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Preface

This technical report summarises the software developments performed by the consortium of the ETC/CDS from the year 1996 to the year 2000. The available instruments went through several phases of user input, refinement and control. They form a well tested toolbox for anybody who wants to register environmental information for the purpose of facilitating and improving the access to this information. The report also provides a description of the CDS data model in its annex.

Over the years, the focus of the developments shifted from single PC-based applications over the support of multiple PC networks to client server solutions and increasingly to internet based applications making use of the easily transferable JAVA development environment. Guiding strategy in the development of this family of applications was and is to supply a set of instruments to a variety of customers with different technical background and platforms in order not to leave anyone behind.

Based on these ETC/CDS developments beyond the EEA itself, several current and future EU countries as well as institutions working on the European environment developed their customised applications. Thus this technical report should also be seen as an encouragement for others to follow up this approach, dependent on their individual needs. For this purpose, the tools and the consulting through the ETC/CDS are offered free of charge to collaborating institutions.

EEA’s overall goal in promoting these tools lies in the strong believe that a systematic and consistent usage of metainformation is crucial to the success of information services. In this respect it does not matter whether you decide for classical cataloguing of environmental information or building portals or marketplaces to give access to such information.
Introduction

The European Topic Centre on Catalogue of Data Sources (ETC/CDS) was founded in 1995 in the framework of the European Environment Agency (EEA) as one of nine Topic Centres dealing with various environmental issues. Its work is guided by the mandate of the EEA to provide and give access to up-to-date, harmonised, reliable information on the state of the European environment.

The ETC/CDS collects, maintains and harmonises information about environmental information and data, so-called metainformation. CDS metainformation supplies answers on WHO is responsible for WHAT information in Europe, in WHICH form and WHERE the data exists, as well as HOW to get access to it.

The mission of the ETC/CDS is to conceptualise and implement a locator system on environmental metainformation which includes relevant sources of the EEA network members – the Catalogue of Data Sources (CDS). Also, the ETC/CDS harmonises and promotes concepts for registering and locating environmental metainformation. Based on selection criteria, guided and agreed upon by the EEA and belonging countries (EU15 +3), ETC/CDS collects and maintains addresses and data sources of the EEA, its member organisations, and 13 PHARE (Eastern European) countries.

In the meantime, the ETC/CDS has established the “Directory of Information Resources” (DIR), the official directory of EEA’s authoritative information. Being the backbone of EEA’s European Reference Centre on Environmental Information (E2RC), the DIR is a catalogue of well selected and sorted environmental information resources that have been used and produced in the context of the reporting process on the state of Europe’s environment. Built on the electronic cataloguing system CDS, the DIR presents a structured approach towards ‘access to environmental information’.

The ETC/CDS has developed several tools to accomplish its goal to collect, maintain and harmonise European environmental information. The first available tool was the WinCDS, an offline registration software based on MS Windows. Until now, it has been developed into a comprehensive database administration instrument for the MS jet engine database. WinCDS was complemented by WebCDS, the online tool for search and retrieval of the collected metainformation (addresses and data sources). During the years of development and further refinement of the software, WebCDS was extended by a Java application (J-CDS) and an online tool for registering metainformation (WebCDS UpdateModule) to overcome the problems with exchanging different data formats of distributed metainformation. Both tools were refined and finally established in 2000. Furthermore, a prototype of the European Environmental Information Services (EEIS) gateway to remote sensing data was developed, leading to distributed catalogues of the Earth observation community and allowing search and retrieval of both distributed catalogues and the DIR.

All these software tools are supported by the controlled vocabulary of the General Multilingual Environmental Thesaurus (GEMET). GEMET was created by a consortium of international experts, conceptually merging different national (Germany, Netherlands, France, Italy, Spain) and international (UNEP, European Parliament) environmental thesauri. GEMET is used for indexing and retrieval of environmental data sources.
1. WinCDS

Introduction

WinCDS is an MS Windows based catalogue software for registering, retrieving and managing locator information. The tool is build upon a core set of 13 mandatory fields which are essential to adequately describe the information resource. Included are a brief description of the information source and hints to its availability as well as address information. The mandatory fields correspond to the GILS, GELOS and Dublin Core standards, thus furthering the harmonisation of metainformation description in Europe.

The mandatory fields are:

1. title
2. object class
3. date of creation, last update of information resource*
4. last modification of locator record*
5. originator (incl. address information)
6. distributor (incl. address information)
7. administrator (incl. address information)
8. controlled vocabulary (title of thesaurus, terms)
9. spatial coverage
10. temporal coverage
11. language of information resource
12. language of locator record
13. control identifier*

* automatically generated

By registering the mandatory fields via WinCDS, the information seeker is provided with the essential knowledge about what the information resource is about and where and how to find it. In addition to the mandatory fields, WinCDS offers the user to fill in a more comprehensive description of the information resource. Each resource is assigned one of the following record classes: address, project, station/site, document, dataset, map, tool, structuring element

There are always several options to describe environmental data. You may be very precise or accept blind spots which have to be worked out later. As long as there are guidelines right from the start, the software is able to handle later refinements. Therefore try making a master plan before starting to gather information.

Recently, the WinCDS has been further consolidated. It has been developed into a comprehensive administration instrument for the MS jet engine database. ETC/CDS has worked on refining the Export and Import as well as the reporting functionality.

WinCDS has been integrated into the current metadata workflow which is built on the idea of a central database that can be remotely managed and administered. This database, located at the ETC/CDS in Hannover, is a development database invisible to and not accessible by the public. Its sole use is to keep EEA’s Directory of Information Resources (DIR) up to date. The development database is being mirrored to the (public) production database
located at EEA, Copenhagen. The production database is a read only application accessible via WebCDS or other applications for a more specialised purpose. WinCDS 2000 is now a fully functional tool for constructing and managing a complex metainformation database.

1.1. Getting started with WinCDS

1.1.1. System Requirements

WinCDS runs virtually on every newer machine (486 and up). Your hard disk requires Space of 20 MB. Memory should be 16 MB RAM at least. The display should be VGA or compatible. WinCDS runs on MS Windows 95 and 98 as well as NT.

1.1.2. Setup and Program Start

The setup program will guide you through the installation process. Before running the program, we recommend making a backup copy of empty.mdb. Empty.mdb contains the database structure that is needed to construct a new CDS catalogue.

WinCDS offers the possibility to enter different database formats with ACCESS being the default. After selecting the database type, selection of an existing database as well as creating a new one is possible. To create a new database, please open an existing one (e.g. empty.mdb, coming with the software), since the software needs to copy the database structure to the new file.

1.2. Addresses

All metainformation in WinCDS is organised in two categories: Addresses and Data Sources. Addresses are hierarchically divided into organisations and persons. A Data Source may be assigned to one of eight classes and can be of hierarchical structure. Each metainformation object shall be linked to at least one address in order to offer information on the distributor or administrator of the information.

