

---

# Remote Data Access with OPeNDAP

---

Dr. Dennis Heimbigner  
Unidata netCDF Workshop  
October 25, 2012

---

# Overview

- What are OPeNDAP and DAP?
  - What is a Client-Server Architecture
  - Why is Remote Data Access Useful?
  - Specifying a DAP Data Source
  - The netCDF-DAP Integration
  - Selected Public DAP Data Sources
  - Questions
- 
- Debugging
  - Build and Install NETCDF+DAP
-

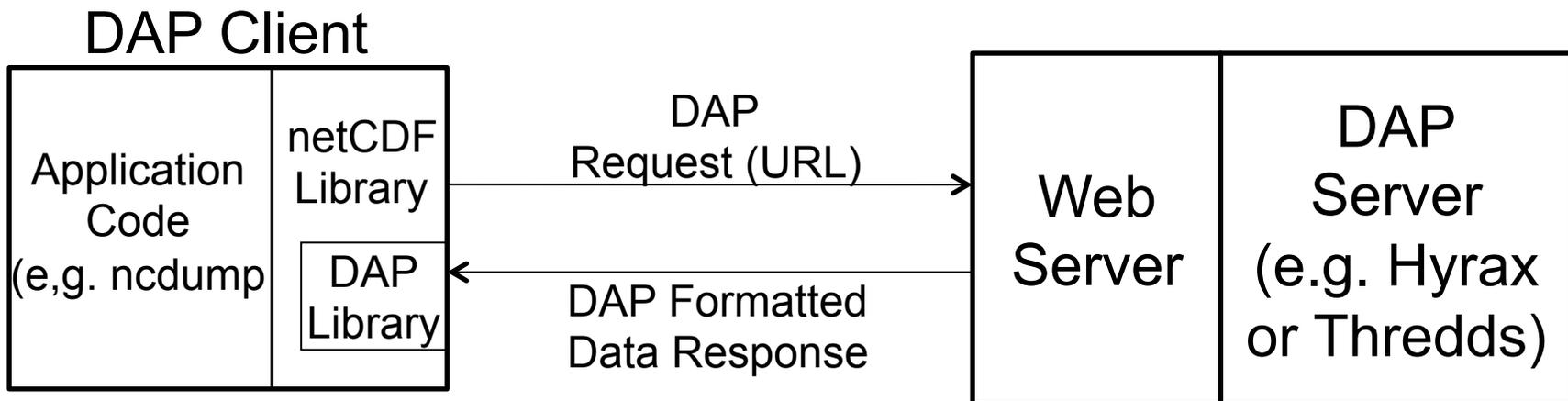
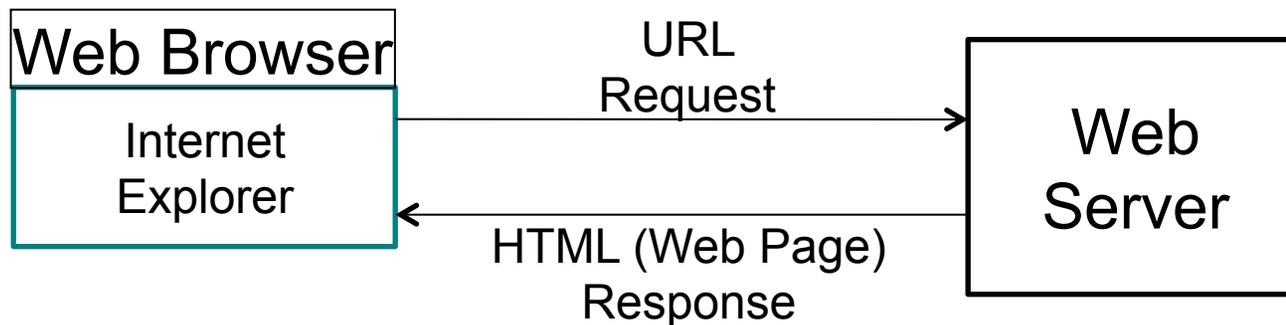
---

# What are OPeNAP and DAP?

- DAP (version 2) is a widely supported protocol and standard data format for accessing remote data
  - The standard is maintained by the OPeNDAP organization(<http://www.opendap.org/>)
  - DAP was expressly designed to serve as intermediate format for accessing a wide variety of data sources
  - The terms “DAP” and “OPeNDAP” will be used interchangeably in this talk
-

# What is a Client-Server Architecture

- DAP data access is similar to accessing a web page through a web browser



---

# Why is Remote Data Access Useful?

- Remote access allows the netCDF library to retrieve data that is stored on other machines in the internet.
  - Remote => not local => saves local disk space
  - The DAP2 protocol supports finer grain transfers than e.g. FTP.
    - Only the necessary minimum amount of data needs be transferred from the server
    - E.g. “ncdump -v” retrieves only a specific variable
  - DAP is integrated into netCDF => remote access to DAP Data Servers through the netCDF API
-

