

# MORE ABOUT A NEW SERVER 5/13/25

→ TRY USING NGINX + Cpp-http-lib

↳ BASED ON SOME SEARCHING W/AI  
(ChatGPT)

→ WHAT SHOULD THAT SERVER'S CHARACTERISTICS BE?

- READ DATA FILES, RETURN A DMR

↳ CACHE, USE TO RETURN A DMR, DAP, DDS, DAS, DODS RESPONSE

- BUILD FILE RESPONSES (DMR/DAP → NACF)

- INSTEAD OF A MODULE FOR EACH, SUBCLASS/IMPLEMENT

```
class ReadData: public ? {...};
```

```
class FileResponse: public ? {...};
```

- USE 'Keys' FOR CONFIGURATION

↳ EACH SHOULD HAVE A DEFAULT

VALUE. DOCUMENT IN LOGICAL GROUPS AND PROVIDE AN ALPHABETICAL INDEX.

- USE REGEXES TO MATCH FILES, ETC., TO A ReadData INSTANCE.

- WEB API - /opendap/dmr/<paths>  
OR /opendap/<paths>.dmr?

↳ BOTH HAVE GOOD & BAD POINTS.

↳ ARE WE TRYING TO OPTIMIZE FOR DEVS W/THE FIRST ONE?

- ReadData :: get-dmr(...): TAKES A PATH AND A CF

- SHOULD WE USE THE CONTAINER ABSTRACTION?

- A CONTAINER HAS A

- NAME - THE TOKEN USED TO ACCESS DATA

- ACCESS - THE OPERATION THAT RETURNS THE DATA

} ?

⇒ THIS SEEMS HALF-BAKED

→ WHAT DOES THE 'opendap' SERVICE DO?

- Returns dap, dmr, etc., responses

- Uses files, remote files (HTTP/S), S3,

## ROB

- uses 'file type'. Each type has a ReadData class. Types are matched to a class by configuration param.
- The returned information is either a DAP4/2 response or a WEB file (eg, netCDF4).

→ each request has 3 parts:

- o what is requested (i.e., the response)
- o what type is it requested from
- o how should it be returned (i.e., format)

→ Only dap & dods responses can be have a format

→ we can support the 'returns' DMR++ using a 'stream' Service/API

- o 'stream' sends bytes for a given type. It can get those bytes in various type-specific ways.

→ maybe we add a 'format' service that works by type

⇒ Hyrax 2.0 has 4 web APIs

- /opendap - returns DAP responses
- /stream - streams 'files'
- /format - changes the format
- /catalog - navigates hierarchies (STAC?)

→ CONTAINERS - Replace with 'type' bound to a ReadData Class.

But, how to handle data that needs to be decompressed or fetched using http/s?

→ Develop a simple POC for reading from NetCDF files. Support only DAP4. No return formats, no stream, no catalog.

→ can this be made to not copy data? Is the 'framework' thread safe?

→ POC 2: Add support for HDF5,

STILL DAP4 only. Add a netCDF return format option. Does the netCDF return format work w/ the netCDF ReadData class?

⇒ The ReadData class will ~~use~~<sup>have</sup> functions, methods, etc. that the Format (ReturnFormat) class can call. ← MAY BE NOT  
→ DON'T PUT 'format' IN ReadData.

⇒ The Framework (Orchestration layer?) will have methods/functions that call <sup>methods in the</sup> ReadData and ReturnFormat classes

⇒ ReadDataNetCDF {  
    shared\_ptr(Dmr) get-dmr(  
        const string & name,  
        const string & ce,  
        const string & function);  
}

IBASE CLASS  
PROVIDES  
COMMON  
FUNCTIONS

ReadData {

/// decompress and cache the  
/// file. Return an open file desc.

→ int decompress-file (...);

/// get file using HTTP, cache,  
/// return an open file desc.

