

# THE INTERNATIONAL DIRECTORY NETWORK AND CONNECTED DATA INFORMATION SYSTEMS FOR RESEARCH IN THE EARTH AND SPACE SCIENCES

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## ABSTRACT

Many researchers are becoming aware of the International Directory Network (IDN), an interconnected federation of international directories to Earth and space science data. These directories may become distributed nodes of a single, virtual master data directory of the future. Not as many are aware, however, of the many Earth-and-space-science-relevant information systems which can be accessed automatically from the directories. After determining potentially useful data sets in various disciplines through IDN directories it is becoming increasingly possible to get detailed information about the correlative possibilities of these data sets through the connected guide/catalog and inventory systems. Such capabilities as data set browse, subsetting, analysis, etc. are available now and will be improving in the future.

## INTERNATIONAL DIRECTORY NETWORK

In the attempt to bring the research community closer together, the International Directory Network (IDN) was created. The IDN is composed of a federation of directory databases on widely-scattered computers which are interconnected through networks. The directories are intended as a service to the entire world community and many are made freely accessible to the community through computer network connections and dial-in lines. The user does not need to establish an account to use the directories and no passwords are required. No training is necessary to use the system to get information on Earth and space science data sets as well as information on selected data information systems, spacecraft, sensors, and data gathering projects or campaigns.

Two types of nodes make up the IDN. The coordinating nodes have completely identical databases at each location (U.S., Italy, and Japan). They are open to use by the general community and are particularly intended for access by users in the continental vicinity in which they are located (i.e., America, Europe, and Asia). Access information for these nodes is supplied at the end of this article. The other nodes are cooperating nodes which share information with the coordinating nodes but have databases which may be a subset of that of the coordinating nodes. Cooperating nodes contribute information to the overall network, but may only be used by a small group for local data management and information purposes. Many of these types of nodes exist now and more are being contemplated in the near future. Figure 1 shows the current configuration of coordinating and cooperating nodes along with some indication of potential future nodes as indicated by the dashed lines. In the future the IDN nodes may become part of a single virtual directory in the manner of a distributed database system. Testing of this concept is now underway.

The glue which holds the entire IDN together is a standard method of describing dataset information called the Directory Interchange Format (DIF). All dataset information passed among the nodes is exchanged in this form. Contributions of information on datasets by the general community are encouraged. Creation of a DIF file describing a dataset is a relatively simple process and, once this file is created it can be automatically loaded into the directory databases and shared with the other directory nodes. Thus, the information is quickly spread throughout the world. Contact the author for further information about DIF if you have datasets you wish to advertise.

## CONNECTED INFORMATION SYSTEMS

The IDN provides more than just dataset information, however. When the user accesses a particular dataset description there is sometimes an indication that an automatic connection is available to another information system which has more detailed information about this

dataset. Whereas directories just have brief, overview information about datasets, the other information systems may offer more complete information about the whole dataset such as calibration information, sensor characteristics, detailed usage information, etc. These types of information systems are classified as "guide" systems. Still others contain details about the parts of the datasets such as whether the data are available for a particular location and/or time period. Systems which have dataset "granule" information are classified as "inventories". Some information systems have combinations of directory, guide, and/or inventory capabilities. They may also allow the user to browse and manipulate the data.

From the directories a user can be automatically connected to the guides and inventories and use the capabilities there to ultimately determine exactly what data are needed and then order the data. This can be done in a matter of minutes or hours rather than the weeks to months that were required through mail and telephone interactions. Increasingly, it is becoming possible to get subsets of the data themselves directly through the network, so the entire data acquisition process can be completed in a very short time. Once the users find out about the other information systems they can also learn how to access them directly rather than through the IDN. Then they can go directly to these systems in the future. More of these types of automated connections are being added all the time. If you

are aware of a system which may be useful in this context, please contact the author.

Table 1 is an example of some of the Earth Sciences data systems which have connections through the directory and may be helpful to a researcher studying the area of global change. Many others are available in the space science disciplines as well. Further information about these systems can be obtained by accessing their descriptions in the on-line directories or connecting to them through the directory network.

