
Remote Data Access with OPeNDAP

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Overview

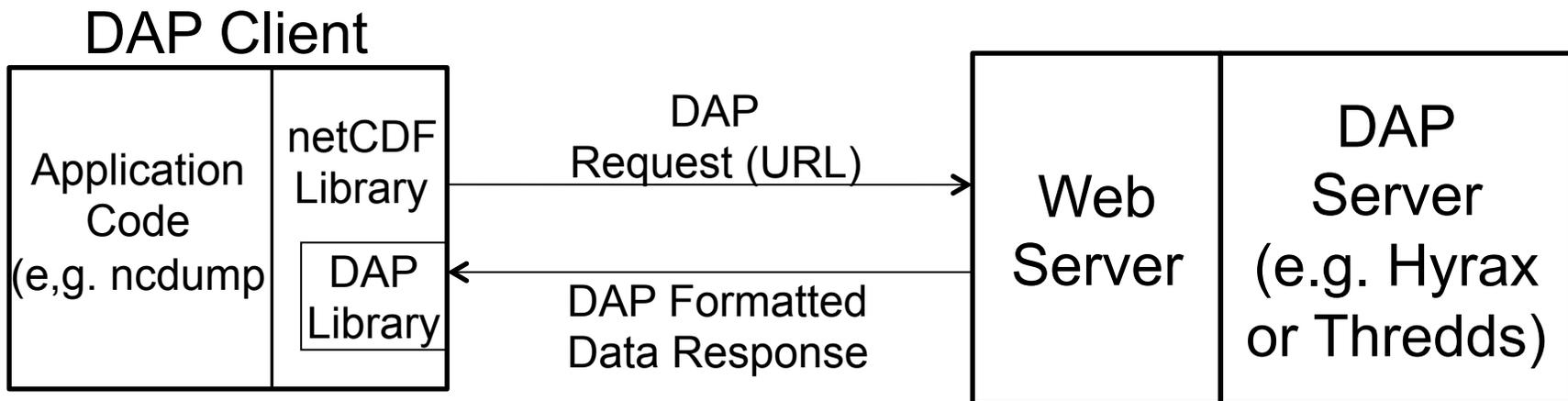
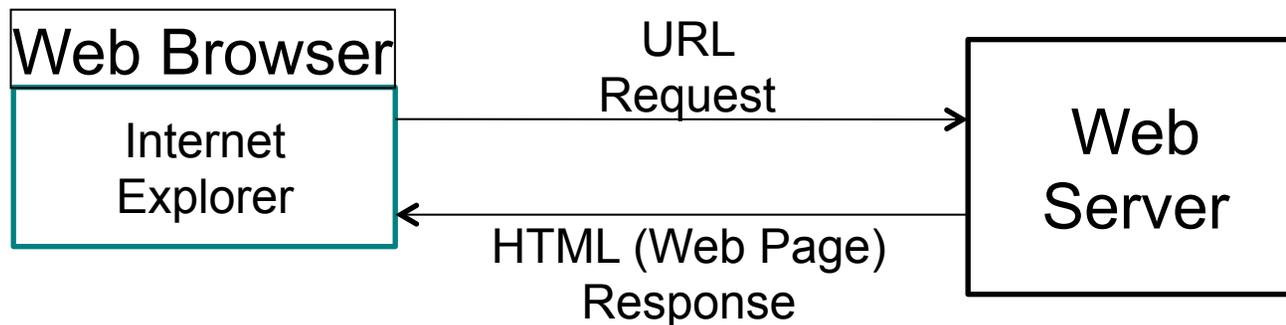
- What are OPeNDAP and DAP?
 - What is a Client-Server Architecture
 - Why is Remote Data Access Useful?
 - Specifying a DAP Data Source
 - The netCDF-DAP Integration
 - Selected Public DAP Data Sources
 - Questions
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- Debugging
 - Build and Install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

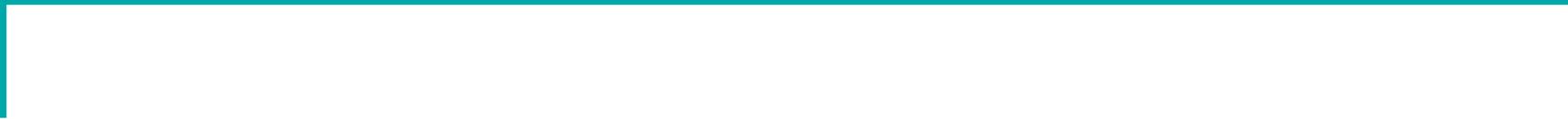
- A DAP data source is specified using a URL that refers to the DAP server containing that data
 - Much like specifying a web page
 - Used in place of a file name in e.g. ncdump
 - Beware: Shell may require quotes around URL
 - Example:
 - ncdump ["http://motherlode.ucar.edu:8081/dts/Drifters"](http://motherlode.ucar.edu:8081/dts/Drifters)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

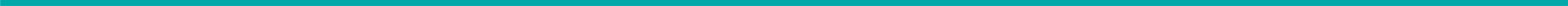
- DAP support is enabled in netCDF by default
 - Use `--disable-dap` to turn it off
 - DAP requires the curl library (libcurl)
 - If your `./configure` fails because it cannot find libcurl, then you must specify it like you do other libraries (e.g HDF5).
 - Use `curl-config` to get the appropriate flags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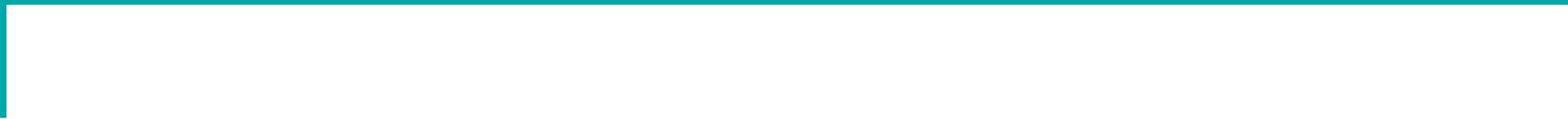
Debugging (cont.)

- 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)
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Questions?



Demos Sites

- <http://test.opendap.org:8080/dods/dts/Drifters>
 - <http://test.opendap.org>
 - <http://test.opendap.org/dap/data/ff>
 - http://www.usgodaie.org/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>
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