→ int get-file (...);

/// various cache stuff

/// a plain file cache

/// support so each handler

/// can cache its own specific

/// stuff (a NetCDF or

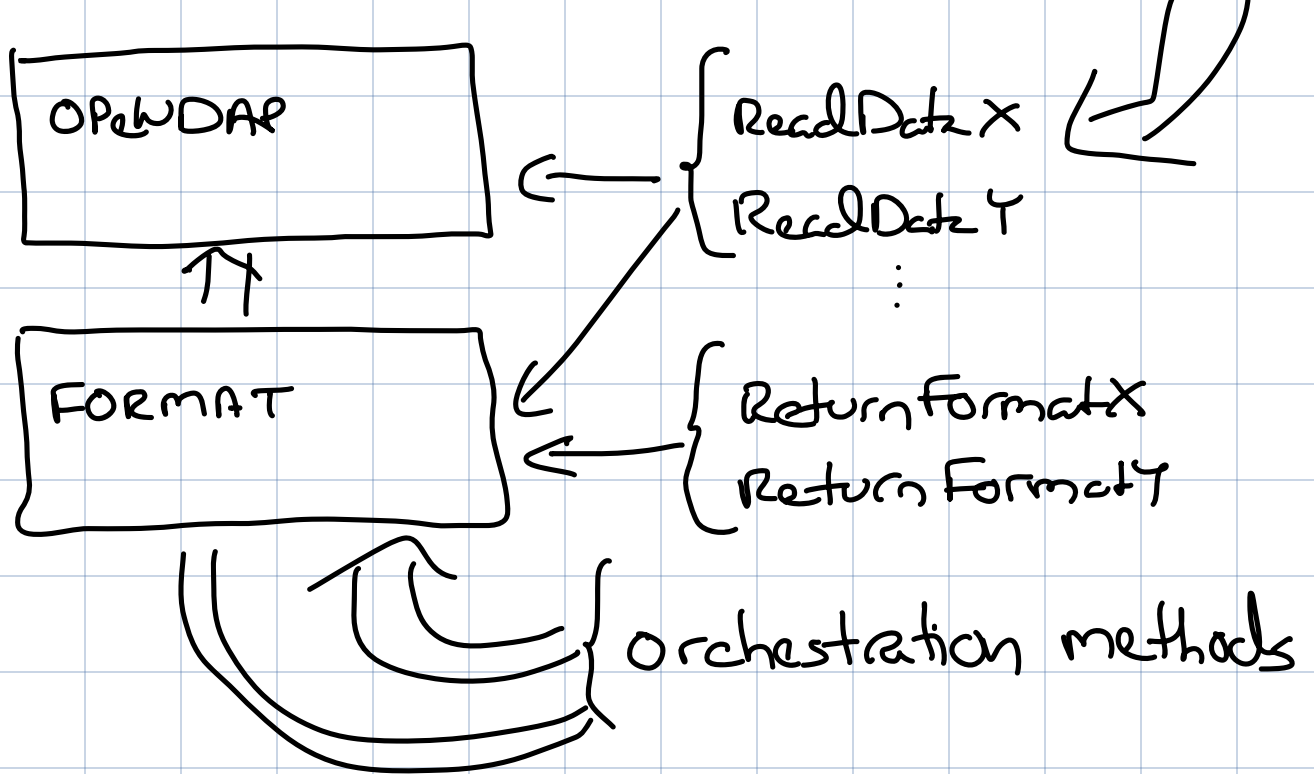
/// etc.).

}

⇒ Implementation

ReadData

utils — ways to  
[ decompress ] get data  
[ get-file ]



```

ReadDataX {
  getDMRForX(path, ce)
    Get the data file name
    decompress local file
    cache decomp file
    Build and return a DMR for
    format X
}
  
```

THESE ARE PART OF  
THE SERVICE/ORCH.  
CODE.

```

Send DMR(path, ce, stream)
← getDMR for X(path, ce)
  Send headers?
  Send DMR(stream)
  
```

Send Data (path, ce, stream)  
 ← get DMR for X (path, ce)  
 send header?  
 Send Data (stream)

COULD USE DEPENDENCY  
INJECTION.

```

class OpendapServer: public ServerBase {
    send_header(..)
    * send_string(..); stream->data(..)
    OpendapServer (ReadData & read-
    error_response (code, mess.)data(..)
  
```

\*CAN WE  
XML?  
STREAM

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BASIC UTILITIES TO GET FROM BE

BEKeys  
 File & Memory cache  
 Decompression cache  
 Logging  
 Time out  
 Debug  
 Stopwatch



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WHAT OTHER THINGS DOES THE  
CLFS PROVIDE ?

LOGIN (OAUTH2)

AWS LOG STREAM

ERROR RETURN