

LAS and THREDDs: Partners for Education

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The LAS, The THREDDDS and The Wardrobe

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What's in Store

- The Live Access Server (LAS)
 - What is LAS?
 - Objectives
 - Architecture
 - Customization
- THREDDS and LAS
 - Current capabilities
 - Future plans

Lost in a cloud of data?



LAS and THREDDDS can help



The Live Access Server (LAS)

A highly configurable Web server designed to provide flexible access to geo-referenced scientific data

The screenshot displays the Live Access to the National Virtual Ocean Data System (NVODS) web interface. The main window shows the "Live Access to the National Virtual Ocean Data System (NVODS)" page with a navigation menu on the left and a central area for selecting data. The "Variables" section is set to "SSTA forecast (03 month lead)". The "Constraints" section includes "xy (lat/lon) slice", "Shaded plot (GIF)", and "Full Region". The "Output" section is set to "xy (lat/lon) slice". The "Select time" section is set to "16 Jan 1983".

The interface also shows a "Customize data for selected variable" section with the following parameters:

- Variable: SSTA forecast (03 month lead)
- Geometry: xy (lat/lon) slice
- Output: Shaded plot (GIF)
- Region: Full Region
- Time: 16 Jan 1983

The interface displays several data visualizations:

- A line plot showing SSTA (degC) vs. time (1980-2000).
- A shaded plot (GIF) showing SSTA (degC) vs. longitude and latitude.
- A table of data points for SSTA (degC) at various latitudes and longitudes.

The table of data points is as follows:

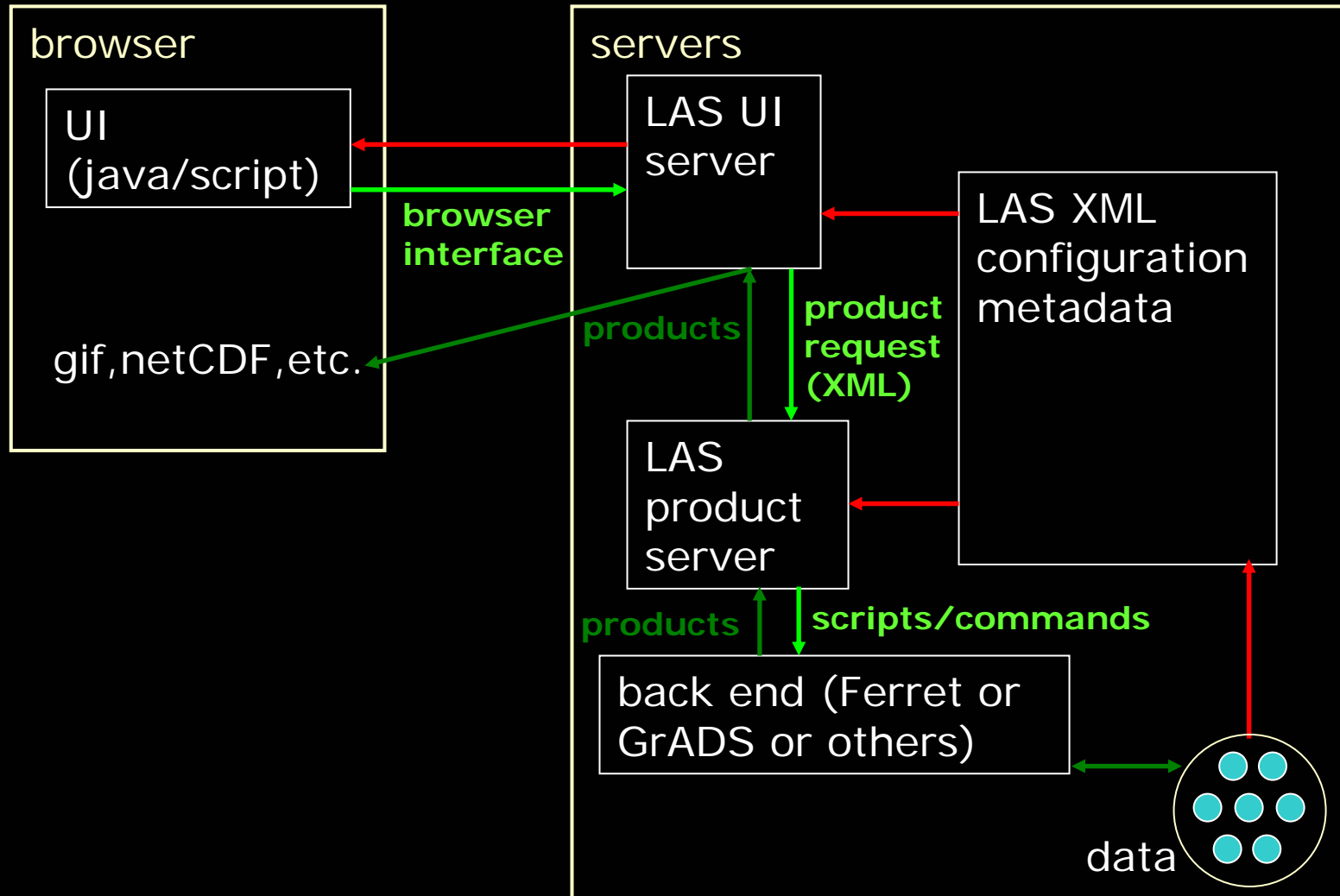
FILENAME	152W	148W	144W	180W	136W	132W	
15-SEP-1981	116:	-0.076	-0.030	-0.015	-0.042	-0.065	-0.110
16-OCT-1981	117:	0.083	0.126	0.157	0.151	0.146	0.128
15-NOV-1981	118:	0.330	0.382	0.415	0.410	0.415	0.448
16-DEC-1981	119:	0.791	0.860	0.896	0.885	0.871	0.974
17-JAN-1982	120:	1.153	1.244	1.273	1.252	1.298	1.501
16-FEB-1982	121:	1.231	1.314	1.329	1.316	1.464	1.731
17-MAR-1982	122:	1.218	1.232	1.203	1.228	1.467	1.764
16-APR-1982	123:	1.199	1.160	1.102	1.119	1.387	1.661
17-MAY-1982	124:	1.222	1.228	1.171	1.113	1.307	1.510
16-JUN-1982	125:	1.281	1.354	1.333	1.203	1.289	1.434
17-JUL-1982	126:	1.430	1.568	1.594	1.439	1.447	1.586
16-AUG-1982	127:	1.702	1.847	1.897	1.774	1.728	1.910
15-SEP-1982	128:	1.968	2.051	2.096	2.070	1.590	2.213
16-OCT-1982	129:	2.080	2.104	2.141	2.213	2.119	2.356
15-NOV-1982	130:	2.178	2.185	2.227	2.319	2.198	2.450
16-DEC-1982	131:	2.362	2.391	2.405	2.479	2.400	2.696
15-JAN-1983	132:	2.598	2.661	2.671	2.680	2.708	3.056

Objectives for LAS

- Web-based interface to diverse data and the capabilities of intelligent “back-end” visualization software
- Single interface for sub-setting, download, visualization, comparison
- Easy access to metadata and documentation
- Unified access to distributed data holdings
- Customizable user interface

LAS accommodates many data providers and educators.

