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Contact details:	<p>BMT MARINE INFORMATION SYSTEMS LTD Grove House, 7 Ocean Way, Ocean Village, Southampton, Hampshire, SO14 3TJ. United Kingdom.</p> <p>Tel: +44 (0) 2380 232222 Fax: +44 (0) 2380 232891</p> <p>e-mail: mis@bmtmis.demon.co.uk Website: http://www.bmtmis.com</p>

	Name	Signature	Date
Author:	Chris Rawlings		
Approved by:	Dr Andrew Tyler		

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Contributors

Company	Name
BMT	Chris Rawlings
	Paul Goddard
	Paul Taylor
TXT	Matteo Villa

Distribution List

Company	Name	Number of Copies
EU Commission (DG-XIII)	Guy Weets	
BMT	Paul Taylor	
TXT	Matteo Villa	
CEDRE	Vincent Gouriou	
Met. Office	Jack Hopkins	
IMGW-OM	Wlodek Kryzminski	
NC	Koen DeHulsters	



Revision

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0	26/04/2001	Chris Rawlings	Initial Release
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1 Introduction

The Marine Environmental Response Data Management and Acquisition Using Internet Data Brokerage (MERMAID) is an Internet based data broker used to quickly supply geographic information to Emergency Response organisations around the world.

This document forms the Low Level Design for the Data Access Engine component of the MERMAID Internet Data Broker and describes the overall architecture, including the interactions between components and the interfaces required for these interactions.

This is not one of the official deliverables originally defined in the project contract. However, the design of this component includes the search and retrieval, and data transfer utilities, and therefore forms an essential part of the deliverables for workpackage 3; Data Management. It has therefore been given the reference D2.3.

2 Overview

Dataset Transfer is dealt with using the Data Access Engine Components which are implemented using servlet / SOAP technology.

These components are either on the MERMAID Server or on the remote provider's server depending upon the location of the dataset file to be delivered.

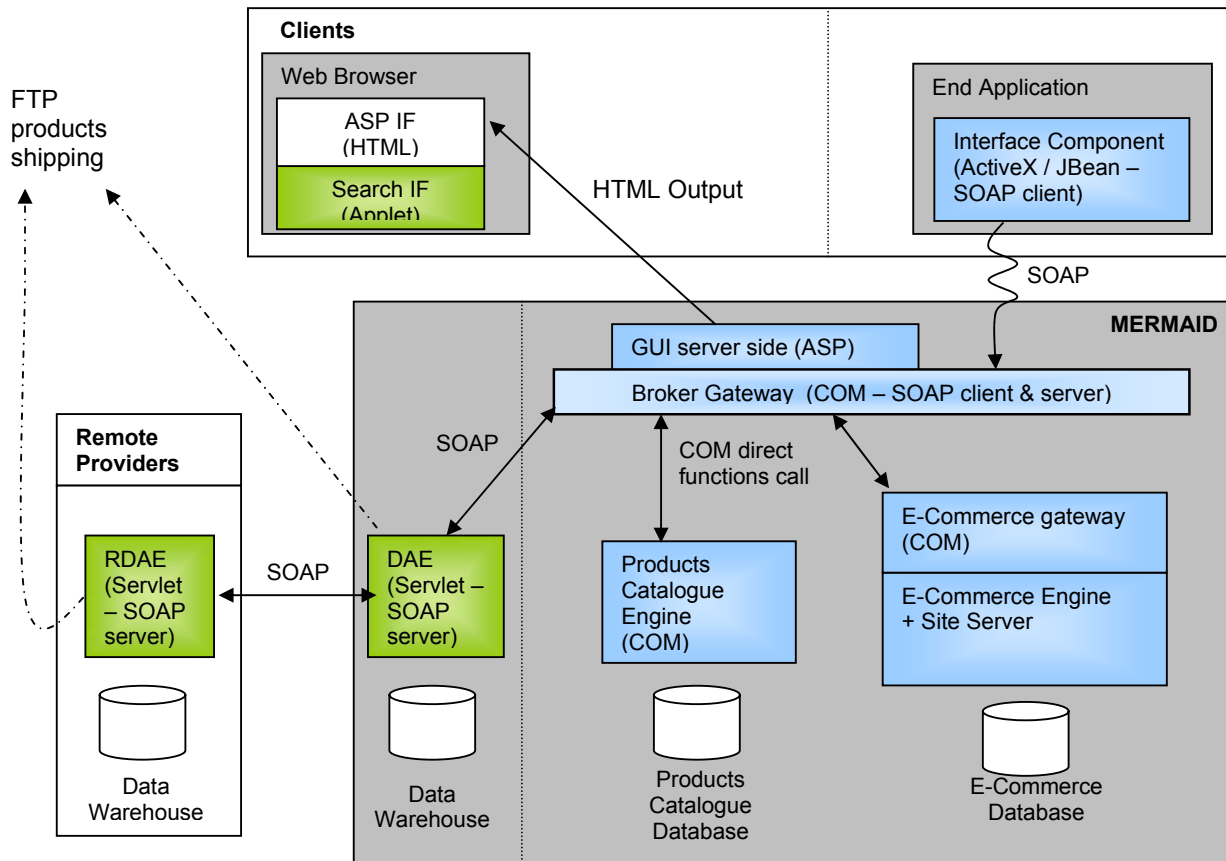


Figure 1 - Dataset Transfer

Once the Consumer has successfully purchased a dataset, the E-Commerce Engine uses the Broker Gateway to instruct the Data Access Engine (DAE) to download the dataset file to the clients machine.

