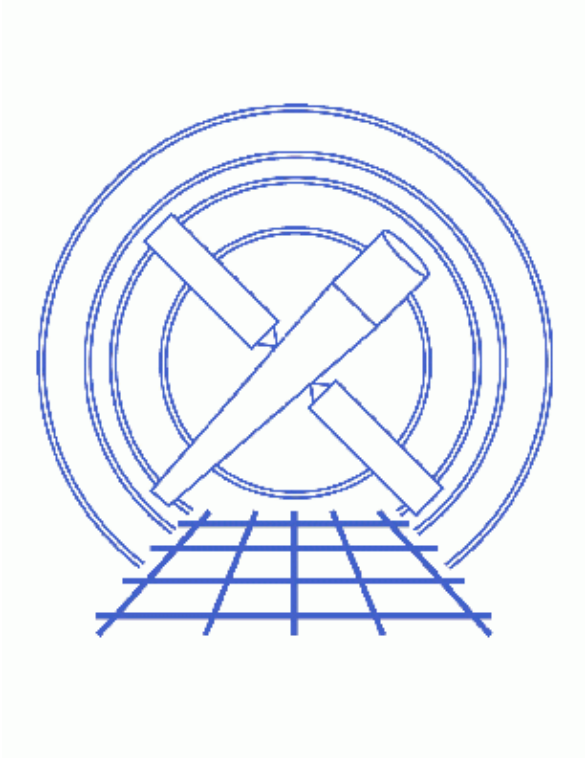
Installing CIAO using the ciao-install tool



CIAO 4.1 Science Threads

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URL: http://cxc.harvard.edu/ciao/threads/ciao_install_tool/ Last modified: 16 June 2009

Installing CIAO using the ciao-install tool

CIAO 4.1 Science Threads

Overview

Last Update: 16 Jun 2009 - clarified why `ciao-install` must be run twice to install CALDB in a separate location

Synopsis:

The `ciao-install` tool is intended to simplify and automate the installation and upgrade of the CIAO - Chandra Interactive Analysis of Observations - software package, and the Chandra Calibration DataBase (CALDB). It is currently a beta release, and user comments are welcome via Helpdesk.

This thread **does not** explain how to re-compile CIAO yourself. Refer to the INSTALL_SOURCE file for information on that process.

Related Links:

- Installing CIAO 4.1: how to manually install CIAO 4.1.2.
- Patching CIAO 4.1 to CIAO 4.1.1: how to manually upgrade to CIAO 4.1.1 if you already have CIAO 4.1 installed.
- Patching CIAO 4.1 or 4.1.1 to CIAO 4.1.2: how to manually upgrade to CIAO 4.1.2 if you already have CIAO 4.1 or 4.1.1 installed.

Proceed to the HTML or hardcopy (PDF: A4 | letter) version of the thread.

System Requirements

CIAO is supported on a number of operating systems, which are listed on the Platform Support page. Certain system requirements are necessary to successfully install and run CIAO; review these system requirements before continuing with the installation.

The ciao-install tool (beta)

This is a beta release of `ciao-install`

You will need a copy of the `ciao-install` tool. It can be placed in the same directory as the tar files, and should have its executable bit set:

```
unix% chmod u+x ciao-install
```

There is also a README file that describes the tool.

This version of `ciao-install` is a beta release, and will be upgraded at a later date to improve its functionality. If you have comments on how the tool works then please send them to the Helpdesk.

Installation Options

The `ciao-install` tool can be used to install a full CIAO installation or to upgrade an existing CIAO 4.1 installation. The tool will attempt to determine what version of CIAO is currently installed and only apply the necessary files.

There is no upgrade option for Solaris 10 systems, as it was added to the set of supported platforms in the CIAO 4.1.2 release.

Upgrading to CIAO 4.1.2

If the installation directory contains an existing CIAO installation then `ciao-install` will only attempt to install the patch/upgrade files.

Therefore, if you are upgrading CIAO, you only need to download the necessary patch file or files. It does not cause any problems if you have downloaded the full CIAO installation, other than the time taken and disk space used.

Note that the tool is currently not intelligent enough to determine whether the CALDB or CIAO contributed script packages are up to date, so these files will always be installed. As noted below the script package has been updated to match the CIAO 4.1.2 release and so it should be downloaded.