Addresses and Data Sources shall be indexed with terms from GEMET.

The Address fields should store information about the person/organisation who collected the data, who is responsible for the data and who distributes the data.

Physically, the database stores each single address only once. However, the address may be linked to many data sources in different types of relations, i.e. as data owner.

1.2.1 Registration of Addresses

The main address information in WinCDS is be registered by using one dedicated mask. The user may choose the class of the address (organisation/person) and then register all available fields. The yellow marked fields are mandatory, i.e. registration is necessary to complete the data set. Fields coloured in light yellow are conditionally mandatory, i.e. if e.g. an eMail address is registered, no further address information is required. The lower part of the address entry form displays possibilities to link other information to the address: other addresses (e.g. parent organisation, child person), related data sources (e.g. Annual Topic Report) and thesaurus terms (currently, GEMET and ‘EIONET roles and topics’ are possible choices).
1.3. Data Sources

The main purpose of the WinCDS is to record, retrieve and maintain metainformation, i.e. information about information and data. This metainformation is stored in the section **Data Sources**. All WinCDS mandatory fields (displayed in yellow) should be registered to provide a full locator record to the public and thus to enable proper identification of the given information.

In addition to the mandatory fields, WinCDS allows to register comprehensive description of the information resource. Each resource is assigned to one of the following record classes: **project, dataset, document, station/site, map, tool, structuring element**. All classes have a common set of fields plus a limited number of special fields which are relevant only for the specific class.
1.3.1. Registration of Data Sources

Similar to recording a new Address, there are two options for adding a new Data Source:

**Registration of a single Data Source:**
In order to register a new data source, choose File from the menu and then select a record class. Each record class has a special entry form. Fill in all available information to receive a proper description of the data source. Please be aware that a data source without any address information is considered to be useless for the user.

**Registration of a sibling to an existing Data Source:**
By selecting File/Save as, part of the original Data Source information is transferred to the sibling to make data registration more convenient. This is especially useful for registration of several data sets to one parent. Corresponding to Addresses, you may list the existing data sources alphabetically or hierarchically and select an object from the list. The application queries you to enter a new title for the record. All other information is copied.
1.3.2. Supplements

In addition to the core data source information, WinCDS offers the possibility to register temporal, spatial and technical details. Information on spatial and temporal coverage is mandatory for all object classes, while technical details are optional.

The central part of the Next entry form holds the element for registration of the details. The user may flip between the respective coverage by selecting the appropriate radio button. The forms for spatial and temporal coverage are identical for all object classes, while the mask for technical coverage differs from class to class.

![Registration Form for Supplements](image)

Figure 3: Registration Form for Supplements (spatial and temporal coverage)

1.4. Retrieving Information

There are three ways to search the database for Data Sources and/or Addresses:

...one

Choose the textual search option from the menu or the binoculars from the toolbar. Enter a search string or name in the appropriate field. The search can be specified by selecting entries from different pick lists, e.g. location - country codes, language, legislation. Checkboxes allow specification of the search by using the flag functions.
By selecting the menu item List or the open folder symbol on the toolbar, an alphabetical or hierarchical list of Data Sources or Addresses is displayed.

T hematic search using the Thesaurus (see also paragraph 1.5: Using the Thesaurus Function). Pick the terms you want to search for from the Terms & Thesauri window. Push the binocular button on the toolbar to start searching the database. A result window displays the results.

1.5. Using the Thesaurus Function

Retrieval and indexing of Data Sources and Addresses using the thesaurus have been integrated into a single form. Here, the user can select a term list and the thesaurus language from a pick list.

To start the thesaurus function, select Terms and Thesauri from the Tools menu. This will open the menu, applicable for both Addresses and Data Sources. Currently, two thesauri are implemented to choose from: the General Multilingual Environmental Thesaurus GEMET and the list of EIONET roles and topics.

The list of picked terms is active until you close the form. This feature allows a switch between the Thesaurus form and the Address or Data Source mode moving to different records without losing the list of terms.

Hence you may define a term list once and attach the terms to various data sources.

Furthermore you may edit the list of terms using the functions Delete picked term and Delete all picked terms from the menu to drop one or all terms from the list.
When using the list of picked terms to search within WinCDS, each search is stored in a separate table. Thus, you may always come back to a search you performed earlier. Select the Search Definitions item from the Tools menu to see a list of all performed queries. Once you open an old search, the software reruns the search query. This feature simplifies the process of performing a special query frequently.

1.6. Printing an Object

WinCDS offers several ways of printing objects: Via the special Data Source or Address forms, or via the feature Textual Search.

...from the Address or Data Source form

| Select Addresses or Data Source from Main Form | Opens Address or Data Source form. |
| Select Print from File menu | Opens Print form |
| Select print format from pick list | Opens checklist |
| Check Fields to preview or print or choose records to be printed | Only selected items will be printed. Leave dialog by clicking on open door. |

...from the Textual Search form

| select Textual Search from Search menu | opens Textual Search window |
| push Binoculars | starts search |
| enter Text string to search | |
| push Printer button | opens Print form |
| select list format | opens checklist |
| check Fields to preview or print | only selected items will be printed/previewed |
| push Print Preview or Print buttons | previews or prints selected format |

1.7. Export and Import of Databases

WinCDS offers the option to import or export metainformation records using the SGML format. SGML stands for Structured General Markup Language. It is a widely spread and very flexible library standard.

1.7.1. SGML Export

It is possible to export

- the complete database
- predefined record collections
- single records
To export CDS data, select the **SGML Export** from the main **File** menu. Choose the format of the export, either CDS, GELOS, or Thesaurus Export. Select **Data Sources** or **Addresses** from the buttons and choose respective datasets from the picklist. Close the form by entering the open door. Hit the **Go!** button to enter a name for the export target file and then perform the export.

![Export Dialogue Form and CDS Data Source selection picklist.](image)

### 1.7.2. SGML Import

To import CDS data, the user has to open a database first. Select **SGML Import** from the **File** menu to open the import dialog window. Select the file to be imported in the browser. The import starts by hitting the **Open** button.

The user may choose to import into an empty database (open the file empty.mdb as the target .mdb first) or into a database that is already populated (first open the database the SGML file shall be imported into).

During import, the program checks for redundancy, i.e. whether a record does already exist in the target database. Should this be the case the existing record will be overwritten when the ‘new’ record has a ‘younger’ timestamp.

**Please note that WinCDS does only accept CDS input format.**
2. WebCDS

Introduction

To provide global access to the CDS data via the Internet, WebCDS has been developed. The main task of WebCDS is to give access to the Directory of Information Resources (DIR) for a wide user community coming from public authorities; members of the European Environment Agency (EEA) and its network, the EIONET (Environmental Information and Observation NET work), and associated countries (e.g. PHARE countries), as well as the general public. While the collection and maintenance of CDS data is done by using the Windows-based software WinCDS, WebCDS enables and assists search and retrieval of Data Sources and Addresses within the DIR. The advantages of the web – e.g. global access to software and data, minimum installation effort at client stations, platform independence – convinced the WebCDS users to use WebCDS not only as a retrieval tool but also for collecting and maintaining the CDS data via the Web (see WebCDS UpdateModule).

