

# A Service-Oriented Interface to the iRODS Data Grid

*Nicola Venuti, Francesco Locunto  
Nice S.r.l.*

*Michael Conway  
DICE Center – UNC*

*Leesa Brieger  
RENCI - UNC*

# The Many (Inter)Faces of a Data Grid

- Simple data browser
- Access to specialized services (administrative)
  - \* audit tracking
  - \* usage/quota monitoring
- Access to a subset of services (user)
  - \* audit only my own files
  - \* check my own usage
- Different views and services for different communities (e.g.. a university institutional repository):
  - \* librarian
  - \* data administrator
  - \* system administrator
  - \* user groups

# The Data Management Toolkit

- Basic iRODS services
  - \* Data grid architecture and support
  - \* DCAPE archival policy implemented into services
  - \* ERA module services
- iRODS framework
- Libraries of specialized services developed by grid deployers
- Specialized data grid *interface* to:
  - \* provide intuitive access to customized services
  - \* separate IT from data management (separate data grid deployment from usage)
  - \* enable data administrator  $\neq$  iRODS programmer

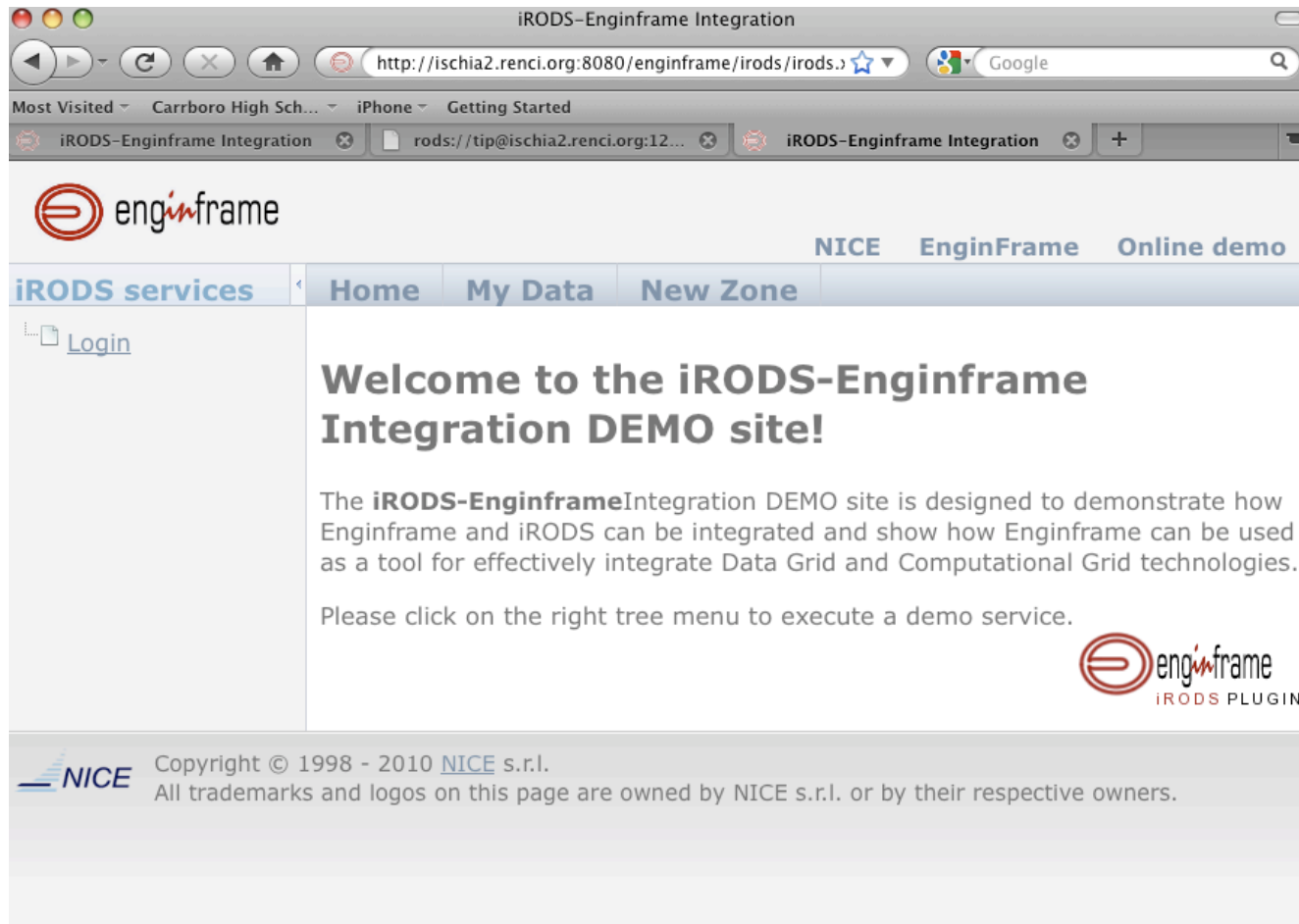
# The EnginFrame Interface

- Current version created as a demo platform
- Showcase for core iRODS services
  - \* audit tracking
  - \* quota/usage monitoring
  - \* metadata services
  - \* rule editing and running
- User-friendly and intuitive
- Proprietary software from Nice S.r.l., available to iRODS users

