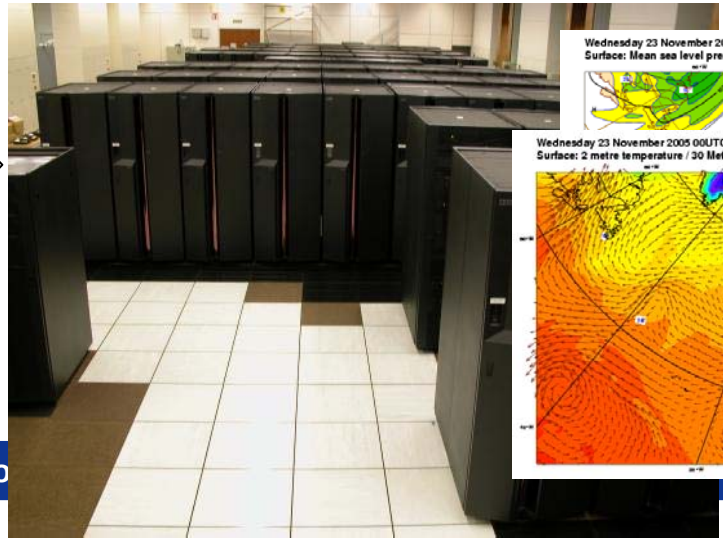
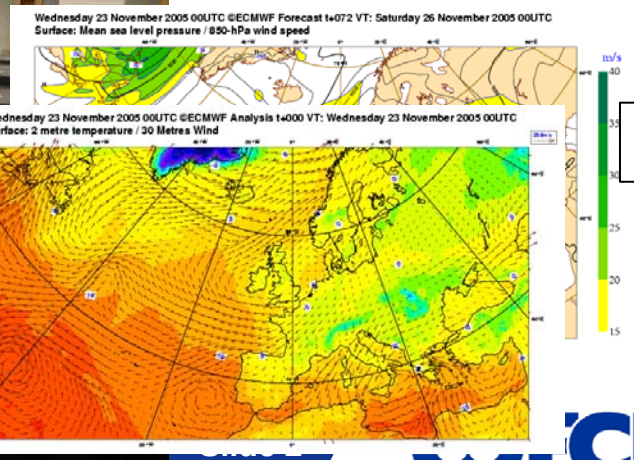
SIMDAT
Elements for building the WIS

Guillaume Aubert
ECMWF

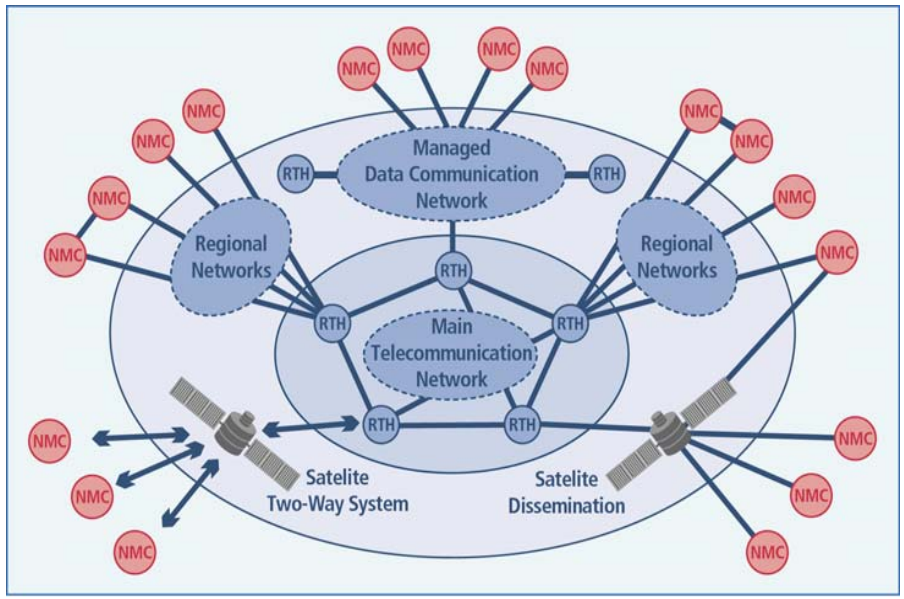
Real-time data flow: From Observation to Numerical Weather Prediction to Decision Making





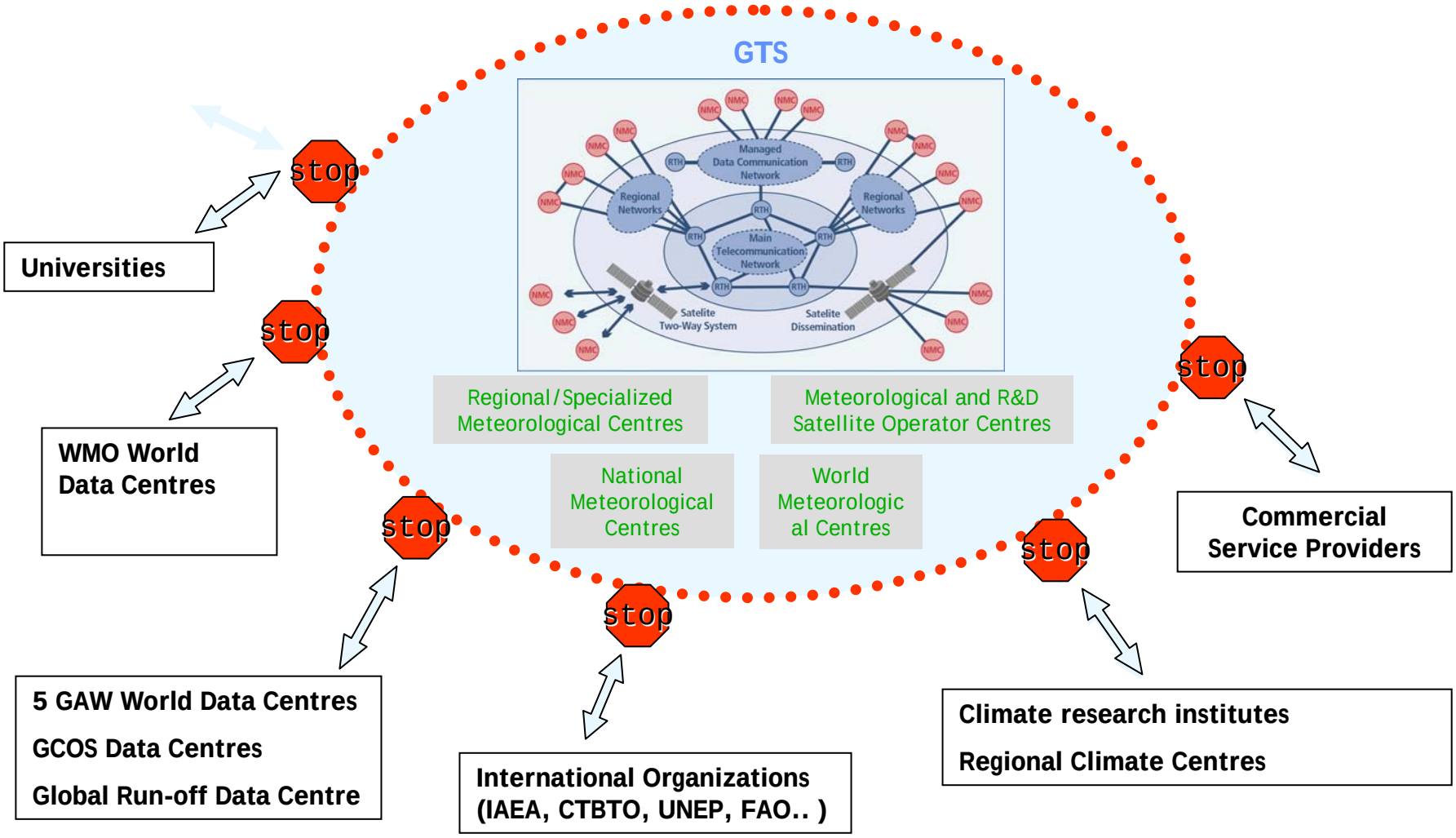
Current Situation: GTS

- **Global Telecommunications System (GTS)**
  - **Observations**
  - **Forecasts**
  - **Warnings**