Upgrading from CIAO 4.1

If your existing CIAO installation is CIAO 4.1 then you need to download *both* the CIAO 4.1.1 and CIAO 4.1.2 patches. They are available from the CIAO download pages for your system.

The CIAO 4.1.1 patch is a platform independent file called `ciao-4.1.1-tools.tar.gz` and the 4.1.2 patch is called `ciao-4.1.2-patch-<os>.tar.gz`, where `<os>` is one of `fc4`, `fc8`, `osxi`, `osxppc`, `sun`, or `sun10` and should match the system you are upgrading.

Upgrading from CIAO 4.1.1

If your existing CIAO installation is CIAO 4.1.1 then you need to download the CIAO 4.1.2 patch file from the CIAO download pages for your system.

The 4.1.2 patch file is called `ciao-4.1.2-patch-<os>.tar.gz`, where `<os>` is one of `fc4`, `fc8`, `osxi`, `osxppc`, `sun`, or `sun10` and should match the system you are upgrading.

CIAO contributed scripts

Since the CIAO contributed script package has been updated for the CIAO 4.1.2 release then you should also download this file. It is called `CIAO_4.1_scripts.tar` and is available from the same page as the patch files.

A full installation of CIAO 4.1.2

If all the CIAO components are downloaded, and the installation directory does not contain an existing CIAO installation, then the tool will install the full CIAO package (version 4.1.2).

To install CIAO, you need the following packages from the CIAO download pages:

- Binaries: `ciao-4.1-bin-<component>-<OS>.tar.gz`

  Contains the CIAO tools, libraries, parameter files, and help files. Also contains the pre-compiled off-the-shelf (OTS) programs required to run CIAO. There are five components in CIAO 4.1: core, tools, chips, sherpa, and obsvis.

  The relationship between `<OS>` and the supported operating systems is given in the following table:

<OS>	**Operating system**
`fc8`	Fedora Core 8
`fc4`	Fedora Core 4
`osxi`	OS-X with an Intel processor
`osxppc`	OS-X with a PPC processor
`sun`	Solaris 8 and 9
`sun10`	Solaris 10

  CIAO 4.1.1 (optional, all platforms): there is a platform-independent patch which contains Cycle 11 proposal planning calibration files: `ciao-4.1.1-tools.tar`. This is required for users of PIMMS or if you are planning to use the `ciao-install` tool to install CIAO.

  CIAO 4.1.2: the platform-specific binary patch file: `ciao-4.1.2-patch-<OS>.tar.gz`.

  Solaris 10 Note: the CIAO 4.1.2 release for Solaris 10 is a full release, so there are no 4.1.1 or 4.1.2 patch files for that platform *and* the binary files are called `ciao-4.1.2-bin-xxx` rather than `ciao-4.1-bin-xxx`.
- Chandra Calibration Database (CALDB)
- Contributed science scripts and modules: `CIAO_4.1_scripts.tar`

Save the tarfiles to a location that is accessible from where you wish to install CIAO. These files were used to install CIAO on a Fedora Core 8 machine:

```
unix% ls -1
acis_bkgrnd_4.1.2.tar.gz
caldb_4.1.2_main.tar.gz
ciao-4.1.1-tools.tar.gz
ciao-4.1.2-patch-fc8.tar.gz
ciao-4.1-bin-chips-fc8.tar.gz
ciao-4.1-bin-core-fc8.tar.gz
ciao-4.1-bin-obsvis-fc8.tar.gz
ciao-4.1-bin-sherpa-fc8.tar.gz
ciao-4.1-bin-tools-fc8.tar.gz
CIAO_4.1_scripts.tar
```

Where should CIAO and CALDB be installed?

This section can be skipped if you are updating an existing CIAO installation.

The CIAO software package and the Chandra Calibration Database (CALDB) can be installed in any location and **do not** need to be installed with root or super-user privileges.

CIAO

As of CIAO 4.0, CIAO unpacks into a directory called `ciao-<version>/`, so for the current release this is `ciao-4.1/`; prior to CIAO 4.0 the files unpacked into the working directory. So if CIAO were to be installed into `/usr/local/`, it would be placed into the directory `/usr/local/ciao-4.1/`. This directory (`/usr/local/ciao-4.1/`) is referred to as the *root directory* of CIAO in the rest of this thread. It is also the value that the `$ASCDS_INSTALL` environment variable is set to once CIAO has been started.

