The 110 SDIS VO IMS prototype and Distributed Active Archive Centers

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Overview

The NASA EOS Data and Information System (EOSDIS) provides a structure for data management and derived products from Earth Observing System (1 OS) satellite instruments slated for launch over the next two decades. Within the EOSDIS framework, the Distributed Active Archive Centers (DAACs) are responsible for providing data and information services to support the global than.ge research community.

Although much of the development within EOSDIS has been in anticipation of the future launch of the EOS instruments, each of the nine DAACs now has significant data holdings. These holdings can be searched and ordered via the Version O Information Management System (VO IMS) prototype. Data can also be ordered via e-mail, fax, phone mail, and in some cases through the World Wide Web (using a browser such as Mosaic) and heritage order systems which pre-date EOSDIS.

Distributed Active Archive Centers (DAACs)

There are currently nine Distributed Active Archive Centers (DAACs) responsible for data archival, product development, distribution and user support. The DAACs are distinguished from one another by data subject area and hold pre-EOS data that can be used to address global change issues. Since the inception of 130 S1>1S, the DAACs have worked to provide a consistent and high level of service to support the concept of a single but distributed system, of which the VO IMS prototype is a major part. Electronically linked by the VO IMS prototype, which was released in August 1994, DAACs appear to users as a single system. Users can search for and order data from any or al I of them, and can cent act the User Services staff at any DAAC to obtain assist ante in using the 1 MS or to find out more about a particular data product.

in addition to the capabilities provided by the VO IMS prototype, some DAACs have individual on-line systems, allowing them to provide unique services for users of a particular type of data. These "I)AAC-unique" systems look and function much like the VO IMS prototype, but emphasize products or services specific to that DAAC.

Cooperating Data Centers

In addition to the EOSDIS DAACS, there are a number of different agencies and data centers cooperating within the Mission To Planet Earth (MTPE) framework to make data more accessible. One example of this cooperation within EOSDIS is the Satellite Active Archive (SAA) developed by the National Oceanic and Atmospheric Administration (NOAA) which is searchable using the VO IMS prototype. The DAACs also have close tics with other NOAA archives but these have yet to be manifested through the VO 1 MS prototype.

The role of the VO IMS prototype

The development of the VO 1 MS prototype is seen as an important step towards the realization of interdisciplinary Earth science research. Historically it has been difficult for scientists conducting interdisciplinary research to locate useful data, because it was necessary to cent act many different data centers regarding data holdings and availability.

The VO IMS is a prototype system designed to overcome that difficulty by allowing a user to search for and order data from any DAAC, or combination of DAACs, in a single on-line session. With this system, researchers have the ability to search for data based on a number of criteria that include time, space, geophysical parameter, sensor and instrument. Beyond the ability to search for interdisciplinary data, features of the VO IMS prototype that are especially useful to the science community are the ability to visualize the extent of available data on a globe that can be rotated and the ability to retrieve browse images which can be used to assess the product usefulness prior to ordering. Meta-data has also been addressed; the VO IMS prototype is linked to the GCMD such that the DIFs (Directory Interchange Formats which describe a product) are accessible. In addition, to support the VO 1 MS prototype, online documents that provide detailed and comprehensive information about the data products are being produced. Known as Guides, they represent a further step in ensuring the high quality and usability of data.

In addition there has been a strong emphasis on providing data in a common format so that data from different sources can be readily compared. EOSDIS has selected HDF (1 Hierarchical Data Format), a format that has been developed by the National Center for Supercomputing Applications) NCSA. NCSA has also developed S/W software to work with HDF. Development of both HDF and associated software is on-going.

VO IMS prototype functionality

The following list of VO IMS prototype functions provides an overview of the utility of the system:

Directory - Provides high level information about VO 1 MS data sets by linking to data set information held within the Global Change Master Directory (GCMD).

Guide - Provides detailed descriptions about data sets, platforms, sensors, projects, and data centers.

Inventory - Provides descriptions of individual observations or data items (granules) which can be ordered, from a DAAC, in some cases individually otherwise as part of a product.

Coverage Maps - Shows the geographical coverage of user-selected inventory granules.

Browse - Allows a user to view images as an aid to data selection. This is particularly useful for images where cloud cover is an issue. Browse images may be staged for FTP pickup or viewed in the graphical interface.

Product Request - Allows users to select preferences such as processing options and media types available for the data product, and then submit a request which is forwarded to the appropriate DAAC.