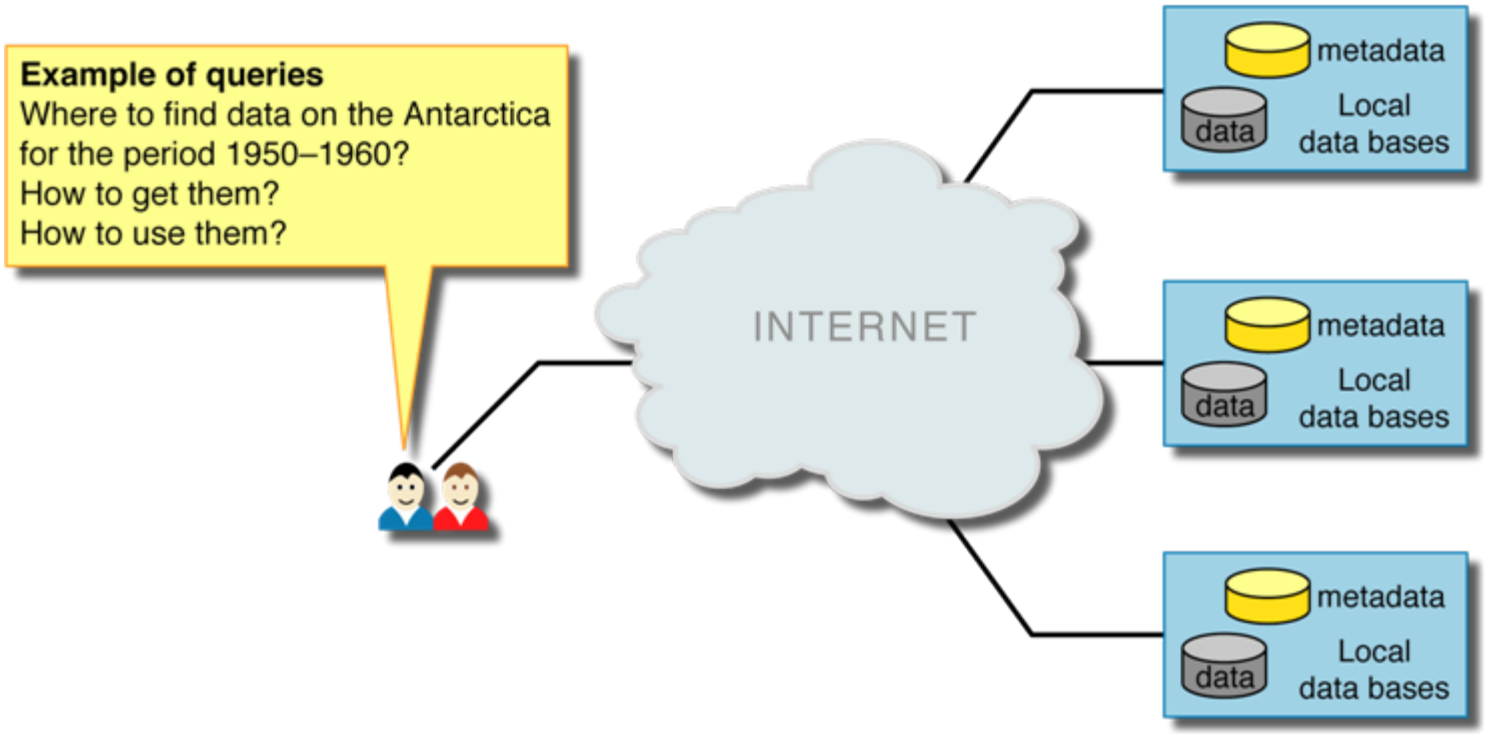


- **Private Network**
  - **Point to point network**
  - **NOT an Internet**

Current Situation: GTS



Current Situation (cont.)



- **At present, WMO Programmes do not offer appropriate response to such queries**

WMO Information System - Vision

- **Real-time collection and dissemination:**
  - Real-time “push” through dedicated telecommunication for operation-critical data
- **Timely delivery of data and products:**
  - Delayed mode “push” through dedicated telecommunication means and public data networks, especially the Internet
- **Data discovery and retrieval service:**
  - “Pull” through the Internet (HTTP, FTP,…)
- **Unified procedures**
  - More efficient data exchange
- **Coordinated and standardized metadata**
  - Data interoperability between programmes
  - Improved data management
  - ISO 191xxx series

WMO Information System and VGISC

- **The Fourteenth WMO Congress (2003) approved the concept of the WMO Information System (WIS)**
  - ***"a single, co-ordinated global infrastructure for the collection and sharing of information in support of all WMO and related international programmes"***
- **The WIS defines three functional components:**
  - **National Centres (NC)**
  - **Data Collection or Production Centres (DCPC)**
  - **Global Information System Centres (GISC)**
- **DWD, Météo France and the UK Met Office have volunteered to collaborate on development of a virtual GISC (VGISC)**
- **ECMWF and EUMETSAT are included in the project as DCPCs.**

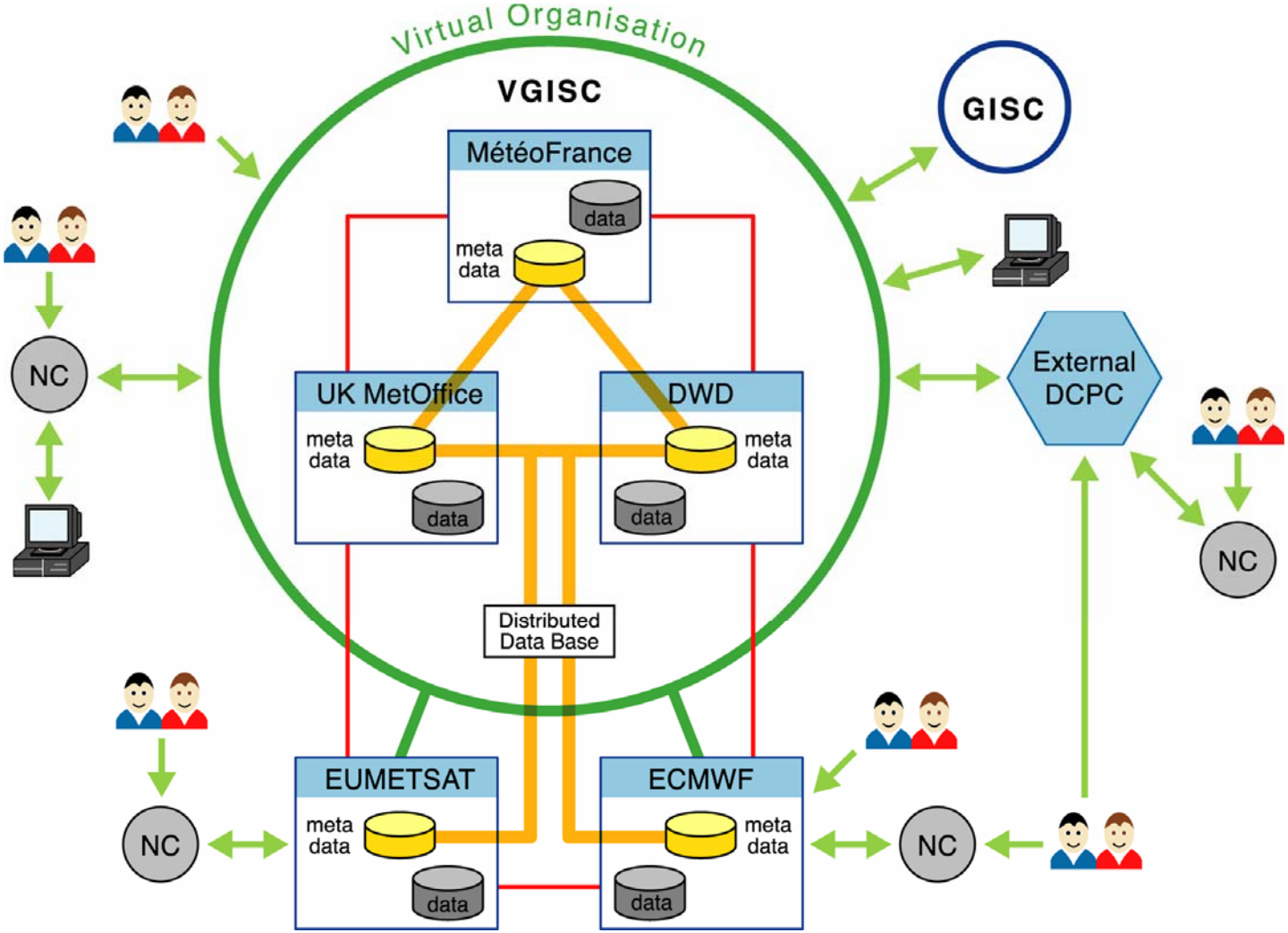
SIMDAT and the VGISC Project

- **SIMDAT is a four years EU funded project under FP6**
  - **It started in 2004**
- **SIMDAT was an opportunity to fund to development of the VGISC**
  - **ECMWF is the project coordinator**
  - **Most of the developments are done at ECMWF**
- **The available budget is approximately 1.1 M€.**
  - **ECMWF: 84 person/months (2 consultants)**
  - **DWD: 36 person/months**
  - **UK Met Office: 6 person/months**
  - **Météo France: 6 person/months**
  - **EUMETSAT participates as a non-funded partner.**