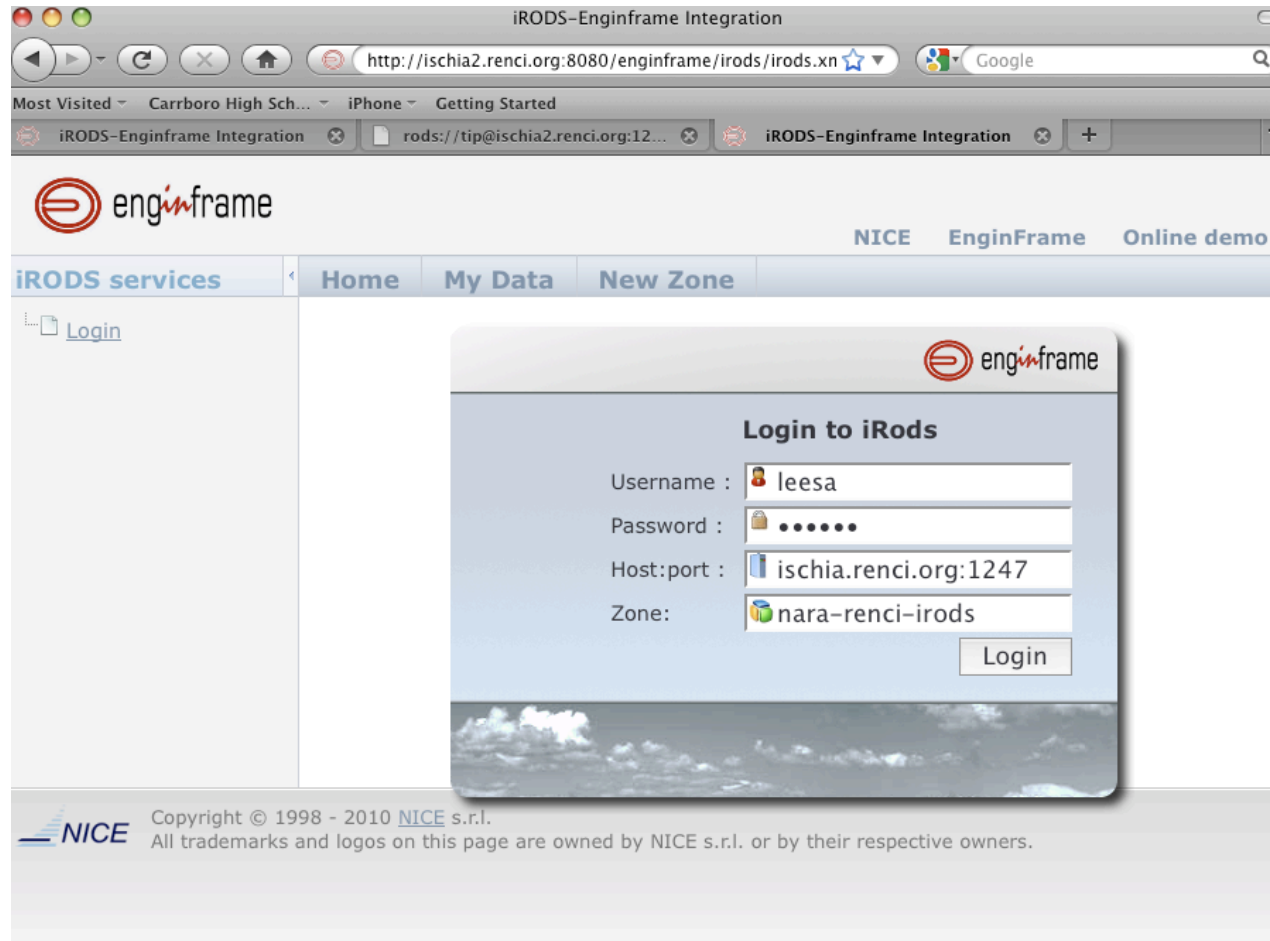
# Audit Services

- **Must query iCAT audit information**
  - \* `msiMakeGenQuery` and `msiExecGenQuery`
  - \* `iquest`
  - \* differences in performance, control, results
- **Audit table contains ID of the “object” in question**
  - \* `user`
  - \* `data object`
  - \* `collection`
- **Series of `iquest` commands to yield correct result**

# EF Interface Demo



# EF Interface Demo



# Data Browser

The screenshot shows a web browser window titled "iRODS-Enginframe Integration". The address bar displays the URL "http://ischia2.renci.org:8080/enginframe/irods/irods.xn". The browser's Most Visited list includes "Carrboro High Sch...", "iPhone", and "Getting Started". The page features the Enginframe logo and a navigation bar with tabs: "Home", "My Data", "New Zone", and "Logout". On the left, a sidebar lists "iRODS services" including "Audit" (with links "Audit by user" and "Audit by file") and "Rules" (with link "Running rules"). The main content area has buttons for "Upload", "Download", "Create Folder", "Delete", and "Refresh". Below these is a location path: "Location: > nara-renci-irods > home > leesa". A table lists files and folders:

Name	Size	Resource	Date Modified
test	--	--	--
foo.txt	22 bytes	renci_msResc:0	Mar 15 17:13
hello	11 bytes	renci-node1:0	Jan 27 20:40
hello	11 bytes	ncsuVault:1	Jan 30 14:58
lscolors	2 KB	renci-node1:0	Sep 03, 2008
notes	55 bytes	renci_msResc:0	Jul 21, 2009
test1	24 bytes	renci-node1:0	Sep 04, 2008
test_write.txt	13 bytes	renci_msResc:0	Aug 19, 2009



# Data Browser

# Browse Metadata

The screenshot shows the iRODS-Enginframe Integration web interface. The browser address bar displays `http://ischia2.renci.org:8080/enginframe/irods/irods.xml?_uri=//com.enginframe`. The interface includes a navigation bar with tabs: Home, My Data, New Zone, and Logout. Below the navigation bar are buttons for Upload, Download, Create Folder, Delete, and Refresh. The location bar shows the path: `nara-renci-irods / home / leesa`. A table lists files and folders with columns for Name, Size, Resource, and Date Modified. The file 'hello' is selected, and a context menu is open over it, showing options: Delete, Rename..., Replicate..., ACL..., and Metadata....

