CSDS User Interface
ISDAT Server
User's Manual

Swedish Institute of Space Physics, Uppsala Division

with change bars for issue 2.0

Contents

1 Introduction

1.1 Intended readership

This manual is intended for the person responsible for an ISDAT Server within the CSDS
User Interface ISDAT sub-system.

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 UNIX, SUN Solaris workstations.

1.3 Purpose of the CSDS UI ISDAT sub-system

The purpose of the CSDS User Interface ISDAT sub-system, of which *the ISDAT Server* is
one component, 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

This document mainly serves as a reference manual for the person responsible for the
operation of the ISDAT server at a CSDS National Data Centre. In the CSDS User
Interface, Release 4, it is possible for the end user to install a local server.

1.5 Related documents

An overview of the CSDS UI ISDAT sub-system is given in [Ref. 3]. It is assumed that
the reader is familiar with the information given in that manual.

1.6 Installation of the server

The installation of the ISDAT package is described in [Ref. 2]. For the CSDS National
Data Centers the ISDAT server is included in the CSDS UI package provided by ESRIN.
For the scientific users, a local ISDAT server is optional. Scientific users interested in
installing a local server should contact the CSDS National Data Centre for advice.

1.7   Conventions and acronyms

In the following, we will use:

- *italics* to indicate exact names or expressions.

- Courier fonts to give command line expressions.

- > to indicate the terminal prompter.

Acronyms and abbrieviations used are described in Table 1.

Acronym	Meaning
CSDS	Cluster Science data System
CUI	CSDS User Interface
ESRIN	TBW
IRF-U	Institutet för Rymdfysik, Uppsalaavdelningen
	Swedish Inst. of Space Phys., Uppsala Division
ISDAT	Interactive Science Data Analysis Tool
NDC	National Data Centre
SP	Summary Parameters
UI	User Interface

Table 1: Acronyms and abbrieviations

1.8   Problem reporting

Problems encountered by the scientific user should be reported to CSDS National Data
Centre.

2   Overview of the CSDS UI ISDAT Server

The reader is referred to the Architectural design document [Ref. 1] for an overview of
the ISDAT Server software.

3   Operator Instructions

3.1   Starting the server

The server is started using the command

```
> dbh [:x[.y]] [options]
```

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where x is the server number (default is 0) and y is the network base port number (default is 14734).

The available options are:

-help list available options

-ld size limit the process data space to *size* kbytes (1024 bytes)

-ls size limit the process stack space to *size* kbytes (1024 bytes)

-pn continue even if unable to bind all protocols

-to sec number of seconds within which a client must complete its connection to not be killed

To start the first server on a given host, use the command

```
> dbh
```

If a second server is needed on the same host, use the command

```
> dbh :1
```

3.2   Running several servers concurrently

To enable the *ISDAT server* to handle many requests at the same time the server can be configured to run several instances of itself concurrently.

When concurrent servers are enabled each user will get its own exclusive server throughout his session. When the user has finished his session by closing all his *ISDAT clients* the allocated server will be killed.

The server number used by the server allocated to a user (child server) will differ from the parent server. The new server number is calculated by taking the database number of the parent server and multiply it by 256 (MAXSERVERS value), adding 100 and adding the instance number given to the child server.

Example 1:   • The parent server is started as *dbh :0*.

- The server allocated to the first user will be started as *dbh :100*.

- The server allocated to the second user will be started as *dbh :101*.

- The server allocated to the third user will be started as *dbh :102*.

Example 2:   • The parent server is started as *dbh :2*.

- The server allocated to the first user will be started as *dbh :612*.

- The server allocated to the second user will be started as *dbh :613*.

- The server allocated to the third user will be started as *dbh :614*.

The number of child servers can be limited by changing the variable *common.serverLimit* in the *isdat.server* configuration file. Setting it to zero will disable the concurrent server

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mechanism, which will make the parent server to handle all requests in an iterative manner. There is a related variable called *common.clientLimit*, which will limit the number of connections per server.

3.3   Customizing the server

3.3.1   Local settings

Local settings are given in a file

`$CUI_PRD_ROOT/cfg/isdat.server`

The configurable variables are:

common.serverLimit Limits the number of concurrent servers. The hard limit is 256, setting a larger value will have no effect. Setting a zero limit gives an iterative server.

common.clientLimit Limits the number of connected clients per server. The hard limit is 512, setting a larger value will have no effect.

csds.ppMaxInterval Limits the maximum interval of PP data that a user may request. The value is given in seconds, setting it to zero means no limit.

csds.spMaxInterval Limits the maximum interval of SP data that a user may request. The value is given in seconds, setting it to zero means no limit.

An example of the file is shown in Appendix A.

3.3.2   Controlling the user access

For the CSDS National Data Centre installation within the CSDS User Interface, user access is controlled by the ordinary CSDS access control mechanism.