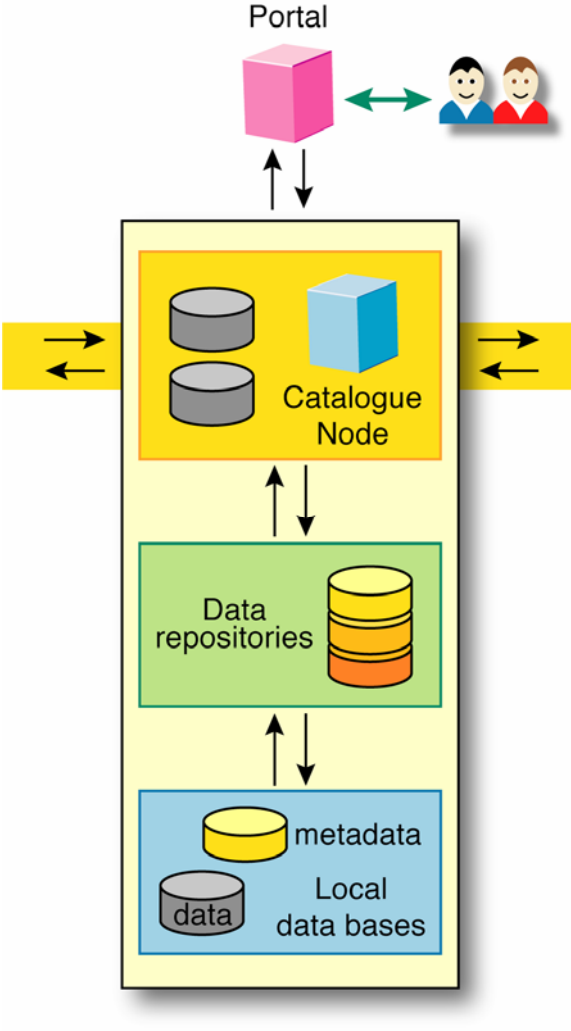
SIMDAT Project Aims

- **To build an integrated and scalable framework for the collection and sharing of distributed data**
  - **Targeting meteorology, hydrology, climate and other environmental data**
- **To provide a unified view of all available data**
- **To provide a transparent access to distributed resources**
  - **Discovery service, Cataloguing service, Subscription service,…**
- **To implement a non-intrusive system**
  - **Provide access to existing local databases**
  - **Provide a global access control policy managed by the partners and integrated into their existing security infrastructure**

The VGISC architecture

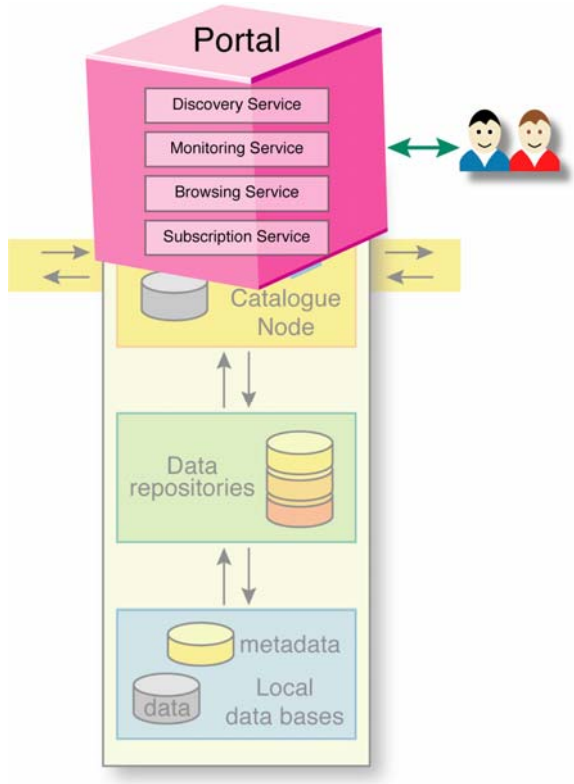


Access to existing data repositories in a non-intrusive fashion



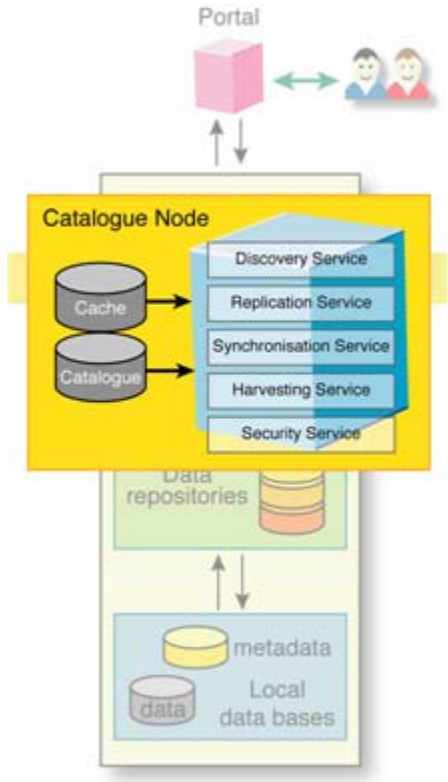
Components: Portal

- **Web based user Interface of the system**
- **Offers discovery facilities**
  - **Catalogue Browsing**
  - **Searching (keyword, time and space)**
- **Allows data selection and request submission**
- **Offers per user request management**
  - **Progress monitoring, …**
- **Offers data download facility**



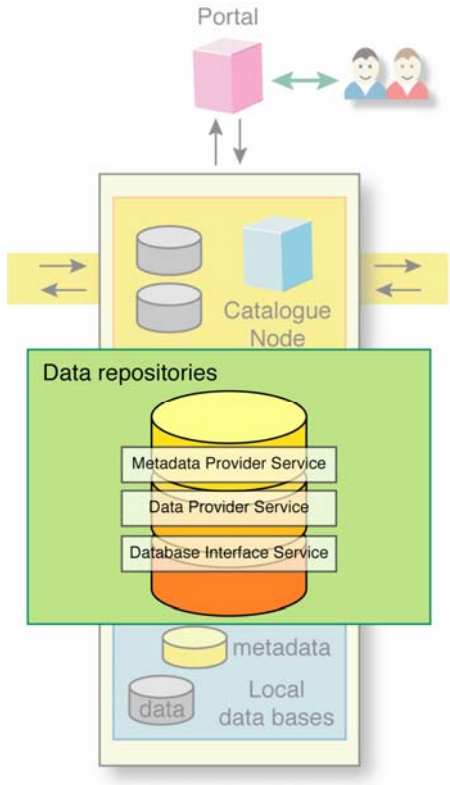
Components: Catalogue Node

- **Provides connectivity between Partners**
  - Can reach any other Catalogue Node
- **Holds the metadata catalogue**
  - Provide discovery services to the Portal
- **Implement peer-to-peer synchronization of metadata with other Catalogue Nodes**
- **Forward data requests**
  - To its Data Repositories
  - To peer Catalogue Nodes
- **Stream retrieved data between Data Repository and End User**