Name	Size	Resource	Date Modified
test	--	--	--
foo.txt	22 bytes	renci_msResc:0	Mar 15 17:13
hello	11 bytes	renci-node1:0	Jan 27 20:40
hello	11 bytes	ncsuVault:1	Jan 30 14:58
lscolors	2 KB	renci-node1:0	Sep 03, 2010
notes	55 bytes	renci_msResc:0	Jul 21, 2010
test1	24 bytes	renci-node1:0	Sep 04, 2010
test_write.txt	13 bytes	renci_msResc:0	Aug 19, 2010

# Data Browser

# Browse Metadata

leesa ischia.renci.org:1247 nara-renci-irods Click Here to choose the Default Res

Home My Data New Zone Logout

Upload Download Create Folder Delete Refresh

Location: > nara-renci-irods > home > leesa

**Metadata for: /nara-renci-irods/home/leesa/hello**

Refresh Add Remove Search by Attribute

Attribute	Value	Units
Comment	Newfile	
Date	2010-03-24	

Page 1 of 1 25 View 1 - 2 of

Close

Date Modified

- 
- Mar 15 17:13
- Jan 27 20:40
- Jan 30 14:58
- Sep 03, 2008
- Jul 21, 2009
- Sep 04, 2008
- Aug 19, 2009

## Data Browser

# Modify Metadata

The screenshot shows the Data Browser interface with a modal dialog box titled "Add Metadata". The dialog has a close button (X) in the top right corner. It contains three input fields: "Attribute:" with the value "Course", "Value:" with the value "INLS490", and "Units:" which is empty. At the bottom of the dialog are "Add" and "Cancel" buttons. The background interface includes a top navigation bar with links for "Home", "My Data", "New Zone", and "Logout". Below this is a toolbar with "Upload" and "Download" buttons. A sidebar on the left shows a tree view with "Metadata for:" and a "Refresh" button. The main content area displays a table with columns for "Attribute" and "Date Modified". The "Attribute" column has a search box and a trash icon. The "Date Modified" column shows a list of dates and times. A "Close" button is located at the bottom right of the main interface.

leesa ischia.renci.org:1247 nara-renci-irods Click Here to choose the Default

Home My Data New Zone Logout

Upload Download

Location:

Metadata for:

Refresh

☐ Attribute

☐ Comment

☐ Date

**Add Metadata** X

Attribute:

Course

Value:

INLS490

Units:

Add Cancel

Attribute

Units

Date Modified

--

Mar 15 17:13

Jan 27 20:40

Jan 30 14:58

Sep 03, 2008

Jul 21, 2009

Sep 04, 2008

Aug 19, 2009

View 1 - 2 of

Close

# Data Browser

## Modify Metadata

The screenshot shows the iRODS Data Browser interface. At the top, there's a navigation bar with links: Home, My Data, New Zone, and Logout. Below this is a toolbar with buttons: Upload, Download, Create Folder, Delete, and Refresh. The main area displays the location: /nara-enci-irods/home/leesa. A modal dialog box titled 'Metadata for: /nara-enci-irods/home/leesa/hello' is open, showing a table of metadata attributes and their values. The table has columns for Attribute, Value, and Units. The attributes listed are Comment (Newfile), Course (INLS490), and Date (2010-03-24). The dialog also includes a search bar, a 'Search by Attribute' dropdown, and a 'Close' button.

Attribute	Value	Units
Comment	Newfile	
Course	INLS490	
Date	2010-03-24	

## Data Browser

# Browse Access Control List

The screenshot shows the iRODS-Enginframe integration web interface. The browser address bar displays the URL: `http://ischia2.renci.org:8080/enginframe/irods/irods.xml?url=//com.enginfr...`. The interface includes a navigation bar with links for Home, My Data, New Zone, and Logout. Below this is a toolbar with buttons for Upload, Download, Create Folder, Delete, and Refresh. The main content area shows the location: `nara-renci-irods / home / leesa`. A table lists files and folders with columns for Name, Size, Resource, and Date Modified. The file 'lscolors' is selected, and a context menu is open, showing options: Delete, Rename..., Replicate..., ACL..., and Metadata...

Name	Size	Resource	Date Modified
test	--	--	--
foo.txt	22 bytes	renci_msResc:0	Mar 15 17:13
hello	11 bytes	renci-node1:0	Jan 27 20:40
hello	11 bytes	ncsuVault:1	Jan 30 14:58
lscolors	2 KB	renci-node1:0	Sep 03, 2008
notes	55 bytes	renci_msResc:0	Jul 21, 2008
test1	24 bytes	renci-node1:0	Sep 04, 2008
test_write.txt	13 bytes	renci_msResc:0	Aug 19, 2008

## Data Browser

# Browse Access Control List

The screenshot shows the iRODS-Enginframe Integration web interface. The browser address bar displays the URL: `http://ischia2.renci.org:8080/enginframe/irods/irods.xml?_uri=//com.enginfr`. The interface includes a navigation bar with links: Home, My Data, New Zone, and Logout. Below the navigation bar are buttons for Upload, Download, Create Folder, Delete, and Refresh. The main content area shows a file browser view with a list of files and folders. A dialog box titled "ACL" is open, displaying the file path: `File: /nara-renci-irods/home/leesa`. The dialog also shows the ACL entry: `demo#nara-renci-irods:read` and `leesa#nara-renci-irods:own`. Below the ACL entry are radio buttons for Read (selected), write, Own, and Remove. The User field is set to TUCASI. The dialog has Apply and Cancel buttons.

