



# Analyze 8.1 UNIX/Linux Installation Instructions

Welcome to Analyze 8.1, a robust, powerful, and practical research software for advanced biomedical imaging visualization, manipulation, and measurement. Analyze features integrated, complementary tools for fully interactive multi-dimensional display, processing, segmentation, registration, and measurement of biomedical imaging modalities including MRI, CT, PET, SPECT, ultrasound, and digital microscopy. It has been designed and carefully programmed to be highly efficient and user-interactive, performing powerful 3-D image processing and display operations in seconds. The applications of Analyze are broad in scope, wide in scale, and penetrating in impact.

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## I. Installing Analyze 8.1 on UNIX and Linux Systems:

### System Requirements

#### System Specific Disk Space Requirements:

Manufacturer	Disk Space	Operating System
AMD64 Linux	49 Mb	Red Hat Enterprise Linux 3+
Mac OS X Intel (64-bit)	41 Mb	OS X 10.5+ (Leopard)
Mac OS X Intel (32-bit)	41 Mb	OS X 10.4.8+ (Tiger)
Mac OS X (PowerPC)	41 Mb	OS X 10.4.8+
Intel Linux (32-bit)	45 Mb	Red Hat 7.3+
Itanium 2 Linux (64-bit)	91 Mb	Red Hat Enterprise Linux 3+
Silicon Graphics (32-bit)	61 Mb	IRIX 6.5.2+
Silicon Graphics (64-bit)	68 Mb	IRIX 6.5.2+
Sun Microsystems (32-bit)	45 Mb	Solaris 2.6+
Sun Microsystems (64-bit)	53 Mb	Solaris 2.7+

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

#### Additional Disk Space Requirements:

Section	Disk Space	Options
Analyze root	61 Mb	Mandatory
Analyze Tutorial Documents	31 Mb	Optional
ITK Runtime	22 Mb	Optional
AVW Development Environment	36 Mb	Optional
ITK Development Environment	1 Mb	Optional

### System Preparation

1. The disk space requirements and operating system levels for supported platforms are indicated in the above tables. The **Analyze 8.1** installation CD 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 install script 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, **Analyze** may not function.
3. If the system on which **Analyze 8.1** is being installed has a resident copy of a previous version of **Analyze**, you may wish to uninstall the previous version. Otherwise, make sure to choose a new installation directory for this version. To uninstall the previous version, follow the steps below to mount the Analyze 8.1 installation CD and run the install script. Upon startup of the **install script**, select the 'u' option and specify the directory of the previous version. This will delete Analyze entirely from your workstation disk.
4. To begin the installation procedure for the **Analyze** package, login as **root** on the system that has the target disk mounted that will store the Analyze 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.

## I. Installing Analyze 8.1 on UNIX and Linux Systems:

### Mounting the Analyze 8.1 Installation CD

The **Analyze 8.1** installation CD contains a mountable file system (hsfs) that is mountable on the workstations supported by Analyze (those which support the ISO 9660 format with Rock Ridge extensions). Each of the different systems provide various mechanisms for mounting the CD on a directory for that system. Often this mount needs to be done manually, specifying the CD device and a directory on which to do the mount. Some systems will automatically mount the CD on a specific directory when the CD is inserted into the drive, often invoking a file manager window in association with the inserted CD. Check with your systems administrator or workstation documentation for information on mounting a CD on your system.

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

### Running the Install Script

1. The **install script** on the installation CD facilitates easy installation of all Analyze 8.1 components. To invoke the setup script, change to the mounted directory for the CD and in a terminal shell window (such as 'xterm') execute the following command:

```
./install
```

2. The interactive installation script provides all information necessary to install the **Analyze 8.1** components. The initial option list is displayed once the script is executed:

```
Welcome to the Analyze 8.1 install script.
```

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

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

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

3. For additional information on the installation procedure, select the 'i' option. To remove a previously installed version of Analyze (BIR directory), select the 'u' option. This will delete the entire Analyze software package from your workstation disk.