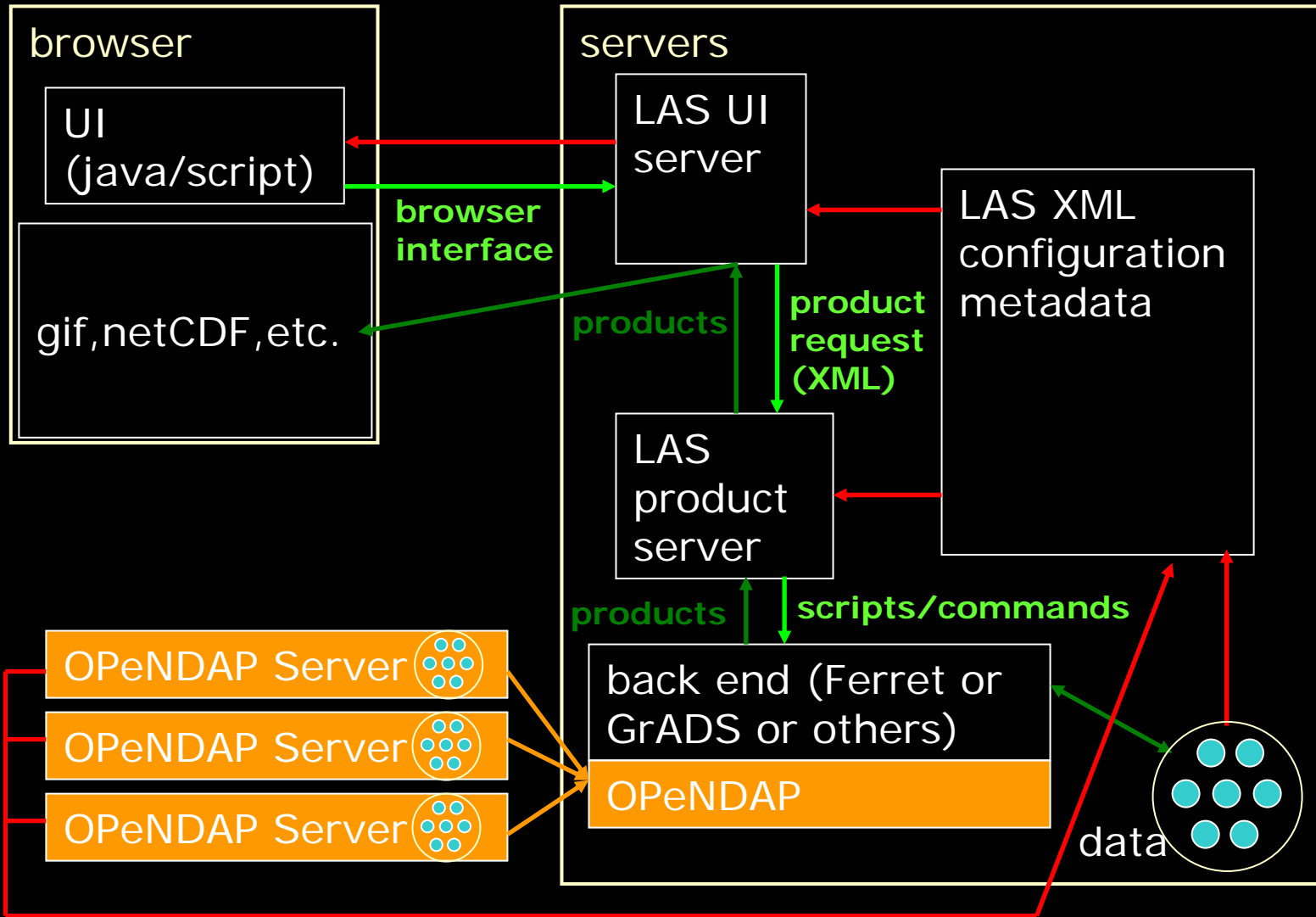
LAS Architecture



LAS uses OPeNDAP Data

- OPeNDAP is a technology that allows clients to use remote data via a local file API
- Servers exist for binary, GRIB, netCDF and HDF data files
- LAS installations can be configured to use both local data and data served from a remote OPeNDAP server

LAS Architecture with OPeNDAP



Customization Features

- Expanded hierarchies
- Custom HTML headers
- Custom pages for data set and variable selection
- Custom back-end operations (products)
- Use of “product server” with user's own interface client

Example (Expanded Hierarchy)

The screenshot shows a Netscape browser window titled "Live Access to the National Virtual Ocean Data System (NVODS) - Netscape". The address bar contains the URL "http://ferret.pmel.noaa.gov/NVODS/servlets/dataset". The browser's menu bar includes File, Edit, View, Go, Bookmarks, Tools, Window, and Help. The toolbar contains navigation buttons and a search box. The page content features a search bar at the top right with a "Go" button. On the left, there are two tabs: "single data set" and "compare two". Below the tabs is a vertical navigation menu with the following items: "Datasets", "Variables", "Constraints", "Output", "Output Options", "Previous Output", "Define variable", and "About". The main content area is titled "Datasets" and contains a message: "Click on a dataset to continue or an [i](#) for information about a dataset." Below this is a "Help" link. A red warning message states: "Welcome to LAS. This session will expire after 180 minutes of inactivity." Underneath is a "Select dataset:" section with five blue links: "by Dataset Name", "by Discipline (Atmosphere, Ocean, Surface Marine, Land Surface, Topography, Bathymetry)", "by Serving Institution (COLA GDS, FSU COAPS, IPRC-SOEST, IRI/LDEO, ...)", "by Source (Satellite, Surface Obs, Data Product, Model Output)", and "by Temporal Resolution (Annual, Seasonal, Monthly, Multi-day, Daily, Hourly, Reference)". At the bottom left of the page, it says "LAS UI Version 6.3".