The DAE Controller is responsible for determining the location of the dataset file to be transferred, which then depicts which FTP Transfer component to be used for file transfer. If the dataset file is located on the MERMAID server then the FTP Transfer will take place on the Server, otherwise the FTP Transfer will take place from the Remote DAE (RDAE) on the remote Server.

Download status is returned from the DAE via the Broker Gateway to let the E-Commerce Engine know whether download was successful or not.



3 Graphical Interfaces

The following displays will be provided for status monitoring:

- **Data Warehouse Upload Indicator:** a status indicator providing upload + success/failure information to the user.
- **Extraction:** messaging service providing success/failure information upon extraction.
- **FTP Transfer Indicator:** a status indicator providing Transfer + success/failure information to the user.



4 Component Interfaces

4.1 TransferDataset (datasetID, DeliveryIP, DeliveryDirectory)

TransferDataset will be used to initiate the transfer of a dataset from the MERMAID system to a directory on the client's machine.

The parameters are as follows:

DatasetID: is the unique id of the dataset to be transferred.

DeliveryIP: is the IP address of the server to which the dataset is to be delivered.

DeliveryDirectory: is the directory on the server identified by **DeliveryIP** to which the dataset is to be saved to.

4.2 TransferSubset (datasetID, DeliveryIP, DeliveryDirectory, SubsetParameters)

TransferSubset will be used to initiate the extraction and transfer of a subset from a dataset file from the MERMAID system to a directory on the client's machine.

The parameters are as follows:

DatasetID: is the unique id of the dataset to which the subset shall be extracted from.

DeliveryIP: is the IP address of the server to which the subset is to be delivered.

DeliveryDirectory: is the directory on the server identified by **DeliveryIP** to which the subset is to be saved to.

SubsetParameters: contains the list of parameters to extract the subset from the dataset. These parameters shall include: left longitude, right longitude, top latitude, bottom latitude, altitude (or depth), start time and end time.

4.3 UploadDataset (providerID, directoryLocation, filename)

UploadDataset will be used to initiate the upload of a dataset from the remote provider's server to the MERMAID system.

The parameters are as follows:

providerID: is the unique id of the provider to which the dataset belongs.

directoryLocation: is the directory on the remote server indicating where the dataset is stored.

filename: is the name of the dataset file to be uploaded.

4.4 EmailDataset (datasetID, emailAddress, subsetParameters)

EmailDataset will be used to send a dataset from the provider to the consumer via email.

The parameters are as follows:

datasetID: identifies the dataset to be delivered.

emailAddress: identifies the email address of the recipient that the dataset file is to be delivered.

SubsetParameters: contains the list of parameters to extract the subset from the dataset. These parameters shall include: left longitude, right longitude, top latitude, bottom latitude, altitude (or depth), start time and end time.

4.5 EmailSubset (datasetID, emailAddress)

EmailSubset will be used to send a subset of a dataset from the provider to the consumer via email.

The parameters are as follows:

datasetID: identifies the dataset to be delivered.

emailAddress: identifies the email address of the recipient that the dataset file is to be delivered.

4.6 DeleteDataset (datasetID)

DeleteDataset will be used to initiate the delete of a dataset from the MERMAID system.

The parameters are as follows:

datasetID: is the unique id of the dataset to be deleted.

4.7 ReturnUsedSpace (providerID)

Returns the amount of disk space currently in use for a given provider.

The parameters are as follows:

providerID: is the unique id of the provider of which used space is required.

4.8 ReturnTransferStatus()

Returns the progress of the transfer from the MERMAID system to the consumer's machine.

4.9 ReturnUploadStatus()



Returns the progress of the transfer from the provider's machine to the MERMAID system.

4.10 ReturnDeleteStatus()

Indicates whether the deletion of a dataset from the MERMAID system was successful or not.

4.11 ReturnExtractionStatus()

Indicates whether the extraction of a subset from a dataset was successful or not.

4.12 NotifyTransferComplete()

Notifies the system when FTP transfer has completed.

5 Data Access Engine

Commands are received via the Broker Gateway using SOAP as shown in Figure 2 - DAE Communication, and are returned back through the Broker Gateway in the same fashion.

