CSDS User Interface
ISDAT User's Manual

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with change bars for issue 2.0

Contents

1 Introduction

1.1 Intended readership

This manual is intended for the user of the ISDAT client package within the CSDS User Interface.

1.2 Applicability of the manual

The current version of the document applies to the ISDAT version 2.2 , delivered as release 4 within the CSDS User Interface Project. It is valid for SUN Solaris workstations.

1.3 Purpose of the CSDS UI Data Manipulation software

The purpose of the CSDS User Interface ISDAT sub-system is to provide the scientific community with software tools to manipulate and display Cluster CSDS summary and primary parameters.

1.4 How to use this document

The CSDS ISDAT sub-system consist of an ISDAT server and an ISDAT client package. The CSDS UI ISDAT client package consists of a number of self-standing clients. Each such ISDAT client has its own user manual. The ISDAT server also has its own user manual. This document gives an overview of the ISDAT sub-system and covers items that are not covered by individual client or server manuals. The installation of the ISDAT client package is described in [Ref. 1]. The use of the CUI ISDAT server is described in [Ref. 4]. The use of the complete CSDS User Interface is described in [Ref. 3].

Section 2 Gives a short overview of the ISDAT architecture. Section 3 contains a short hands-on instruction that helps you to get started the first time you use the CSDS UI ISDAT package. All detailed descriptions of the clients are given in separate documents.

1.5 Conventions and acronyms

In the following, we will use *italics* to indicate exact names or expressions.

`Courier`

fonts will be used to give command line expressions or source code . > will be used to indicate the terminal prompter.

Acronyms and abbreviations are explained in Table 1.

Acronym	Meaning
CDF	Common Data Format
CD-ROM	Compact Disc Read Only Memory
CSDS	Cluster Science data System
CUI	CSDS User Interface
ESRIN	European Space Research Institute
IDL	Interactive Data Language
IRF-U	Institutet för Rymdfysik, Uppsalaavdelningen
	Swedish Inst. of Space Phys., Uppsala Division
ISDAT	Interactive Science Data Analysis Tool
NDC	National Data Centre
UI	User Interface

Table 1: Acronyms and abbreviations

1.6   Problem reporting

Problems should be reported to your CSDS National Data Centre.

2   Overview of the CSDS UI ISDAT System

2.1   The role of the ISDAT sub-system in the CSDS User Interface

The CUI ISDAT constitutes one component in the CSDS User Interface. The role of the ISDAT package is to manipulate and display scientific data contained in the CSDS summary and prime parameter data bases at the CSDS National Data Centres. Other functions, like data catalogue browsing are performed by other components of the CUI, see [Ref. 3].

2.2   ISDAT Data Flow

The CUI ISDAT consists of a client-server system. A simplified data flow diagram is shown in Figure 1. The ISDAT server is normally residing at a National Data Centre, and the ISDAT clients are normally located at the user work station. A typical data analysis and display loop is roughly the following:

1. The user interacts with the client package via an X-window and specifies time interval, parameter of interest, type of manipulation etc.

2. The client requests the required data, locally or via networks, from the ISDAT Server.

3. The server returns the requested data.

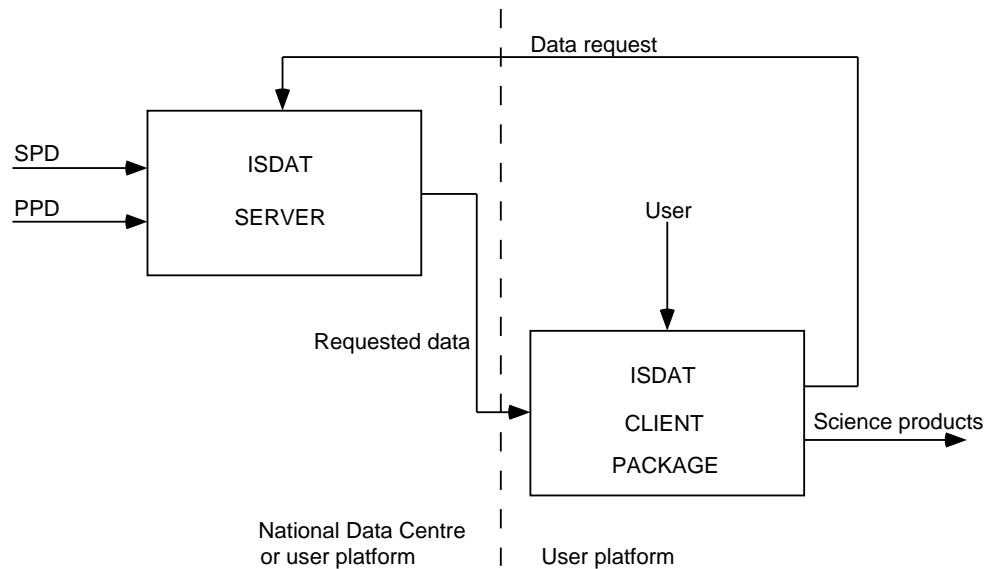4. The client manipulates and displays the resulting data.

