The THREDDS Data Server Jupyter Notebook Service

GSA2020 Virtual Data Help Desk

About: The Jupyter Notebook service is a tool included in the THREDDS Data Server (https://www.unidata.ucar.edu/software/tds/) (TDS) to improve access to datasets and help users explore and visualize the data.

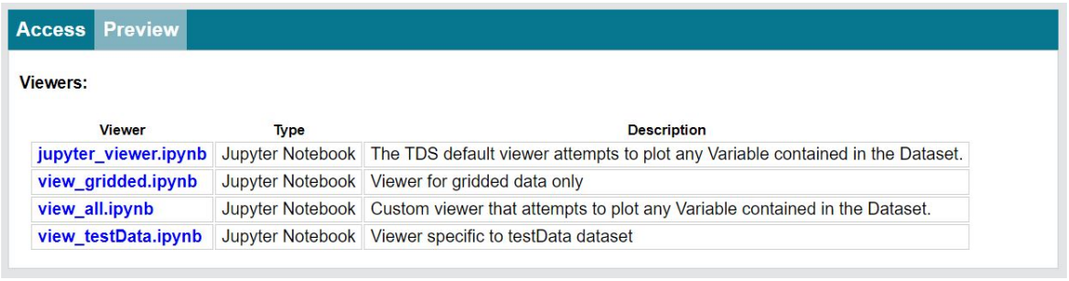
How it works: The Jupyter Notebook service provides TDS end users access Notebook viewers for each dataset in the TDS (provided any viewers exist for the dataset). Notebook viewers are Jupyter Notebook (https://jupyter-notebook.readthedocs.io/en/stable/notebook.html) files that use Siphon (https://unidata.github.io/siphon/latest/api/index.html) to access the given dataset and attempt to display the included data. Users can run, edit, and extend the Notebook viewers as an introduction to accessing and interacting with the dataset.

Availability: The Jupyter Notebook service is included in TDS v.5.0 and available to end users unless disabled by the TDS administrators. For a working example, visit the Unidata THREDDS test catalog (https://thredds-test.unidata.ucar.edu/).

Accessing Notebook data viewers

Web browser access

When browsing a THREDDS catalog online, all available Notebook viewers will appear on the `Dataset` page under the `Preview` tab and can be download via the provided link.



Code access ¶

For clients accessing the Jupyter Notebook service through code (e.g. a script or application), two public endpoints are available:

- Get all valid viewers for a dataset: {hostURL}/thredds/notebook/{datasetID}?catalog={catalogURL}
  - e.g. https://mysite.edu/thredds/notebook/mydataset?catalog=catalog.xml
- Download a selected viewer by name: {hostURL}/thredds/notebook/{datasetID}?catalog={catalogURL}&filename={filename}
  - e.g. https://mysite.edu/thredds/notebook/mydataset?catalog=catalog.xml&filename=jupyter_viewer.ipynb

Viewer example

The downloaded viewer will fill in the catalog URL and dataset name for the user to remotely access the dataset via Siphon.

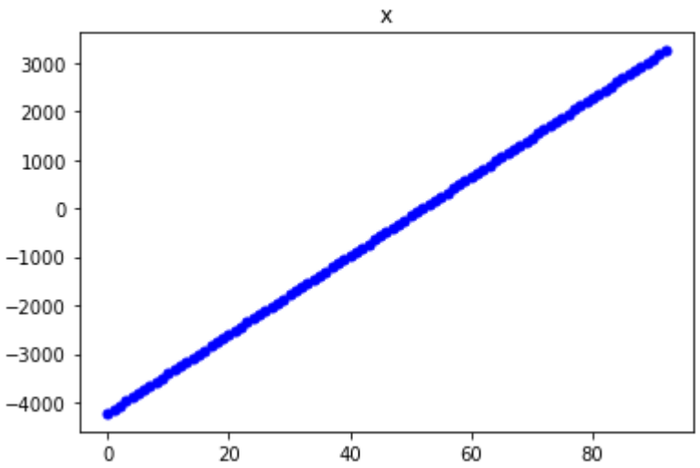
In [11]:
```
catalog = TDSCatalog(catUrl)
ds = catalog.datasets[datasetName]
dataset = ds.remote_access()
```

In this example, the viewer builds an interactive widget of the datasets variables, and attempts to plot any variable selected.

In [26]:
```
var_name = widgets.RadioButtons(
    options=list(dataset.variables),
    description='Variable:')
display(var_name)
```

Running the next cell with the variable "x" selected might look like this:

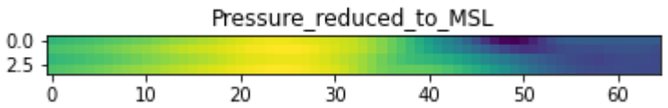
In [29]:
```
plot(dataset.variables[var_name.value])
```



Whereas running the same cell with "Pressure_reduced_to_MSL" might look like this:

In [30]:
```
plot(dataset.variables[var_name.value])
```

```
Too many dimensions - reducing last 1 dimensions.
New shape: [ 4 65  1]
```



Notebook viewers provide an easier way to get started working with datasets in the TDS>

Questions? Ideas? Contact: *support-thredds@unidata.ucar.edu*

Award # NSF-1901712