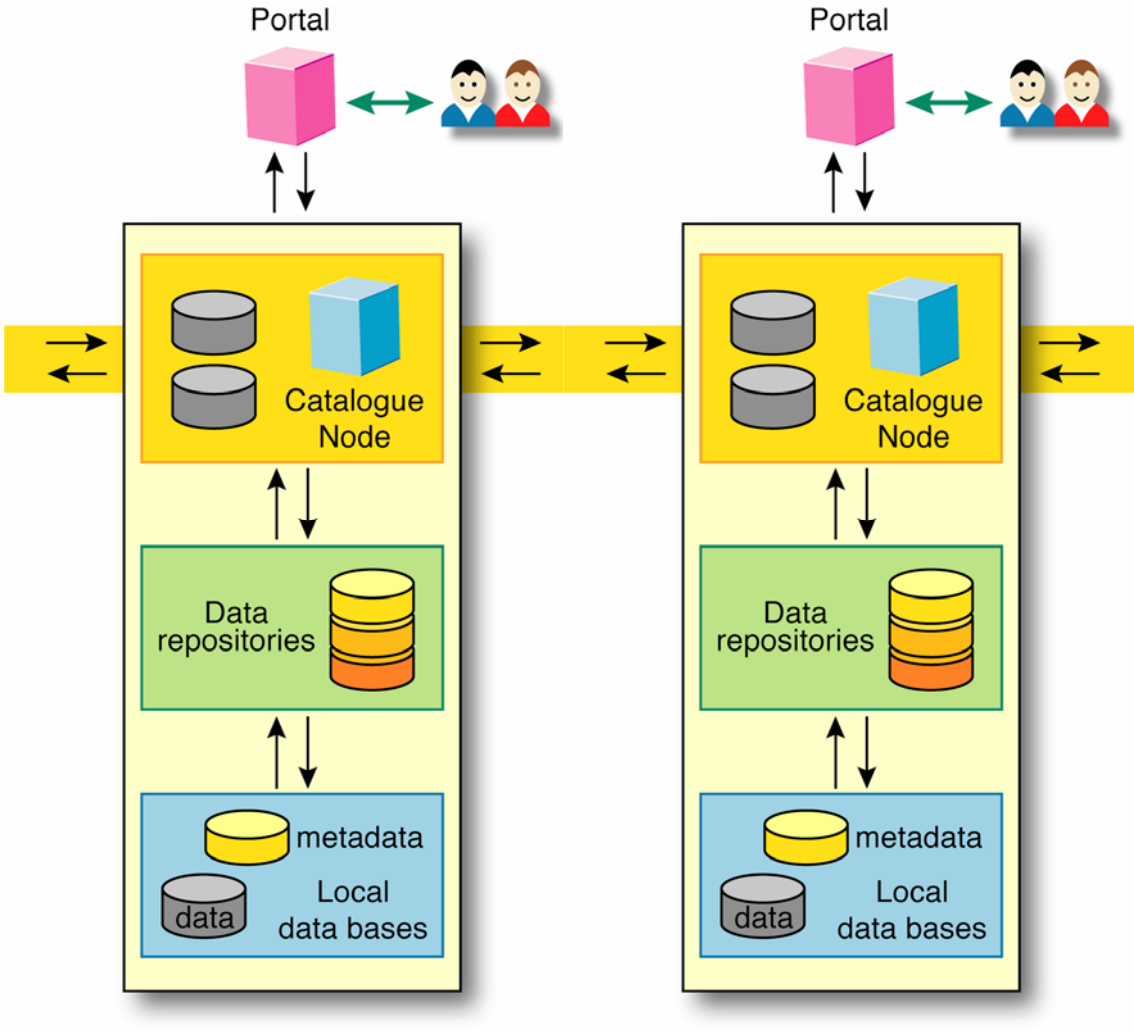


Components: Data Repository

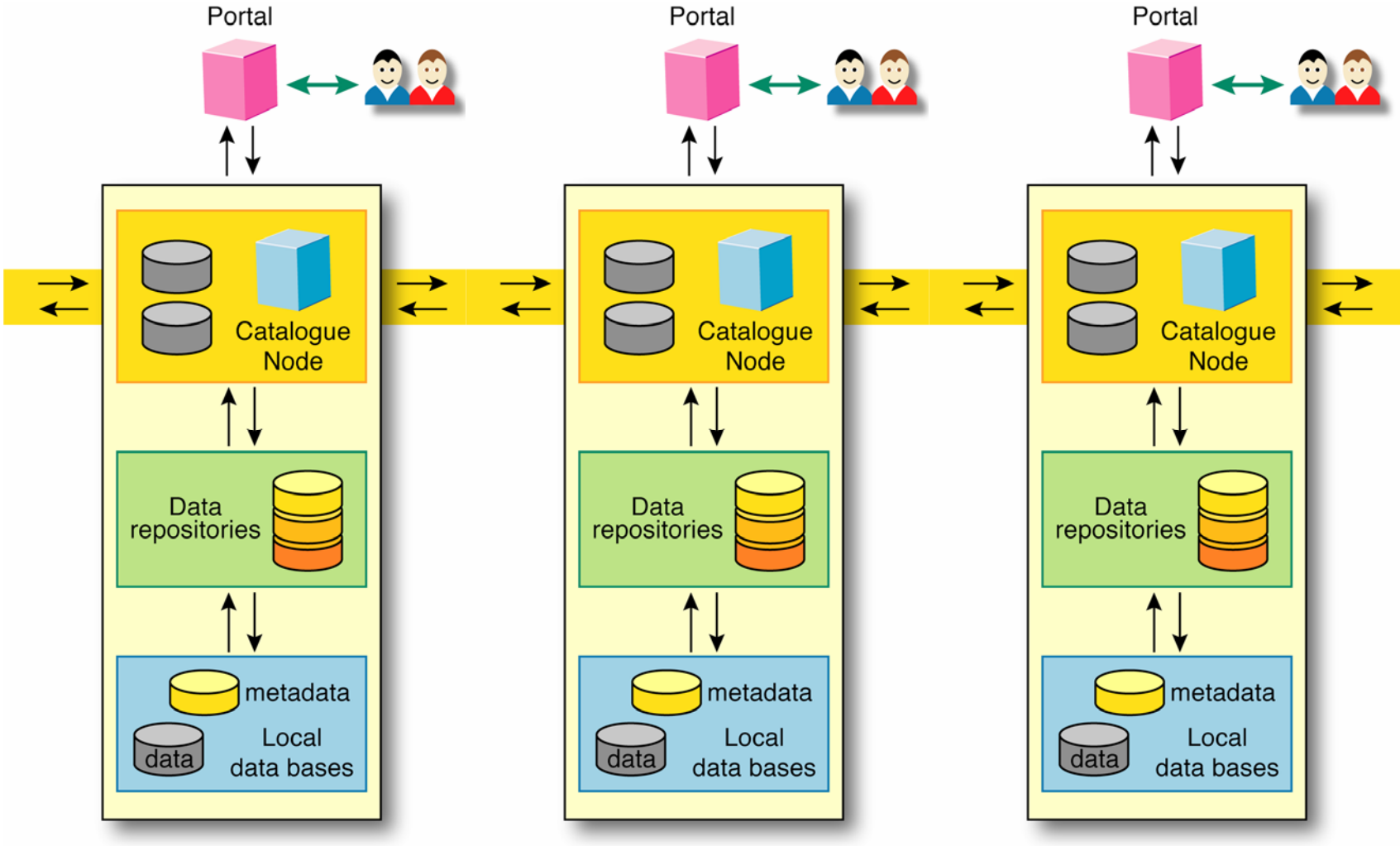
- **Provides a unified interface between the Catalogue Node and local databases**
- **Acts as a metadata provider**
  - **Publish metadata for harvesting by the Catalogue Node**
- **Acts as a data provider**
  - **Accept data requests from the Catalogue Node**
  - **Translate data requests into request for local databases**
  - **Implement asynchronous handling of data requests**
    - **Support for access to off-line data**



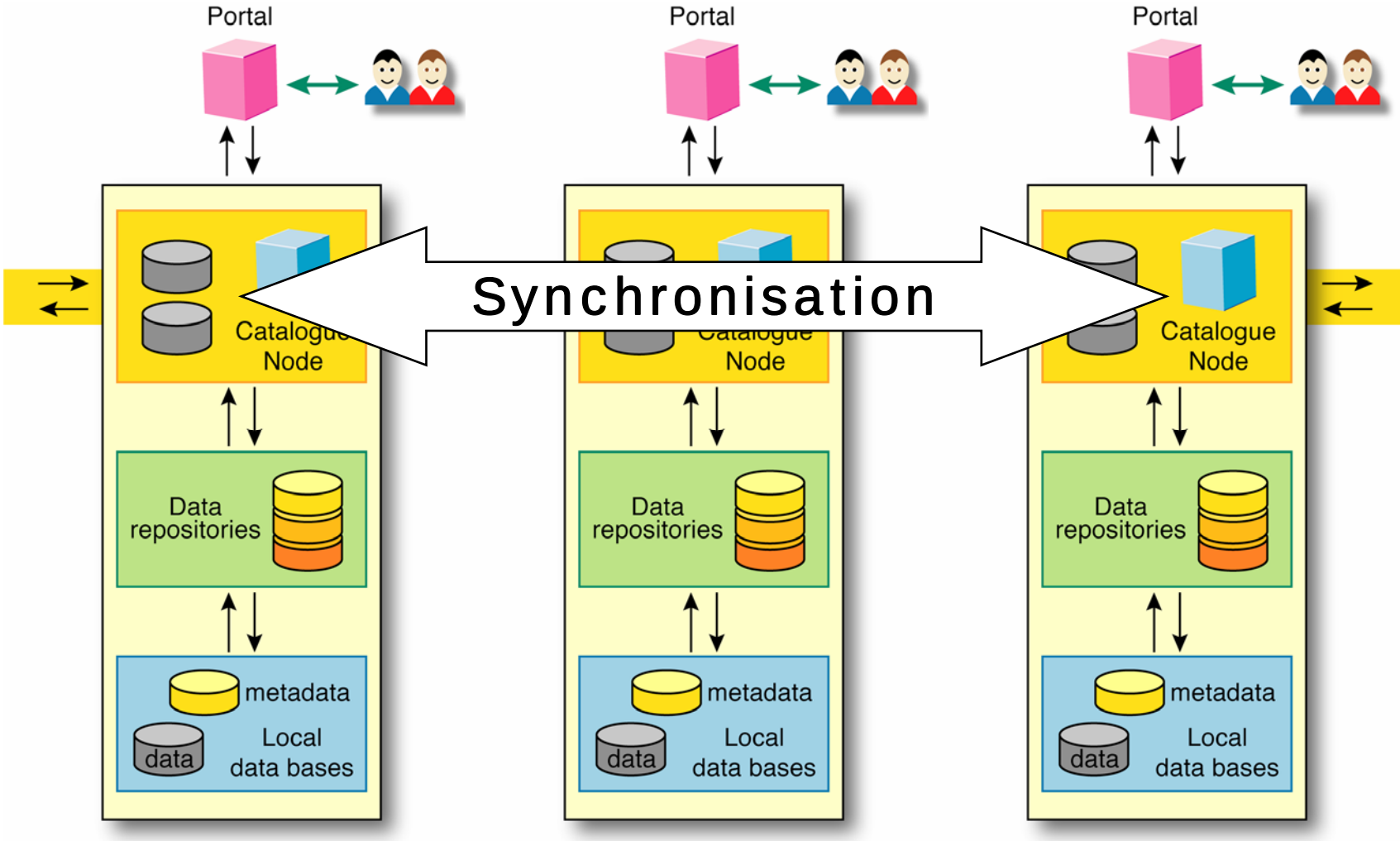
Connectivity to another site via secure connection layer