## I. Installing Analyze 8.1 on UNIX and Linux Systems:

### Analyze 8.1 Software Installation (option 'a')

1. To **install Analyze 8.1**, 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 Analyze package.
2. 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

NOTE: Normally only one of the following system targets will be specified. The choices will be: AMD64 Linux 64-bit, Mac Intel 64-bit, Mac Intel 32-bit, Mac PPC, SGI 32-bit, SGI 64-bit, Sun 32-bit, Sun 64-bit, PC Linux 32-bit and Itanium Linux 64-bit. The system type upon which you are running this installation will default to [y].

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

Install:

```
AMD64 Linux 64-bit Version (y n) [n] ?  
Mac Intel 64-bit Version (y n) [n] ?  
Mac Intel 32-bit Version (y n) [n] ?  
Mac PPC Version (y n) [n] ?  
SGI 32-bit Version (y n) [n] ?  
SGI 64-bit Version (y n) [n] ?  
Sun 32-bit Version (y n) [n] ?  
Sun 64-bit Version (y n) [n] ?  
PC Linux 32-bit Version (y n) [y] ?  
Itanium Linux 64-bit Version (y n) [n] ?
```

*Note: Any combination of full installation and no action can be selected beyond this point.*

4. Following the system types, selection of the **ITK Runtime** option is similarly provided:

NOTE: Analyze can be extended with functions from the ITK library. Functionality includes Filtering, Segmentation and Registration. (22 Mb)

```
Install ITK Runtime (y n) [y]?
```

5. Next, the **Analyze Tutorials** can be installed if desired:

NOTE: Online tutorials, with step by step instructions, are available for many of the Analyze modules. (31 Mb)

```
Install Tutorials (y n) [y]?
```

6. Next, the ancillary **Analyze** and **AVW** files can be installed if desired:

NOTE: The following option allows development with the AVW programming environment. It has no effect on the ability to run Analyze. (36 Mb)

```
AVW Development Files (man pages, include, examples) (y n) [n]?
```

## I. Installing Analyze 8.1 on UNIX and Linux Systems:

7. The **ITK Developers Add On** can also be installed if desired:

NOTE: AVW Developers might also be interested in the AVW\_ITK library. This library allows access to ITK functionality from a AVW C program. This is not necessary to use the ITK functions within Analyze. (1 Mb)

```
Install ITK Developers Kit (y n) [y]?
```

8. The next entry specifies the location in which a directory called **BIR** will be created to which all files will be copied:

Please enter the directory where you wish Analyze to be installed.  
The directory specified should already exist and have write access.  
(Note: The / or root directory is not legal and will result in an install script error.) The install script will automatically append /BIR to the directory path provided [ /home ] ?

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

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

10. 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] ?
```

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

11. 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 Analyze root  
Install PC Linux 32-bit Version  
Install ITK Runtime  
Install Tutorials  
  
Required Space = 146 Mb  
  
Install (y n) [n] ?
```

*Note: 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.*

12. As the installation proceeds, messages will be displayed to indicate the current item being processed to show the status of the installation:

```
Installing Analyze root... done.  
Installing PC Linux 32-bit... done.  
Installing ITK Runtime... done.  
Installing Tutorials... done.  
  
Editing the default path in the Analyze script.  
  
<Hit return to continue>
```

## I. Installing Analyze 8.1 on UNIX and Linux Systems:

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

13. To complete the installation prior to running **Analyze**, the system-specific **AnalyzeDirect.lic** license file must be installed for this system, and the **BIRlic license server process** must be started. For instructions on how to obtain and install your license file, please refer to “**Analyze License Files**”.

To complete the installation, a valid license file for Analyze must be established on this system. Detailed instructions on installing a valid Analyze license file are included in the installation documentation in the section: Analyze License Installation (page 11). Follow these instructions to install the Analyze license on this system.

<Hit return to continue>

14. After installation of the ‘**AnalyzeDirect.lic**’ license file, the license server will need to be started to provide license service to all Analyze clients. The section “**Starting the BIRlic License Server**” describes this process. It is very important to read this entire section and follow the instructions to enable a license server for all Analyze clients.