2.1. WebCDS architecture

WebCDS was developed with the aim to achieve independence of client and server platforms, Database Management Systems (DBMS), and web servers, as well as user friendliness and easy extensibility. In order to achieve this, an additional layer between server and client was introduced, which detaches WebCDS completely from the web server. The approach incorporates Java, JDBC, RMI, servlets and HTML.

WebCDS is designed as a 3-tier architecture (figure 1) where the WebCDS application server is the core element. It receives the requests from the clients (HTML- and Java-CDS) transforms the request objects to proper SQL statements and sends them to the CDS database. After receiving the results, it encapsulates them into result objects and sends them back to the clients. The WebCDS application server is implemented as an RMI server. Server and clients are written entirely in Java.

Figure 6: WebCDS general architecture
All software modules (web server, application server, database server) are currently installed on the same workstation, although the general architecture supports a distribution of the components. Due to the client-server architecture, one server for each single component is possible for load balancing.

WebCDS supports two types of clients: an HTML based client and a Java based one. The CDS servlet converts the results into HTML (HTML generation engine) to present them in any HTML 3.2 capable web browser. Therefore, only a standard web browser and an Internet connection are needed on the user site.

The Java based J-CDS accesses the CDS application directly via RMI and therefore requires specific ports for bi-directional communication as well as a browser plug-in.

J-CDS includes Java applets for specific search features i.e. map based search, thesaurus search and browsing through the database content. They are, like the results, displayed in an integrated desktop on the user’s [Java enabled] web browser.

The range of WebCDS applications is completed by the UpdateModule for online registration of metainformation. This tool offers direct access to the database for keeping the information up to date by access-entitled metainformation administrators.

2.1.1. Functions of WebCDS

The basic function of WebCDS is the search and retrieval of CDS metainformation. For this purpose, and with respect to the different data stored in the catalogue, the catalogue system supports two different search types: a data source search and an address search. Both a quick search and an expert search function are implemented for the different data types. Thus, the user is given opportunity to refine the search and add more constraints to the request. Furthermore there is a thematic search feature offering the possibility to search for the environmental topics of the General Multilingual Environmental Thesaurus (GEMET). Both Data Sources and Addresses are indexed with terms of GEMET for better retrieval.

2.2. Working with WebCDS

2.2.1. User Interface

When you enter the WebCDS, you may so far choose between eight languages for the user interface (English, French, Norwegian, German, Greek, Spanish, Italian, Portuguese).

The user interface is clearly structured and follows an easy principle (see Figure 7): It is divided into three categories and is ‘readable’ from the left to the right like a book. The left frame (1) displays general functions / sections (Data Sources, Addresses, Topic Search, Printfolder etc.). The middle section (2) provides a search interface for the Quick Search or Expert Search and the right frame (3) displays the search results. By mouse-click on one of the search results, details (4) of the found object(s) are shown in the middle section.
The Detailed Information allows direct turn to parent or child data, related data or addresses, connection to an offered URL, transmission of emails to the provided contact person of a Data Source or Address. Furthermore WebCDS offers possibility to select search results of different searches (see check boxes in frame 3) and store them in a printfolder. Before closing WebCDS after a search session, the user is able to print the stored results or save them on his local machine for further preparation.

2.2.2. Multilinguality

...in the graphical user interface (GUI)

The CDS is a catalogue used all over Europe. Hence, support of several languages is one of the major requirements. In contrast to other settings such as local area networks, the Internet is a challenge for multilingual applications because of its global character. Usually, English is used to support access to local data for the international public. However, this approach is insufficient when, like in WebCDS, the user is searching for data in his mother tongue.

Therefore, WebCDS gives opportunity to search for data in several languages via a multilingual user interface: The language for search forms and result pages may be chosen. This implies that all visible fields are language sensitive. For this purpose, WebCDS uses the resource bundle functionality as suggested by the internationalisation specification for Java. The resource bundle approach offers
possibility to switch between different languages, with the special advantage of an 
easy extensibility of the catalogue system.

... in the data presentation
The second aspect, which cannot be solved by this approach, is the presentation 
of multilingual data. In an ideal case, all data retrieved from the catalogue are 
represented in the chosen language for the user interface. As this is not possible 
without translating all data into all supported languages, the catalogue system 
supports multilingual representations as far as possible.

... in the search functionality
CDS tools (Thesshow, UpdateModule, WinCDS) support the indexing of Data 
Sources and Addresses with terms from the multilingual harmonised thesaurus 
GEMET. This ideally means that all available data in the DIR are indexed with 
keywords/terms of GEMET. Thus, retrieval of data is language independent: 
WebCDS routinely searches for all translations of the keyword and displays the 
thesaurus descriptor (keywords/terms) in the chosen GUI language instead of the 
language that was initially used for indexing.

As opposed to the rather passive multilingual search functionality in WebCDS, a 
more interactive one is available in J-CDS through the function Keywords. Here, 
navigation through the thesaurus as well as searching the thesaurus for the 
appropriate keyword fitting one's needs are supported features.
3. J-CDS - The Java Client for the Catalogue of Data Sources

Introduction

In the course of refining the functionality of the WebCDS, the idea of a Java Client for the Catalogue of Data Sources (J-CDS) was born. J-CDS adds more search functionality and better visualisation to the CDS data search. It integrates and combines three Java tools to facilitate retrieval of metainformation.

The main reason to implement a Java based search facility has been the user need for more functionality in searching a database. The following new features are realised within J-CDS:

- enable easy navigation through the hierarchy of the CDS database entries and therefore a totally different approach to search
- enable a map based search by setting a bounding box or selecting an administrative unit in different levels
- enable the full integration and use of the General Multilingual Environmental Thesaurus (GEMET) for searching the CDS database

With these three main features the J-CDS is a powerful search facility offering new and important modules like the GEMET to increase the performance and the usability of the CDS retrieval tools.

3.1. Requirements

...installation of Java Plug-In
As long as the Java 1.1 support of the Browser does not include 100% Java compliance, J-CDS needs a Java Plug-In to be installed at the client site. The Version needed is 1.1.2 and can be downloaded from the SUN site http://java.sun.com/products/plugin/1.1.2/index-1.1.2.html. Please do not use any other version.

...firewall requirements
J-CDS Client communicates with the application server through remote method invocation (RMI). Like all Internet protocols (HTTP, FTP etc.), RMI needs ports for communication. These ports are configurable. Where a firewall is installed between J-CDS client (user’s local machine) and J-CDS server, these ports have to be opened to allow bidirectional communication. The current installation of J-CDS uses ports 3000, 3001, and 3002.