Figure 1: CUI ISDAT sub-system simplified data flow

2.3　ISDAT Server functions

The role of the CSDS ISDAT Server is:

- to access a data base according to the user requests.

- to select data according to the request of the user.

- to convert data to units, time resolution etc. according to the user request.

- to format data according to the ISDAT client server protocol.

- to communicate the data to an ISDAT client.

- to check the access rights of the user.

The use of the ISDAT server is normally of no concern for the science user. However, optionally an ISDAT server can be installed at the user's workstation. Further details are described in [Ref. 4].

2.4　ISDAT clients functions

2.4.1　Definition of ISDAT clients

By *ISDAT clients* in general, we understand analysis and display programs by which the user interacts with the ISDAT and receives his products. There are three classes of clients:

1. time managers
2. general clients

3. specific clients

A particular client may or may not be a part of the particular ISDAT installation. It could well be a personal client residing only at one local workstation. Every client is a self standing program (main program) that may or may not run at the same work station as the ISDAT server from which it gets its data. The two latter classes of clients may include direct links to commercial program packages like IDL. The data flow related to clients is shown in Figure 1 where the activity *ISDAT client package* can be replaced by one particular client.

Time managers are special *clients* that are used to coordinate the behaviour of an associated family of clients. A typical set of functions for a *time manager* may be:

Activate other clients At start time, the time manager traverses the ISDAT directory tree, identifies all executable files, builds a menu or a list of clients. The user then can select clients from the list to be activated and added to the family of clients controlled by the particular *time manager* . A particular client can also be started from a command line. However, in that case, servers with CSDS User Interface access control cannot be used.

Select project At start time the time manager identifies available *project, member, and instrument* and the user may choose one of the available combinations.

Select data file At start time the time manager identifies available data periods, and the user can select a suitable time interval. As the time interval is updated, all active clients, in the family, are informed about the currently selected interval. This means that the user can have several graphic windows open and he can be sure that all windows belonging to the family of clients represent the same time interval.

Several time managers, each controlling its family of clients, may be active simultaneously. In the CUI distribution one time manager *cuitm* is included. Several parallel processes of the *cuitm* can be active concurrently however.

The *general clients* do not depend on any particular project or instrument etc. They normally start by quering the ISDAT server about the supported data bases and its properties and build up menus to support the user in requesting data.

The *specific clients* depend on a particular project or instrument etc. and are intended for particular data analysis purposes.

The simplified decomposition of the CUI ISDAT client package is shown in Figure 2.

2.4.2 Clients included in the CSDS package

The following *clients* are provided within the CUI ISDAT client package (see Figure 2):

cuitm A client of class *time managers*. See section 3.2.1 and [Ref. 6] for a description and instructions.
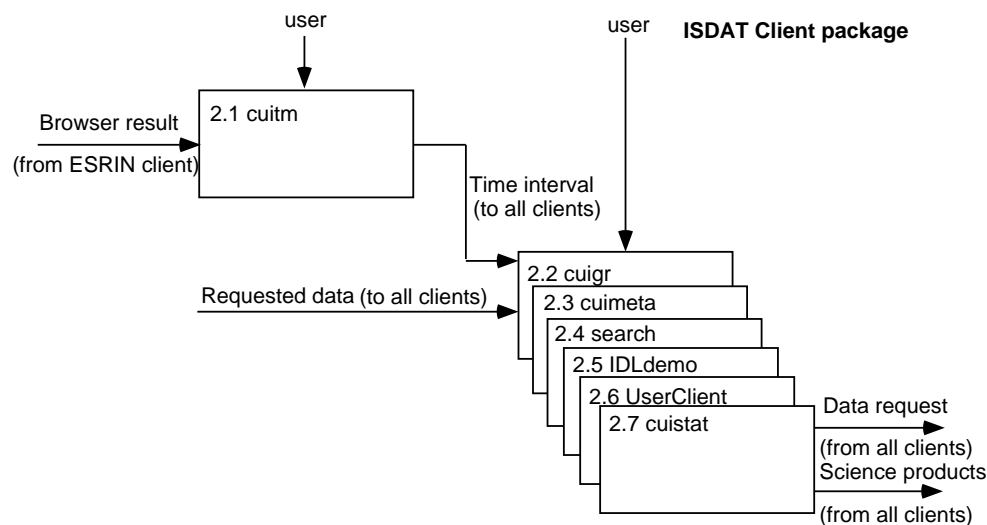
Figure 2: CUI ISDAT client package, simplified data flow