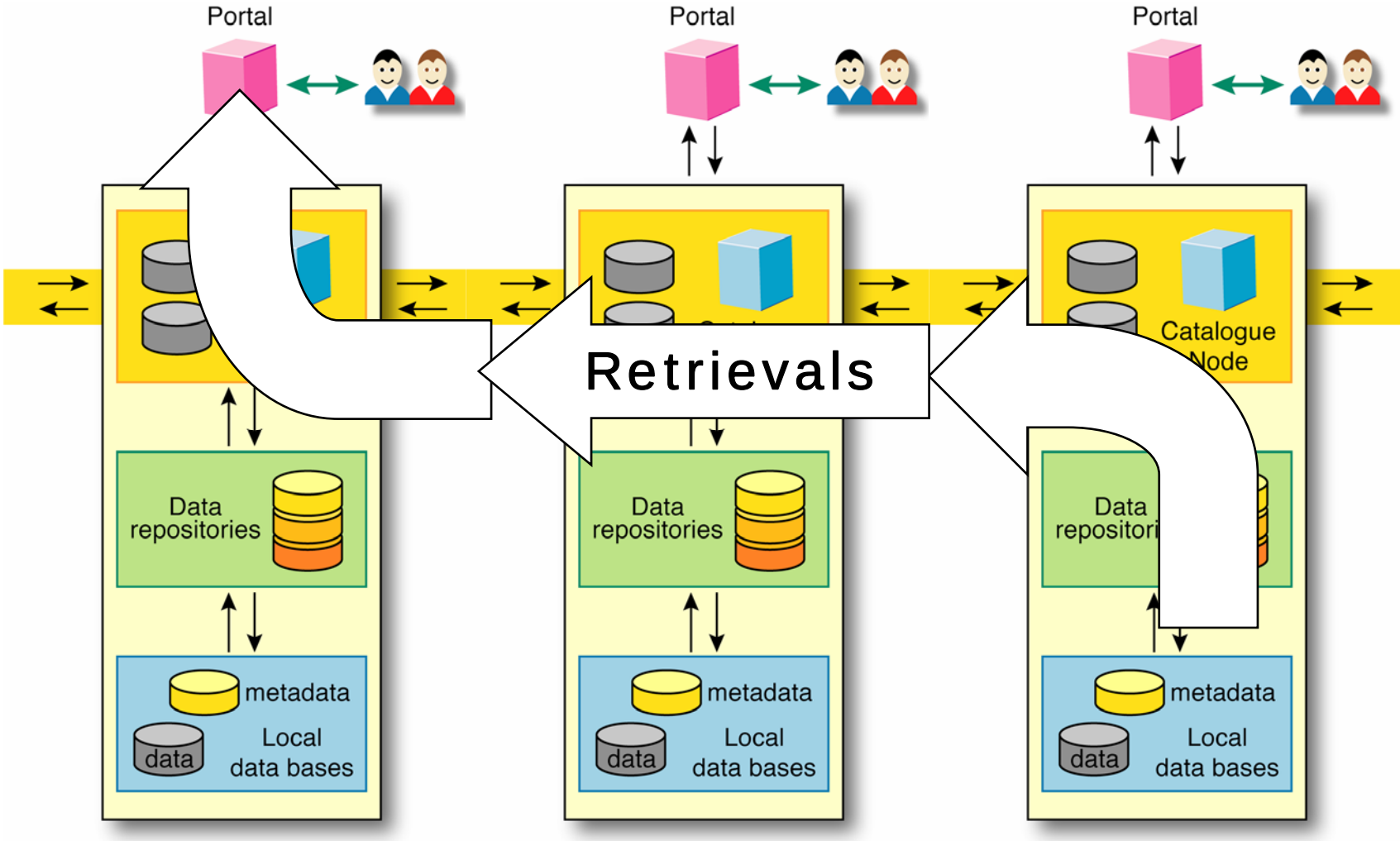
A scalable system: addition of new sites



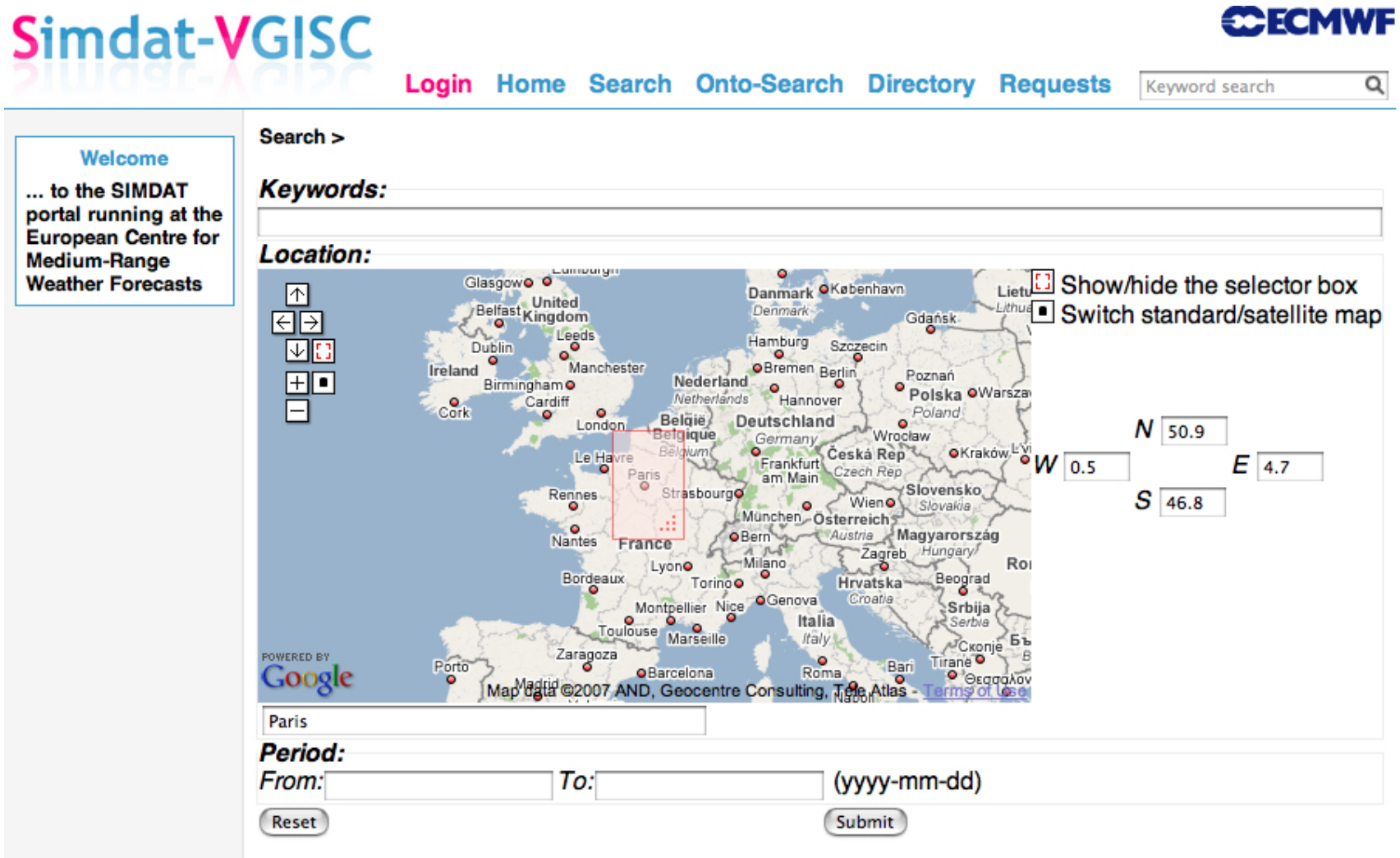
Catalogue Synchronisation: each site has a copy of the global catalogue



