

iExplore for iRODS Distributed Data Management

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Abstract

iExplore is a graphical user interface client tool for navigation and manipulation of data within the iRODS distributed data system. Designed and implemented in the Windows platform, it offers a rich set of functions with excellent performance for iRODS users.

Index Keyword Terms—Graphical User Interface, iRODS Client Tool, Data Manipulation, Windows Platform.

1. Introduction

iExplorer is a graphic user interface tool that runs on the Windows platform for browsing distributed data and related digital information managed by iRODS, the Integrated Rule-Oriented Data System [1, 2]. iExplore supports a rich set of iRODS client functions through its main browser window, which comprises a tree display and a list box showing the hierarchical collection structure and the content of the selected collection that is stored in a distributed iRODS environment, federated data grid, or heterogeneous storage systems, etc.

iExplore is developed using the Microsoft Foundation Class (MFC) with enabled .net GUI features. iExplore interacts with iRODS through the iRODS client library, which issues the iRODS communication protocol [3], an RPC-based client-server software package developed by iRODS team. Fig. 1 shows a snapshot of the main screen.

iExplore software can be downloaded from the iRODS web site at: <https://www.irods.org/index.php/windows>. Since it is developed using the original iRODS C library and Microsoft C++ within the user interface, iExplore demonstrates superb performance for all data manipulation operations.

2. Functions and Dialogs

iExplore provides many client functions through its GUI implementation, such as iRODS file system browsing, file/collection downloading, file/collection uploading, searching, and metadata editing. Below are detailed descriptions of the functions and dialogs implemented in the current version of iExplore. Some new features introduced in the latest release will be described in a separate section.

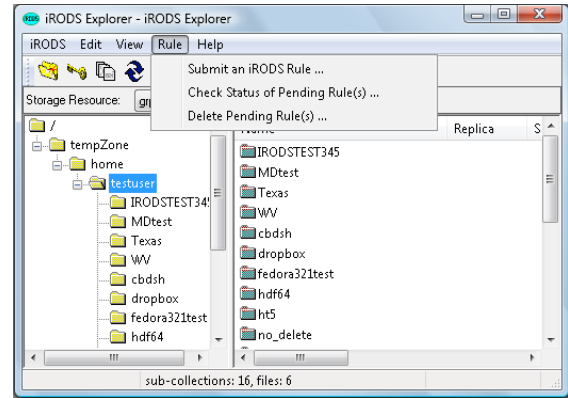


Fig 1. The main screen of iExplore

1. **Navigation of hierarchical structure:** Navigation within an iRODS collection and datasets is through either a tree view or a list in the main screen.
2. **Uploading files/folders:** Users can use the menu to launch a file or folder selection dialog to upload files or folders into iRODS. The storage resource is determined by the resource combo box above the tree.
3. **Downloading datasets:** iRODS files can be downloaded to a local disk through the download menu. Users will be asked to select a local folder for downloading files.
4. **Data Replication:** Users can make replicas of selected files or a collection through "Replicate" menu.
5. **Data Access Control:** A user can set data access permissions on files for other users.
6. **Manipulation of metadata:** A metadata dialog allows users to enter, edit, and view metadata.
7. **Change Password:** The change password dialog allows a user to change their password.
8. **iRODS Rules:** The "Rule" menu supports three submenus for submitting rules, checking rule status, and deleting a submitted rule.
9. **Online help:** iExplore has a link in its About dialog that directs users to iRODS on-line documents for full descriptions of the iRODS system and various operations.

3. New Features in Latest Release

The following new features were introduced in the latest release of iExplore.

1. **Job Progress Indicator:** A job progress indicator has been implemented to show the progress of tasks in uploading and downloading files or collections. Usually the GUI progress indicator is hidden in the main window next to the resource selection field. It will automatically appear when a job starts.
2. **HTML information display:** An HTML display was introduced in the latest release to display information about distributed stores, user, and metadata in tabular form, a more user-friendly representation of the information.
3. **Search Dialog:** A new search dialog allows user to search on patterns in file and user-defined metadata. Although the search criteria is like a database query language, a simple query such as the “contain” operation is quite intuitive, and users will find this search very useful.

4. Proposed Future Development

As Microsoft technologies evolve, and based on user requests, iExplore will continue to evolve to provide additional iRODS functions and interfaces for new technologies.

1. **New main screen:** This has an extra pane to show rich information: thumbnail, system metadata, user metadata, as shown in Fig 2.

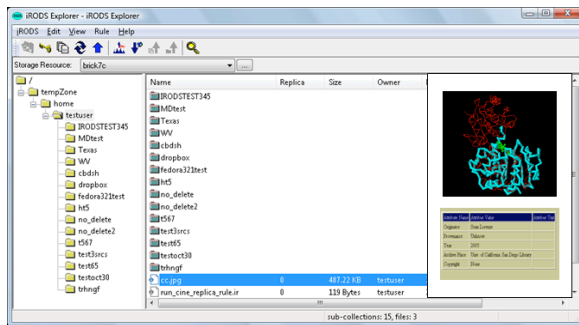


Fig 2. A Proposed iExplore Main Screen. A third pane will be added in the right panel to display thumbnails, metadata, properties, etc.

2. **Multi-Language Support:** New development will provide multi-language support through Microsoft UNICODE implementation.
3. **Generic Interface** for integration with other software applications: New development of iExplore will look into incorporation of the

Windows Presentation Foundation so that it can be easily integrated with other applications, map applications, data cube displays, multi-media software, numerous web applications, etc.

4. **A generic interface** for iRODS Plug-play modules such as automatic metadata extraction, thumbnail creation, etc.
5. **New Rule Editor:** A new user-friendly iRODS rule editor will allow users to navigate through the list of available iRODS micro-services in a server to construct new iRODS rules. There will be a check that verifies iRODS rule syntax.
6. **Advanced Search:** The Advanced Search will allow experienced users to conduct more complex searches against iRODS distributed stores. The advanced search will also keep track of user search patterns and provide intelligent assistance for users.

5. Summary

iExplore is an efficient client tool for navigating the iRODS distributed data system. It offers a rich set of functions and user dialogs that are convenient and easy to use for iRODS users. Future development will include rich data representations such as auto-display of thumbnail images, movie proxies, and metadata by combining the latest Microsoft technologies such as Windows Presentation Foundation.

7. References

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