cuigr A general purpose graphics client of class *general clients*. See section 3.2.4 and [Ref. 5] for a description and instructions.

cuimeta A client of class *special clients* used for display of Cluster CDF file meta data. See section 3.2.2 and [Ref. 7] for a description and instructions.

search A client of class *general clients* used for searching in Cluster CDF file scientific data. See section 3.2.5 and [Ref. 10] for a description and instructions.

cuistat A client of class *special clients* used for display of Cluster instrument status words. See section 3.2.3 and [Ref. 11] for a description and instructions.

Optionally two clients:

IDLdemo Included only in order to demonstrate how to include user defined IDL clients. See section 3.3.2 and [Ref. 8] for a description and instructions.

UserClient Included only in order to demonstrate how to include user written clients. See section 3.3.1 and [Ref. 9] for a description and instructions.

can be obtained from your *CSDS National Data Centre.*

3 User Instructions

3.1 Introduction

This instructions section gives you a short self-contained practical introduction to the use and capabilities of the CSDS UI ISDAT package. It is intended for familiarization only. Prior to any productive work using the tools, the user should consult the user manuals for the individual ISDAT clients.

A successful use of these instructions requires that:

- You are familiar with the X-window and mouse usage. If not, consult the appropriate manuals for your work station.

- You have logged in and have a CSDS *session manager* running. If not, see [Ref. 2] for instructions.

- The ISDAT client package has been properly installed and configured at your local workstation. If not, consult your National Data Centre.

- That you are a registered user at your *CSDS National Data Centre*. Summary parameters might be freely accesible (TBC) though .

3.2   Using the CSDS UI supplied clients

For a short hands-on first introduction to the CUI ISDAT tools, please follow the following steps (not necessarily in order).

- Start the ISDAT tools by clicking on the *ISDAT* button of the *CUI Session Manager*, see [Ref. 2]. From here onwards, please follow the instructions under section 3.2.1.

3.2.1   The Time Manager (cuitm)

For a complete description of the *cuitm* client, see [Ref. 6].

After clicking on the CSDS Session manager *ISDAT* button, the ISDAT Time manager start window, shown in Figure 3, should appear on your screen.

- click on the *catalog* button in the lower edge of the *time manager* window. You should now get a window, showing your catalogue selections from your current or previous *ESRIN client* CSDS session. If the *catalog* button is in a passive state, click on the *content* button instead. A window similar, but not identical, to the *catalog* window should appear.

- Select one or several intervals of the *catalog* window by pressing the left mouse button over the selected lines in the *catalog* window. The selected intervals should appear in reverse video.

- click on the *OK* button in the *catalog* window. The *catalog* window should now disappear and the selected time and interval should appear in the *Start, Stop,* and *Interval* frames of the *time manager* window.

- Press the left mouse button over the *Clients* menu entry of the *time manager* window. A pull-down menu displaying the available clients, should appear.

- Release the left mouse button over the *csds → cuimeta* entry. Follow the instructions under section 3.2.2.