Following installation of the license file, the license server process must be started on the license server system. Detailed instructions on invoking this license server process are included in the installation documentation in the section: Analyze License Installation (page 11). Follow these instructions to start the license server process prior to running Analyze.

<Hit return to continue>

15. Once the license server has been started the Analyze software system can be started using the Analyze startup script as follows:

To run Analyze:

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

Analyze Installation Complete.

## II. Analyze License Files:

### Analyze License File Installation

**Analyze requires a license file to run, you can obtain this license file from AnalyzeDirect.**

To generate the license file, AnalyzeDirect needs to receive specific system information from your UNIX, Linux or Mac workstation: the workstation HOSTNAME and the workstation SYSTEM ID.

1. To get the **HOSTNAME** please type the following command in a terminal window: **uname -n**
2. To get the **SYSTEM ID** different instructions are followed depending on which kind of workstation you are using:
  - **SGI systems:** Type the command "**sysinfo -s**" and report the returned decimal number
  - **Sun systems:** Type the command "**hostid**" and report the returned hexadecimal number
  - **PC-Based Linux systems:** Type the command "**/sbin/ifconfig eth0**" and report the hexadecimal number in the HWaddr field
  - **Mac OS X systems:** Type the command "**/usr/sbin/netstat -i**" and report the address for the Ethernet card
3. Please send an e-mail to [validate@analyzedirect.com](mailto:validate@analyzedirect.com) with the **HOSTNAME** and **SYSTEM ID**, along with your **name, company, and telephone number**.
4. Once AnalyzeDirect receives your system information, a license file will be generated and sent to you via e-mail. The name of the license file is **AnalyzeDirect.lic**.

### BIRlic License Management

The **Analyze** software system uses the **BIRlic** license management software system for Analyze validation and runtime license administration. **BIRlic** administers two types of licenses: counted node-locked licenses and uncounted node-locked licenses. For Linux/Unix/MacOSX-based systems, counted node-locked licenses are the primary license type. For counted node-locked licenses, **BIRlic** uses a client/server mechanism, with a given license server providing counted node-locked licenses to a specific set of clients that request a license when **Analyze** is invoked. Prior to running **Analyze**, both the **BIRlic** server and each **Analyze client** must be configured and the **BIRlic** server daemon started on the server for licenses to be available for Analyze.

### The AnalyzeDirect.lic License File

The **BIRlic** license manager software is located in the **\$BIR/BIRlic-8.1** directory. This directory contains a subdirectory called **Licenses**, within which an example license file is provided, called **AnalyzeDirect.lic**.

**This file must be replaced with a valid AnalyzeDirect.lic license file for your specific system on which Analyze has been installed.**

This file will have been provided to you via e-mail and it will reflect the client/server information you provided with your Analyze order. Note that the **AnalyzeDirect.lic** license file must be installed on both the license server system and on all clients with copies of Analyze that will access their license via the license server.

## II. Analyze License Files:

### Installing the AnalyzeDirect.lic License File and Starting the BIRlic License Server

The **BIRlic** license manager requires a valid server license file installed on the license server system and a background process to be running on the BIRlic server to provide counted license service to the clients. There are two methods to install a valid **AnalyzeDirect.lic** license file on the server and invoke the BIRlic license server process - using an automated tool called the **BIRlic Tool** or manually installing the license file and starting the license server.

#### To install the license and invoke the license server process using the BIRlic Tool:

1. Start the **BIRlic Tool** by invoking the command (from a terminal shell window such as 'xterm'):

**\$BIR/BIRlic-8.1/\$TARGET/bin/BIRlic Tool**

*\*Where \$BIR is the path to the installed software and \$TARGET is the proper system type (AMD\_LINUX64, MAC\_I64, MAC\_I32, MAC\_X, SGI, SGI64, SUN, SUN64, PC\_LINUX, PC\_LINUX64).*