3.2. Functions of J-CDS

J-CDS combines three independent modules (Java applets), whose specific search features may also be combined.

- GeoView (Location) is an easy to use tool for spatial access. It allows zooming, moving in a European map and selection of countries and bounding boxes in different levels of the map.
- GenThes (Keywords) allows navigation within the terms and hierarchies of the GEMET thesaurus. Besides a search for thesaurus descriptors and synonyms, GenThes supports browsing in the thesaurus hierarchy, detailed description, and translation of selected terms in 12 languages. The user can select one or more terms and start a search in the CDS Data...
Sources. To search for addresses within GenThes, the EEA roles and topics hierarchy can be accessed and displayed. Other thesauri may be added in the future.

- The Navigator allows to browse Addresses and Data Sources of the CDS database. The user can navigate through the hierarchy and select an object of interest to view detailed information.

Independent of the selected module, the results are collected in a result list window where the specific search criteria (selected by keyword, location or navigation) may be combined to refine the search settings or add a new search. The user may combine the results of different searches either by just keeping the old results in the list or by comparing them with the new search criteria or just delete (default) them.

To display the detailed information of each search result, a mini browser was implemented which shows the results by accessing the HTML engine of WebCDS. The mini browser allows survey of all detailed information of the search session using the back and forward buttons. Additionally, it offers the possibility to save or print the detailed information, a benefit which is currently impossible in other Java applications.

For saving or printing, the results are transferred and displayed in the local Internet browser (e.g. Netscape) where standard functions like print or save are available.

### 3.3. How to use J-CDS

![Startpage of J-CDS](image)

Figure 8: Startpage of J-CDS
The current Version of J-CDS consists of three search modules which are all accessible within the J-CDS desktop and through the main menu. The main menu (at the top of the applet) consists of four buttons, three corresponding to each tool, plus Help button.

Each module appears as internal frame within the J-CDS desktop and will take some time to load at the first time. Once initialised, the components are available fast (cached). On the bottom of the frame, you will find a status bar, showing information about the whereabouts of the loading process and all activities of the applet in general.

3.3.1. Navigator
The Navigator shows the hierarchy within Data Sources and Addresses. Browsing through the CDS database and retrieving metainformation is easily possible by selecting one item (e.g. person, document, map, ...) via mouse click. The appearing ‘Detail’ window gives exhaustive information of the selected item.

3.3.2. Location
Location initialises the GeoView applet which is a map based retrieval module for CDS data. It covers a map of Europe, aggregated from GISCO data, in which you can navigate, zoom and select a country or bounding box in different map levels (currently only one level).

Figure 9: View on Location Window
3.3.3. Keywords

Keywords initialise the GenThes module, a tool for retrieval of CDS data by using different thesauri i.e. GEMET and EEA Roles and Topics. Data Sources and Addresses may be searched by using different thesauri. Generally speaking, the user is able to choose between supported thesauri (which may be own thesauri also). GenThes offers following functions:

- **Hierarchy** displays the hierarchy of the terms of the selected thesaurus. If you have selected a term in another tabbed folder and switch to the hierarchy, the first place of this term in the hierarchy is displayed. If this term appears more than once, the search all paths button is activated. By pressing this button, all appearances of the selected term are displayed.
- **Detail** shows more detailed information of the selected term. Within this folder, you are once more able to navigate through the hierarchies of the selected thesaurus and to display the definitions of the terms.
- **Search** enables the user to search for thesaurus terms.
- **Translation** shows the selected term in all available languages.

![Figure 10: Detail Window](image)

While browsing through the thesaurus hierarchy, the ETC/CDS logo and a mail folder indicate that there are Data Sources / Addresses associated with a term. The parenthesis after a term indicates the number of data or addresses associated with the term, e.g. water [5]. An (s) after the term indicates its function as a synonym. Once you have selected a term via the Select button, start a search by pressing CDS Search. As soon as the search is completed, the search result list will appear in another window.
3.3.4. Search Result List

The search results are short listed and by double click on one item the user gets more detailed information. The buttons Keep, Compare and Delete allow the combination of two or more search result lists.

Use Keep to hold the current results in the folder, which will be out-greyed (see figure below) for easy recognition after a new search. Compare offers the opportunity to merge different searches by using a second search criterium (keyword or location). The result list does only show results matching both search criteria. Use Delete to cancel the old results and begin a fresh list with the actual ones.

Please be aware that you have to select these functions before setting a new search!

Figure 11: Result List
3.3.5. Detailed Information

The detailed information about an Address or Data Source is displayed in a simple HTML browser (implemented in Java) with two navigation buttons at the top of its frame. You can directly use URL or eMail links (if provided) to get more information or contact.

Furthermore, there are links to parent data, child data, related data or addresses.

3.3.6. Print/Save Results

A great benefit of the J-CDS is its possibility to enable save and print functionality on the user's desktop, which is normally not intended for Java applets. To enable print, save or transfer the results of a session to its local environment. The data is loaded into an external HTML browser window (e.g. Internet Explorer or Netscape Navigator) for further subsequent treatment by using the print/save button.
4. WebCDS UpdateModule

Introduction

The web-based UpdateModule for the CDS has been developed in cooperation with the Swiss Agency for the Environment, Forests and Landscape (SAEFL). Main goal was to overcome the problems with exchanging different data formats of distributed metainformation. The new approach provides direct access to the CDS database via the Internet. It was designed to simplify the update process for providing timely and reliable information.

Due to the pure Java development, the whole service is platform independent and is to run on virtually every client and server platform (Java 1.1 and Swing enabled). The use of Java Swing technology allows a WINDOWS-like look and feel for a comfortable user interface.

Since client and server communicate via RMI (Remote Method Invocation) over the web, some ports have to be opened to ensure proper interaction. These ports are statically defined and have to be open in possibly existing firewalls before installing the UpdateModule. The client’s queries and updates are send to the database server, where they are transformed into the appropriate form and sent to the database. The access (reading and writing rights) to the database is handled by user management (ID, password, super user, etc.).

Every time you want to update your metadata in the CDS, you may start the application on your local PC (which has to be connected to the Internet), log-in with ID and password for the specified database (e.g. the CDS database), make your necessary changes or inputs and transmit them directly to the database.

The UpdateModule offers a range of functionality but also tries to keep the process as simple as possible. You can

- search for all existing data in the database
- search and change your own data
- register new data

A pre-defined super user (e.g ETC/CDS) has access to all data for quality control and administrative issues.

The update tool is originally foreseen for selected CDS metadata distributors. But you may also use the complete CDS application for your individual national or scientific approach.