- Release the left mouse button over the *csds → cuistat* entry. Follow the instructions under section 3.2.3.
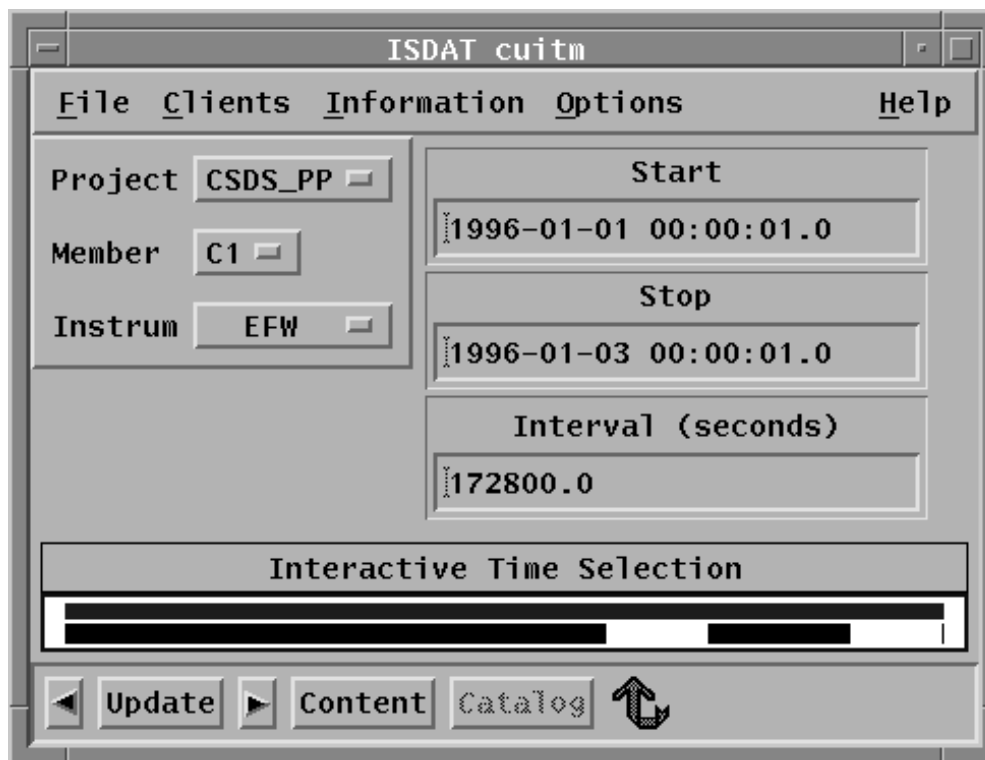
Figure 3: The cuitm start window

- Release the left mouse button over the *general* → *cuigr* entry. Follow the instructions under section 3.2.4.

- Release the left mouse button over the *general* → *search* entry. Follow the instructions under section 3.2.5.

- Release the left mouse button over the *Quit* entry of the *File* menu. This action should remove all ISDAT related windows from the screen.

3.2.2   The Meta Data Client (cuimeta)

The meta data clients is used to display global or variable meta data accompanying the science data in the CDF file. For a complete description of the *cuimeta* client, see [Ref. 7]. After starting the *cuimeta* client, a window, shown in Figure 4 should appear on your screen.

- Close the *meta* window from the *Exit* entry of the *File* menu of the *cuimeta* window.

- Return to section 3.2.1, to the point where you left.

3.2.3   The Instrument Status Client (cuistat)

The status word data clients is used to display instrument status words accompanying the physical data in the CDF file. For a complete description of the *cuistat* client, see
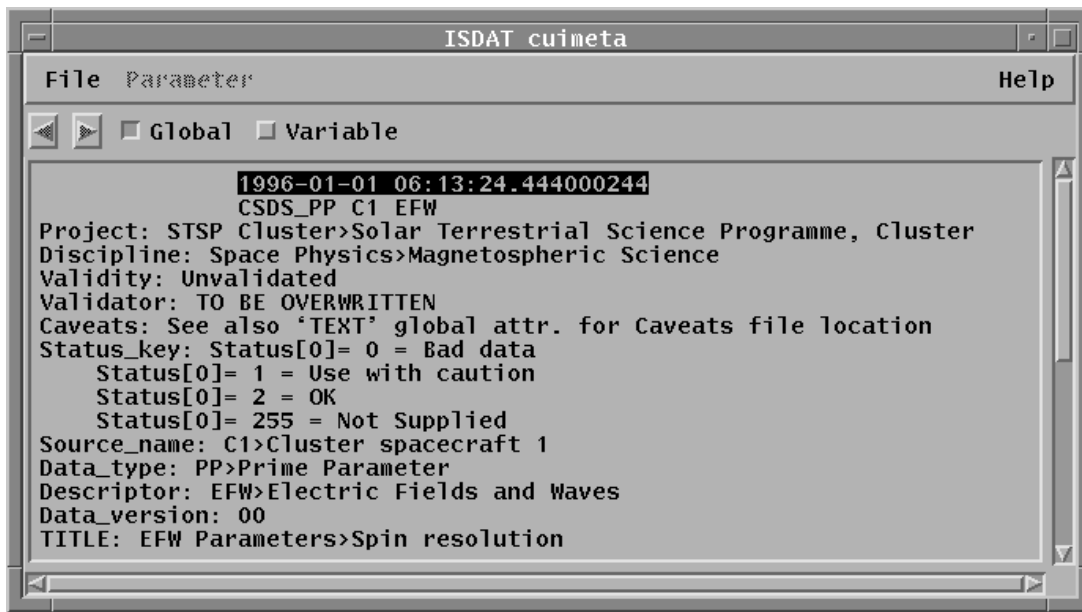
Figure 4: The cuimeta client window