Name	Size	Date Modified
test		--
foo.txt		Mar 15 17:13
hello		Jan 27 20:40
hello		Jan 30 14:58
lscolors		Sep 03, 2008
notes		Jul 21, 2009
test1		Sep 04, 2008
test_write.txt		Aug 19, 2009

# Data Browser

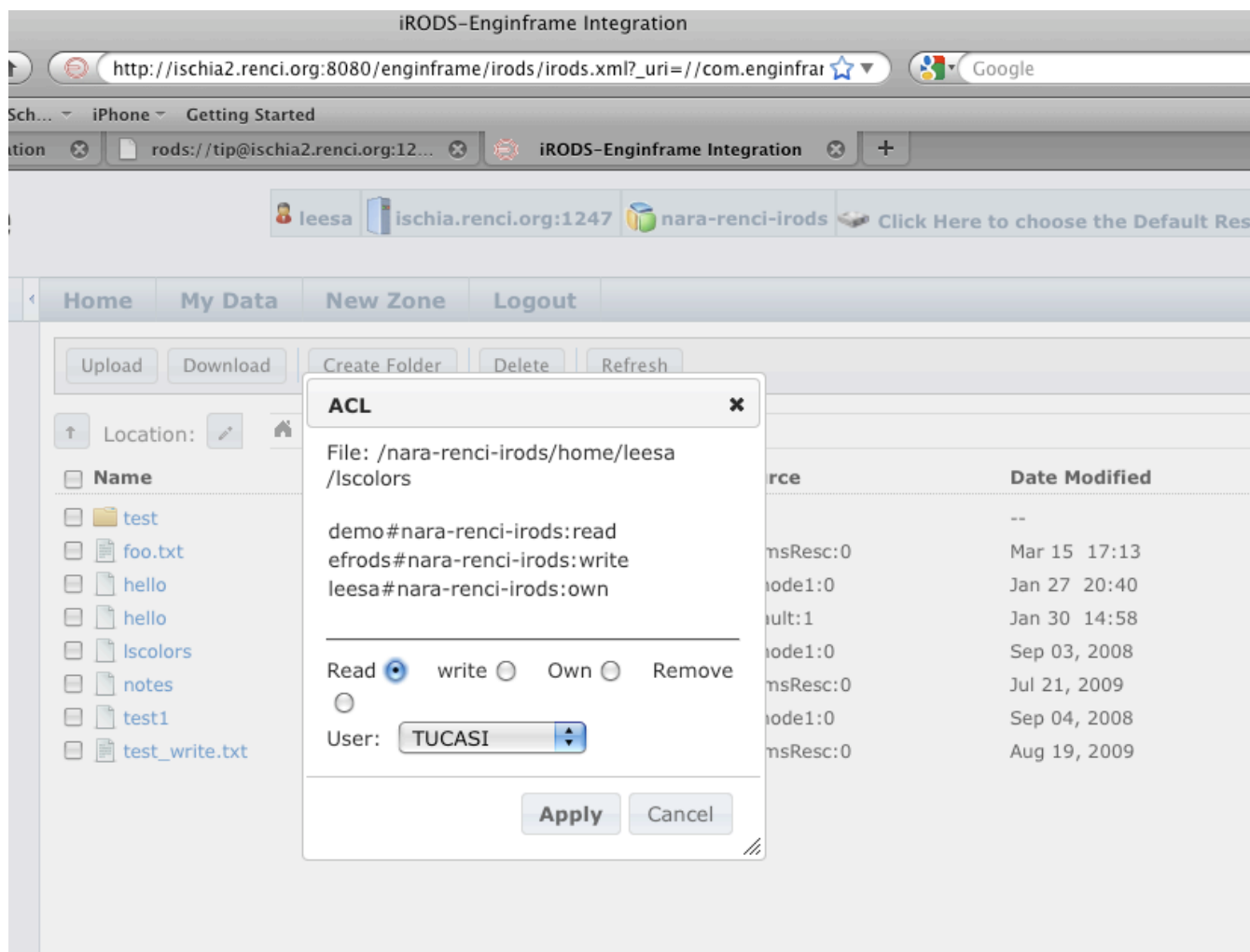
# Modify ACL

The screenshot shows the iRODS-Enginframe Integration web interface. The browser address bar displays the URL: `http://ischia2.renci.org:8080/enginframe/irods/irods.xml?_uri=/com.enginfrar`. The interface includes a navigation bar with links: Home, My Data, New Zone, and Logout. Below the navigation bar, there are buttons for Upload, Download, Create Folder, Delete, and Refresh. The location bar shows the path: `nara-renci-irods > home > leesa`. On the left, a file list is visible with entries: test, foo.txt, hello, hello, lscolors, notes, test1, and test\_write.txt. A modal dialog titled "ACL" is open, showing the file path `/nara-renci-irods/home/leesa/lscolors`. The dialog lists the ACL entries: `demo#nara-renci-irods:read` and `leesa#nara-renci-irods:own`. Below the list, there are radio buttons for Read, write (selected), Own, and Remove. The User field is set to `efrods`. The dialog has Apply and Cancel buttons.