4.1. User requirements

The performance of the WebCDS Update Module is connected tightly to the internet performance. All communication to server and database is transmitted over the web. Thus, slow internet connections strongly affect the speed of the tool. In order to achieve better performance, all non-changing data (e.g. NUTS Codes, country names, languages etc.) are cached locally. To enable a faster reload, cards are cached as well. Please be aware that the more parallel processes are opened, the slower is the performance.
4.2. Architecture

The WebCDS UpdateModule is built upon a server-client architecture. The interaction of user and database is diverted to the database server which directs the user’s queries to the database and receives its results. The database server serves as interaction layer between the client GUI (Graphical User Interface) and the database. It consists of a search engine which receives the search queries sent by the GUI and an update engine which puts the queries for data change into the appropriate form and directs them to the database. The results of those queries are sent from the database to the database server which hands them over to the GUI. All three communication partners (database, database server, client) may be at different locations and communicate over the web. The architecture of the system is shown in Figure 13.

![Architecture of the WebCDS Update Module](image)

The update system is split into four modules: The database module contains all classes responsible for functions of the database server. The client module, taking over the role of the client in the interaction with the database server, realises the functionality of the update module. The classes in the data_carriers module carry all data relevant for interaction between the database server and the update module. The classes in the gui_elements module represent the graphical elements used on the search window of the update module.

The data structure of the UpdateModule has been separated from the running program in order to be able to make independent changes in one of the parts. Between these modules, any bidirectional dependencies should be kept aside. The modules and their dependencies are shown in the following figure.

![Dependencies of Modules](image)
4.3. General

In the catalogue system exist different levels of actors. An actor can be a person or a system. There are four different actors dealing with WebCDS:

- Interested parties who search the database
- Authorised users, who are researching in the database and are able to modify data sets
- Administrators who are able to manipulate the database as well as authorise users
- a DBMS in which the data sets of the system are stored

4.4. Using WebCDS Update Module

To use the WebCDS Update Module, the user must have a valid user name and password (to be gained at the administrator). He has to specify the database he wants to be connected with and the language. After the login, the Main Window (MainFrame) is opened. The main window contains three menus namely Dataset, Extra and Help.

4.4.1 Dataset

By choosing the menu item New..., the user can specify the record class of the new data set. Supported record classes are similar to those available in WinCDS: address, project, station/site, document, dataset, map, tool, structural element. Further, a brief registration based on the GELOS fields is possible.

The user has to fill in several cards (shown as tabbed folders) for each record and submits the cards (transmit all button) to the database. Mandatory fields have to be filled, otherwise an error message reminds the user to do so. Mandatory fields are, corresponding to WinCDS, marked yellow so that the user can distinguish them easily from optional fields. The main tabbed folder of the GELOS card is shown in Figure 15.

![Figure 15: Basic Tabbed Folder of GELOS](image)
Addresses: Parent-Child relations can be defined between Persons and Organisations. The relations to several data sources (is Distributor of, is Originator of, is Metadata Administrator of) can be specified.

Data Sources: When creating a new data source, the user can define the Distributor of Data, the Originator of Data, the Metadata Administrator and the parent/child data sources of the described data source. By clicking on the List button, a CDS Navigator internal frame will open and the user may select the Addresses and Data Sources he wants to link to the data set being created.

In order to specify the region and the countries a data source covers, NUTS Codes may be entered and Bounding Boxes can be. The user may also specify the Time Interval, Update Period and Time Period covered by the described Data Source as well as the date of its creation.

Persons, Organisations and classes of Data Sources should be indexed with Thesaurus terms (GEMET 2.0) and, if necessary, free terms. Thesaurus terms can be chosen by using the integrated GenThes (Java tool allowing access on and use of thesauri, see Figure 16), free terms can be entered into the respective text fields. The user may enter multiple thesaurus terms and multiple free terms.

Figure 16: Thesaurus and Free Terms

Every data source card contains a card Technical where the user can register technical information depending on the class of the data set he has chosen to create.
By choosing the menu item **Find**, the Search Window will open. It contains three tabbed folders:

- **Basic** (Figure 17): specify the type of data, a search string and the database field to be searched in (pick list). This string can either be searched for as substring or as complete term. All translation will automatically translate a used GEMET keyword and search with all available languages of GEMET. Three check boxes offer to search for your data only and/or for special flagged (flag1, flag2) data sets (Flag 1 and 2 may be defined individually. The inscription of the corresponding flags can be changed easily by editing the entries (find_ge1.1_type1 and find_ge1.1_type1) in the property file common_xx.properties)

![Search Window (Basic)](image)

Figure 17: Search Window (Basic)

- **Modification**: to enter time intervals for the date of creation and the date of the last update of a data set (Metadata Record).
- **Spatial**: to enable spatial restriction of the search by entering NUTS Codes (disabled for Address Search)

Search results are displayed in the Result List which is an extension to the Search Window. By clicking on an entry of the result list, modification or deletion of the data set is possible, if you are an authorised user (see figure 18).
4.4.2. Extra Menu

The EXTRA menu contains four items:

- **New Login...**: change the current user
- **Options...**: switch between supported languages or change the password
- **User Administration...**: create new users (access for user_admin only)
- **Refresh NUTSCodes...**: load new pre-defined location tables when connecting to a new database

**Help**

Before working with WebCDS UpdateModule, graphical elements for the user interface have to be implemented in Java. WebCDS UpdateModule is configured by using `ResourceBundle` which is used in Java to specify information on language dependent configuration. Also, property files are used. There are several property files that configure the GUI and language dependent text strings used by the graphical elements. The files can be changed without compiling the Java code again. After changing anything in the property files, the application has to be restarted.

By writing new property files a new language can be installed easily.

Changes to property files should be made by administrators only, since unauthorised manipulation could cause severe problems.
## 5. Annex: Datamodel Description

