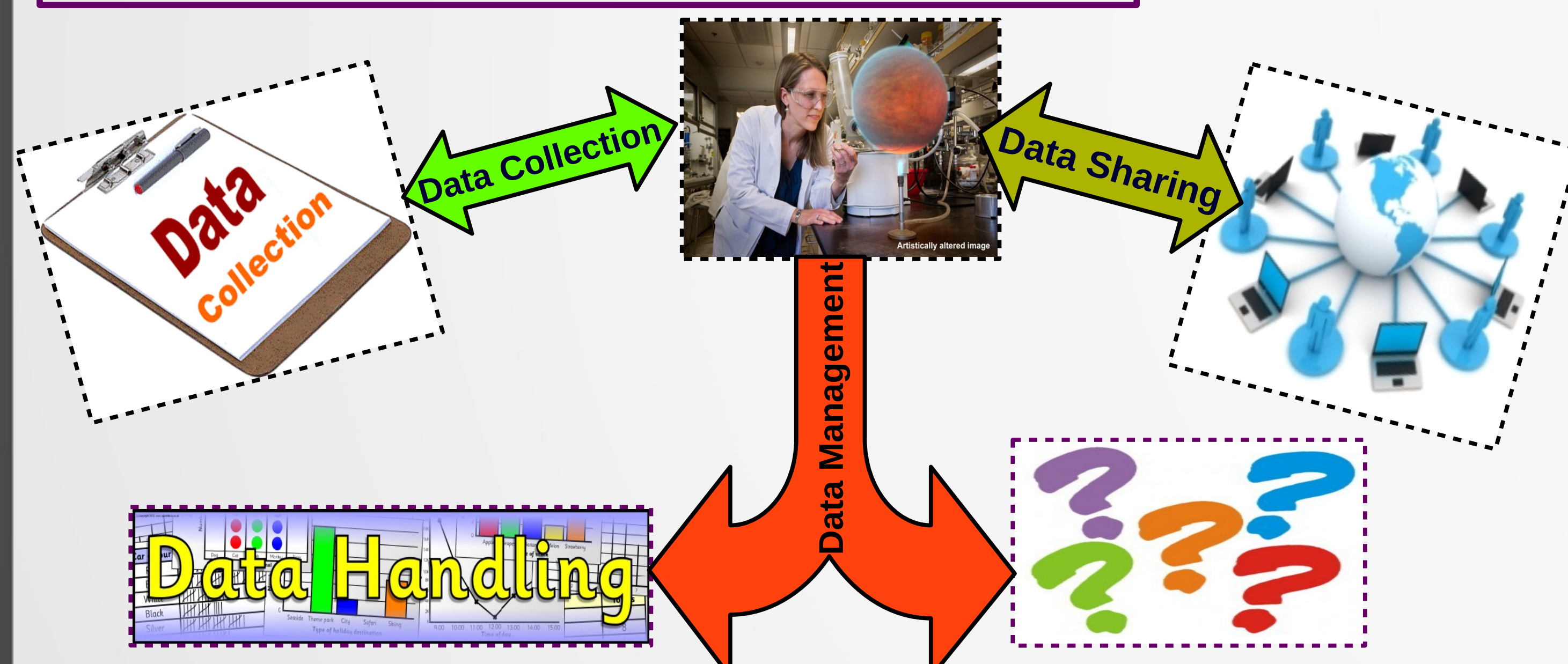
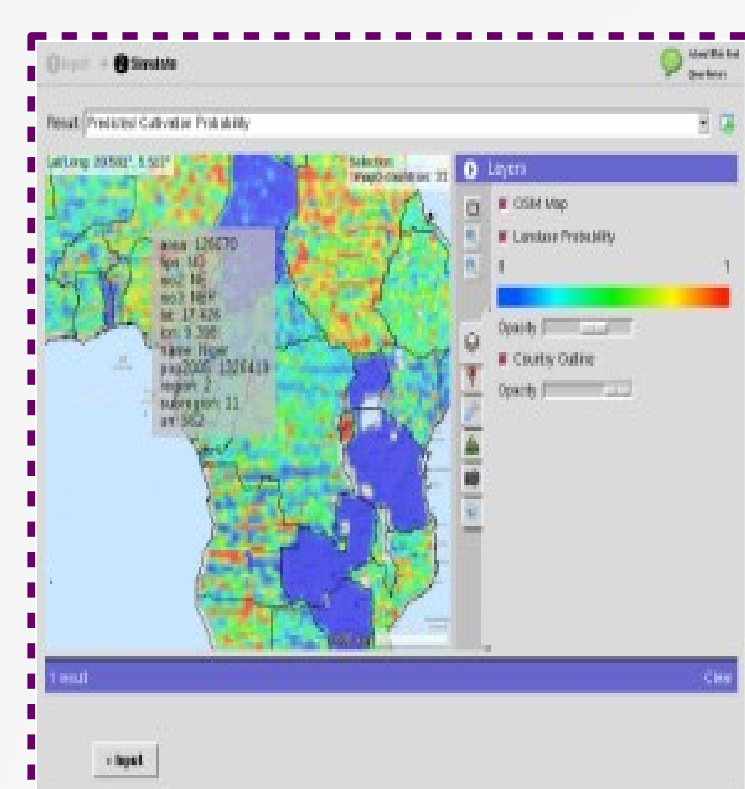
