple clients receiving license administration from that server. This server may most likely be one of the *AnalyzeAVW* clients, but the **FLEXlm** server could also be a non-*AnalyzeAVW* validated system, such as a specific system that currently does **FLEXlm** license management for other software packages.

Node Locked Licenses

Additional lines will appear in the **AnalyzeAVW.dat** file for each node locked client system that has been validated to run the *AnalyzeAVW* software. Client *AnalyzeAVW* licenses will have the form of the following:

```
INCREMENT Analyze_Package mayd 3.0 31-dec-2000 1 000000000000 \
    HOSTID=12345678 vendor_info=hostname ISSUER=ADC
INCREMENT AnalyzeMain mayd 3.0 31-dec-2000 1 000000000000 \
    HOSTID=12345678 vendor_info=hostname ISSUER=ADC
```

In this case, the client system is called *hostname* and has a system id of 12345678. The license is for a complete copy of *AnalyzeAVW* that will permit 1 simultaneous copy to run on the client system until the expiration date of 31-dec-2000. The field for the encrypted validation code is currently empty (0000000000000000). Again, from the provided license information, the expiration date (31-dec-2000), number of simultaneous users (1), validation code (0000000000000000), system id (12345678), and system name (*hostname*) fields must be set to the specific information provided in your license information. If any of the fields do not match the information provided, the

license code will not work and *AnalyzeAVW* will not run. These four lines will be replicated in this same file for all clients supported by this license server. (Note: The \ at the end of each line is a line continuation character. These four lines are actually two long lines of information).

Floating Licenses

License file lines in the **AnalyzeAVW.dat** file for floating client licenses will not contain specific system ID information, but will rather establish a number of licenses that can be checked out. Floating *AnalyzeAVW* licenses will have the form of the following:

```
INCREMENT Analyze_Package mayd 3.0 31-dec-2000 5 000000000000 ISSUER=ADC
INCREMENT AnalyzeMain mayd 3.0 31-dec-2000 5 000000000000 ISSUER=ADC
```

In this case, specific client systems are not identified, as these licenses can float to any system on the network. These lines indicate that there are 5 floating licenses available from the server which will expire on 31-dec-2000.

Note that the **AnalyzeAVW.dat** file must exist and contain the exact information provided on both the server system and all client systems, as this information is important to the communication between the client(s) and the server during license administration. The file should not contain any other information, i.e. client information for other *AnalyzeAVW* systems served by other **FLEXlm** servers.

Once this file has been established with correct information on the server and all client systems, the server can be started and *AnalyzeAVW* can be run on the client systems.

The AnalyzeAVW / FLEXlm License Server

As mentioned previously, the **FLEXlm** license manager requires a daemon process to be running on a specific **FLEXlm** server to provide license service to the clients for either node locked or floating licenses. To invoke the license server process, a special command must be used, called **lmgrd**, which is located in the **\$BIR/FLEXlm-7.0** directory under each system-specific subdirectory. The following command line can be used to start the license server daemon on the server system:

```
 $BIR/FLEXlm-7.0/$TARGET/bin/lmgrd -c $BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat
```

where **\$BIR** is the path to the installed software and **\$TARGET** is the proper system type (ALPHA, HP, IBM, SGI5, SGI6, SPARC, PC_LINUX). The **-c** flag specifies the full path to the location of the specific **AnalyzeAVW.dat** file to be used for this license server process. The license server **lmgrd** and daemon process **mayd** will start running and will output information on the status of the license server to the shell window from which the command was issued. An alternative command to start the server daemon and route the output to a log file for server information is:

```
 $BIR/FLEXlm-7.0/$TARGET/bin/lmgrd -c $BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat > $BIR/FLEXlm-7.0/Log
```

Once the server process is running on the license server, the clients authorized to obtain licenses from the server may be used to run the *AnalyzeAVW* software.

Other commands exist in the **\$BIR/FLEXlm-7.0** system-specific bin directories to manage the **FLEXlm** license daemon on the server. All commands reference the specific license server and daemon by specification of the full path to the license file using the **-c** option. The **lmdown** command will shut down the specific license server. The **lmstat** command will provide useful information about the current status of the license server. The **lmdiag** command will provide additional diagnostics output to the Log or the shell window during the license server execution. The server process can also be added to the system startup files and the license server invoked automatically upon system initialization. Examples for various systems startup procedures are provided in **\$BIR/FLEXlm-7.0/flexlmstartup**. For additional information on these commands and other **FLEXlm** license server specifics, see the **FLEXlm End User Manual** located in the **\$BIR/FLEXlm-7.0/htmlman/flexuser** directory (HTML files) or refer to GLOBEtrouter Software's web page at <http://www.globetrotter.com>.

