QRODS: A Qt library for iRODS data system access

Presenter: Bruno Silva - bs@cin.ufpe.br

B. Silva, A. Lobo Jr., D.Oliveira, F. Silva, G.Callou, V. Alves, P.Maciel

Center for Informatics UFPE, Brazil

Stephen Worth

EMC Corporation

Jason Coposky

iRODS Consortium

Agenda

- Introduction
- QRODS library
  - Features
  - Architecture
- RODEX
- Live demonstration

Introduction

- IRODS is an open source platform for managing, sharing and integrating data.

- Client tools for using iRODS
  - iCommands
  - iRODS Explorer

Introduction

Qt is a comprehensive C++ application development framework for creating crossplatform GUI applications using a

"write once, compile everywhere" approach.

Introduction

Projects that adopts Qt

- VirtualBox
- Wireshark
- Amazon Kindle
- Ubuntu Touch
- Skype
- ...

Introduction

- There is no easy way to adopt iRODS in Qt applications.

- We propose a library to provide support for Qt apps to communicate with iRODS data system.

Introduction

- The proposed library provides a mapping between iRODS API commands and Qt equivalents.

- QRODS library is a MVC component that extends QAbstractItemModel class.
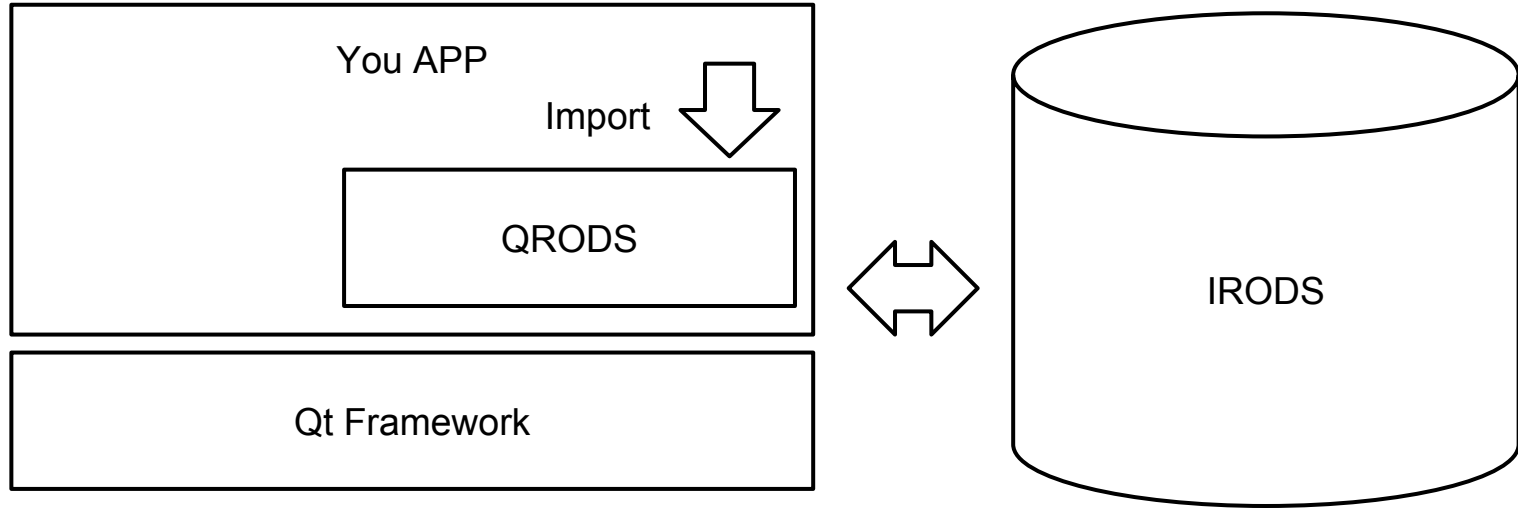
Introduction

- QRODS supports table, tree and list views.