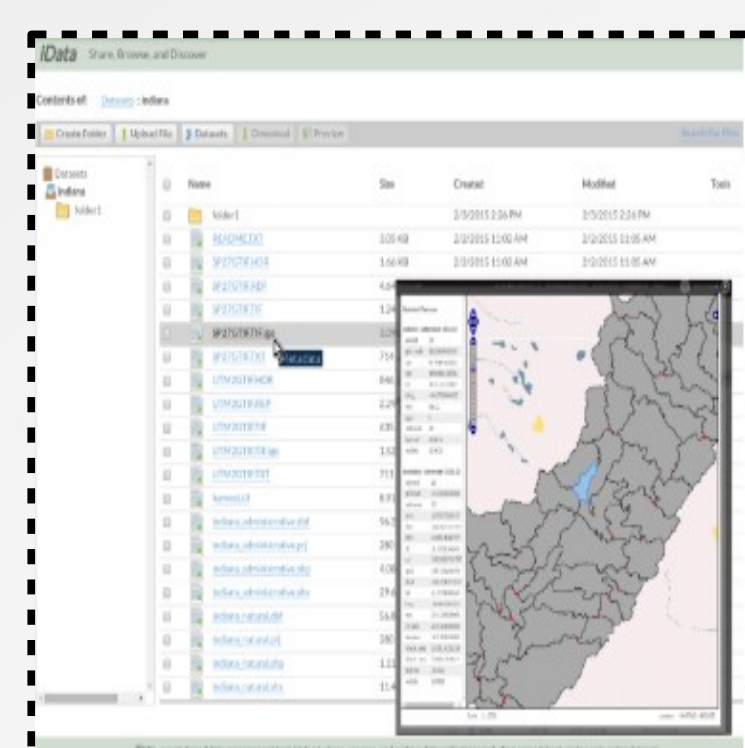


