Subject: Re: HDF SDS data attributes
Posted by Liam E. Gumley on Tue, 19 Sep 2000 07:00:00 GMT
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William B. Clodius < wclodius@lanl.gov> wrote in message news:39C6A8DC.6C0F3BA1@lanl.gov...

- > My team has been using HDF files to store data from a multi-spectral
- > imaging sensor. The images are typically stored as band sequential
- > arrays in SDS data sets. Ideally we would like to attach various
- > information to the SDS data sets such as band names, x, y coordinate
- > mappings, band wavelengths, etc. Some of thsi information can be
- > readilly implemented using IDL's HDF interface but the dimension
- > specific information such as band name and band wavelength doe not seem
- > to be easilly implemented in IDL. The C and Fortran interfaces to HDF
- > appear to let you define attributes associated with specific dimensions
- > of an SDS, but not the IDL interface. Does anyone know of a workaround?

Let me see if I understand your problem. You have a dimension named 'Band\_Number', which is used for image SDS arrays. However you'd also like to record the actual band numbers which correspond to the 'Band\_Number' dimension.

In the HDF world, you can create an SDS known as a 'dimension scale', which assigns values to a dimension (in the netCDF world, this type of variable is known as a coordinate variable). Dimension scales encode the 'values' of a dimension, and attributes may be added as well (e.g. 'units'. For example, if you stored atmospheric profiles using a 'Pressure\_Level' dimension, you might want to also store the pressure values at each level. In this case you would create a dimension scale named 'Pressure\_Level' which contained the pressure values, e.g.

```
float Pressure(Pressure);
  Pressure:long_name = "Pressure Levels for Atmospheric Profiles";
  Pressure:units = "hPa";
```

Here's an example from IDL 5.3 for Windows. The trick when creating the dimension scale is to use the desired dimension name as the SDS name:

```
;----
PRO TESTHDF

;- Create the file
hdfid = hdf_sd_start('test.hdf', /create)

;- Create the profile SDS
varid = hdf_sd_create(hdfid, 'Profile', [10], /float)
dimid = hdf_sd_dimgetid(varid, 0)
hdf_sd_dimset, dimid, name='Pressure'
```

```
hdf_sd_adddata, varid, findgen(10)
hdf sd endaccess, varid
:- Check for coordinate variable
index = hdf_sd_nametoindex(hdfid, 'Profile')
varid = hdf_sd_select(hdfid, index)
print, hdf sd iscoordvar(varid)
hdf_sd_endaccess, varid
:- Create the pressure coordinate variable (aka dimension scale)
varid = hdf_sd_create(hdfid, 'Pressure', [10], /float)
dimid = hdf sd dimgetid(varid, 0)
hdf_sd_dimset, dimid, name='Pressure'
hdf_sd_adddata, varid, (findgen(10) + 1.0) * 100.0
hdf_sd_endaccess, varid
:- Check for coordinate variable
index = hdf_sd_nametoindex(hdfid, 'Pressure')
varid = hdf sd select(hdfid, index)
print, hdf sd iscoordvar(varid)
hdf sd endaccess, varid
:- Close the file
hdf sd end, hdfid
END
;----
You can add attributes to the dimension scale as desired. When this
procedure is executed, it correctly identifies the second variable
'Pressure' as a coordinate variable (aka dimension scale).
IDL> testhdf
      0
      1
Here are the contents of the file as seen by the HDF version of ncdump:
netcdf test {
dimensions:
Pressure = 10;
variables:
float Profile(Pressure);
float Pressure(Pressure);
data:
```

```
Profile = 0 , 1 , 2 , 3 , 4 , 5 , 6 , 7 , 8 , 9 ;

Pressure = 100 , 200 , 300 , 400 , 500 , 600 , 700 , 800 , 900 , 1000 ;
}
```

For more information, see the HDF documentation at http://hdf.ncsa.uiuc.edu/UG41r3\_html/SDS\_SD.fm7.html#40381

Cheers, Liam.

http://cimss.ssec.wisc.edu/~gumley