Donald W. Denbo[*]

Joint Institute for the Study of Ocean and Atmosphere, University of Washington, Seattle, WA

1. INTRODUCTION

The Fisheries-Oceanography Coordinated Investigations (FOCI) is an interdisciplinary research program seeking to understand the influence of the environment on the abundance of various commercially valuable fish and shellfish stocks in Alaskan waters and their role in the ecosystem. To meet the need of the FOCI collaborators, we have built upon two previous projects: Ocean-Share (Denbo and Windsor, 2000) (http://www.epic.noaa.gov/collab), a robust prototype collaborative tool based on the CORBA, Java and Habanero technologies, and the Climate Data Portal (Soreide, et al., 2002; Soreide, et al., 2001) (http://www.epic.noaa.gov/cdp), a powerful, flexible and extensible Data Server. The new collaborative tool expands OceanShare data types from profile-type data to accommodate a wide range of oceanographic and atmospheric in-situ and gridded data types.

The FOCI scientists also need a system that will enable text, graphics, data, and OceanShare sessions to be easily shared. This requirement is satisfied by creating the Secure Document Repository (SDR). The SDR is developed using the Web-based Distributed Authoring and Versioning (WebDAV) protocol and software. Web-DAV enabled clients can access distributed file systems via the http protocol. The SDR will provide distributed file access from custom Java applications and WebDAV enabled commercial applications, e.g. Internet Explorer.

2. DESIGN GOALS

The FOCI collaboration software needs to have the following features and characteristics to meet the needs of the FOCI program.
- Secure location to share documents, data, images, and collaborative sessions.
- Access control by individual document and/or folder
- Document version control.
- Extend OceanShare.
- Integrate ndEdit (Osborne and Denbo, 2002) data selection tool.
- Implement both textual and graphical annotation tools.
- Extend data handling to include time series and gridded data.
- Implement session save and restore.

3. APPROACH

The FOCI collaboration software will use software components and infrastructure built as part of past software development efforts, Climate Data Portal, Ocean-Share and the Scientific Graphics toolkit (Denbo, 2001), which in turn built on the experience gained from the NOAAServer project (Daddio et al., 1999). Whenever possible we will use standard based protocols to leverage from past and existing development efforts and to minimize compatibility issues.
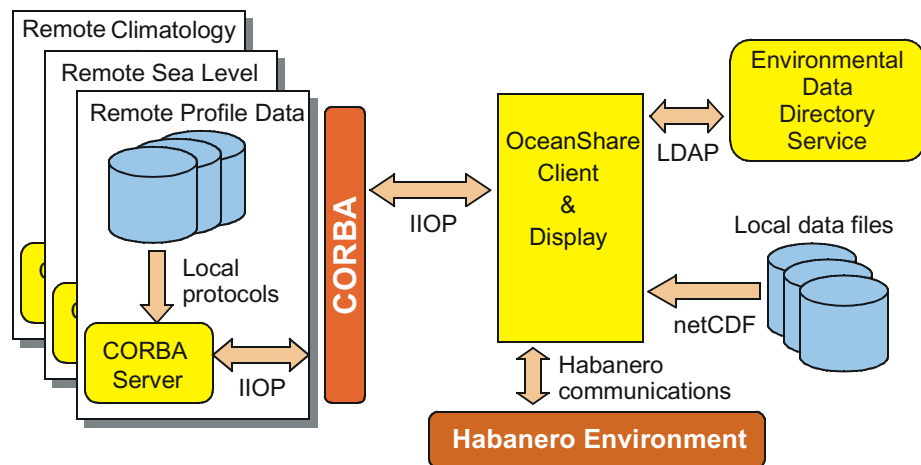
4. COMPONENTS

The FOCI collaboration software will initially consist of an enhanced and updated version of OceanShare and a WebDAV based Secure Document Repository.

4.1 *OceanShare*

OceanShare (Figure 1) will be updated to use the Climate Data Portal for remote data access and incorporate the latest improvements to the Scientific Graphics Toolkit. Enhancements to Ocean-Share will enable FOCI researchers and collaborators to more easily find the data of interest in large datasets, annotate the graphics, and use OceanShare in and off-line (asynchronous) mode.

OceanShare is capable of access both local (netCDF) and remote (Climate Data Portal) files. It will use the

Figure 1. OceanShare architecture and data flow.

* *Corresponding author address:* Donald W. Denbo, NOAA/PMEL/OCRD, 7600 Sand Point Way NE, Seattle, WA 98115; e-mail: dwd@pmel.noaa.gov

LDAP Directory Service to locate data sets of interest and use the Habanero framework to support on-line (synchronous) collaboration.

4.2 *Secure Document Repository*

The Secure Document Repository (SDR) is a network-based set of tools that provides geographically distributed researchers an single access point to share documents (Figure 2). The documents can be ASCII or binary
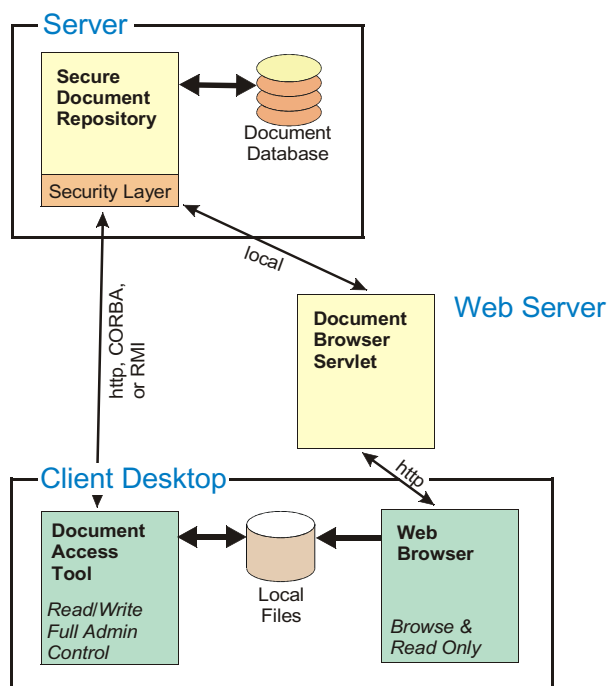

Figure 2. Secure document repository schematic showing the primary system components.

files (data tables, images, OceanShare sessions, etc.). The SDR will be implemented using WebDAV, a standard protocol for remote access of file developed by the Internet Engineering Task Force (IETF). Presently Web-DAV does not support all the features that the SDR will eventually need, however, WebDAV is being actively developed by the open source community and Apache server modules for basic WebDAV and versioning control functions are available.

5. FUTURE DIRECTIONS

Eventually the collaborative software could include modules for data analysis (e.g. spectral analysis, dynamic height computations, field computations), advanced visualization (e.g. VRML, area and contour plotting, GIS maps), project management (e.g. time line, task flow plots), and instrumentation access (e.g. real-time access and control of remote moorings).

The Secure Document Repository could include functions to support on-line document access control (e.g. read, write, and administration permissions by user or group), and strict version control (i.e. never allow a document to be over-written require a new version be created).

6. REFERENCES

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