---

# Specifying a DAP Data Source

- A DAP data source is specified using a URL that refers to the DAP server containing that data
    - Much like specifying a web page
  - Used in place of a file name in e.g. ncdump
  - Beware: Shell may require quotes around URL
  - Example:
    - ncdump ["http://motherlode.ucar.edu:8081/dts/Drifters"](http://motherlode.ucar.edu:8081/dts/Drifters)
-

---

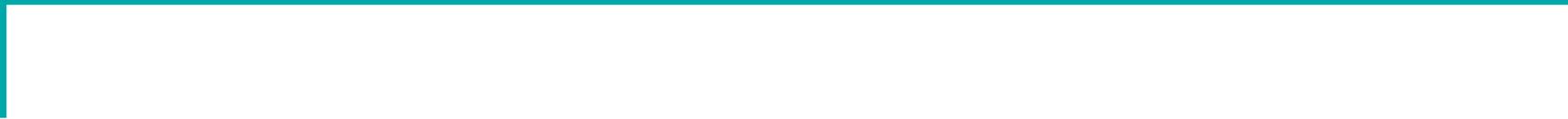
# The netCDF-DAP Integration

- DAP support is enabled in netCDF by default
    - Use `--disable-dap` to turn it off
  - DAP requires the curl library (libcurl)
  - If your `./configure` fails because it cannot find libcurl, then you must specify it like you do other libraries (e.g HDF5).
    - Use `curl-config` to get the appropriate flags
-

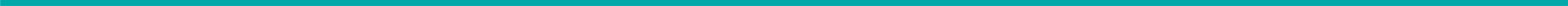
---

# Selected Public DAP Data Sources

- <http://motherlode.ucar.edu:8081/dts>
    - When you install netcdf from the source, the “make check” command uses this site to test the correct operation of DAP within netcdf.
    - Note: sometimes this server is down, in which case “make check” will fail. You can disable DAP from testing against this test servers by setting the ./configure flag  
`--disable-dap-remote-tests`
  - [\*http://motherlode.ucar.edu:8080/thredds/catalog.html\*](http://motherlode.ucar.edu:8080/thredds/catalog.html)
    - This is the primary Unidata data server. If you look into it, you will see that many of the datasets can be accessed using DAP.
-



Questions?



---

# Debugging

- When things go wrong it is usually a problem with the server
    - E.g. bad url, the server is down, or access rights
  - First symptoms:
    - “NetCDF: I/O failure”
      - => Server probably is down or otherwise unreachable
    - “*Malformed or inaccessible DAP DDS*”
      - => Server sent back non-dap response
-

---

# Debugging (cont.)

- Step 1: Try again with the “-h” flag
  - `ncdump -h http://motherlode.ucar.edu:8081/dts/Drifters`
  - Ok => problem is the data, not the meta-data
- Step 2: Get more information
  - `ncdump -h “[log]http://motherlode.ucar.edu:8081/dts/Drifters”`
  - [log] causes extra information to be printed
- Step 3: Access the url in your web browser
  - Requires changing the url a bit.

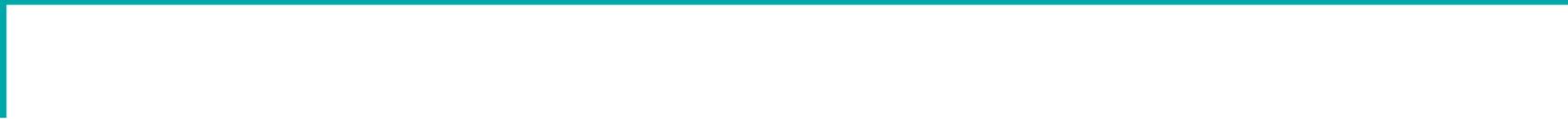
[\[log\]http://motherlode.ucar.edu:8081/dts/Drifters](http://motherlode.ucar.edu:8081/dts/Drifters) =>  
<http://motherlode.ucar.edu:8081/dts/Drifters>

---

---

## Debugging (cont.)

- Step 4: Contact the site you are trying to access and send them the output from, especially, step 3.
  - Step 5: If the problem is not obvious at that point, then collect the information from the previous steps and send it to Unidata support.
  - BTW: the problem in this case is actually an access rights problem.
  - Other typical problems:
    - Asking for too much data
    - Asking for a variable that does not exist (usually a typo)
-



Questions?



---

# Demos Sites

- <http://test.opendap.org:8080/dods/dts/Drifters>
  - <http://test.opendap.org>
  - <http://test.opendap.org/dap/data/ff>
  - [http://www.usgoda.gov/dods/GDS/coamps\\_cent\\_am](http://www.usgoda.gov/dods/GDS/coamps_cent_am)
  - <http://www.opendap.org/data/datasets.cgi?xmlfilename=datasets.xml&exfunction=none>
  - <http://motherlode.ucar.edu:8080/thredds/catalog.html>
-