[Ref. 11]. After starting the *cuistat* client, a new window should appear on your screen, see Figure 5.

- Choose a status parameter in the menu *Parameter*.

- Close the *cuistat* window from the *Exit* entry of the *File* menu of the *cuistat* window.

- Return to section 3.2.1.

3.2.4   The Graphics and Data Manipulation Client (cuigr)

This is the general purpose client used both for data manipulation and display. For a complete description of the *cuigr* client, see [Ref. 5]. After starting the *cuigr* client, a window, shown in Figure 6 should appear on your screen, (not with data).

- Press the *Param* button and select one of the sensors in the pull-down menu.

- Press the *Update* button of the *time manager*. Data should now be displayed in the graphics window.

- Close the *cuigr* window from the *Exit* entry of the *File* menu of the *cuigr* window.

- Return to section 3.2.1.

3.2.5   The Search Client (search)

The search client is used to search for data fulfilling user defined search criteria in the data file. For a complete description of the *search* client, see [Ref. 10]. After starting the *search* client, a window, shown in Figure 7 should appear on your screen.

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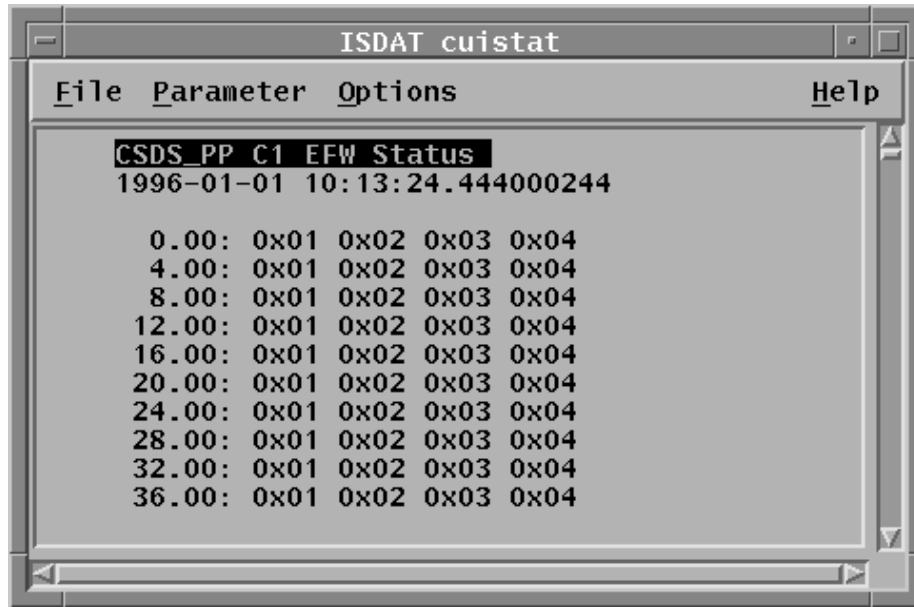Date: 1995 September 29