The NVODS Server (<http://www.ferret.noaa.gov/nvods>)

Example (Custom Headers)

Live Access to the National Virtual Ocean Data System (NVODS) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <https://access.pmel.noaa.gov/NVODS/servlets/dataset,DanaInfo=ferret.pmel.noaa.gov+?catitem=2470#>

Live Access to the National Virtual Ocean Data System (NVODS) Search: Go

single data set compare two

Datasets
Variables
Constraints
Output
Output Options
Previous Output
Define variable
About
LAS UI Version 6.3

IRI INTERNATIONAL RESEARCH INSTITUTE FOR CLIMATE PREDICTION
LINKING SCIENCE TO SOCIETY

Select dataset:

- [America topography at 1/120 degree](#)
- [CAC monthly observed SST, anomalies and climatology](#)
- [Cayan Analysis of COADS](#)
- [CDIAC MSU Precipitation](#)
- [CDIAC ndp043a Coastal Hazards Database US East Coast\(1992\)](#)
- [CDIAC tr051 Seasonal precipitation anomalies \(1851-1989\)](#)
- [ECHAM surface stresses](#)
- [GEDEX: ISCCP-C2 Monthly Mean Cloud Product](#)
- [Global Ocean Heat Flux and Wind Stress from Oregon State University Climate](#)
- [Hulme global precipitation](#)
- [Oberhuber heat flux climatology](#)
- [OORT - Geophysical Fluid Dynamics Laboratory \(GFDL\) Global Atmospheric Circulation](#)
- [SOC Heat Flux Climatology](#)
- [World Ocean Atlas 1998 Annual](#)
- [World Ocean Atlas 1998 Monthly](#)
- [World Ocean Atlas 1998 Seasonal](#)
- [Zebiak and Cane ENSO forecast LDE01](#)
- [Zebiak and Cane ENSO forecast LDE02](#)

The NVODS Server (<http://www.ferret.noaa.gov/nvods>)

Example (Custom Selection)

Test Installation for Roland (v6.3+) - Netscape

File Edit View Go Bookmarks Tools Window Help

http://tmap.pmel.noaa.gov:8688/las/servlets/dataset?catitem=2

Test Installation for Roland (v6.3+) Search: [] Go

Datasets > COADS 2-degree Data > Standard (Trimmed at 3.5 Standard Deviation; Ships Only)

Click on a dataset to continue or an **i** for information about a dataset. [Help](#)

Standard (Trimmed at 3.5 Standard Deviation; Ships Only)

Air Temperature [Next >](#)

1st Sextile 3rd Sextile

5th Sextile Day Fraction

Mean Mean Day

Mean Latitude (Off SW Corner) Mean Longitude (Off SW Corner)

Number of Observations Standard Deviation

Number of Observations

Cloudiness [Next >](#)

1st Sextile 3rd Sextile

5th Sextile Day Fraction

Mean Mean Day

Mean Latitude (Off SW Corner) Mean Longitude (Off SW Corner)

Number of Observations Standard Deviation

Number of Observations

Latent Heat Parameter ((saturation specific humidity at sst) - specific humidity)*wind speed [Next >](#)