- For huge collections, QRODS presents lazy loading functionalities for all the views.
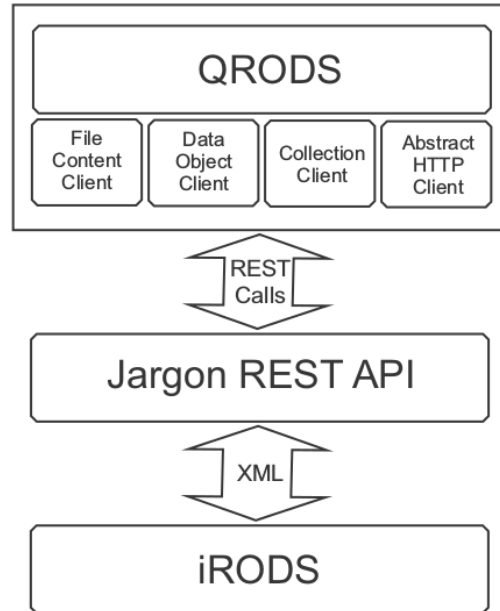
QRODS Library

Features:

- Create and delete files or collections.
- Download and upload files.
- Add and delete metadata from an object.
- List content (files, metadata, collections).
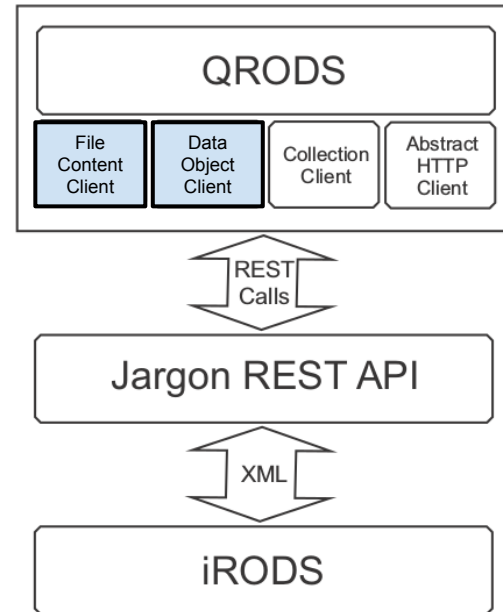
Using QRODS

QRODS Library

QRODS Library

- Although Jargon API has been implemented in Java, It presents a REST API that allows apps to communicate with iRODS
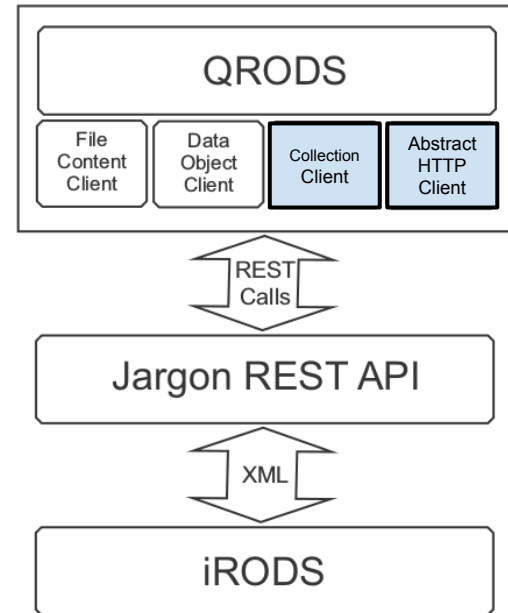
QRODS Library

- **FileContentClient** for file operations.