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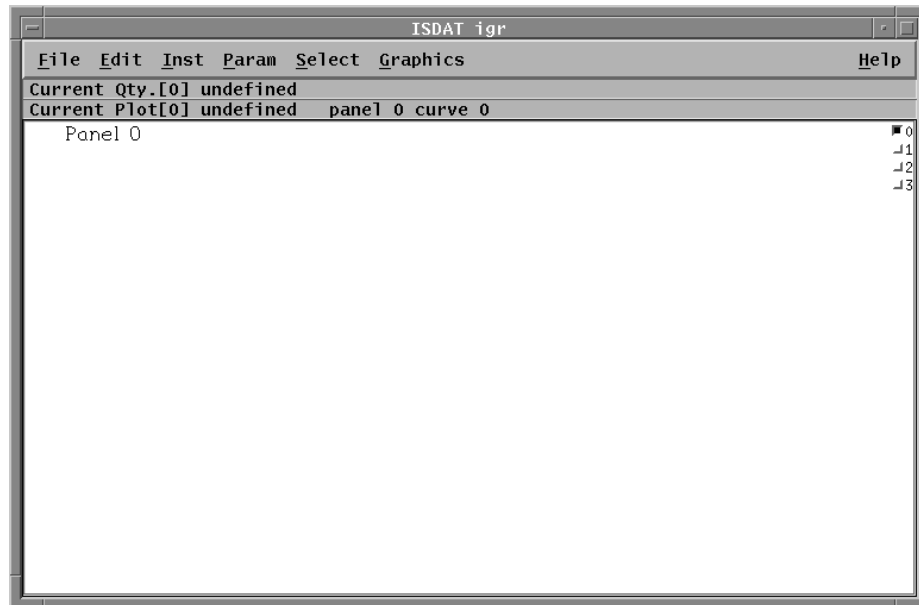Figure 5: The cuistat client window

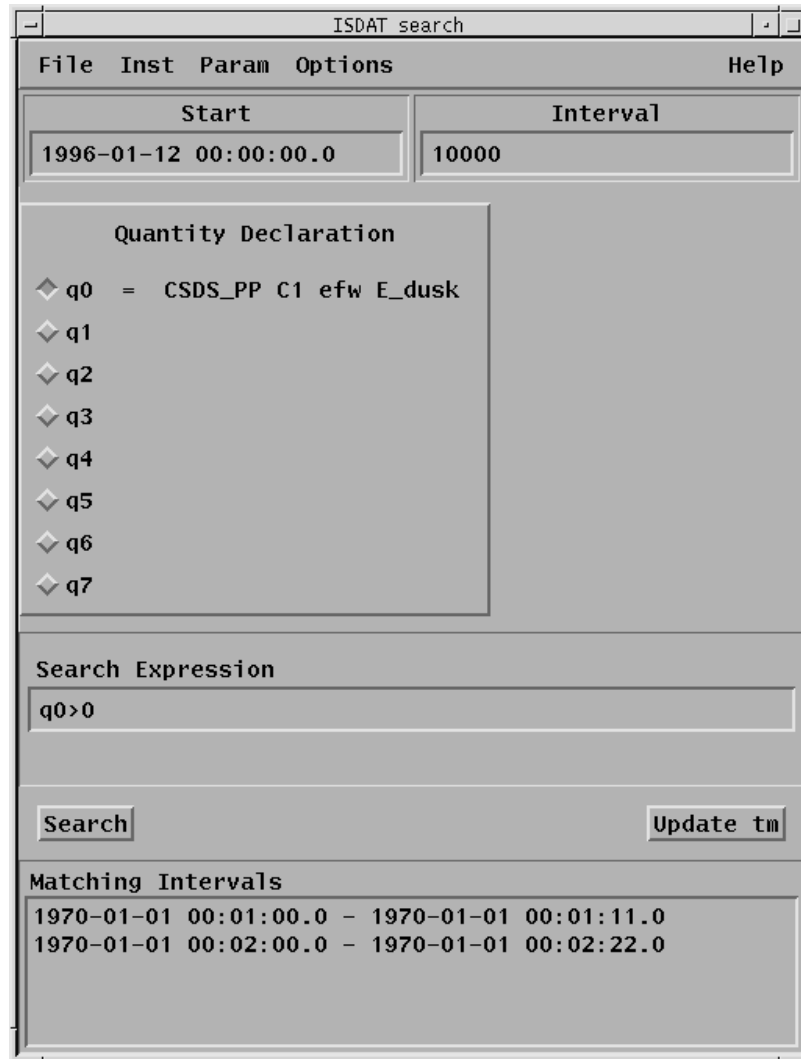Figure 6: The cuigr client window

Figure 7: The search client window

- Close the *search* window from the *Exit* entry of the *File* menu of the *search* window.