Name	Owner	Date Modified
test	msResc:0	Mar 15 17:13
foo.txt	ode1:0	Jan 27 20:40
hello	ult:1	Jan 30 14:58
hello	ode1:0	Sep 03, 2008
lscolors	msResc:0	Jul 21, 2009
notes	ode1:0	Sep 04, 2008
test1	msResc:0	Aug 19, 2009
test_write.txt		

# Data Browser

# Modify ACL



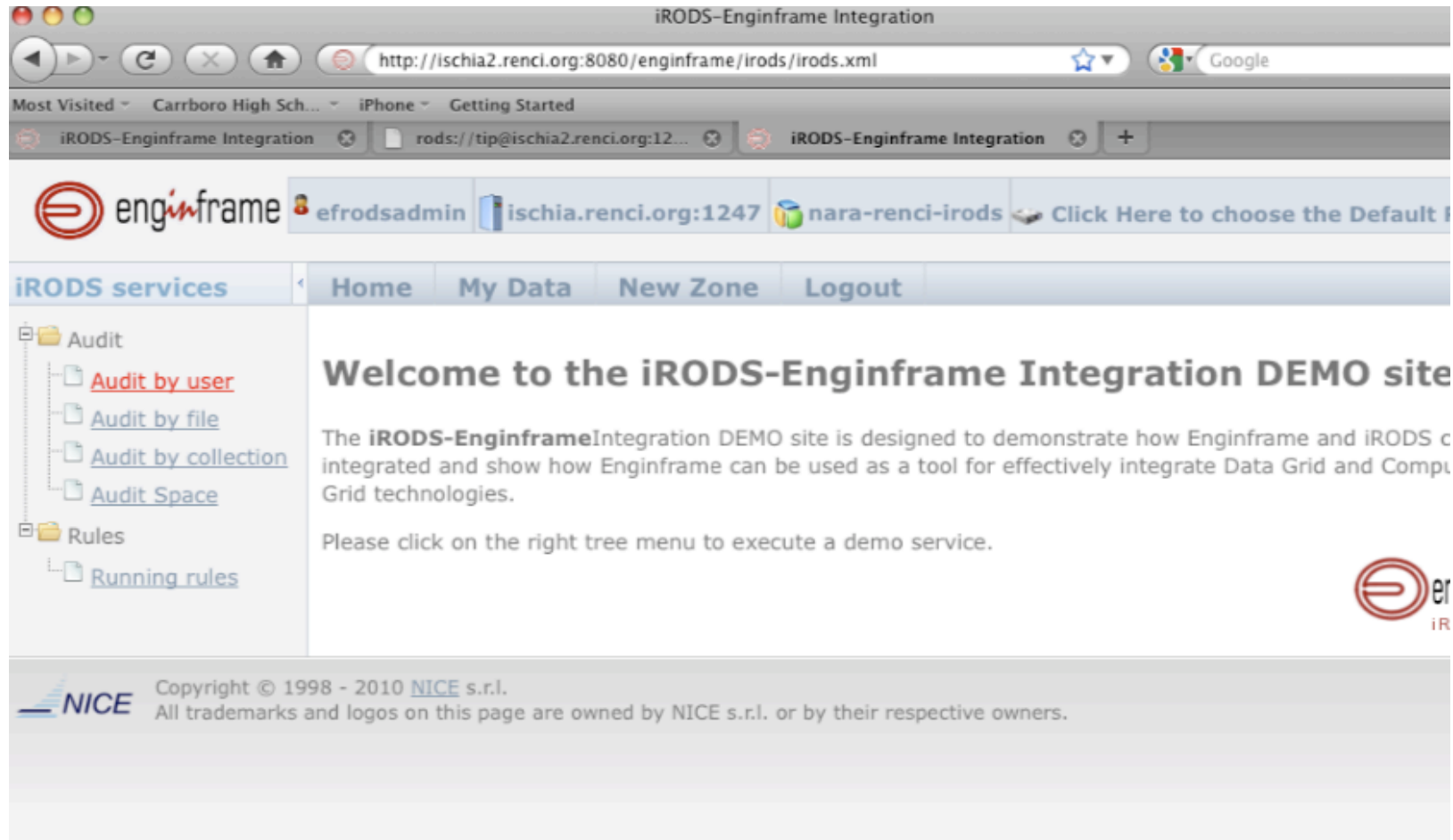


# Services

The screenshot displays the iRODS-Enginframe Integration web interface. The browser's address bar shows the URL `http://ischia2.renci.org:8080/enginframe/irods/irods.xml?uri=/com.enginfr...`. The interface features a sidebar on the left with 'iRODS services' including 'Audit' (with sub-items 'Audit by user' and 'Audit by file') and 'Rules' (with sub-item 'Running rules'). The main content area has navigation tabs: 'Home', 'My Data', 'New Zone', and 'Logout'. Below these tabs are buttons for 'Upload', 'Download', 'Create Folder', 'Delete', and 'Refresh'. A location bar indicates the current path: `nara-renci-irods / home / leesa`. A table lists files and folders with columns for Name, Size, Resource, and Date Modified.