2. Select the **License** tab in the BIRlic Tool window.
3. Choose the **Copy from File** option on this panel and use the file selection box to locate the **AnalyzeDirect.lic** license file provided to you and select this file. (Note: the license text can also be selected in an e-mail or text editor and copied to the clipboard, followed by selecting the Copy from Clipboard button).
4. The license file will be displayed in the BIRlic Tool license editor. If the license contents are correct, choose the **Save** button to write the license to the **AnalyzeDirect.lic** file in your installed copy of Analyze.
5. Select the **Server** tab in the BIRlic Tool to check the license server status and invoke process.
6. To check the current license server status, select the **Server Status** button. With no license server process running, this will generate a "Connect Error" (this may take up to 30 seconds while the check makes multiple attempts to connect to the server). If a license server is running from a prior copy of Analyze, please shut down the previous license server before proceeding with this installation.
7. Select the **Start Server** button and **Yes** at the prompt to start the license server on this system. The license server process should now be running and listening for license requests from the Analyze client systems.
8. Select the **Server Status** button again to check the license server status. If the status check fails, make sure all of the license information is correct for this server system (examine the license using the View button on the License tab; check the Server HOSTID to make sure this is correct; check the Server system name and Port number). The View button on the Log tab may also provide additional information if an error occurs during license server startup.

#### Installing your license file and starting the license server manually:

1. Copy the **AnalyzeDirect.lic** file provided to you via e-mail to the **\$BIR\BIRlic-8.1\Licenses** directory, replacing the exiting AnalyzeDirect.lic file at that location.
2. To invoke the license server process manually, the command '**BIRlic**' must be used, which is located in the **\$BIR/BIRlic-8.1** directory under each system-specific subdirectory, along with a specific option to the command, the '**Server**' option.

## II. Analyze License Files:

- The following command can be used to start the license server process manually on the server system:

**`$BIR/BIRlic-8.1/$TARGET/bin/BIRlic Server`**

*\*Where \$BIR is the path to the installed software and \$TARGET is the proper system type (AMD\_LINUX64, MAC\_I64, MAC\_I32, MAC\_X, SGI, SGI64, SUN, SUN64, PC\_LINUX, PC\_LINUX64).*

- The license server will start running and will output information on the status of the license server to the **`$BIR/BIRlic-8.1/BIRlic.log`** file.
- An ampersand (&) can be appended to the **Server** start line, to run the process in the background, but during initial installation it is recommended that the process be run in the foreground (without the ampersand).
- 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 **Analyze** software.
- The **BIRlic** command also has other options to manually control the license server process:
  - Hostid** – returns the unique system id.
  - Status** – displays the status of checked out licenses.
  - Update** – causes the server to re-read the license file.
  - Shutdown** – causes the license server to shutdown.
  - Recover** – recover a license lost because of a program error (automatic recovery will occur with 30 minutes).

## Automatic License Server Startup During System Boot

The license server process can also be added to the system startup files and the license server invoked automatically upon system initialization (boot/reboot). An example of a system startup procedure is provided in the **`$BIR/BIRlic-8.1`** directory in a file named **`S99birlic`**. The BIRlic Tool can also be used to establish the startup files for the license server process automatically. To establish automatic startup for the license server, do the following:

- Start the **BIRlic Tool** by invoking the command (from a terminal shell window such as 'xterm'):

**`$BIR/BIRlic-8.1/$TARGET/bin/BIRlic Tool`**

*\*Where \$BIR is the path to the installed software and \$TARGET is the proper system type (AMD\_LINUX64, MAC\_I64, MAC\_I32, MAC\_X, SGI, SGI64, SUN, SUN64, PC\_LINUX, PC\_LINUX64).*

- Select the **Shutdown Server** button on the **Server** tab to shutdown the current license server.
- Select the **Install Bootscript** button to establish the system startup files that will invoke the license server process whenever the server is started. (Note: you may need to be running with root access to install these system files).
- Select the **Start Bootscript** button to execute the startup files and invoke the license manager (if you don't want to reboot the system at this point).
- Now each time the system is started, the license server process will be automatically started and can immediately provide licenses to the Analyze clients.