- Return to section 3.2.1, to the point where you left.

3.3 Including and using user supplied clients

3.3.1 User defined C clients

The process of designing and including user supplied C clients is described in a separate user's manual [Ref. 9].

3.3.2 User defined IDL clients

The process of designing and including user supplied IDL clients is described in a separate user's manual [Ref. 8].

3.4 Connecting to a non-standard ISDAT server

At installation of the ISDAT package at the local user platform, a number of settings are made to ease the work of the user. One such setting is the default ISDAT server to connect to. Usually it is set to the ISDAT server running at user's National data centre. Some users may have access to other ISDAT servers, locally or remotely. In order to access alternative servers, an environment variable *ISDAT_DATABASE* has to be set prior to starting the ISDAT programs. The commands are:

```
> ISDAT_DATABASE=hostname:display
> export ISDAT_DATABASE
```

See section 3.5 for instructions how to set up the full user specific ISDAT environment.

3.5 Customising the user environment

There are a number of UNIX and ISDAT environment variables and X11 specifications that can be pre-set to suit your personal needs. They are specified in the

```
$CUI_PRD_ROOT/cfg/isdat.client
```

file. However, you can copy that file to your own home directory under name [1] *.isdat.client* and modify it to your own preferences. An example of an isdat.client file is shown in Appendix A.

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[1] Notice the leading dot (.) in the file name

3.6   Errors and probable causes

Certain features of the ISDAT should be kept in mind:

- If a client breaks down, it does not affect the other clients, the time manager or the ISDAT Server.

Some frequent mistakes are listed below:

- If you try to start a time manager and get the message *Cannot connect to database
  **. Check that a Server is running by

  ```
  >ps -ef | grep dbh
  ```

  if you are trying to connect to a local server. Set the $ISDAT_DATABASE to an
  appropriate value corresponding to the Server.

- *Cannot open display* means that you have not set the $DISPLAY variable or your
  display does not allow the foreign machine to use it. Make

  ```
  >DISPLAY=mymachine:0; export DISPLAY;
  ```

  or:

  ```
  > xhost +;
  ```

- No data available on line means that no data is available for selected time interval
  and parameter. Change time interval or requested parameter.

A   File isdat.client

```
# $Id: isdat.client,v 1.4 1995/04/17 15:12:15 al Exp $


# The specification starts with a host name. If no entry matches
# your host, the entry that starts with a * will be used.


# time manager defaults
*.tm.project:           CSDS_PP

*.tm.member:            C1

*.tm.instrument:        EFW

*.tm.start:             1996-01-01 00:00:00
*.tm.interval:          100.0
```

B   Reference Documents

[1] CSDS-UI Installation Guide for Scientific Users. Technical Report DS-ESR-IM-0002, ESRIN, 1995.

[2] CSDS-UI software user manual. Technical Report DS-ESR-SM-0001, ESRIN, August 1994.

[3] CSDS-UI Scientific User, User's Manual. Technical Report DS-ESR-SM-0002, ES-RIN, 1995.

[4] CSDS User Interface, ISDAT Server User Manual. Technical Report DS-IRF-UM-0002, IRF-U, September 1995.

[5] CSDS User Interface, ISDAT cuigr Client User Manual. Technical Report DS-IRF-UM-0003, IRF-U, September 1995.

[6] CSDS User Interface, ISDAT cuitm User Manual. Technical Report DS-IRF-UM-0004, IRF-U, September 1995.

[7] CSDS User Interface, ISDAT ciumeta Client User Manual. Technical Report DS-IRF-UM-0005, IRF-U, September 1995.

[8] CSDS User Interface, Including IDL Clients in the ISDAT Client Package. Technical Report DS-IRF-UM-0006, IRF-U, September 1995.

[9] CSDS User Interface, Writing User Defined C Clients to be included in the ISDAT Client Package. Technical Report DS-IRF-UM-0007, IRF-U, September 1995.

[10] CSDS User Interface, ISDAT search Client User's Manual. Technical Report DS-IRF-UM-0008, IRF-U, September 1995.

[11] CSDS User Interface ISDAT cuistat Client User Manual. Technical Report DS-IRF-UM-0009, IRF-U, September 1995.