INTRODUCTION

- **Geospatial Data Analysis Building Blocks (GABBS)**
 - Reusable blocks supporting sharing, processing and publication of geospatial data.
- **Intended to be deployed on HUBzero platform.**
 - Cyberinfrastructure platform supporting community-driven research.
 - Ability to share, visualize, manage files.
- **Hub tools**
 - Web-enable processing tools.
 - Rapid deployment.
- **Hub community space (hub projects) linked to tools**
 - Enables complete data pipeline from collection, sharing and processing.

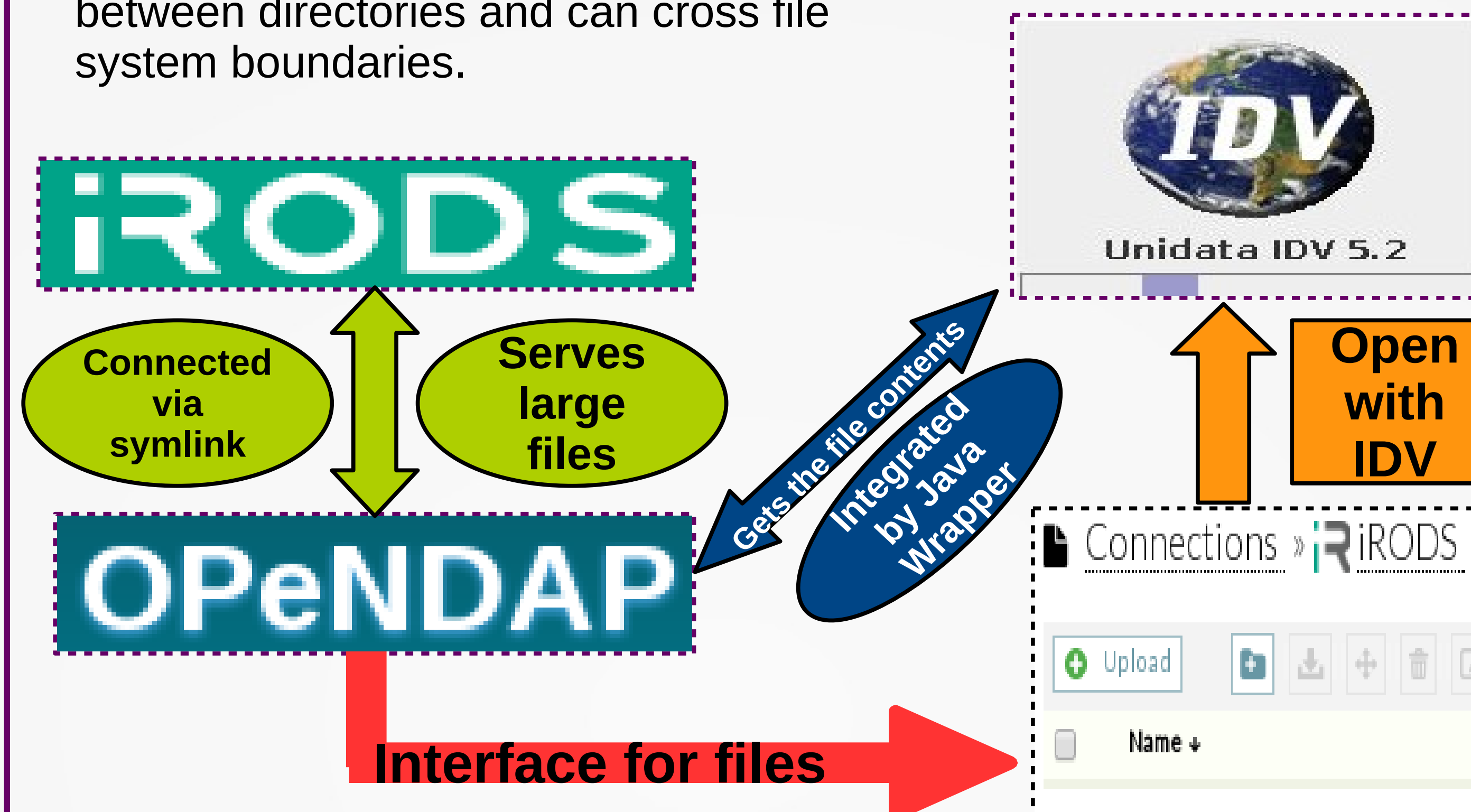


OBJECTIVE

- **Geospatial data files are often large in size**
 - Satellite data that may contain multiple channels with data such as water vapor, cloud and vegetation cover etc.
 - People are typically not interested in all of the data.
- **Distribution of resources**
 - Files are in iRODS – a data storage system on a separate server, hub is on a different web server.
 - It is unaffordable to open/read large files all at once.
- **Use of data access protocol can subset the data**
 - IDV (data visualizer) is designed to work with the OPeNDAP (data sub-setting and aggregation protocol) where it only requests meta-data on the file first and then the subset of data the user is interested in.
 - The formats used (e.g. netCDF) are designed to contain several independent but related data-sets in the same file.
 - Data access protocols provide a more nuanced interface to the data rather than just the contents of the file.
- **Main Question**
 - Integrate the iRODS with the OPeNDAP protocol to serve the files using that protocol? Finally, integrate OPeNDAP with IDV.