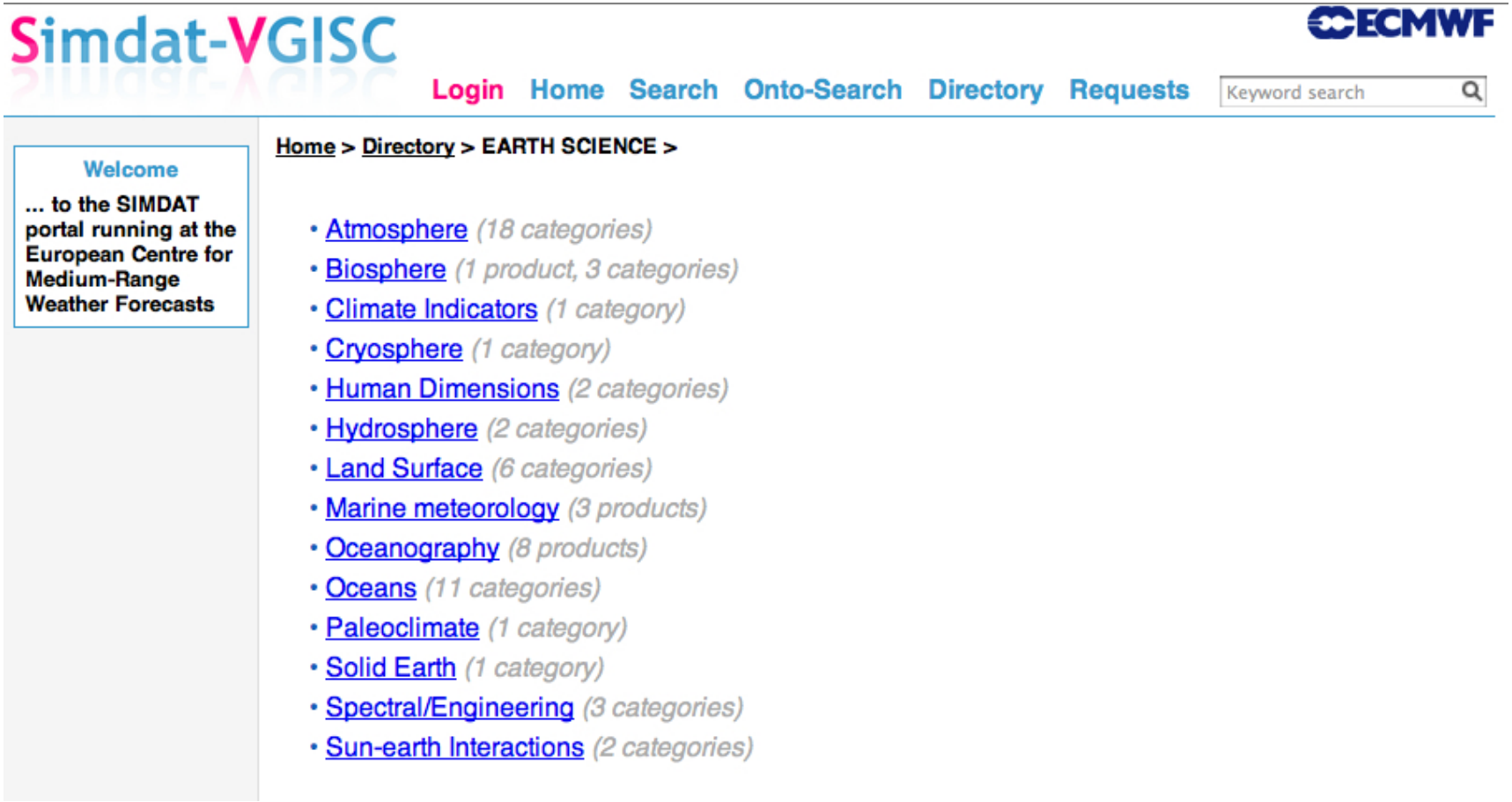
Data from anywhere can be accessed from everywhere



Datasets are indexed (text, location, time)



Datasets are categorised (browsing)



Datasets are described using Metadata

Simdat-VGISC

ECMWF

Login Home Search Onto-Search Directory Requests Keyword search

Metadata
Retrieve Data
Show XML

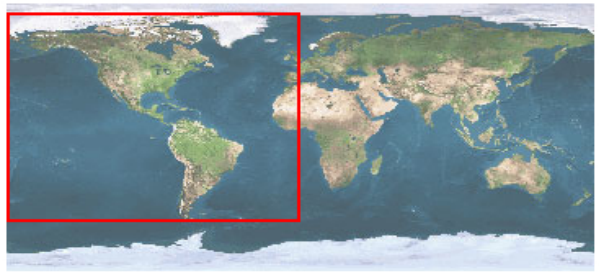
Please note:
This is an external dataset. If you which to retreive it, you will be redirected to another site.

Home > Metadata >

Title: ***MEGAN (Model of Emissions of Gases and Aerosols from Nature)***

Abstract: MEGAN is a modeling system for estimating the net emission of gases and aerosols from terrestrial ecosystems into the atmosphere. It is driven by landcover, weather, and atmospheric chemical composition. MEGAN is a global model with a base resolution of ~ 1 km. It can run as a stand-alone model for generating emission inventories but is also being incorporated as an on-line component of chemistry/transport and earth system models.
The MEGAN collection is currently being updated to version 2.0 so these data are not currently available. This notice will be removed when the update is complete. You may email cdp@ucar.edu if you have further questions.

Bounding Box: 84°N 180°E 57°S -0°W

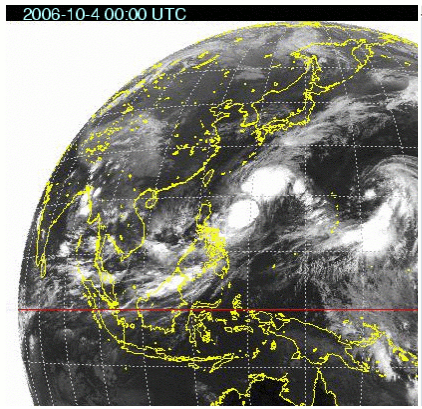


Categories: EARTH SCIENCE > Atmosphere > Air Quality > Emissions >
EARTH SCIENCE > Atmosphere > Air Quality > Volatile Organic Compounds >
EARTH SCIENCE > Atmosphere > Air Quality > Nitrogen Oxides >
EARTH SCIENCE > Atmosphere > Atmospheric Chemistry > Trace Gases/Trace Species >
18 more...

On Line Source: https://cdp.ucar.edu/getCatalog.do?ID=ucar.ncar.acd.software.megan

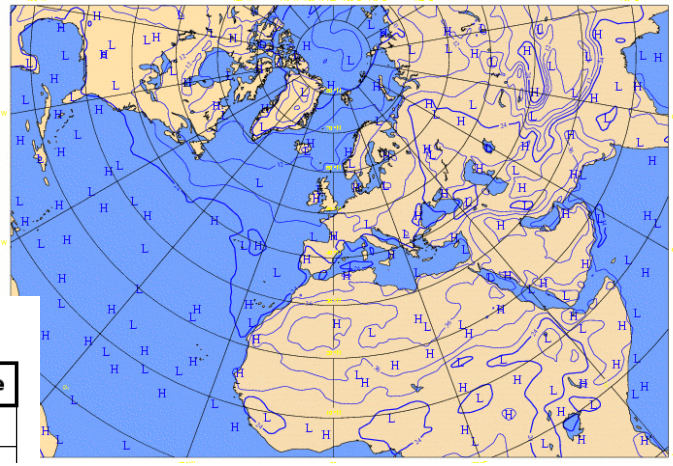
ECMWF

Multiple data types support



Home > Your requests > Request test.ecmwf_1161186647548 >

Status: complete



Stationname: Aachen

Date	Value	QualityLevel	Latitude	Longitude	Altitude
2006-09-17	19.2	high	50.7839	6.095	202
2006-09-18	17.5	high	50.7839	6.095	202
2006-09-19	19	high	50.7839	6.095	202
2006-09-20	21.5	high	50.7839	6.095	202
2006-09-21	27.2	high	50.7839	6.095	202
2006-09-22	27.3	high	50.7839	6.095	202
2006-09-23	25.3	high	50.7839	6.095	202
2006-09-24	23.8	high	50.7839	6.095	202
...	...	...	...	...	...

```
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SIHU21 HABP 170900
AAXX 17091
12772 41982 10301 10074 21001 39984 40272 52004 70300 80001=
12822 41975 01502 10094 20011 30124 40268 50001 70200=
12843 41982 00901 10095 20001 30101 40273 50004 70200=
12882 41982 00304 10081 21017 30132 40266 52006 70100=
12925 41975 01701 10094 20013 30094 40267 52001 70200=
12942 41980 10802 10084 20015 30023 40273 52007 70200 80001=
12982 41980 00502 10085 20012 30166 40268 52007 70100=000000000000043901
...
```

METEO FRANCE Home | Search | Directory | Requests Keyword search

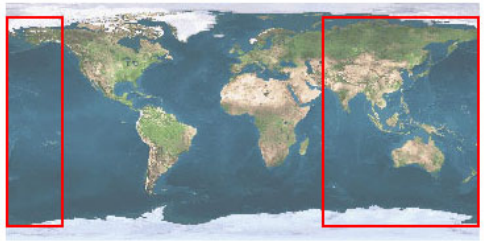
Home > Metadata >

Title: *Satellite imageries of MTSAT*

Abstract: Full disk satelllite imagieries observed by MTSAT-1R.