Name	Size	Resource	Date Modified
test	--	--	--
foo.txt	22 bytes	renci_msResc:0	Mar 15 17:13
hello	11 bytes	renci-node1:0	Jan 27 20:40
hello	11 bytes	ncsuVault:1	Jan 30 14:58
lscolors	2 KB	renci-node1:0	Sep 03, 2008
notes	55 bytes	renci_msResc:0	Jul 21, 2009
test1	24 bytes	renci-node1:0	Sep 04, 2008
test_write.txt	13 bytes	renci_msResc:0	Aug 19, 2009

# Differentiated Services



# Services

# Audit

The screenshot shows a web browser window with the URL `http://ischia2.renci.org:8080/enginframe/irods/irods.xml?_service=audit_user`. The page title is "iRODS-Enginframe Integration". The user is logged in as "efrodsadmin" from "ischia.renci.org". The navigation bar includes "Home", "My Data", "New Zone", and "Logout". The left sidebar shows a tree structure with "Audit" (containing "Audit by user", "Audit by file", "Audit by collection", and "Audit Space") and "Rules" (containing "Running rules"). The main content area is titled "Audit by user" and contains the following form:

Username:

Start date:

End date:

A calendar dropdown is open, showing "March 2010". The calendar grid is as follows:

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

The footer of the page includes the NICE logo, copyright information "Copyright © 1998 - 2010 NICE", and the text "All trademarks and logos on this page are the property of their respective owners."

## Services

# Audit by User

iRODS-Enginframe Integration

http://ischia2.renci.org:8080/enginframe/irods/irods.xml?\_uri=/irods/audit\_user&\_actionid=submit

Sch... iPhone Getting Started

tion x rods://tip@ischia2.renci.org:12... x iRODS-Enginframe Integration x +

efrodsadmin ischia.renci.org:1247 nara-renci-irods Click Here to choose the Def

Home My Data New Zone Logout

Refresh Search by name Filters

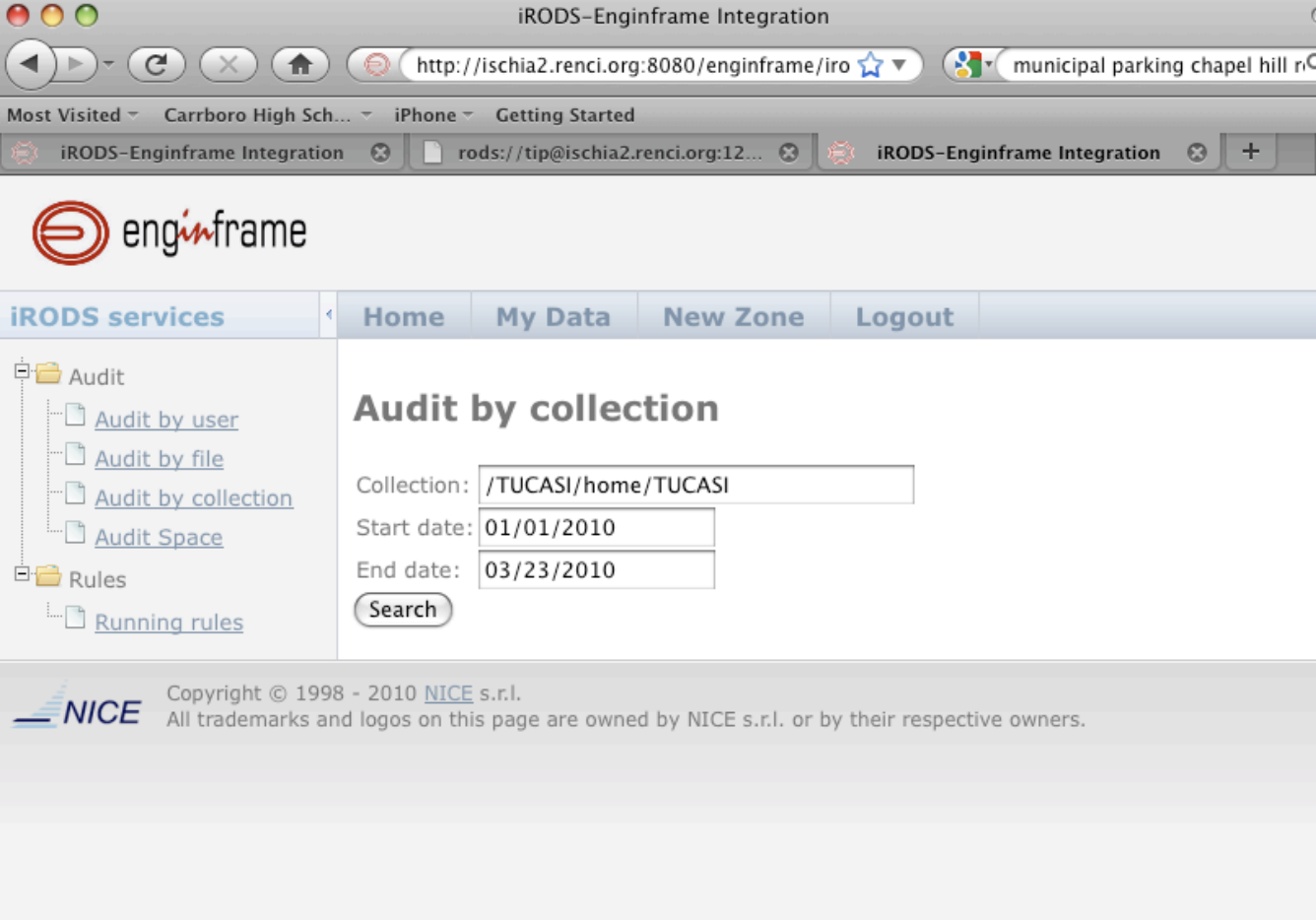
Type	Name	Action	Comment	Date
Data	/nara-renci-irods/home/tip/browser.php	Access granted	modify	03/04/10 13:20:...
Data	/nara-renci-irods/home/tip/browser.php	Register data object		03/04/10 13:20:...
Data	/nara-renci-irods/home/tip/hello-ischia	Access granted	modify	03/04/10 13:20:...
Data	/nara-renci-irods/home/tip/hello-ischia	Register data object		03/04/10 13:20:...
Data	/nara-renci-irods/home/tip/hello-ischia	Add AVU metadata	-d	03/04/10 13:20:...
Collec...	/nara-renci-irods/home/tip/testdir	Register collection	/nara-renci-irods/home/tip/testdir	03/04/10 13:24:...
Data	/nara-renci-irods/home/tip/testdir/notes	Access granted	modify	03/04/10 13:25:...
Data	/nara-renci-irods/home/tip/testdir/notes	Register data object		03/04/10 13:25:...
UNDE...	UNDEFINED	Access granted	delete	03/04/10 13:20:...
UNDE...	UNDEFINED	Unregister data object		03/04/10 13:20:...