### CONCLUSION

In conclusion, the IDN and interconnected information systems are services available to you now! Of course many people, especially those in developing countries do not now have connections to computer networks or modems for computer access through telephone system. If you do not have network or dial-in connection capability there are PC-based stand-alone versions of the directory database. Contact the author if you are interested in this approach.

For those who can access the directories as they are now available on-line please try them and let the author know how their utility can be improved for your purposes.

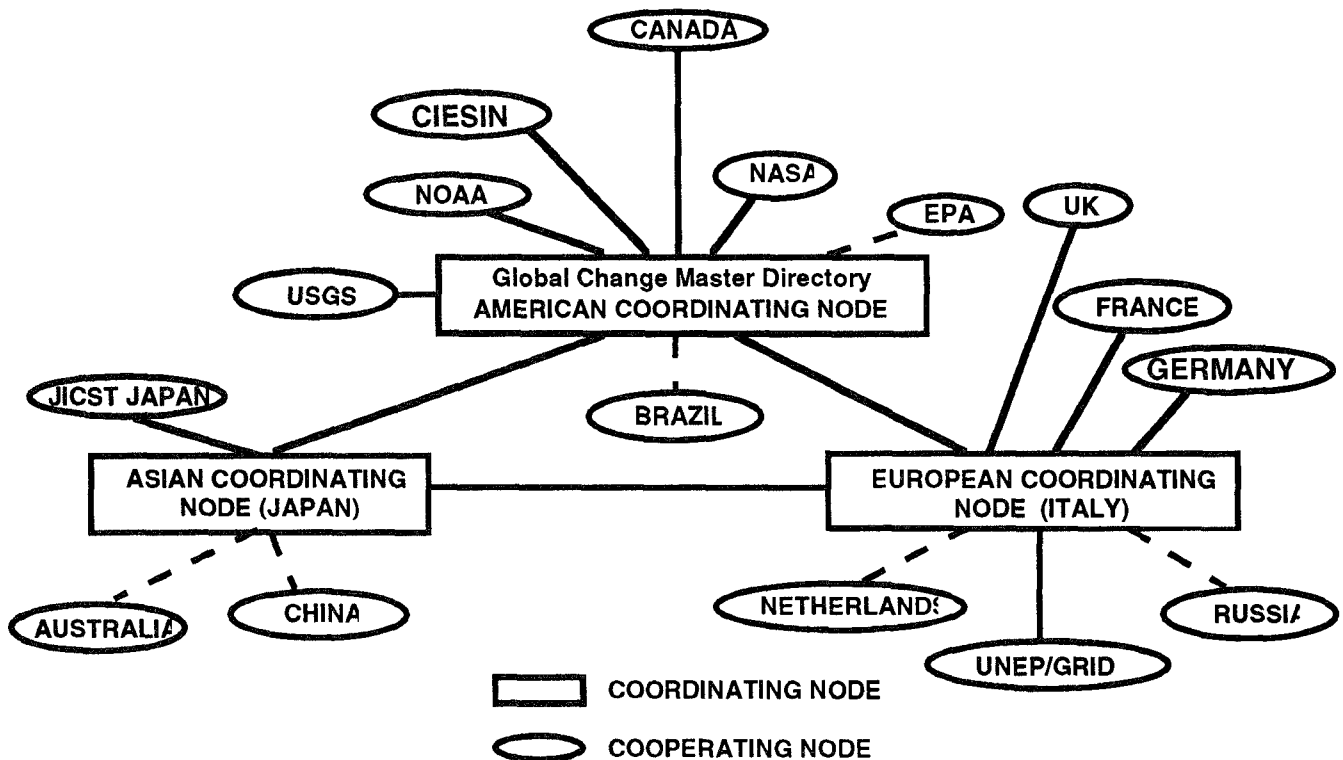


Figure 1. Diagram of interconnections of nodes of the International Directory Network

## DIRECTORY ACCESS

To use the coordinating nodes of the IDN one can follow the procedures listed below according to what type of access (network connection or dial-in line) is available.