## II. Analyze License Files:

### The Analyze / BIRlic Client

The client systems authorized to run the **Analyze** software must be set up to make requests to the proper **BIRlic** server. As previously mentioned, the **\$BIR/BIRlic-8.1/Licenses/AnalyzeDirect.lic** file on the client side must be exactly the same as that on the server for working communication to the license manager. The **Analyze** software will automatically look for the license file at **\$BIR/BIRlic-8.1/Licenses/AnalyzeDirect.lic** 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 **BIRLIC\_LICENSE\_FILE** environment variable will need to be set to look for this alternative license file (complete path specification to the file). The same methods used to install the license file on the server system can be used to install the license file on each Analyze client.

1. Start the **BIRlic Tool** by invoking the command (from a terminal shell window such as 'xterm'):

**\$BIR/BIRlic-8.1/\$TARGET/bin/BIRlic Tool**

*\*Where \$BIR is the path to the installed software and \$TARGET is the proper system type (AMD\_LINUX64, MAC\_I64, MAC\_I32, MAC\_X, SGI, SGI64, SUN, SUN64, PC\_LINUX, PC\_LINUX64).*

2. Select the **License** tab in the BIRlic Tool window.
3. Choose the **Copy from File** option on this panel and use the file selection box to locate the **AnalyzeDirect.lic** license file provided to you and select this file. (Note: the license text can also be selected in an email or text editor and copied to the clipboard, followed by selecting the Copy from Clipboard button).
4. The license file will be displayed in the BIRlic Tool license editor. If the license contents are correct, choose the **Save** button to write the license to the AnalyzeDirect.lic file in your installed copy of Analyze.
5. To install the license file manually, copy the **AnalyzeDirect.lic** file provided to you via e-mail to the **\$BIR\BIRlic-8.1\Licenses** directory, replacing the exiting AnalyzeDirect.lic file at that location.

### License File Expiration, Renewal, and Installation

All Analyze license files have a built-in expiration date. For Analyze evaluators, this date is 30 days after the license file was first sent. If you are an evaluator and you still wish to use Analyze following the expiration of your license file, please contact us at [sales@analyzedirect.com](mailto:sales@analyzedirect.com) to find out about purchasing options.

For Analyze customers, long-term Analyze license files are provided in 12-month increments. This provides the opportunity for you to change the system running Analyze, if required.

AnalyzeDirect contacts all customers one month prior to the expiration of the license file to determine if the license file system information is still current. Once we receive system confirmation, a new license file will be sent by e-mail. If your license file expires, and you have not yet received a new license file, please contact us at [validate@analyzedirect.com](mailto:validate@analyzedirect.com) to obtain your renewal license file.

To install your renewal license file you must first stop the license server. Follow the instructions in "Analyze License File Installation" to install your renewal license.

### III. Running Analyze 8.1:

#### Running the Analyze Program

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

1. To run the Analyze software, open a terminal shell on the system, go to the **\$BIR/bin** directory (where \$BIR is the install directory - default is /home/BIR) and execute the Analyze startup script:

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

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

```
if (!$?BIR == 0) setenv BIR /home/BIR
```

The **BIR** environment variable needs to be set to the proper location of the **Analyze** software package. This will have been changed by the install 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 **Analyze** software system can be invoked by simply typing **\$BIR/bin/Analyze** or **Analyze**.

#### Analyze Patch Updates

As with most software products, the process of bug fixing and minor maintenance between versions is an ongoing process. Analyze has all such fixes available in the form of a patch. Patches can be automatically downloaded and installed by selecting the **Help > Analyze Update** option from the main Analyze window. It is recommended to check periodically for updates.

#### Analyze Image Memory Management

The **Analyze** software system uses a method of memory management for loaded volume images that directly memory maps to a new file which is created for each volume image when it is loaded. These memory mapped copies of the original volume image 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, 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 Analyze.*

The memory mapped files directory (also referred to as the 'workspace' directory), can also be changed while running **Analyze**. With the cursor over the main Analyze 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.

### III. Running Analyze 8.1:

#### Drag-and-Drop in Analyze

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

#### Drag-and-Drop on SGI Systems:

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**”.