In the rest of this thread we will assume CIAO is being installed into `/soft/`.

CALDB

You can choose to install the CALDB within the CIAO installation - in the directory `$ASCDS_INSTALL/CALDB` or in a separate directory, in which case `$ASCDS_INSTALL/CALDB` should be a soft link to the actual location.

For this thread, we assume that the database will be installed in the `/soft` directory:

```
/soft/CALDB/
```

Installing CIAO as the root user

It is is strongly suggested that CIAO be installed as a non-privileged user and **not as the root user**. If CIAO must be installed in a directory owned by root and you are following the manual process, then

1. unpack CIAO as root (so creating the `ciao-4.1/` directory);
2. use the `chown` utility to change ownership of this directory to the installer's username.

When using the `ciao-install` tool to install in a root-owned directory, run the tool as a normal user and it will use `sudo` to create the directory (prompting you for the super user password), followed by running `chown` on the directory to return ownership to the installer.

Installing the CIAO Software

Unlike the manual approach, you should **not** unzip the downloaded tar files, since the `ciao-install` tool expects to find the files as they are named on the download site.

The following output assumes that we are using `ciao-install` to do a *full installation* of CIAO. If you are *upgrading* CIAO then the prompts and behavior will be similar except that:

a. The tool should not be run twice. It should be run just once, *without* using the `-caldb` switch.
b. The list of installed files will only include those files that you have downloaded.

If you are upgrading CIAO with `ciao-install` then you should still follow the run the tests and check the CALDB installation steps.

In this example, we want to install the CALDB into `/soft/CALDB`, so the `-caldb` switch is used to set this location. This means the tool has to be run twice:

1. to install CIAO and create the link from CIAO to `/soft/CALDB`
2. to install the CALDB (`ciao-install` follows the link created in the first run to know where to install the CALDB files)

If the CALDB is installed *within* the CIAO installation (i.e. in the directory `ciao-4.1/CALDB`), `ciao-install` is only run once and the `-caldb` flag is never used.

```
unix% mkdir /soft/CALDB

unix% ./ciao-install -caldb /soft/CALDB
Output recorded in /home/ciaouser/ciao-install-7557.log
Download Directory - Default: /soft/download:
```

The `ciao-install` tool prompts for any required information that hasn't been provided by a command-line flag.

1. The installation log

The tool prints brief messages to the screen and a more extensive log to the file `~/ciao-install-<pid>.log`; in our example the user running the tool is called `ciaouser`.

The log file can be used to help diagnose problems via the Helpdesk, as well as to monitor progress of the installation. It is suggested that at this point you start another terminal and use the `tail` command to monitor this output; in this case the command would be:

```
unix% tail -f ~/ciao-install-7557.log
Output recorded in /home/ciaouser/ciao-install-7557.log
```

2. The download directory

At this stage we move back into the terminal running the `ciao-install` tool and enter return to accept the default location for the download directory. For this installation the files were placed in the directory `/soft/download/`. If we wanted to change this location then we would have entered the full path to the desired directory; note that tab completion is possible at these prompts.

3. The OS

The following message is printed to both the screen and the log file:

```
Installing system fc8
```

The tool has analyzed the contents of the download directory and realized that there is only one system available for installation; in this case `fc8` so it has automatically selected it. If there were multiple systems present then the tool would have asked you which one to install (the output of this prompt is not shown here).

4. Location for CIAO

The next prompt is for the location of CIAO; as we wish CIAO to be installed into `/soft/ciao-4.1` so we answer `/soft` rather than accept the default value (again, command-line completion is available at this prompt):

```
Install Directory - Default: /usr: /soft
```

5. Test the installation

The next prompt asks you whether to run the CIAO smoke tests; these are some simple tests we provide to help validate the installation. Is is strongly suggested that you accept the default value of `y` here:

```
Run Smoke tests? (Default y) y/n?:
```

6. Update the defaults

The final prompt is to ask you whether the default answers for the prompts should be updated to use your current selection. If you accept the default here (which is `yes`), then the values will be written to the text file `~/.ciaoinstall.rc` and will be used the next time the tool is run. In this case we accept the default value:

```
Update Defaults? (Default y) y/n?:
```