1st Sextile 3rd Sextile

single data set compare two

Datasets

Variables

Constraints

Output

Output Options

Previous Output

Define variable

About

LAS UI Version 6.3

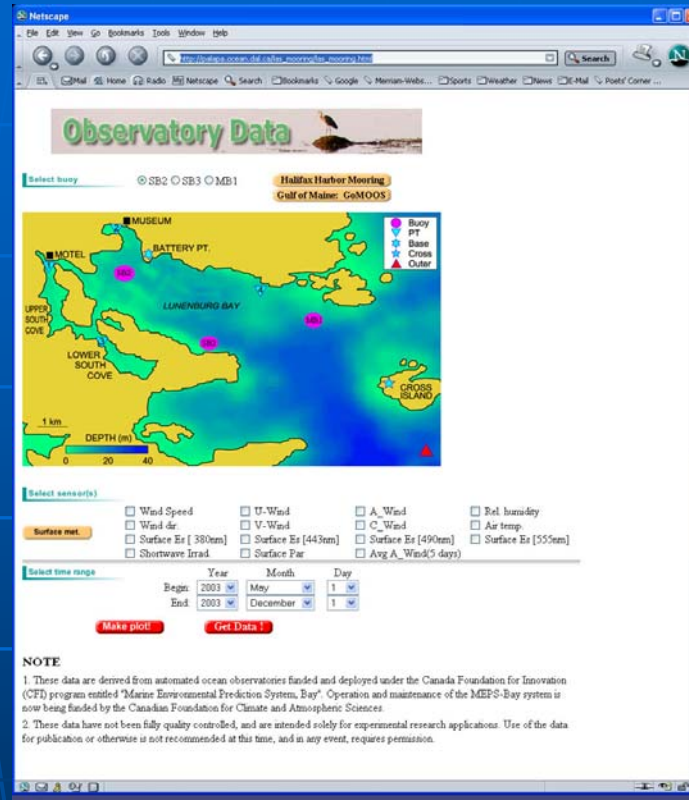
Experimental Development Server

Example (Custom Backend)

The image displays two overlapping Netscape browser windows. The background window is titled "Live Access to Climate Data - Netscape" and shows the main interface of the "Live Access to DATA" website. The URL in the address bar is <http://panther.ngdc.noaa.gov/las5/main.pl?cookieCheck=1>. The page features a navigation menu with links for "Help", "Options", "Home", and "Ferret". A sidebar on the left lists various data categories such as "Leemans Holdridge Life Zone Classifications", "Leqates and Willmott Climatology", and "Ocean World Ecosystems". The main content area displays a "Basic World" map with a color-coded overlay. Below the map are controls for "Select view" (set to "xy (lat/lon) slice"), "Select" (radio buttons for "single variable" and "comparison"), "Full Region" dropdown, latitude/longitude coordinates (89.0 N, 178.0 W, 178.0 W, 90.0 S), and "Zoom In" / "Zoom Out" buttons. A "Get Data" button is also present. The foreground window is titled "Map Generated by ArcIMS - Netscape" and shows a detailed world map with a grid overlay, representing the data generated by the ArcIMS server.

NGDC (<http://panther.ngdc.noaa.gov/las5>)

Example (User's Own Interface)



Marine Environmental Prediction System funded by the Canadian Foundation for Climate and Atmospheric Sciences
(http://palapa.ocean.dal.ca/las_mooring/las_mooring.html)

Behind the Wardrobe

The magic land of the future!

Ferret Data Server (FDS)

- FDS is an OPeNDAP server implementation (based on Anagram)
- FDS has some extended capabilities (similar to GDS).

Extended Capabilities of FDS

- Create and serve data sets as result of an analysis operation on-the-fly
- Add or modify inadequate metadata
- Fix coordinate system deficiencies
 - Missing axes
 - Axes reordering
 - Corrupted coordinates
- Aggregate time-series files into one URL
- Embed analysis requests into URL

LAS and THREDDDS

- Every LAS installation can present a Dataset Inventory Catalog of the underlying data sets
- (Needs to be upgraded to 1.0 Schema)
- (Needs correct service type for both LAS operations and FDS services)

LAS, THREDDDS and FDS

- All of the data behind an LAS installation has been “regularized”
- LAS will have an FDS OPeNDAP URL as an output product
- Subsets can be defined via geographic and time constraints
- **Any** sub-set of **any** LAS data set can become an OPeNDAP data set.

More Information

- www.ferret.noaa.gov
- Subscribe to the LAS User's mailing list

The End