Global Change Master Directory Access - Provides a link to the GCMD which is a multidisciplinary and international database of information about Earth and space science data. Users may search this data base for data not available through the VO IMS prototype.

Accessing the VO IMS prototype

The Version O IMS prototype offers both a Graphical User Interface (GUI) and a Character User Interface (ChUI). Running the GUI requires a workstation, X terminal, or PC/Macintosh capable of running the X Windows System (or an X terminal emulator such as MacX), with a 1024X768 pixel color display. System response time for the Version 0

IMS Graphical User Interface (GUI) will be limited by the capacity of the network connection between the user site and the DAAC the user accesses. Generally, a communicant ions capacity of 56kbps is needed for good performance. The ChUI requires less communications bandwidth and thus performs better where network capacity is limited. Running the ChUI requires a PC/Macintosh using a VT100 emulator or any VT 100 compatible terminal.

Users may access the Version O IMS prototype from the WWW Version O IMS Home Page by selecting "Access to the EOSDIS VO IMS". The Home Page also provides additional information such as an on-line Users Manual and tips for usage and user terminal configuration. The following is the Home Page URL:
http://harp.gsfc.nasa.gov:1729/eosdis_documents/eosdis_home.html

V0 IMS prototype evaluation

As would be expected with a prototype, users will encounter some rough edges, both in terms of minor problems with the system and with performance. Information gained from user experience with this prototype will be used in the development of future search and orders yst em. Comments on this system are welcome and can be provided on-line or through the User Services offices at the individual DAACs.

Archives and Discipline areas

The DAACs and the SAA are listed below with their subject areas, contact information and VO IMS telnet access.

ASF DAAC - SAR & Polar Regions
Voice: 907-474-6166 Fax: 907-474-5195
Internet: asf@cos.nasa.gov
WWW URL:
http://eosims.asf.alaska.edu:12355/asf_homepage.html
VO IMS prototype telnet access: eosims.asf.alaska.edu
 12345

EDC DAAC - Land Processes
Voice: 605-594-6116 Fax: 605-594-6589
Internet: edc@cos.nasa.gov
W WW URL: http://sunl.cr.usgs.gov/landdaac/landdaac.html
VO IMS prototype telnet access: eosims.cr.usgs.gov 12345

GSFC DAAC - Upper Atmosphere, Global Biospheic
Voice: 301-286-3209 Fax: 301-286-1775
Internet: gsfc@cos.nasa. gov
W WW URL: http://daac.gsfc.nasa.gov
VO IMS prototype telnet access: eosims.gsfc.nasa.gov 12345

JPL DAAC - Physical Oceanography
Voice : 81 8-354-9890 Fax: 818-393-2718
Internet: jpl @cos.nasa.gov
W WW URL: http://podaac-www.jpl.nasa.gov
VO IMS prototype telnet access: eosims.jpl.nasa.gov 12345

LaRC DAAC - Radiation Budget, Tropospheric Chemistry
Voice: 804-864-8656 Fax: 804-864-8807

Internet: larc@eos.nasa.gov
WWW URL: http://eosdis.larc.nasa.gov
VO IMS prototype telnet access: eosims.larc.nasa.gov 12345

MSFC DAAC - Hydrologic Cycle
Voice: 205-922-5932 Fax: 205-922-5859
Internet: msfc@eos.nasa.gov
WWW URL: http://wwwdaac.msfc.nasa.gov/
VO IMS prototype telnet access: eosims.msfc.nasa.gov 12345

NSIDC DAAC - Snow and Ice, Cryosphere and Climate
Voice: 303-492-6199 Fax: 303-492-2468
Internet: nsidc@eos.nasa.gov
WWW URL: http://eosims.colorado.edu:1733
VO IMS prototype telnet access: eosims.colorado.edu 12345

ORNL DAAC - Biogeochemical Dynamics
Voice: 615-241-3952 Fax: 615-574-4665
Internet:ol'111@eos.nasa.gov
WWW URL: http://www-eosdis.ornl.gov/
VO IMS prototype telnet access: eosims.esd.ornl.gov 12345

SEDAC -Human impact on Global Change
Voice: 517-797-2727 Fax: 517-797-2622
Internet: sedac@eos.nasa.gov
WWW URL: http://www.ciesin.org
VO IMS prototype telnet access:

NOAA SAA - Satellite Earth Sciences Data
Voice:301 763-8400   Fax:301 763-8443
Internet:saainfo@nesdis.noaa.gov
WWW URL: http://ns.noaa.gov/saa/homepage.html
VO IMS prototype telnet access:eosims.saa.noaa.gov 12345

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