7. The smoke tests

At this point the tool starts to unpack and install CIAO; both the screen and log file will be filled by lines like the following (the exact output depends on what parts of CIAO you downloaded):

```
Installing /soft/download/ciao-4.1-bin-core-fc8.tar.gz in /soft
Installing /soft/download/ciao-4.1-bin-sherpa-fc8.tar.gz in /soft
Installing /soft/download/ciao-4.1-bin-tools-fc8.tar.gz in /soft
Installing /soft/download/ciao-4.1-bin-chips-fc8.tar.gz in /soft
Installing /soft/download/ciao-4.1-bin-obsvis-fc8.tar.gz in /soft
Installing /soft/download/ciao-4.1.1-tools.tar.gz in /soft
Installing /soft/download/ciao-4.1.2-patch-fc8.tar.gz in /soft
Installing /soft/download/CIAO_4.1_scripts.tar in /soft
running chcon to allow CIAO to work with SELinux
Running configure ./configure
```

The 'running chcon' line only appears on Linux installations. It indicates that the installation has been updated to run under Security-Enhanced Linux, if is installed on your system.

If `ciao-install` was run without the `-caldb` flag then the CALDB files would also be installed at this stage, so the screen output would include lines like

```
Installing /soft/download/caldb_4.1.2_main.tar.gz in /soft
Installing /soft/download/acis_bkgrnd_4.1.2.tar.gz in /soft
```

At this point the output of the installation log will diverge from the screen output; the screen will show the following (the time taken to output all these lines depends on the speed of your system)

```
Re-indexing system
Creating binary compiled python modules
Running smoke tests
Smoke tests complete. Please check logfile.
```

```
Processing complete! Log file is /home/ciaouser/ciao-install-7557.log
```

whilst the log file will include more details. The main part of the log file output to notice is the test results. This begins with

```
Running smoke tests
PATH=${PWD}/smoke/bin:${PATH} && \
        export PATH && \
        make test-ui test-obsvis test-chips test-sherpa \
                test-dm test-crates test-tools
make[1]: Entering directory `/soft/ciao-4.1/test'

Running test prism-smoke001
prism-smoke001 completed SUCCESSFULLY

Running test prism-smoke002
prism-smoke002 completed SUCCESSFULLY
```

and will continue until all the tests have been run, at which point you should see

```
Running test tools-dmstat3
PASS: Test tools-dmstat3 completed successfully

make[1]: Leaving directory `/soft/ciao-4.1/test'
Smoke tests complete. Please check logfile.
Processing complete! Log file is /home/ciaouser/ciao-install-7557.log
```

and you can control-c out of the `tail` command.

Screen output during the tests

Since the smoke tests include tests of a number of the GUI applications in CIAO, windows will appear and disappear during these tests. This can make using your computer difficult, since these windows may take the mouse focus or overlap your working windows.

Verifying test successes

A successful test logs the message:

```
<testname> completed SUCCESSFULLY

or

PASS: Test <testname> completed SUCCESSFULLY
```

whilst unsuccessful tests report:

```
<testname> FAILED
 Review /tmp/smoke/<testname>/diff.log for details
```

The smoke tests do not currently print a summary of successful and failed tests. Review the log file to be certain that none of the tests failed.

Known Smoke Test Issues

There is a bug page for known smoke test issues. If you experience a problem that isn't listed there, submit it to Helpdesk.

8. CALDB installation

Since the CALDB is being installed in a separate location the `ciao-install` tool needs to be re-run **without** the `-caldb` switch to unpack and install the CALDB. `ciao-install` follows the link created in the first run to know where to install the CALDB files.

If the CALDB were installed within the CIAO installation (i.e. `ciao-install` was run without the `-caldb` switch) then this step is unnecessary and you can skip to checking the CALDB installation.