#### Analyze Image File Format Support

Of special note - Analyze does not automatically load all of the image file format support libraries that are possible with Analyze. This keeps module startup time to a minimum, loading only those image formats that you need to use with Analyze for your purposes. To configure your version of Analyze to load additional image file formats, use the Import/Export External Libraries tool; instructions on configuration can be found in the Quick Start Guide, Exercise 2: Switching on Support for Additional Formats.

#### Analyze 8.1 Resources

There are several excellent resources available to help you get started with **Analyze 8.1**.

To quickly learn the basics of Analyze, we recommend that you work through the **Analyze 8.1 Quick Start Guide**—found on the **Resources CD** included with your installation disk. The Quick Start Guide contains a series of short exercises covering the most commonly used Analyze features and functions. Please refer to the “**Installing Tutorial Data**” section in the Quick Start Guide to install the tutorial data used in the exercises.

The **Analyze Tutorials** (optional component during installation) and the **Analyze User’s Guide**, both available from the **Help menu** in the main Analyze window, are another excellent resource, providing detailed information about the Analyze modules.

Note: The Quick Start Guide, Analyze Tutorials, and Analyze User’s Guide are all in PDF format and require Adobe Acrobat Reader. To install the latest version of Acrobat Reader please visit [www.adobe.com/acrobat](http://www.adobe.com/acrobat).

**Analyze Viewlets** (short tutorial movies) are also now available and can be accessed by selecting the Analyze Viewlets option from the **Help menu**. The viewlets show many of the key features and functionality of the Analyze modules and can help you become familiar with the program interface.

#### AnalyzeDirect Technical Support

For support related issues, please send an e-mail to the AnalyzeDirect support team at [support@analyzedirect.com](mailto:support@analyzedirect.com). Maintenance Agreements, which include access to unlimited priority technical support and free version upgrades, can be purchased by contacting us at +1.913.338.2527 or via e-mail at [sales@analyzedirect.com](mailto:sales@analyzedirect.com).

## IV. Analyze Developers Add-On:

The **Analyze Developers Add-On** allows software developers to extend the capabilities of Analyze by developing their own macros and modules, using the **AVW** (A Visualization Workshop) image function library on which Analyze is built, and **Tcl/Tk**, the interface language used by Analyze.

To get access to development capabilities, enter 'y' when asked if you would like to install the **AVW Development Files** during **installation**. The Developers Add-On also requires an **AnalyzeDirect.lic** license file that allows access to these development capabilities. By default, the license file ordering process outlined in "Obtaining a License File", sends a license file that does not give development access – please indicate that you need a **Developers Add-On license file** when you send your e-mail to [validate@analyzedirect.com](mailto:validate@analyzedirect.com).

The Developers Add-On assumes you are familiar with programming in the C and Tcl programming environment. If you want to know more about Tcl programming, we recommend starting with the 'Bible' of Tcl/Tk - "**Practical Programming in Tcl and Tk**" by Brent Welch. This comes with a CD that you can load on to your computer, which includes a full Tcl/Tk implementation and many examples.

The **AVW Programmers Guide**, **AVW Reference Manual**, and **AVW Quick Reference Guide** can be found in the **/BIR/AVW-8.1/Manuals** directory, or can be downloaded in PDF format from our website at [www.analyzedirect.com/support/downloads.asp](http://www.analyzedirect.com/support/downloads.asp).

The best place to start practicing AVW-based Tcl/Tk is in the examples provided in the **/BIR/AVW-8.1/extras** directory. Here you will find a number of example source files, both in C and in Tcl/Tk, for common Analyze imaging tasks (like rendering, segmentation, etc.). The .tcl scripts contained in these subdirectories are full source code scripts that can be run, but you do need the Tcl/Tk environment set up such that these scripts can find the Tcl/Tk files needed to execute. The **develop\_env.bat** script included in the **/BIR/AVW-8.1** directory should be used to set the development environment variables. The **develop\_env.bat** file is for Windows NT systems only. You should use the **develop\_env.bat** file to make sure everything is set up before running any of the Tcl/Tk scripts.