The Atmospheric Science Data Center (ASDC) at NASA Langley Research Center is responsible for the ingest, archive, and distribution of NASA Earth Science data in the areas of radiation budget, clouds, aerosols, and tropospheric chemistry. The ASDC specializes in atmospheric data that is important to understanding the causes and processes of global climate change and the consequences of human activities on the climate. The ASDC currently supports more than 44 projects and has over 1,700 archived data sets, which increase daily. ASDC customers include scientists, researchers, federal, state, and local governments, academia, industry, and application users, the remote sensing community, and the general public.

The 2013 ASDC strategic defines six goals that emphasize the vision and support mission and the values of the ASDC. The ASDC’s drive to improve access to and the understanding of data is outlined by two goals:

**Goal #1:** The ASDC will strive to expand beyond its existing customer base by increasing accessibility to a broader, worldwide market; through the use of innovative technologies, the ASDC will enhance data access capabilities and develop plans to share data with new user communities.

**Goal #2:** The ASDC will continue to foster innovation by actively assessing emerging technologies and their applicability to existing and projected customer needs and requirements in order to mitigate gaps in capability.

### Data Distribution Architecture

The ASDC realizes that an integrated architecture would be beneficial as the use of these systems could serve as a means to reduce latency and create a path for machine-to-machine access in order to more efficiently distribute the data products. By better understanding of the implementation, capabilities, and operational considerations of these systems, the ASDC has been able to draw more conclusive decisions on whether or not to implement technologies and/or pursue additional options.

### Lessons Learned

**Goal:** To deploy a more modern web site that provides users with an "easy to use" interface that delivers better data, information, data ordering, Services, access to external sites, and is easier for ASDC staff and science content providers to sustain and maintain.

**Constraints:**

- **REVERB-ECHO** is the primary Ordering Tool for data sets, if the ordering format were to be revised, the ASDC would need to update these products on ECHO. To avoid this potential issue the ASDC is coordinating with the REVERB team to create a future-proof ordering link.
- When configuring third-party developer modules, some open source technology used on ECHO can conflict with other areas of the site. A section has been initiated using jIRA that catalogs any conflicts.

**Performance Results and Lessons**

- For more information see the poster titled: "Increasing access in order to more efficiently distribute data products. By better understanding of the implementation, capabilities, and operational considerations of these systems, the ASDC has been able to draw more conclusive decisions on whether or not to implement technologies and/or pursue additional options.

**For more information see the poster titled: "Ontology Driven Interactive Search Environment Earth Science"**

**For more information the presentation titled: **ODISEES: A New Paradigm in Data Access**

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**Data Distribution Architecture**

The ASDC's Data Products Online (DPO) GFPS file system consists of 12 x IBM DC4800 and 6 x IBM DC7900 Storage subsystems, 14x Intel 2.4 GHz cores, 1,400 TB usable storage. Currently the ASDC and the NASA Center for Climate Simulation (NCCS) at Goddard Space Flight Center (GSFC) are working to use IRods to federate data from ASDC's DPO with data at the NCCS.

**Constraints:**

- An agile approach to development in which rapid prototyping, testing and debugging can be carried out is critical. Currently ODISEES is under development and has many unknowns to be able to anticipate all requirements.

**ODISEES:**

**Ontology Driven Interactive Search Environment Earth Science**

**Goal:** To provide semantically enhanced metadata to support data exploration and discovery to enable prospective consumers to quickly and easily find the data products that are best suited for their requirements and schema mapping to enable automated data integration.

**Constraints:**

- Many BEs-Listeners were found during testing. There are plans for additional testing of the system with more BEs-Listeners to observe behavior.
- Of the monitoring packages were tested with ODENAP. Found Niiro to be the best match.
- Testing revealed the backend network as a limiting factor for throughput.
- Use of CERES. Aqua FM2/314.5 TA file, enables ASDC to service 100 concurrent queries with an overall latency about 10 min.

**Acknowledgements & Resources**

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**Resources**

- http://www.esri.com
- ODISEES: Bethesda Huffer (Developer)
- iRODS: https://www.irods.org • ODENAP: http://openenap.org