METHODS

- **OpenDAP has a BES (back-end server) and a front-end interface**
 - Allows data providers more flexibility in providing end users views of their data.
 - Several choices were considered to register iRODS files into the BES.
 - Final solution zeroed upon was to put in a symlink. It creates soft links between directories and can cross file system boundaries.



- **However, protection layer is required**
 - To prevent access to the iRODS folder and other catalogs even if user has the URL to the OpenDAP server.
 - These are files from the hub projects, so the hub enforces access controls that need to be respected.
 - DispatchHandlers is a mechanism through which series of incoming requests are evaluated.
 - Turned off DirectoryDispatchHandler and ThreddsDispatchHandler to achieve this.
- **Introducing new features in OPeNDAP HUBzero platform**
 - Wrote a program in PHP – a server side scripting language, to retrieve and use the geospatial files and data contained in them present on the hub.
- **OpenDAP – IDV Integration**
 - Built a client wrapper in Java programming language to integrate OPeNDAP and IDV tool.

RESULTS

- **Connecting OPeNDAP protocol with the iRODS storage system**

- Creating symbolic links served the purpose of providing OPeNDAP interface to the hub project files stored in iRODS.

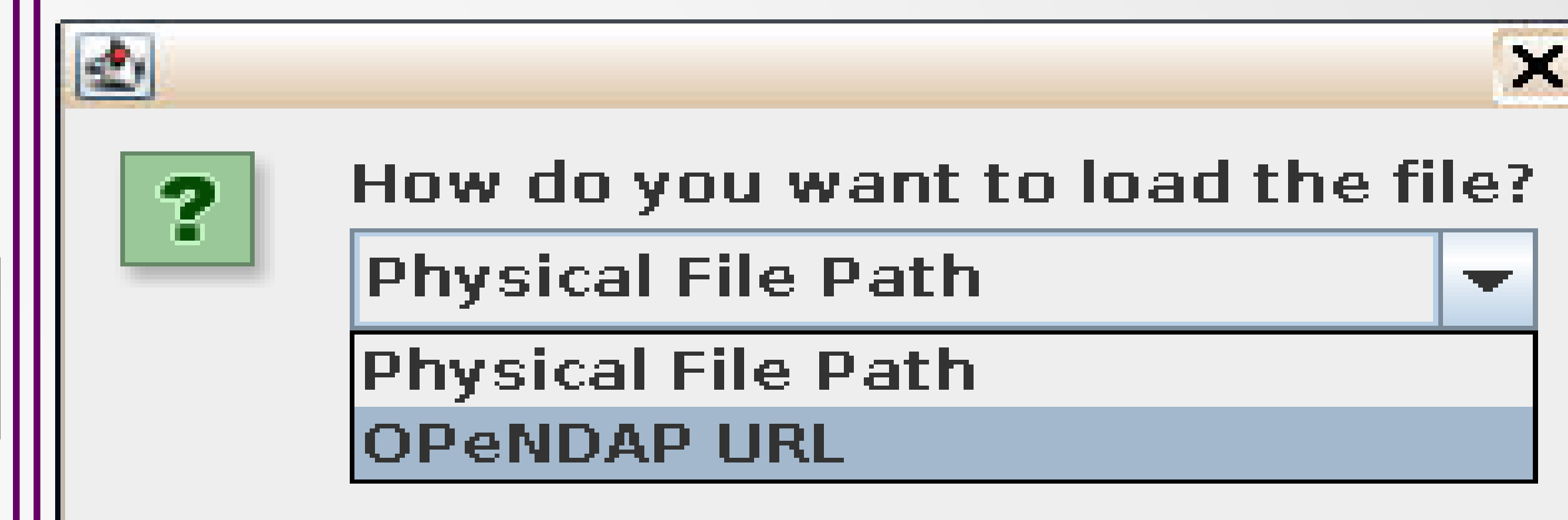
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Name
csv/
dapreader/
ff/
hdf5/
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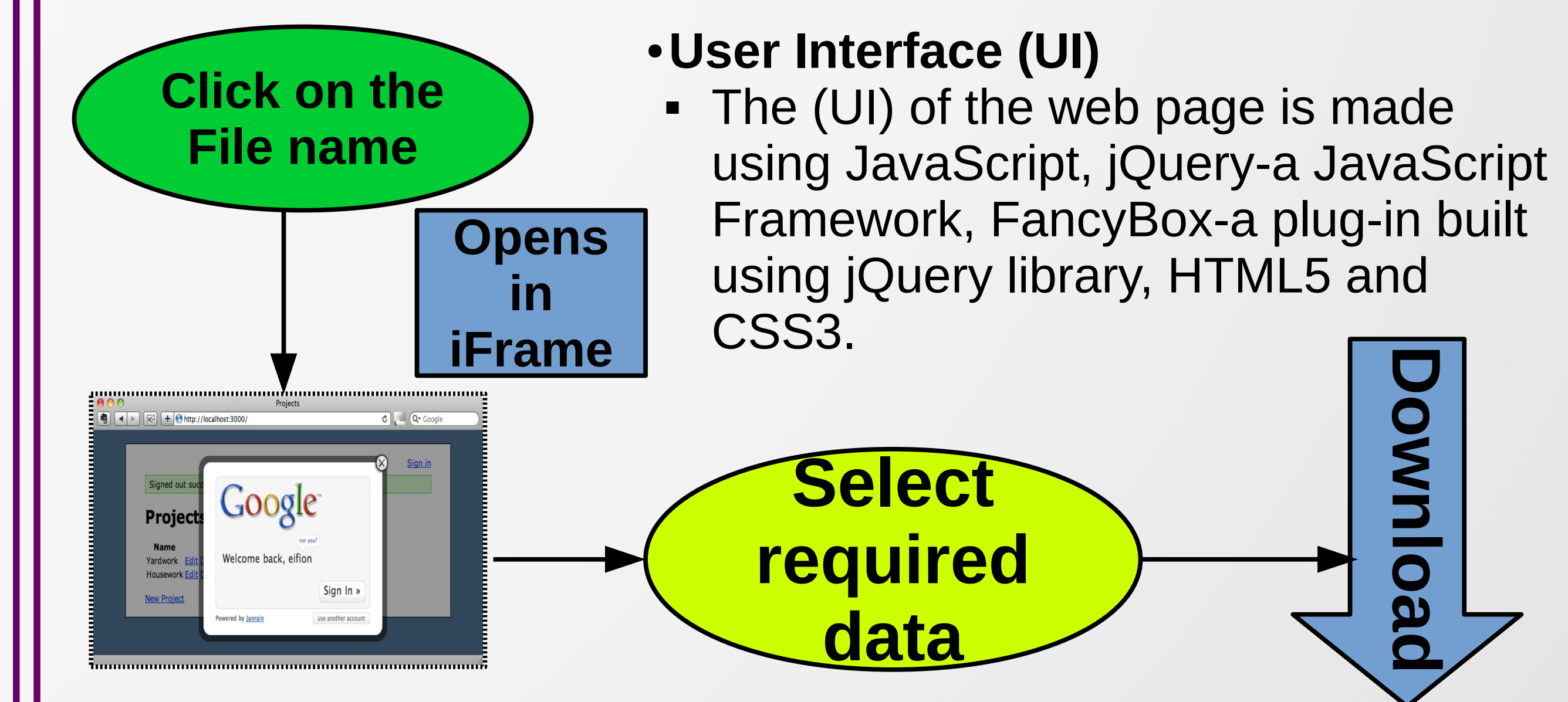
OPeNDAP
Contents of /data

RESULTS–continued

- **How does OPeNDAP integration with IDV work?**
 - The user is provided with a choice when the tool is launched.
 - Without having to modify IDV source and by exploiting its support for command line arguments, wrote a general purpose wrapper.
 - The OPeNDAP URL to the file is automatically constructed.



- **New Features**
 - OPeNDAP can also help in one other respect – file download.
 - Override simple download of the whole file with the OPeNDAP default HTML client (provided by default)
 - Allows users to subset and download parts of the file by displayed the file in an iFrame.



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