Period: 2006-10-30 to 2006-11-05

Bounding Box: 80°N 60°E 80°S 140°W



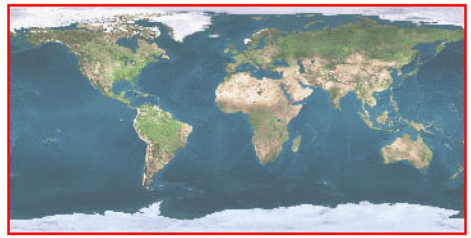
Home | Search | Directory | Requests Keyword search

Home > Metadata >

Title: *GTS stations alphanumeric products (Day -> Day-1)*

Abstract: GTS products (METAR,TAF,SYNOP) with town choice (Day Day-1). The information is extracted from the French legacy databases.

Bounding Box: 90°N 180°W 90°S 180°E



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  <referenceAuthority>
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    <role>originator</role>
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        <voice>+41 22 730 8111</voice>
        <facsimile>+41 22 730 8181</facsimile>
      </phone>
      <address>
        <deliveryPoint>7 bis Avenue de la Paix, CP2300 - 1200 </deliveryPoint>
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      </address>
      <onlineAddress>http://www.WMO.int
```

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0000044501
SIHU21 HABP 170900
AAXX 17091
12772 41982 10301 10074 21001 39984 40272 52004 70300 80
12822 41975 01502 10094 20011 30124 40268 50001 70200=
12843 41982 00901 10095 20001 30101 40273 50004 70200=
12882 41982 00304 10081 21017 30132 40266 52006 70100=
12925 41975 01701 10094 20013 30094 40267 52001 70200=
12942 41980 10802 10084 20015 30023 40273 52007 70200 80
12982 41980 00502 10085 20012 30166 40268 52007 70100=00
...
```
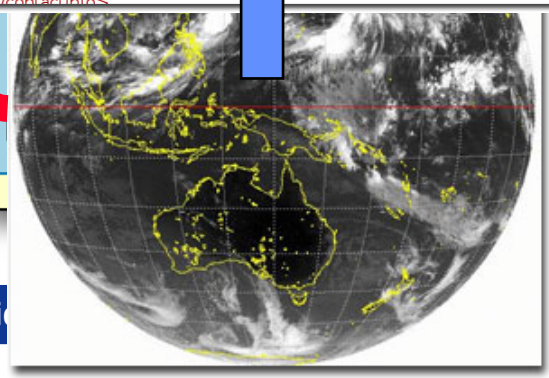
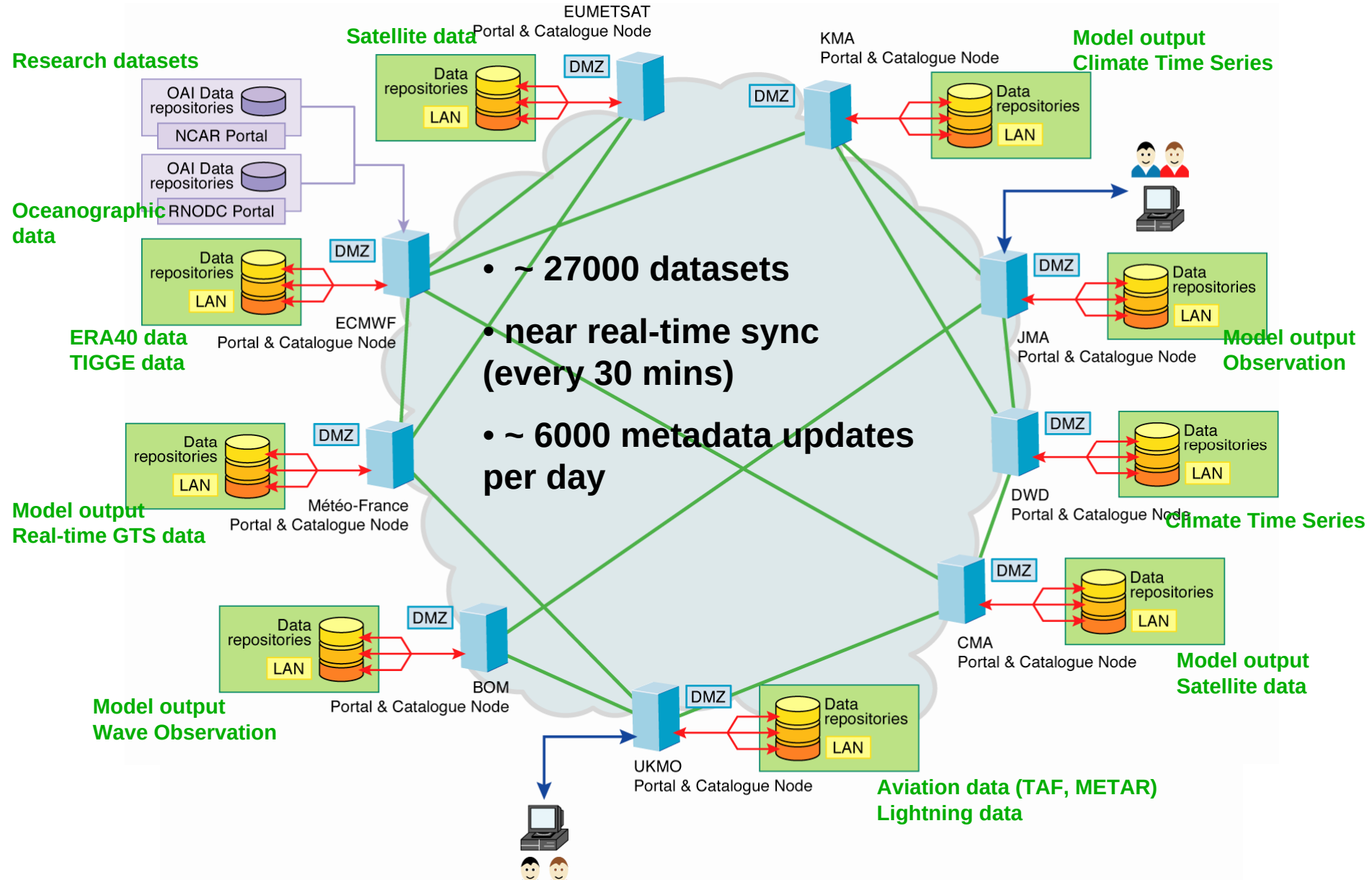



Status: 11 sites connected



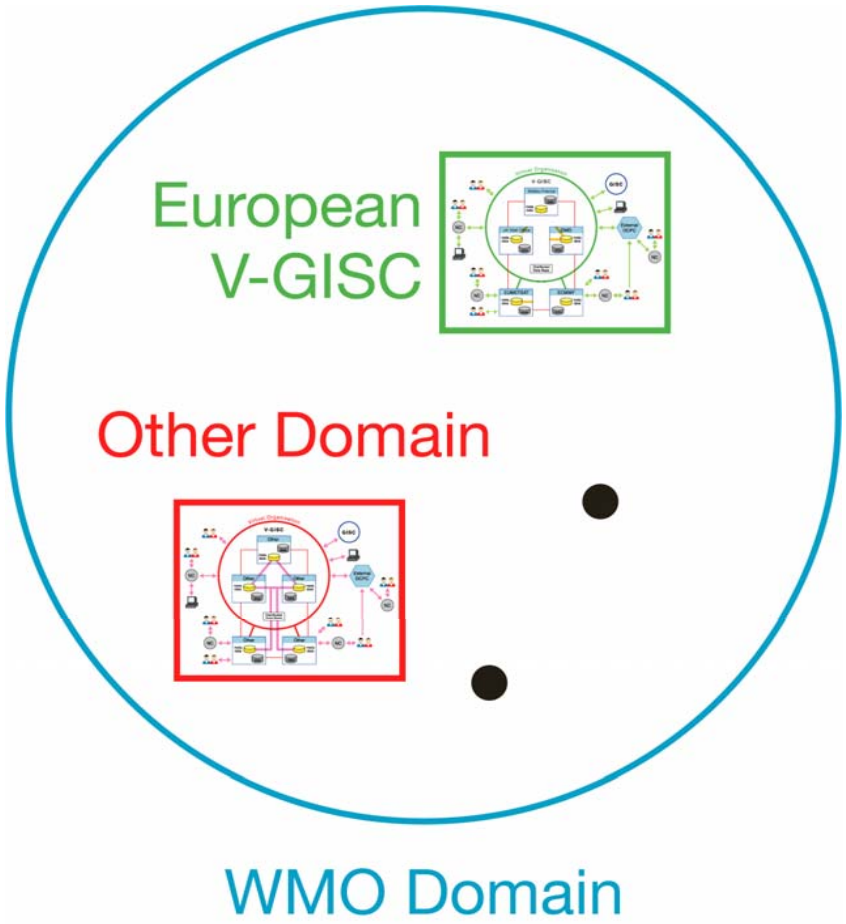
Status and Plans

- **Status**
  - **The prototype has been deployed in a large worldwide test bed (11 sites)**
  - **Provides discovery capabilities**
  - **Allows data retrieval**
  - **Support a wide variety of data types**
  - **Implements user management and data policies**
  - **The software is available under an Open Source Licence**
- **Plans**
  - **Ingestion of GTS data**
  - **Offer subscription services**
  - **Follow the development of the INSPIRE directive**