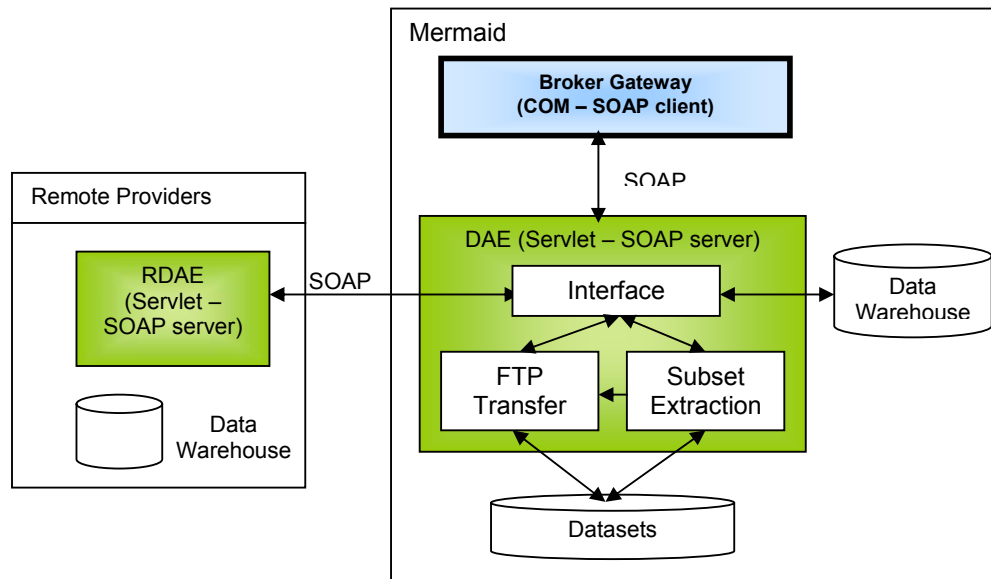


Figure 2 – DAE Communication

5.1 Dataset Transfer

In the case of dataset transfer the DAE is expected to operate as follows:

Upon receipt of a TransferDataset command, the DAE Interface queries the data warehouse using the datasetID parameter to identify where the dataset file is located. If the dataset file is located on a remote providers server then the corresponding RDAE FTP Transfer component is instructed to transfer the dataset file, otherwise the local DAE FTP Transfer component transfers the file to the consumers machine using the deliveryIP parameter (in the case of storing within memory) or the deliveryIP and deliveryDirectory parameters (in the case of storing to file).

5.2 Subset Extraction and Transfer

In the case of subset extraction and transfer the DAE is expected to operate as follows:

Upon receipt of a TransferSubset command, the DAE Interface queries the data warehouse using the datasetID parameter to identify where the dataset file for extraction is located. If the dataset file is located on a remote providers server then the corresponding RDAE Subset Extraction component is instructed to extract the subset information using the SubsetParameters details, and then transfer the dataset file using the FTP Transfer component in the same way as in 5.1 Dataset Transfer. Otherwise the local DAE Substract



Extraction component extracts the subset of data using the SubsetParameters details and then passes the new dataset (made from the subset) to the DAE FTP transfer component for transfer to the consumer machine in the same fashion as 5.1 Dataset Transfer.

5.3 Dataset Upload

In the case of a remote provider wishing to upload their dataset to the MERMAID data warehouse, the DAE is expected to operate as follows:

Upon receipt of an UploadDataset command, the DAE interface queries the data warehouse to identify where the new dataset needs to be put, using the providerID parameter. Then using the directoryLocation parameter and filename parameter the dataset file is pulled onto the MERMAID server using the FTP transfer component.

5.4 Dataset Delete

In the case of a remote provider wishing to delete their dataset from the MERMAID data warehouse, the DAE is expected to operate as follows:

Upon receipt of a DeleteDataset command, the DAE interface queries the data warehouse to locate the dataset, using the datasetID parameter. Then the dataset file is deleted from the MERMAID server using the Delete component.

5.5 TransferStatus

Transfer status is returned as a success/fail message.

5.6 ExtractionStatus

Extraction status is returned as a success/fail message.

5.7 DeleteStatus

Delete status is returned as a success/fail message.

5.8 UploadStatus

Upload status is returned as a success/fail message.

6 Remote Data Access Engine

Providers are able to store datasets on the MERMAID server or on their own server. If they store datasets on their own server they require a Remote Data Access Engine (RDAE) to be installed to allow the MERMAID system to send purchased dataset files to the consumer directly. The RDAE also provides extraction utilities for remote datasets.

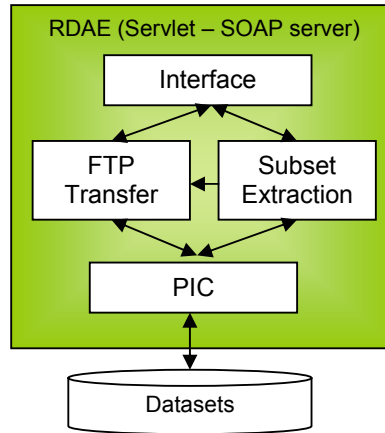


Figure 3 - Remote Data Access Engine

The Remote Data Access Engine (RDAE) consists of the same FTP transfer and Subset Extraction components as the DAE for transfer and extraction of datasets, however it also consists of a Product Interface Component (PIC) which is used to access the datasets stored on the remote providers server.