Page 1 of 1 25 View 1 - 10 of 10

998 - 2010 NICE s.r.l.  
s and logos on this page are owned by NICE s.r.l. or by their respective owners.

## Services

# Audit by Collection



The screenshot shows a web browser window titled "iRODS-Enginframe Integration". The address bar displays the URL "http://ischia2.renci.org:8080/enginframe/iro". The browser's "Most Visited" list includes "Carrboro High Sch...", "iPhone", and "Getting Started". The page features the Enginframe logo and a navigation menu with "Home", "My Data", "New Zone", and "Logout". On the left, a sidebar lists "iRODS services" including "Audit" (with sub-items "Audit by user", "Audit by file", "Audit by collection", and "Audit Space") and "Rules" (with "Running rules"). The main content area is titled "Audit by collection" and contains a form with the following fields: "Collection:" with the value "/TUCASI/home/TUCASI", "Start date:" with the value "01/01/2010", and "End date:" with the value "03/23/2010". A "Search" button is located below these fields. At the bottom of the page, the NICE logo is displayed along with the copyright notice: "Copyright © 1998 - 2010 NICE s.r.l. All trademarks and logos on this page are owned by NICE s.r.l. or by their respective owners."

## Services

# Audit by Collection

The screenshot shows a web browser window titled "iRODS-Enginframe Integration". The address bar displays the URL "http://ischia2.renci.org:8080/enginframe/irods/irods.xml?\_uri=/". The browser's Most Visited list includes "Carrboro High Sch...", "iPhone", and "Getting Started". The page header features the "enginframe" logo, a user profile for "efrodsadmin", the server address "ischia2.renci.org:1248", and a "TUCASI" icon. A navigation bar contains links for "Home", "My Data", "New Zone", and "Logout". On the left, a sidebar menu lists "Audit" (with sub-links for "Audit by user", "Audit by file", "Audit by collection", and "Audit Space") and "Rules" (with a link for "Running rules"). The main content area has a "Refresh" button and a search box labeled "Search by name". Below this is a table with the following data:

Typ Name	Action	Comment	Date
C... /TUCASI/home/TU...	Register collec...	waldoi rods	02/26/10 ...
C... /TUCASI/home/TU...	Recursively m...	modify	03/03/10 ...
C... /TUCASI/home/TU...	Modify access ...	inheritance	03/03/10 ...
C... /TUCASI/home/TU...	Recursively m...	read	02/26/10 ...
C... /TUCASI/home/TU...	Modify access ...	inheritance	02/26/10 ...

At the bottom of the table, it indicates "Page 1 of 1" and "View 1 - 5 of 5". To the right of the table is a "Filters" sidebar with options: "All", "Data", "User", and "Collection". The footer of the page includes the "NICE" logo and copyright information: "Copyright © 1998 - 2010 NICE s.r.l. All trademarks and logos on this page are owned by NICE s.r.l. or by their respective owners."

## Services


# Audit by Collection Filter by Date

iRODS-Enginframe Integration

http://ischia2.renci.org:8080/enginframe/irods/irods.xml?\_uri=/irods/audit\_collection&... municipal parking chapel hill r

Most Visited Carrboro High Sch... iPhone Getting Started

iRODS-Enginframe Integration rods://tip@ischia2.renci.org:12... iRODS-Enginframe Integration +

 efrodsadmin ischia2.renci.org:1248 TUCASI Click Here to choose the Default

iRODS services Home My Data New Zone Logout

Audit

- Audit by user
- Audit by file
- Audit by collection
- Audit Space

Rules

- Running rules


Refresh Search by name

Type Name	Action	Comment	Date
Col... /TUCASI/home/TUCASI	Modify access contr...	inheritance	03/03/10...
Col... /TUCASI/home/TUCASI	Recursively modify ...	modify	03/03/10...
Col... /TUCASI/home/TUCASI	Modify access contr...	inheritance	02/26/10...
Col... /TUCASI/home/TUCASI	Recursively modify ...	read	02/26/10...
Col... /TUCASI/home/TUCASI	Register collection (...	waldoirods	02/26/10...