For a "local server" installation i.e. an ISDAT server running separately from the user interface, there is a separate user access control mechanism described here:

At server startup the access control file given by the *.common.hosts line in the server configuration file $CUI_USR_ROOT/isdat.server is read. If the file doesn't exist or the *.common.hosts line is not found the access control is disabled which means that the server allows any connections. The file consists of lines of the form:

```
# comment
<host name>
<host name>      <user1>, <user2>
```

The first form will allow all users on machine <host name> to connect. The second form will allow access to user <user1> and <user2> on machine <host name> to connect. Example file:

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```
# ISDAT local server access control file
# allow user eric and nils on irfu
irfu    eric, nils
# allow all users on abba
abba
```

Users on the local server machine are always allowed to connect.

3.4 Generating map files with cuimgen

Due to the number of CDF files in the SP and PP database the overhead of trying to keep track of all the CDF files internally is too large. The map files hold some basic information like data intervals and data gaps (data with fill values) to allow rapid lookup of the requested data. One map file is kept per database, instrument and spacecraft.

A related file type is the quantity file which holds information about the available CDF variable names. One quantity file is kept per database, instrument and spacecraft.

The names of the map and quantity files are given as

```
<data_type>_<inst>_C<n>.map
<data_type>_<inst>_C<n>.qty
```

- <data_type> is one of SP or PP

- <inst> is one of ASP, AUX, CIS, DWP, EDI, EFW, FGM, PEA, RAP, STA or WHI

- <n> is one of 1, 2, 3, 4 or L

To be known to the server, every CDF file added to the database must have an entry in the corresponding map file. The map files are located in the $CUI_MAP/map directory. The map generation also updates the list of known variable names in the $CUI_MAP/qty directory.

Map files are generated using the command

```
> cuimgen [-r|-p] [ pp [inst [c1|c2|c3|c4]] | sp [inst] ]
```

or

```
> cuimgen [-r|-p] filename...
```

Cuimgen generates the server map files for the files not yet mapped. If no parameters are given, it generates files for the complete pp and sp database.

It is possible to generate the map files for a partial database type i.e. pp or sp, *instrument* and, for pp data type, it is also possible to specify *satellite*, e.e. c1—c2—c3—c4.

Instrument must be one of *asp, aux, cis, dwp, edi, efw, fgm, pea, rap, sta* or *whi*.

The -r option will regenerate all the map files.

The -p option will purge the map files of unused entries and is useful in the event that CDF files have been removed from the database.

Examples:

Recreate all map files for the entire PP and SP database. This is a time consuming task for large databases.

```
> cuimgen -r
```

Purge all map files from unused entries, which point to nonexistent CDF files.

Creation of the map files for the CDF files in the SP database that has been added since the last map file generation.

```
> cuimgen sp
```

Creation of the map files for the CDF files in the SP database for the ASPOC instrument and the reference satellite C1 that has been added since the last map file generation.

```
> cuimgen pp asp c1
```

Recreate the index entry for the file C1_PP_EFW_19960101_V01.cdf.

```
> cuimgen -r C1_PP_EFW_19960101_V01
```

or

```
> cuimgen -r C1_PP_EFW_19960101_V01.cdf
```

3.5 Error logging

Errors are logged in two files:

$CUI_USR_ROOT/log/dbh_sys.err Logs all errors and warnings orginating from the server kernel.

$CUI_USR_ROOT/log/dbh_csds.err Logs all errors and warnings orginating from the Csds server module (CDF code).

Each line in the log files have the format:

```
<date> <connection> <user> <module> <file> <line>: <message>
```

date Date and time when the error occured.

connection Host name of the client causing the error, set to unknown if the error was caused by an internal action, set to unix if the client used a local unix domain socket.

user User name of the client causing the error, set to unknown if the error was caused by an internal action.

module Module name, will be set to either system or Csds.

file Name of the source file where the error occured.

line Line number within the source file where the error occured.

message Informative text describing the error.

A   File isdat.server

```
# $Id: isdat.server,v 1.5 1995/04/17 15:12:15 csds Exp al $


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


# common database handler parameters
#
# even if common.clientLimit is set greater than 256 the hard limit is 256
# setting serverLimit to 0 gives a single server setup
*.common.serverLimit:    0


# even if common.clientLimit is set greater than 512 the hard limit is 512
*.common.clientLimit:    512


# host/user authorization file (do not use in CSDS PP/SP)
# *.common.hosts:          $CUI_USR_ROOT/ishosts


# Csds configuration parameters
# ppMaxInterval and spMaxInterval in seconds, zero means no limit
*.csds.ppMaxInterval:   0
*.csds.spMaxInterval:   0
```

B   Reference Documents

[1] CSDS User Interface ISDAT Architectural Design Document. Technical Report DS-
    IRF-AD-0001, IRF-U, September 1995. Issue 1.0.

[2] CSDS User Interface, ISDAT Installation Manual. Technical Report DS-IRF-IM-0001,
    IRF-U, September 1995.

[3] CSDS User Interface, ISDAT User Manual. Technical Report DS-IRF-UM-0001, IRF-
    U, September 1995.