### AMERICAN IDN NODE ACCESS:

From NSI/DECnet (SPAN):  
\$ SET HOST NSSDC  
USERNAME: NSSDC

From INTERNET:  
TELNET 128.183.36.23  
USERNAME: NSSDC

From OMNET:  
GOTO NSSDC

By DIAL-IN LINES:  
Set to 8 bits, no parity, 1 stop bit  
Dial 301-286-9000  
CONNECT 1200 (or 2400 or 300)  
Enter several carriage returns  
ENTER NUMBER  
MD  
CALLING 55201 (or 55202)  
CALL COMPLETE  
Enter several carriage returns  
USERNAME: NSSDC

### JAPANESE IDN NODE ACCESS:

From NSI/DECnet (SPAN):  
\$ SET HOST 41950  
USERNAME: NASDADIR

From INTERNET:  
TELNET 133.56.72.1  
USERNAME: NASDADIR

By DIAL-IN LINES:  
Set to 8 bits, no parity, 1 stop bit  
XON/OFF  
Dial 81-492-94-6400 (0492-96-6400 in Japan)  
1200 - 9600 bps, (DEC Kanji)  
USERNAME: NASDADIR

From PACKET EXCHANGE NETWORK:  
(DDX-P, Venus-P  
DTE Number 44014437216 (4437216 in Japan)  
USERNAME: NASDADIR

## EUROPEAN IDN NODE ACCESS:

From NSI/DECnet (SPAN):  
\$ SET HOST 29628  
USERNAME: ESAPID

From INTERNET  
TELNET 192.106.252.160  
USERNAME: ESAPID

Via DIRECT DIAL  
Set to 8 bits, no parity, 1 stop bit  
Dial (+39) 6 9417335

### DIAL-IN LINES - File 21 of ESA Quest System

(no LINKs possible within Quest  
help available at (+39) 6 94180300)

Austria	DATEX-P	(+232) 2618180 61
Belgium	DCS	(+206) 2210443 61
Canada	DATAPAC	(+3020) 85801458 61
Denmark	DATAPAK	(+238) 238301063841 61
Finland	DATAPAK	(+244) 204076 61
France	TRANSPAC	(+2080) 175000394 61
note: when using the prefix, the leading 1 should be dropped		
Germany	DATEX-P	(+262) 45050369 061
Ireland	EIRPAC	(+2724) 36059222 61
Italy	ITAPAC	(+222) 26410174 61
	DDN	111005306009
	ESAPAC	299020030001
NL	DN-1	(+204) 1290176 61
Norway	DATAPAK	(+2422) 110627 61
Spain	IBERPAC	(+2145) 214062321 61
Sweden	DATAPAK	(+2403) 710416 61
UK	PSS	(+234) 219201156 61

Table 1 Examples of Earth Sciences Information Systems Connected to the IDN

ACRONYM	TITLE
ARIN	Aerospace Research Information Network
CCRS	Canada Centre for Remote Sensing
DALI	CNES-SPOT IMAGE Catalogue
EOC	Earth Observation Center, Japan
EROS	Earth Resources Observation Systems (EROS) Data Center
ESA EARTH IMAGES	ESA Earthnet online catalogue (formerly LEDA)
ESA EPO	European Space Agency Earthnet Programme Office
ESIS	European Space Information System
GISS	Goddard Institute for Space Studies
IRIS	Incorporated Research Institutions for Seismology
IRPS	Image Retrieval and Processing System
NCDC	National Climatic Data Center
NCDS	NASA Climate Data System
NOAA-SEL	NOAA Space Environment Laboratory
NSF	NSF Science and Technology Information System
NSSDC	National Space Science Data Center
OCEANIC	Ocean Network Information Center
PLDS	Pilot Land Data System
PNRA	Italian Program for Antarctic Researches South-Pole Directory
RESTEC	Remote Sensing Technology Center of Japan
SDCS	SAR Data Catalog System
SDDAS	SwRI's Data Display and Archival System
SMRSS	Surveys, Mapping and Remote Sensing Sector
UA - GEODATA CENTER	University of Alaska Fairbanks/GeoData Center
UARS	Upper Atmosphere Research Satellite Central Data Handling Facility (CDHF)
URI AVHRR ARCHIVE	University of Rhode Island AVHRR Archive