Page 1 of 1 25 View 1 - 5 of 5

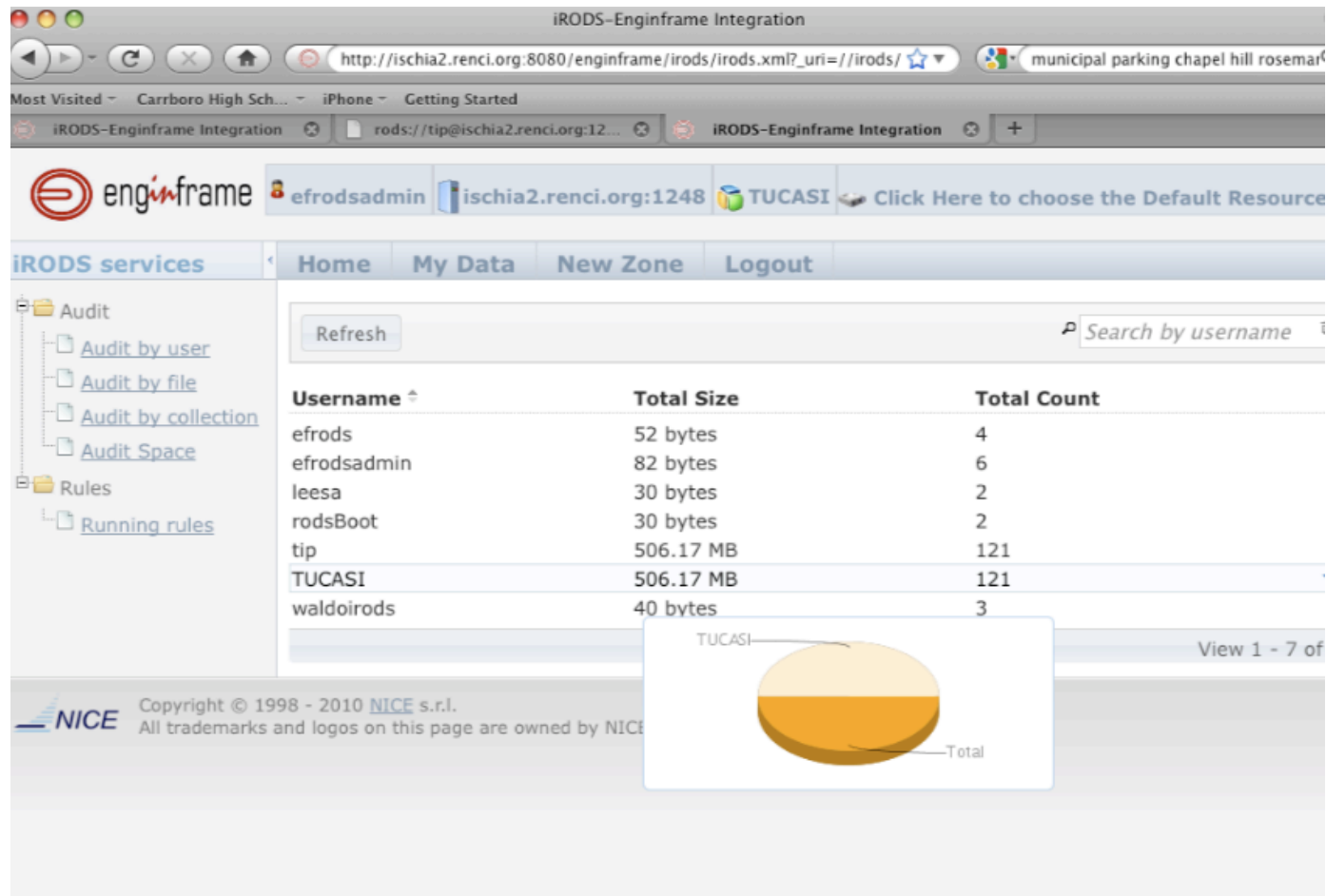
**Filters**

- All
- Data
- User
- Collection

 Copyright © 1998 - 2010 NICE s.r.l.  
All trademarks and logos on this page are owned by NICE s.r.l. or by their respective owners.

## Services

# Monitor Space Usage





# Services

# Rule Editor

**Running rules**

Select, edit and run rules

**Rule Editor**

From EnginFrame

- getATInfoByUserName.ir
- getLeesaInfo.ir
- getSystemTime.ir
- getUserInfo.ir**
- myListColl.ir

getUserInfo | msiGetUserInfo(\*Username,\*BUF,\*Status)##write \*Username=%% ruleExecOut

Execute rule Rule name:  Save rule Clear

public	10004	rodsgroup	TUCASI		01266586157	2010-02-19.08:29:17
efrods	10012	rodsuser	TUCASI		01266586681	2010-02-19.08:38:01
efrodsadmin	10015	rodsadmin	TUCASI		01266586689	2010-02-19.08:38:09
waldoirods	10007	rodsadmin	TUCASI		01266586157	2010-02-19.08:29:17
rodsBoot	9002	rodsadmin	TUCASI		1170000000	2007-01-28.11:00:00
rodsadmin	9001	rodsgroup	TUCASI		1170000000	2007-01-28.11:00:00
leesa	10018	rodsuser	TUCASI		01266586756	2010-02-19.08:39:16
tip	10027	rodsuser	TUCASI		01267209228	2010-02-26.13:33:48
TUCASI	10024	rodsuser	TUCASI		01267209222	2010-02-26.13:33:42
						0