<table>
<thead>
<tr>
<th>Table Name</th>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccessConstraints</td>
<td>dat_access</td>
<td>unique identifier for the access constraint</td>
</tr>
<tr>
<td></td>
<td>acc_constrain</td>
<td>Name of the access constraint to be selected from the Data form</td>
</tr>
<tr>
<td></td>
<td>acc_sequence</td>
<td>sequence for the entries in the picklist</td>
</tr>
<tr>
<td></td>
<td>Old16</td>
<td>identifier for the access constraint name in CDS Version 1.6</td>
</tr>
<tr>
<td>AddressCore</td>
<td>adr_id</td>
<td>Unique Identification of Address; generated</td>
</tr>
<tr>
<td></td>
<td>adr_type</td>
<td>Type of Address (Institutions etc = 2, Persons = 1); mandatory; coded</td>
</tr>
<tr>
<td></td>
<td>adr_name</td>
<td>Name of institution or person; mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_ps_form</td>
<td>Title of addresssee (Mr, Mrs, Miss, Doctor); optional</td>
</tr>
<tr>
<td></td>
<td>adr_ps_title</td>
<td>Job title of addresssee; optional</td>
</tr>
<tr>
<td></td>
<td>adr_ps_first_name</td>
<td>Given name or nickname (John, Mike); optional</td>
</tr>
<tr>
<td></td>
<td>adr_tel</td>
<td>Telephone number; conditionally mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_fax</td>
<td>Telefax number; conditionally mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_email</td>
<td>E-Mail address; conditionally mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_url</td>
<td>URL address; conditionally mandatory</td>
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<tr>
<td></td>
<td>adr_cc</td>
<td>Country code; mandatory; picklist</td>
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<tr>
<td></td>
<td>adr_ml_zip</td>
<td>Postcode; conditionally mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_ml_city</td>
<td>Name of village; conditionally mandatory; picklist form database</td>
</tr>
<tr>
<td></td>
<td>adr_ml_street</td>
<td>Name of street; conditionally mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_ml_zip</td>
<td>Postbox: postcode; conditionally mandatory</td>
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<td></td>
<td>adr_pb_zip</td>
<td>Postbox: number; conditionally mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_creation_date</td>
<td>Date of creation or last revision of Address; generated; mandatory</td>
</tr>
<tr>
<td></td>
<td>adr_id_orig</td>
<td>Id of original record</td>
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<tr>
<td></td>
<td>adr_valid</td>
<td>Yes if all mandatory fields are filled</td>
</tr>
<tr>
<td></td>
<td>adr_has_parent</td>
<td>Performance enhancement: Has Parent = 1,..., No Parent = 0; generated</td>
</tr>
<tr>
<td></td>
<td>adr_mp_flag</td>
<td>flag for export and search conditions</td>
</tr>
<tr>
<td>AddressLanguage</td>
<td>adr_id</td>
<td>Unique Identification of Address; generated</td>
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<tr>
<td></td>
<td>adr_language</td>
<td>preferred languages; mandatory; default</td>
</tr>
<tr>
<td>AddressLocal</td>
<td>adr_id</td>
<td>Unique Identification of Address; generated</td>
</tr>
<tr>
<td></td>
<td>adr_language</td>
<td>selected languages; picklist; default</td>
</tr>
<tr>
<td></td>
<td>adr_loc_name</td>
<td>local address name (different organisation names based on the selected language)</td>
</tr>
<tr>
<td></td>
<td>adr_loc_acro</td>
<td>local address acronym (different organisation acronyms based on the selected language)</td>
</tr>
<tr>
<td>AddressType</td>
<td>adr_type</td>
<td>T number of Address (Organisations etc = 2, Persons = 1)</td>
</tr>
<tr>
<td></td>
<td>adt_name</td>
<td>Type description</td>
</tr>
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<td></td>
<td>adt_sequence</td>
<td>sequence for the entries in the picklist</td>
</tr>
<tr>
<td>AdrDatRelation</td>
<td>dat_id</td>
<td>Unique identification of Data Source; generated</td>
</tr>
<tr>
<td></td>
<td>dat_type</td>
<td>Function or Type of Relation; mandatory</td>
</tr>
<tr>
<td></td>
<td>adt_sequence</td>
<td>sequence for the entries in the picklist</td>
</tr>
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<td></td>
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<td>identifier for the relation type in CDS Version 1.6</td>
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<td>AdrHasChildren</td>
<td>adr_id</td>
<td>Unique Identification of Address</td>
</tr>
<tr>
<td></td>
<td>adr_has_children</td>
<td>Unique Identification of the child Address</td>
</tr>
<tr>
<td>AdrRel</td>
<td>adr_parent_id</td>
<td>Unique Identification of Parent Address; generated</td>
</tr>
<tr>
<td></td>
<td>adr_id</td>
<td>Unique Identification of Address; generated</td>
</tr>
<tr>
<td></td>
<td>adr_name</td>
<td>Name of Parent Address; redundant</td>
</tr>
<tr>
<td></td>
<td>adr_parent_name</td>
<td>Name of Address; redundant</td>
</tr>
<tr>
<td>AdrThesRel</td>
<td>th_thes_no</td>
<td>No of term list or Tthesaurus (see table: TthesThes); generated</td>
</tr>
<tr>
<td></td>
<td>th_lang_no</td>
<td>No of language (see table: Language); generated</td>
</tr>
<tr>
<td></td>
<td>th_desc_no</td>
<td>No of descriptor; generated</td>
</tr>
<tr>
<td></td>
<td>adr_id</td>
<td>Unique Identification of Address; generated</td>
</tr>
<tr>
<td>DataClass</td>
<td>dat_class</td>
<td>Class of Data Source; mandatory; coded</td>
</tr>
<tr>
<td></td>
<td>dtt_name</td>
<td>Description</td>
</tr>
</tbody>
</table>
dtt_dialog_box Name of the extension form which will be opened by clicking the next button on the form Data

Old16 identifier for the dataclass in CDS Version 1.6

DataCore contains data source information of the CDS core datamodel

dat_id Unique Identification of Data Source; generated

dat_title Title of Data Source; mandatory
dat_title_engl English title of Data Source; optional
dat_abstract Abstract; optional
dat_abstract_engl English Abstract, optional
dat_ordering Ordering information; optional
dat_access Accessibility of data, e.g., public, for official use only, not available; optional
dat_use Usage restrictions; optional
dat_language Language of metadata information; mandatory; default; picklist
dat_date Date of last revision of Data Source; generated; mandatory
dat_date_source Date of creation/modification of the resource (no locator); mandatory
dat_class Class of Data Source; mandatory; coded

dat_id_orig Id of Origin

dat_valid Yes if all mandatory fields are filled
dat_has_parent Performance enhancement: Has Parent = 1..., No Parent = 0; generated

dat_mp_flag flag for export and search conditions

DataDistribution contains data source information for the Dobris+3 report

dat_id Unique Identification of Data Source; generated

DataSource Data Source description
Definitions Definitions
Remarks Remarks
Geo_coverage Geographical coverage
Geo_detail Geographical level of detail
Time_series Time series
Units Units
Presentation Probable presentation
Problems Aggregation problems
Target Target/projections/scenario
Compilation Data compilation
Contact Contact
Action Action required
OLE Embedded OLE object

