

Phase II Project Summary

Firm: Tech-X Corporation

Contract Number: NASA SBIR #NNX09CA72C

Project Title: Remote Data Exploration with IDL

Identification and Significance of Innovation:

The Data Access Protocol (DAP) is an open standard for accessing portions of large datasets. Interactive Data Language (IDL) is widely used in NASA missions for data analysis and visualization. Creating robust DAP bindings and a user-friendly GUI application in IDL provides access to the vast amounts of data produced by NASA missions in the familiar environment of IDL.

Technical Objectives and Work Plan:

The objectives of the Phase II are to determine the best method to access remote data in a user-friendly manner and determine the best way to enhance interactive analysis and visualization of remote data.

In order to achieve these objectives, the project has been divided into eight major tasks:

1. Create an IDL server-side function that can execute approved IDL scripts.
2. Integrate the DAP Explorer GUI application with the task farming API, TaskDL.
3. More sophisticated macros for doing user-created operations on DAP data in the DAP Explorer.
4. Create DAP arrays with the same syntax for accessing data as local arrays.
5. Provide an interface that can treat local and remote data sets with the same syntax.
6. Improve the GDL network library.
7. Create a pure IDL DAP client.
8. Enhance testing and create user documentation.

Technical Accomplishments:

During the Phase II, all the tasks have been accomplished:

1. Created a server-side function that can execute IDL scripts and return their results.
2. Improved the integration of the tool suite with computational technology.
3. Created a mechanism to define and register user-defined macros for use within the DAP Explorer.
4. Created an interface for accessing DAP arrays which uses IDL's normal array syntax.
5. Created interface for file formats using the same notation as remote DAP data sets.
6. Created network interface for GDL, and older versions of IDL, that has the same main capabilities as the modern IDL network interface.
7. Created a DAP client written entirely in IDL.
8. Created unit tests and documentation as new features were added to the tool suite.

NASA Application(s):

IDL is widely used for analysis and visualization throughout NASA. DAP is also used by NASA; there are 72 NASA datasets listed on the OPeNDAP website including datasets at GES-DISC Data Holdings, CDAWeb Data Holdings, Physical Oceanography Distributed Active Archive Center (PODAAC), and Ocean Earth Science Information Partner (OceanESIP).

Non-NASA Commercial Applications:

IDL is widely used in academia, industry, national labs. Data analysis in various areas can benefit from accessing remote data, e.g. astronomy, remote sensing, climate studies, medical imaging,

chemical engineering. There are 28 non-NASA organizations with over 100 datasets listed on the OPeNDAP website.

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