The ISO Post-Mission Archive

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Abstract.
ISO (the Infrared Space Observatory) was launched in November 1995 and is now expected to have an operational lifetime of 2.5 years, as compared to the design requirement of 18 months. It is performing astronomical observations at wavelengths from 2.4-240 microns with four instruments; a camera (2.5-18 microns), a photometer (2.5-240 microns), a short-wavelength spectrometer (2.4-45.2 microns) and a long-wavelength spectrometer (43-197 microns). By the end of the mission it will have made in excess of 25,000 high quality Infrared observations which will leave an important astronomical archive.

The ISO post-mission archive (PMA) is being designed to fully exploit this legacy by providing access to the data across the Internet. It will provide an on-line service to the data, supporting documentation and software through a WWW interface which has the goals of being friendly for the novice user, flexible for the expert and rapid for everybody.

1. Introduction

ISO will make its final measurement on April 10 1998 ($\pm$2.5 weeks) when the liquid Helium coolant is expected to run out. All of the data will then be bulk reprocessed with the latest version of the ISO processing pipeline to produce an INTERIM archive; which will be stored on CD in a set of jukeboxes to give easy near-line access to the entire dataset.

The ISO PMA[1] will be hosted at the ESA site, VILSPA, in Villafranca del Castillo, Spain and will become available to the public three months after the end of the mission (i.e., it is expected to go live in July 1998).

The processing pipeline will continue to be regularly updated in the post-mission phase as instrument knowledge and techniques improve. An On-The-Fly-Reprocessing (OFRP) option will be made available to archive users to allow them to retrieve observations processed by the latest software and using the latest calibrations.

Three and a half years after Helium-loss the pipeline will be frozen and all observations reprocessed to form a LEGACY archive. Data will become public

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[1]See http://isowww.estec.esa.nl/science/pub/isopma/isopma.html
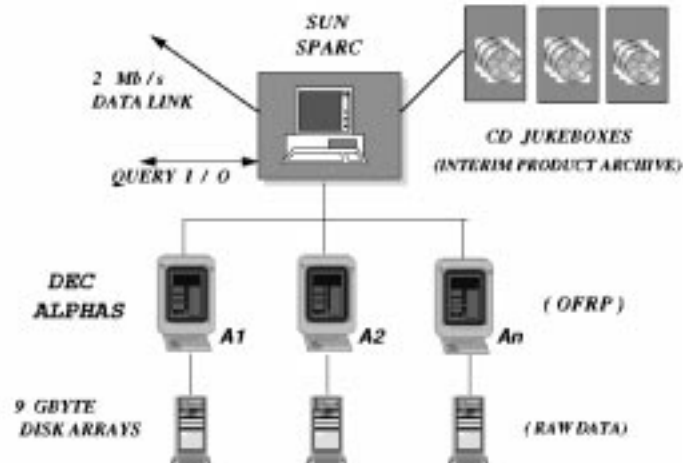
Figure 1.   Hardware configuration

one year after they have been shipped to the observer in fully-calibrated form, which means that all data are likely to be public by April 1999. Until this point is reached proprietary data rights will be respected.

2.   High-Level Design

The INTERIM product archive will be stored in a near-line system on ~ 700 CDs spread between three jukeboxes. Each jukebox will contain four readers and the retrieval software will optimise the performance by scheduling CDs to be read in parallel.

The archive and associated *Sybase* database will be hosted on a Sun Sparc-station connected by a 2Mb/s line to REDIRIS, which has a fast link to Europe through the *Ten 34* capital city network and is linked to the USA by 2 further 2Mb/s lines.

The user interface will be HTML and Java based and will issue SQL queries to the database via *JCONNECT*. The basic interface will allow observations to be selected based on astronomical considerations such as coordinates, source category, exposure time, wavelength etc. An 'expert' interface will also be provided to allow calibration scientists to query the database using engineering, trend and housekeeping parameters.

OFRP will be performed on a cluster of Alpha machines running Open-VMS. The raw data will be stored locally on an array of 9 Gbyte disks and the processing load will be shared between the machines and between disks so that a configurable number of observations (initially 10) can be processed simultaneously.

Files will be returned in FITS format, optionally compressed, into a transfer directory. For large datasets, or when requested, data will be sent on CD to a
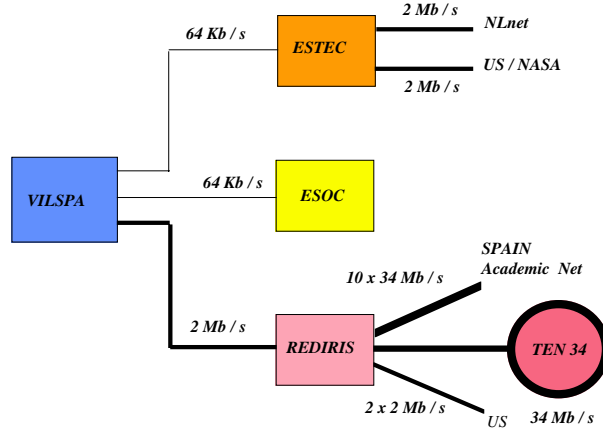
Figure 2.   Network access

mail address. In this case data will be copied into a CD holding area and a batch of CDs written once a week. To improve throughput a cache area of 30Gbytes ($\sim 10\%$ of the archive) will be maintained on magnetic disk to avoid retrieving from CD, or reprocessing, popular observations many times.

3.   User Interface

This will be a suite of HTML pages and Java applets providing on-line access to the archive. The observation catalogue searching and product request functionality will be controlled by a single applet, working in a *modulable load* configuration whereby parts of the applet are downloaded only when necessary.

3.1.   Browse form

- allows the user to select observations based upon a wide range of astronomical and engineering parameters

- a Java applet will run on the client machine to translate the submitted request into SQL and send it to the database via *JCONNECT*

- the observation list will be displayed in a *Results form* which will include a link to a viewable postage stamp product

- each observation may be moved into a SHOPPING BASKET

3.2.   Shopping basket form

For each observation the user specifies:
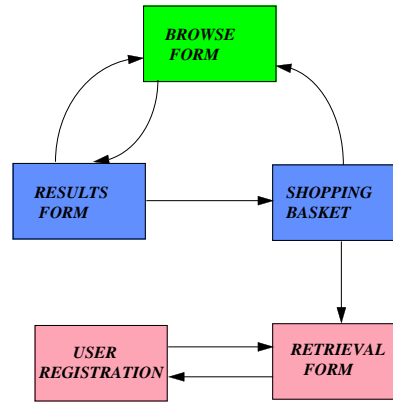
- Archived product or OFRP

Figure 3.   Schematic search/retrieve transition diagram

- Level of products required (Raw data, basic science data etc)

  When the shopping basket is complete the data may be retrieved

3.3.   Retrieval form

- summarises request and displays estimated retrieval time

- asks for transfer medium (FTP or CD)

  Before the data is retrieved the user is asked to register

3.4.   Registration form

First time users are asked to provide a Username,Password,E-mail address, Mail address and Preferred transfer medium. Observers who own observations will be sent a username and password by E-mail at the start of the archive phase.