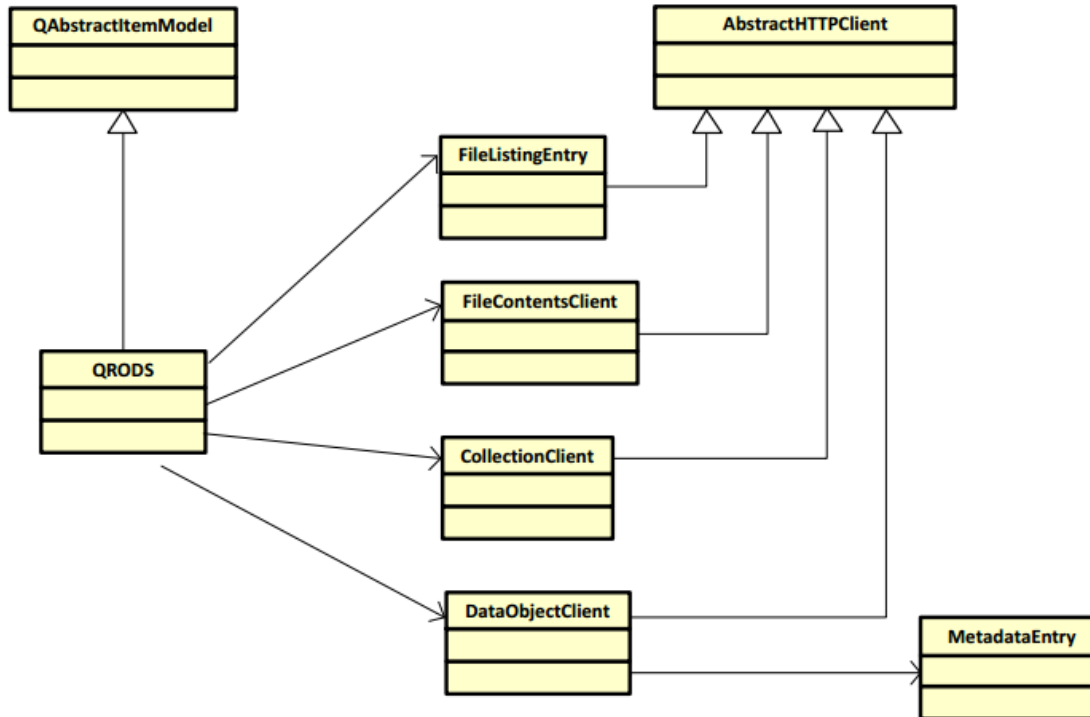- **DataObjectClient** for metadata operations.

QRODS Library

- **CollectionClient** for collection operations.

- **AbstractHTTPClient** for HTTP operations.

Class Diagram

FileContentClient class

- FileContentClient class manages iRODS files.
  - uploadFile()
  - downloadFile()

- Similar to *iput* and *iget* operations

DataObjectClient Class

- DataObjectClient class manages iRODS metadata.
  - removeDataObject()
  - getDataObjectMetadata()
  - addCollectionMetadata()

- Similar to *imeta* operations

CollectionClient class

- CollectionClient class manages iRODS collections.
  - createCollection()
  - removeCollection()
  - getCollectionDataAsync()
  - getCollectionDataLazy()

- Similar to *ils, irm* and *imkdir* operations

CollectionClient class

- getCollectionDataLazy() is called automatically whenever bigs collections are listed.

- The size of big collections is user-definable.

- If the collection size is higher than a threshold, getCollectionDataLazy() is called for listing.

AbstractHTTPClient class

- AbstractHTTPClient generates GET, POST, PUT AND DELETE HTTP calls
  - doGet()
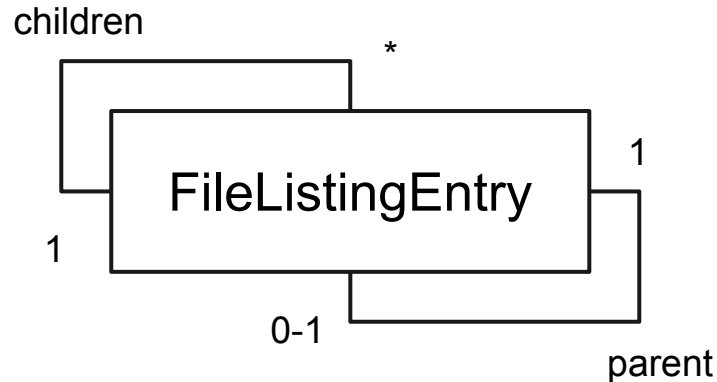 - doPost()
  - doPut()
  - doDelete()