DataExt contains data source information of the level 1 extension

dat_id Unique Identification of Data Source; generated

ext_subclass Name of the group; Subclass Information (1.7-)
ex_notes Special Notes and additional information on Data Source; optional
ext_status State, e.g., planned, closed, in progress, n/a; mandatory; picklist
su_descr General description of technical coverage; regular
su_sta_type Type of Station (1.7-)
su_sta_equip Equipment of Station (1.7-)
su_prod_usage Scope of Tool, e.g., Statistical calculations, test and regression analysis; regular (-1.6 purp; 1.7-) su_proj_type Type of project (1.7-)
su_map_data Type of datacollection underlying the map; regular
su_map_type Type of map, e.g., topographic or thematic; mandatory; picklist
su_map_gis GIS-System; (1.7-)
su_map_res Resolution of Map; (1.7-)
su_map_res_unit Unit of Resolution of Map, (dpi, l/mm); picklist
su_map_coord Coordinate system used for the map, e.g., UTM, Gauss-Krüger, ..., regular; picklist (1.7-)
su_doc_publisher Publisher of Document (1.7-)
su_doc_publ_place Place of Publishing (1.7-)
su_doc_year Year of Publishing (1.7-)
su_doc_isbn ISBN/ISSN Number (1.7-)
su_doc_source Published in / Source (1.7-)
su_doc_type Type of Document (1.7-)
lo_bb_auto Automatically generated BB? (1.7-)
lo_bb_x_coord1 Coordinate of bounding box, lower left, x-coordinate; mandatory (if no dat_lo_id); (1.7-)
lo_bb_y_coord1 Coordinate of bounding box, lower-left, y-coordinate; mandatory (if no dat_lo_id); (1.7-)
lo_bb_z_coord1 Coordinate of bounding box, lower-left, z-coordinate; mandatory (if no dat_lo_id); (1.7-)
<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
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<td>dat_lg_source</td>
<td>Language of DataSource; mandatory; default; picklist</td>
</tr>
<tr>
<td>DataLegislation</td>
<td>Legislation, the data source refers to or satisfies</td>
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<td>dat_id</td>
<td>Unique Identification of Data Source; generated</td>
</tr>
<tr>
<td>leg_abbr</td>
<td>Abbreviation</td>
</tr>
<tr>
<td>leg_descr</td>
<td>Name</td>
</tr>
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<td>leg_country</td>
<td>Country of the Legislation; picklist</td>
</tr>
<tr>
<td>leg_no</td>
<td>Official Number</td>
</tr>
<tr>
<td>leg_part</td>
<td>Article number</td>
</tr>
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<td>DataSubClass</td>
<td>pick list for the group selection</td>
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<td>dat_class</td>
<td>Class identifier, where the subclasses belong to</td>
</tr>
<tr>
<td>ext_subclass</td>
<td>Identifier for the subclass/group</td>
</tr>
<tr>
<td>ett_name</td>
<td>Name of the subclass</td>
</tr>
<tr>
<td>ett_sequence</td>
<td>sequence for the entries in the picklist</td>
</tr>
<tr>
<td>DataSubClassFields</td>
<td>list of all visible fields for the corresponding subclass</td>
</tr>
<tr>
<td>dat_class</td>
<td>Class identifier, where the subclasses belong to</td>
</tr>
<tr>
<td>ext_subclass</td>
<td>Identifier for the subclass/group</td>
</tr>
<tr>
<td>dsf_section</td>
<td>Identifier for the extension type (1=Technical, 2=Spatial, 3=Temporal)</td>
</tr>
<tr>
<td>dsf_field</td>
<td>Field name on the extension form</td>
</tr>
<tr>
<td>dsf_visible</td>
<td>indicates if the field is visible for the affiliated subclass</td>
</tr>
<tr>
<td>dsf_enabled</td>
<td>unused (indicates if the field is enabled for the affiliated subclass)</td>
</tr>
<tr>
<td>dsf_locked</td>
<td>unused (indicates if the field is locked for the affiliated subclass)</td>
</tr>
<tr>
<td>DataUrl</td>
<td>urls associated with data source</td>
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<td>dat_id</td>
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<tr>
<td>dat_url</td>
<td>URL address; optional</td>
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<td>DatRel</td>
<td>reference to data sources (parent-child relation)</td>
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<td>dat_id</td>
<td>Unique Identification of Data Source; generated</td>
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<td>dat_parent_title</td>
<td>Title of Parent Data Source; redundant</td>
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<tr>
<td>dat_title</td>
<td>Title of Data Source; redundant</td>
</tr>
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<td>reference to thesaurus descriptors</td>
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<td>No of term list or Thesaurus (see table: ThesThes); generated</td>
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<tr>
<td>th_lang_no</td>
<td>No of language (see table: ThesLang); generated</td>
</tr>
<tr>
<td>th_desc_no</td>
<td>No of descriptor (see table ThesDesc); generated</td>
</tr>
<tr>
<td>th_no</td>
<td>unused (unique identifier for the descriptor)</td>
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<tr>
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<td>Unique Identification of Data Source; generated</td>
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<td>ISO 3166</td>
<td>ISO 3166 entries (countries)</td>
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<td>ctr_cc</td>
<td>two letter abbreviation of the country</td>
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<tr>
<td>ctr_cc3</td>
<td>three letter abbreviation of the country</td>
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<td>Countryname</td>
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<td>ctr_no</td>
<td>unique index of the country</td>
</tr>
<tr>
<td>ctr_priority</td>
<td>indicates the sequence in the listboxes (where the countries are sorted by the priority)</td>
</tr>
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<td>ISO 639</td>
<td>ISO 639 entries (languages)</td>
</tr>
<tr>
<td>lg_code</td>
<td>three letter abbreviation of the language</td>
</tr>
<tr>
<td>lg_no</td>
<td>unique index of the language</td>
</tr>
<tr>
<td>lg_name</td>
<td>Language name</td>
</tr>
<tr>
<td>lg_priority</td>
<td>indicates the sequence in the listboxes (where the languages are sorted by the priority)</td>
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<tr>
<td>Location0</td>
<td>top level locations list</td>
</tr>
<tr>
<td>loc_code</td>
<td>unique identifier for the region</td>
</tr>
<tr>
<td>loc_sequence</td>
<td>sequence for the entries in the picklist</td>
</tr>
<tr>
<td>loc_name</td>
<td>name of region; picklist</td>
</tr>
<tr>
<td>loc_bb_x_coord1</td>
<td>x,y,z: minimum coordinates of the bounding box enclosing the region</td>
</tr>
<tr>
<td>loc_bb_y_coord1</td>
<td></td>
</tr>
<tr>
<td>loc_bb_z_coord1</td>
<td></td>
</tr>
<tr>
<td>loc_bb_x_coord2</td>
<td>x,y,z: maximum coordinates of the bounding box enclosing the region</td>
</tr>
<tr>
<td>loc_bb_y_coord2</td>
<td></td>
</tr>
<tr>
<td>loc_bb_z_coord2</td>
<td></td>
</tr>
<tr>
<td>Location1</td>
<td>second level locations list (first nuts codes level)</td>
</tr>
<tr>
<td>loc_code</td>
<td>unique identifier for the country</td>
</tr>
<tr>
<td>loc_parent</td>
<td>identifier of the affiliated region (from table Location0)</td>
</tr>
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<td>loc_name</td>
<td>name of country; picklist</td>
</tr>
<tr>
<td>loc_bb_x_coord1</td>
<td>x,y,z: minimum coordinates of the bounding box enclosing the country</td>
</tr>
<tr>
<td>loc_bb_y_coord1</td>
<td></td>
</tr>
<tr>
<td>loc_bb_z_coord1</td>
<td></td>
</tr>
<tr>
<td>loc_bb_x_coord2</td>
<td>x,y,z: maximum coordinates of the bounding box enclosing the country</td>
</tr>
<tr>
<td>loc_bb_y_coord2</td>
<td></td>
</tr>
<tr>
<td>loc_bb_z_coord2</td>
<td></td>
</tr>
<tr>
<td>Location2</td>
<td>third level locations list (second nuts codes level)</td>
</tr>
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<td>unique identifier for the state</td>
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<tr>
<td>loc_parent</td>
<td>identifier of the affiliated country (from table Location1)</td>
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<tr>
<td>loc_name</td>
<td>name of state; picklist</td>
</tr>
<tr>
<td>loc_bb_x_coord1</td>
<td>x,y,z: minimum coordinates of the bounding box enclosing the state</td>
</tr>
<tr>
<td>loc_bb_y_coord1</td>
<td></td>
</tr>
<tr>
<td>loc_bb_z_coord1</td>
<td></td>
</tr>
</tbody>
</table>
loc_bb_z_coord1
loc_bb_x_coord2, y, z: maximum coordinates of the bounding box enclosing the state
loc_bb_y_coord2
loc_bb_z_coord2