New Release with support for VO

- **We want security**
  - **Users needs to be authenticated (who are they?)**
- **We want to enforce data policies**
  - **Can this user access this data?**
  - **Users have “roles”, e.g. this user is a “researcher”**
  - **Data have “policies”, e.g. this data is accessible by “researchers”.**
- **These issues have to be solved in a distributed environment**
  - **Non centralised solution: user may login at one site (authenticated)…**
  - **… to get data from another (authorized)**
- **Problems**
  - **How to we make sure that all sites have the same understanding of roles and policies (e.g. what is a “researcher”)**
  - **How do we solve technically the fact that authentication and authorisation do not take place at the site.**

Virtual Organisations: Domains & Trust



- **A domain represents a group of organisations with a common data access policy.**
- **Organisations within a domain trust each other to authenticate users**
- **Authorization is performed by the Site hosting the data**

Project successes

- **With the EU**
  - **The achievements of the meteorological activity of SIMDAT have been acknowledged by EU reviewers**
- **With the WMO community**
  - **The software was presented during expert team meetings**
- **Evaluation copies of the software**
  - **Australia, Brazil, Canada, China, Finland, Japan, Korea, Morocco, Norway, Portugal, Russia, Sweden, Zimbabwe**
- **Other communities are interested**
  - **Global Monitoring for Environment and Security (GMES)**
  - **EUMETNET OPERA project**
  - **International Polar Year (IPY)**

Conclusion

- **SIMDAT is a virtual distributed database**
  - Fully decentralised and all sites have equal rights
  - Decentralised user and data policies management
  - Integrated catalogue and data retrieval functions (one-stop-shop)
  - Designed for operational use
- **Interfacing with any existing data repositories**
  - Without any impact on the local infrastructure or disruption of operational activities
  - Support for any data types (GTS bulletins, Model outputs, Satellite images, climate time-series, ….)
- **Generates interest in meteorology and other environmental communities**

http://code.ecmwf.int/trac/vmc

SIMDAT

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SIMDAT General Overview

SIMDAT is Data grids for process and product development using numerical simulation and knowledge discovery. The project is funded by the European Commission under the Information Society Technologies Programme(IST), contract number IST-2004-511438

SIMDAT focuses on four application areas: product design in automotive, aerospace and pharma industries as well as a service provision in meteorology.

This WIKI provides information about the results and software developed during the lifetime of the the SIMDAT project for the Meteorological application. General information about the SIMDAT project and the other application areas are found in: http://www.scai.fraunhofer.de/simdat.html

SIMDAT Virtual Global Information System Centre

The objective of SIMDAT for the meteorology sector is to develop a VGISC, a virtual and consistent view of all meteorological data distributed in the real-time and archived databases of the partners. The system will provide a secure, reliable and efficient mechanism to collect, exchange and share these distributed data, in order to support research and operational activities of the meteorological community. DWD, ECMWF, EUMETSAT, Météo-France and the Met Office with

llection and sharing of distributed meteorological data.

e use of Grid technologies and standards for metadata, ailability of the system and provide a uniform external and their associated metadata.

infrastructure, the SIMDAT stack is deployed in top of the legacy systems. See a description of the service and

e part of the prototype. (Including Atmospheri

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- Testing Scenarios

SIMDAT VMC Install Guide
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- Installing VMC Suite
- Configuring and tuning VMC Suite
- Running the VMC Suite
- Running two Installations on the same machine

Testing Scenarios
- Node Installation & Connection to the ECMWF testing Node
- Portal Installation
- Test Data Repository Installation

SIMDAT Management
- The VMC-node tools
  - Domain commands family
  - Role commands family
  - User commands family

SIMDAT

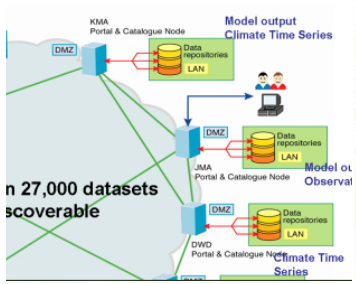
Wiki

root / trunk / src / org / vmc / node / request / executor / AuthorizationFromClientStageTask.java

Revision 883, 5.5 kB (checked in by gaubert, 2 weeks ago)

Create RequestLogger? Object.
The requestLogger object is like a callback object in order to log information with the deep classes of the authorization module.
This is necessary to provide some information regarding NEC DAC and STS

```
Line
1  /**
2  * Copyright 2005-2007 ECMWF
3  *
4  * Licensed under the Apache License, Version 2.0 (the "License"); you may
5  * not use this file except in compliance with the License. You may obtain a
6  * copy of the License at http://www.apache.org/licenses/LICENSE-2.0 Unless
7  * required by applicable law or agreed to in writing, software distributed
8  * under the License is distributed on an "AS IS" BASIS, WITHOUT WARRANTIES
9  * OR CONDITIONS OF ANY KIND, either express or implied. See the License
10 * for the specific language governing permissions and limitations under
11 * the License.
12 */
13
14 package org.vmc.node.request.executor;
15
16 import java.util.List;
17
18 import org.dom4j.Document;
19 import org.vmc.common.authx.UnauthorizedAccessException;
20 import org.vmc.common.exceptions.VMCException;
21 import org.vmc.common.util.Log;
22 import org.vmc.common.util.Logger;
23 import org.vmc.common.util.xml.XMLToolBox;
24 import org.vmc.node.domain.AttributeCertificate;
25 import org.vmc.node.domain.DataPolicies;
26 import org.vmc.node.domain.DataPolicy;
27 import org.vmc.node.domain.Domain;
28 import org.vmc.node.request.PersistentRequestInfo;
29 import org.vmc.node.request.RequestLogger;
30 import org.vmc.node.request.RequestState;
31 import org.vmc.node.services.data.DataRequestMessage;
32 import org.vmc.node.services.pojo.FragmentID;
33
34 /**
35 * Authorization Stage from the Client side. It is handled differently when
36 * a request comes from a node 2 node interface
37 * @author Guillaume Aubert. email:guillaume.aubert@ecmwf.int
38 * creation 18 Jun 2007
39 * copyright ECMWF. All rights reserved
40 *
41 */
42 public class AuthorizationFromClientStageTask extends VMCStageTask
43 {
44         protected final static Logger    ms_Log  = Log.getLogger(AuthorizationFromClientStageTask.class.getName());
45
```



SIMDAT software download

Data Services
- Data Archive services
- Software services
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Related Manuals
- GRIBEX manual
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Binary distributions:

Description	Size	Download Now!
Latest Version		
Mysql Database Schema v0.9.8.1	11KB	create_vmc_mysql-v0.9.8.1.sql
Catalogue Node distribution v0.9.8.1	66,090KB	vmc-node-v0.9.8.1.tar.bz2
DataRepository distribution v0.9.8.1	9,761KB	data-repository-v0.9.8.1.tar.bz2
Portal distribution v0.9.8.1	25,623KB	simdat-meteo-portal-v0.9.8.1.tar.bz2
APPLYING PATCHES TO V0.9.8.1		
V0.9.7.1		
Mysql Database distribution v0.9.7.1	6KB	vmc_mysql_v0_9_7_1.tgz
Catalogue Node distribution v0.9.7.1	58,755KB	vmc_node_v0_9_7_1.tgz
Test DataRepository distribution v0.9.2	15,582KB	test_data_repository_v0_9_2_121006.tgz
Test Portal distribution v0.9.6	21,079KB	simdat_meteo_portal_v0_9_6.tgz

The SIMDAT software components are distributions based on JAVA.

You will need JAVA JDK 1.5.x to run the distributions.

See Installation Guide

Source download:

To download the SIMDAT Meteo project, you will need access to an svn client:

- **From command line**

```
svn checkout http://code.ecmwf.int/svn/vmc/tags/V0.9.8.1 VMC-V0.9.8.1
```

- **With the eclipse IDE svn plugin (http://subclipse.tigris.org/)**

Within the ecipse IDE and the svn plugin installed.

1. Window>Open Prespective>SVN Repository Explorer
2. Right click on the SVN Repository Explorer to create a "New Repository Location"

Thank you