QRODS class

QRODS extends QAbstractItemModel and overrides the methods:

- index()
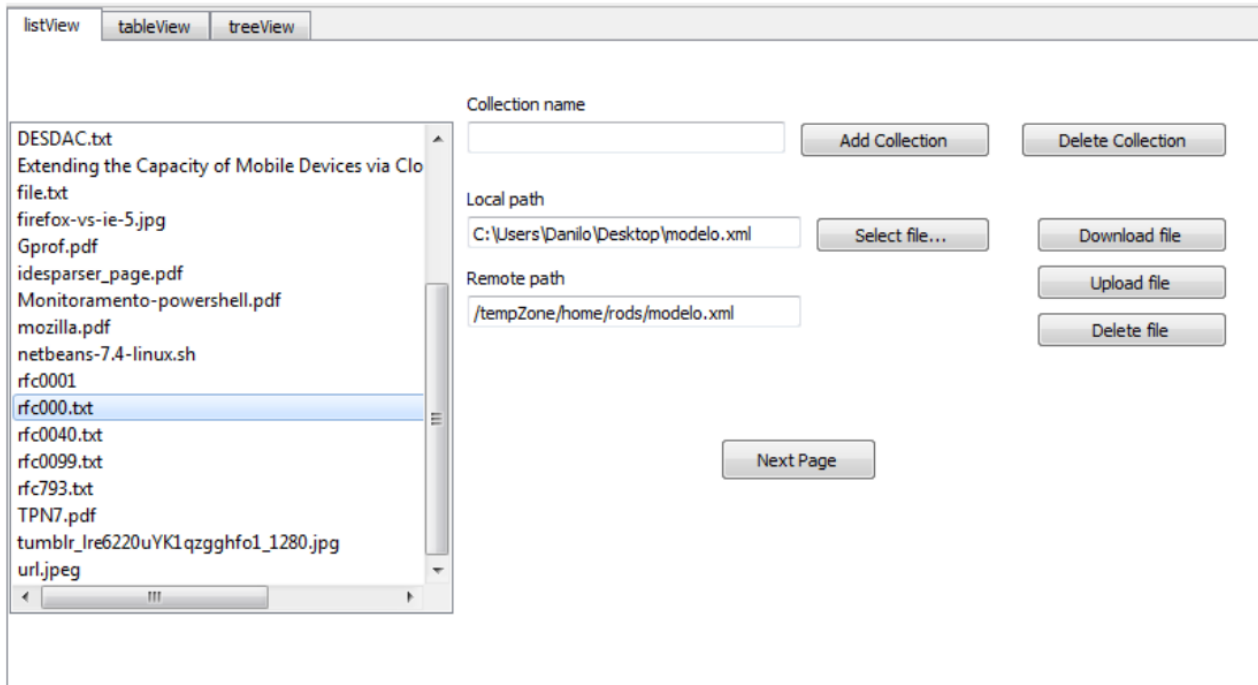- parent()
- data()
- headerData()
- ...

QRODS class

- FileListingEntry represents nodes which can be objects or collections.

children

*

FileListingEntry

1

1

0-1

parent

RODEX (RODs EXplorer)

- RODEX shows the main functionalities of QRODS library.

- RODEX application is able to manage files, collections and metadata.

RODEX (RODs EXplorer)

Live Demonstration

Conclusion

- We presented QRODS, a library for Qt developers to manage iRODS data

- This library has an asynchronous method to perform lazy collection listing

- RODEX application was implemented to show the applicability of QRODS

- As future directions, we intend to extend our QRODS library to deal with different remote access storage