**Location3**

fourth level location list (third nuts codes level)

loc_code unique identifier for the county
loc_parent identifier of the affiliated state (from table Location2)
loc_name name of county; picklist
loc_bb_x_coord1, y, z: minimum coordinates of the bounding box enclosing the county
loc_bb_y_coord1
loc_bb_z_coord1
loc_bb_x_coord2, y, z: maximum coordinates of the bounding box enclosing the county
loc_bb_y_coord2
loc_bb_z_coord2

**Location4**

fifth level location list

loc_code unique identifier for the municipal
loc_parent identifier of the affiliated county (from table Location3)
loc_name name of municipal; picklist
loc_bb_x_coord1, y, z: minimum coordinates of the bounding box enclosing the municipal
loc_bb_y_coord1
loc_bb_z_coord1
loc_bb_x_coord2, y, z: maximum coordinates of the bounding box enclosing the municipal
loc_bb_y_coord2
loc_bb_z_coord2

**MapResolutionUnit**

picklist with resolution units, suitable for GIS System and GIS Layer, groups of data class

su_map_res_unit Unit of Resolution of Map, picklist; (1.7-)
msu_map_res_unit Unit of Resolution of Map, picklist; (1.7-)
msu_sequence sequence for the entries in the picklist

**MapTypes**

picklist with map types, suitable for GIS Systems and GIS Layers (groups of data class map)

su_map_type Type of map underlying the GIS; regular
mpt_map_type Type of map underlying the GIS; regular
mpt_sequence sequence for the entries in the picklist

**StatusOfResource**

contains the entries for the status pick list

ext_status unique identifier for the status
str_status Name of the status to be selected from the Data form
str_sequence sequence for the entries in the picklist
OLD16 identifier for the status name in CDS Version 1.6

**ThemeDatRel**

relation between GEMET Themes and Data Sources

tht_id unique identifier of the theme
tht_theme title of the theme
dat_id unique identifier of the data source

**ThesDef**

thesaurus definitions to corresponding descriptors

th_thes_no Thesaurus number, coded via ThesThes table
th_lang_no Language number, coded via Language table
th_desc_no Descriptor number, unique number from descriptor ThesDesc
th_no unused (unique identifier for the descriptor composed of th_thes_no + th_lang_no + th_desc_no)
definition Definition Note

**ThesDesc**

thesaurus descriptors

th_thes_no Thesaurus number, coded via ThesThes table
th_lang_no Language number, coded via Language table
th_desc_no Descriptor number, unique number for descriptor
th_no Hascode
th_type 1=Descriptor; 2=Used For; 3=Synonym
th_top_term is 1 if no parent
th_term Descriptor

**ThesDescPicked**

temporary thesaurus terms picked by the user

th_thes_no Thesaurus number, coded via ThesThes table
th_lang_no Language number, coded via Language table
th_desc_no Descriptor number, unique number from descriptor

**ThesGrp**

thesaurus descriptor to group reference

th_thes_no Thesaurus number, coded via ThesThes table
th_lang_no Language number, coded via Language table
th_desc_no Descriptor number, unique number from descriptor
th_no unused (unique identifier for the descriptor composed of th_thes_no + th_lang_no + th_desc_no)
ths_id Thesaurus super group number
thg_id Thesaurus group number

**ThesLang**

thesaurus language table

th_thes_no Thesaurus number, coded via ThesThes table
th_lang_no Language number, coded via Language table

**ThesNar**

thesaurus narrower and broader term reference

th_thes_no Thesaurus number, coded via ThesThes table
thg_group_accro  Group acronym
thg_group  Group
ThRefSGrp  thesaurus super group description
th_thes_no  Thesaurus number, coded via ThesThes table
th_lang_no  Language number, coded via Language table
ths_id  Descriptor number, unique number from descriptor ThesDesc
ths_super_group_accro  -  Super group acronym
ths_super_group  Super Group
ThRefTheme  thesaurus themes description
th_thes_no  Thesaurus number, coded via ThesThes table
th_lang_no  Language number, coded via Language table
ths_id  Descriptor number, unique number from descriptor ThesDesc
tht_theme_accro  Theme acronym
tht_theme  Theme
TimeInterval  contains the entries for the units of the time interval picklist
tm_interv  Unit of the time interval; picklist
tt_interv  Unit of the time interval; picklist
tt_sequence  sequence for the entries in the picklist
TimePeriod  contains the entries for the update period picklist
tm_period  Period of data collection or measurement; picklist
tp_period  Period of data collection or measurement; picklist
tp_sequence  sequence for the entries in the picklist
WebListAddress  materialized view of addresscore and adrrel
adr_name  Name of institution or person
adr_inst_name  Name of parent institution or person
adr_id  Unique Identification of Address
adr_inst_id  Unique Identification of parent of Address
adr_ps_first_name  Given name or nickname (John, Mike); optional
adr_ps_form  Title of addressee (Mr, Mrs, Miss, Doctor)
adr_type  Type of Address (Institutions etc = 2, Persons = 1); mandatory; coded
adr_has_parent  Performance enhancement: Has Parent = 1..., No Parent = 0; generated
adr_ml_city  Name of village; conditionally mandatory
adr_cc  Country code; mandatory; picklist
XlastUpdate  Last update of an data source or address
id  unique identifier of the data source or address
timestmp  timestamp, time of last update
xuser  user name who did the last update
XObjectType  help table for the update module
id  unique identifier of an address or data sources
objecttype  objecttype of an address of data source
Xpermission  access restrictions
id  unique identifier of an address or data sources
xuser  user name having the permission to change the record
Xuser  basic authentication of users
xuser  user name
password  password