The AnalyzeAVW / FLEXlm Client

The client systems that will run the *AnalyzeAVW* software must be set up to make requests to the proper **FLEXlm** server. As previously mentioned, the **\$BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat** file on the client side must be exactly the same as that on the server for working communication to the license manager. The *AnalyzeAVW* software will automatically look for the license file at **\$BIR/FLEXlm-7.0/licenses/AnalyzeAVW.dat** in order to make the proper requests to the server (all communication is referenced to the license file). If this license file is at a different location or has a different file name, the **LM_LICENSE_FILE** environment variable will need to be set to look for this alternative license file (complete path specification to the file). Consult the **FLEXlm End User Manual** in the **\$BIR/FLEXlm-7.0/htmlman/flexuser** directory (HTML files) or refer to GLOBEtrotter Software's web page at <http://www.globetrotter.com> for additional information on the client license access.

AnalyzeAVW Image Memory Management

The *AnalyzeAVW* software system uses a completely new method of memory management for loaded volume images from the previous *ANALYZE* software systems. In *AnalyzeAVW*, the volume images are directly memory mapped to a new file which is created for each volume image when it is loaded. These memory mapped copies of the original volume image file have a .mmap extension and are located in a specific directory that can be controlled by the user. By default, this directory is set to the system tmp directory (/tmp,), as it always exists, usually has sufficient space for a few loaded images, is often integrated with the system swap space, and is cleaned of existing files during a reboot. However, depending on the system configuration of the disks, it may be desirable to change the location for these memory mapped files based on the available disk resources. The **ANA_DIR** environment variable permits specification of this directory to hold the memory mapped files. For example, to change the location from the default to a directory on a disk with more available space (site specific):

```
 setenv ANA_DIR /usr/home/images
```

The location of this directory should be on a disk local to the system running *AnalyzeAVW*.

The memory mapped files directory (also referred to as the 'workspace' directory), can also be changed while running *AnalyzeAVW*. With the cursor over the main *AnalyzeAVW* program canvas, select and hold the right mouse button, which will bring up a menu of several selections. The 'Workspace Directory' selection permits the entry of a new directory for the memory mapped files. This directory should be local to the system and should be on a disk partition with sufficient free disk space to handle the volume of loaded image data expected for all users.

Running AnalyzeAVW

If you have completed the installation process and followed the instructions for setting up the various *AnalyzeAVW* facilities, including the license server and client information, you are now ready to run the *AnalyzeAVW* program itself, and may do so with the demo image data provided.

Running The AnalyzeAVW Program

To run the *AnalyzeAVW* software system, change to the **\$BIR/bin** directory and execute the **Analyze** startup script:

```
 cd /home/BIR/bin  
 ./Analyze
```

The first part of this **Analyze** script establishes several environment variables that are needed to specify the location of the **AnalyzeAVW** software and other ancillary files:

```
if ($?BIR == 0) setenv BIR /home/BIR
setenv AVW_VERSION 3.0
setenv AVW $BIR/AVW-$AVW_VERSION
setenv AAVW $BIR/AnalyzeAVW-$AVW_VERSION
setenv TCL_ROOT $BIR/TCL-TK8.0
setenv TCL_LIBRARY $TCL_ROOT/lib/tcl8.0
setenv TK_LIBRARY $TCL_ROOT/lib/tk8.0
```

The **BIR** environment variable needs to be set to the proper location of the **AnalyzeAVW** software package. This will have been changed by the **setup** script to the proper path during installation. Setting this environment variable to the proper path may also be done in other scripts, like **.cshrc**, with the path to **\$BIR/bin** added as part of the **PATH** variable. If **BIR** has been set to the proper path, the **AnalyzeAVW** software system can be invoked by simply typing **\$BIR/bin/Analyze** or **Analyze**.

Drag and Drop in AnalyzeAVW

Drag and drop for volume images in **AnalyzeAVW** requires secure X-windows authorization in the X-windows server. This is the case for most systems, but on two specific systems, configuration files for the X-windows system need to be changed in order to enable secure authorization.

Drag and Drop on SGI

To enable a secure X-server on SGI systems, the **/var/X11/xdm/xdm-config** file must be edited and the **"DisplayManager*authorize:"** entry changed to **"on"**.