We accept the default values for download and installation, but answer no to the smoke tests and update of defaults (the smoke tests do not check the CALDB installation):

```
unix% ./ciao-install
Output recorded in /home/ciaouser/ciao-install-8388.log
Download Directory - Default: /soft/download:
Installing system fc8
Install Directory - Default: /soft:
Run Smoke tests? (Default y) y/n?: n
Update Defaults? (Default y) y/n?: n
```

The tool will now proceed to install the CALDB files into the `/soft/ciao-4.1/CALDB` directory, which was created in the first `ciao-install` run as a soft link to `/soft/CALDB/`.

```
Installing /soft/download/CIAO_4.1_scripts.tar in /soft
Installing /soft/download/caldb_4.1.2_main.tar.gz in /soft
Installing /soft/download/acis_bkgrnd_4.1.2.tar.gz in /soft
running chcon to allow CIAO to work with SELinux
Running configure ./configure
Re-indexing system
Creating binary compiled python modules
Processing complete! Log file is /home/ciaouser/ciao-install-8388.log
```

The `ciao-install` has not installed the CIAO tar files since it determined that they were already installed; it did however re-install the scripts file (`CIAO_4.1_scripts.tar`) since it can not safely compare the version of this package to the installed version.

---

9. Check the CALDB installation

The scripts package contains the `check_ciao_caldb` tool which performs a simple test of the Chandra CALDB installation. Running the tool should produce screen output like the following:

```
unix% ls -1 /soft/ciao-4.1/CALDB/
data/
docs/
software/
unix% check_ciao_caldb
CALDB environment variable = /soft/ciao-4.1/CALDB
        which is a link to = /soft/CALDB/
             CALDB version = 4.1.2
             relelase date = 2009-03-26T18:00:00
CALDB query completed successfully.
```

For a more-thorough validation please follow the `chkcif steps` described on the download CALDB page.

Clean Up

Finally, you may delete the tarfiles from the original download directory. For this example we would say:

```
unix% cd /soft/download
unix% rm ciao*gz
unix% rm caldb_4.1.2_main.tar.gz
unix% rm acis_bkgrnd_4.1.2.tar.gz
unix% rm CIAO_4.1_scripts.tar
unix% rm ciao-install
```

You should also delete the log file(s) - e.g. `~/ciao-install-<pid>.log` - once you have reviewed them for errros.

Create a CIAO alias

It is strongly suggested that you create an alias to make it easy to set up and use CIAO.

The alias syntax depends on the shell (tcsh, csh, bash); see this FAQ for help in determining which shell you are using.

- `csh/tcsh` users should add the following to their `$HOME/.cshrc` file.
  ```
  alias ciao "source /soft/ciao-4.1/bin/ciao.csh"
  ```
- `bash` users should add the following to their `$HOME/.bashrc` file.
  ```
  alias ciao=". /soft/ciao-4.1/bin/ciao.bash"
  ```
- `ksh` users should add the following to their `$HOME/.login` file.
  ```
  alias ciao=". /soft/ciao-4.1/bin/ciao.ksh"
  ```

More information is given in the Running CIAO section of the Starting CIAO thread.

Once the alias is defined, you will be able to simply type

```
unix% ciao
```

and CIAO will be setup and ready to use in that window.

Notes

Solaris: "@LongLink" file

If a file named "`@LongLink`" is created when the tarfiles are unpacked on Solaris, it is an indication that tar was used instead of GNU tar ("gtar").

As noted in the System Requirements section, Solaris users **must** use gtar to unpack the files. If native Solaris tar is used, some of the test filenames will be truncated.

Known Conflicts

There are some known conflicts between CIAO and other software or system libraries and tools. They are documented in the following webpages:

- "Watch Out" List
- Other Software Packages bug page

Usage and Licensing

All non-OTS source code will be freely available in support of any CIAO release. The software is subject to Smithsonian Institution Copyright, a statement of which can be found in the headers of the source files, as well as at `$ASCDS_INSTALL/LICENSE.SAO`.

CIAO 4.1 is further governed by the GNU General Public License (`$ASCDS_INSTALL/COPYING`) and/or the GNU Library General Public License (`$ASCDS_INSTALL/COPYING.LIB`), both of which are bundled with the software.

Summary

The CIAO installation is now complete. For help getting started with the software, read the Introductory science threads.

History

20 Apr 2009	The CIAO 4.1.2 release coincides with the beta release of the `ciao-install` tool.
16 Jun 2009	clarified why `ciao-install` must be run twice to install CALDB in a separate location

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