



# iRODS@RENCI

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renci

RESEARCH \ ENGAGEMENT \ INNOVATION

# irods@renci

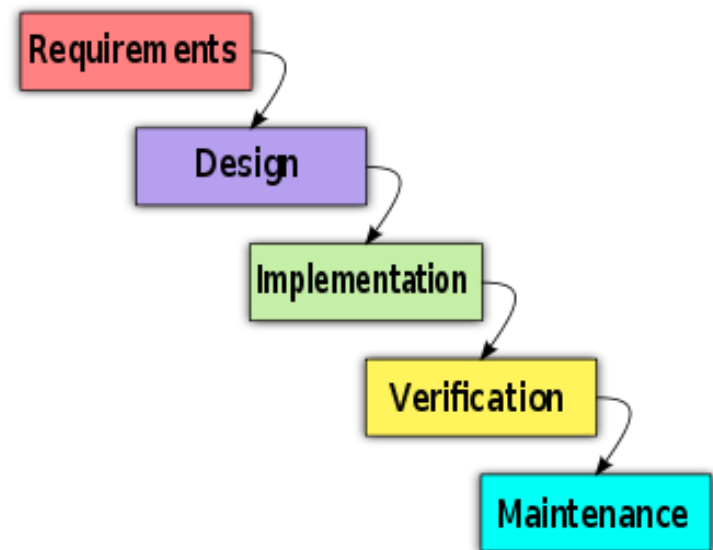
- A new initiative at the Renaissance Computing Institute (RENCI), a research unit of UNC
- An investment by UNC
- A step-up of the collaboration with DICE, already administratively tied to RENCI:
  - DICE-UCSD: Institute of Neural Computing (INC)
  - DICE-UNC: RENCI and the School of Information and Library Science (SILS)
- Stepping toward long-term sustainability

# Agile Development Approach

- Incremental and iterative methodology
- Short development cycles (1-4 weeks)
- Whole team works through a full dev cycle:
  - planning - stakeholder needs taken into account
  - requirements analysis
  - design
  - coding
  - unit and acceptance testing
  - product demonstrated to stakeholders
- Iterate for next dev cycle, adapting to new requirements, technological constraints, etc

# Agile: Not a Waterfall Model

- Waterfall Model:  
good for manufacturing,  
not for software dev
- Agile:  
requirements and solutions evolve  
in short-cycle collaboration between  
self-organizing, cross-functional teams
- iRODS:  
*de facto* Agile development driven by community  
stakeholders; could never have evolved in a waterfall  
model
- RENCi:  
formalize an Agile approach in iRODS development for hardening,  
community participation, and sustainability

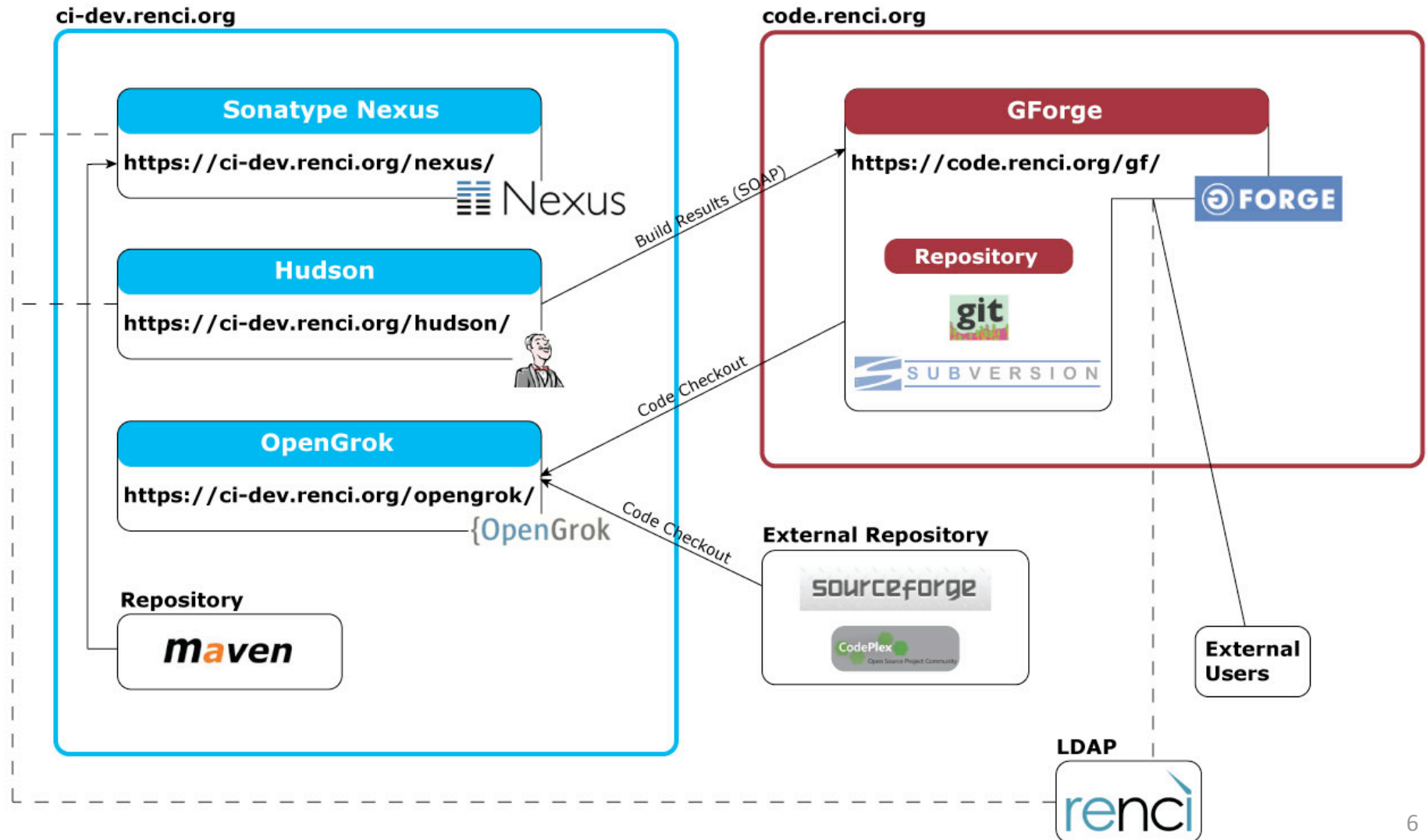


# Collaborative Development Environment

- Git – distributed revision control system
- GForge – project and software development management system:
  - hosting & version control
  - bug-tracking
  - messaging
- Hudson – continuous integration environment: incremental quality control
- Nexus – Maven repository that tracks dependencies and bundles for check-out (Java)

# Infrastructure Overview

Supports community-based software development





# Collaborative Dev Environment

- Starting out with Jargon to test the infrastructure
- Other iRODS clients hosted : PHP, Windows, Python, etc
- A full iRODS mirror will reside in this environment
- Provide automated continuous build and test for iRODS server and clients

# GForge

Academic license: no limit on # of users

Community based plug-ins: Forums  
Trackers  
Document Managers  
News

File Release System  
Mailing lists  
Wiki  
Continuous Build

<https://code.renci.org/gf/>

**GForge® Advanced Server**  
GForge AS is completely rebuilt to make a modern, extensible platform with an intuitive interface that ties together a huge toolset, from Source Code Management (SCM) to extremely customizable Trackers, Task Managers, Document Managers, Forums, Mailing Lists. All of these are controlled by a centralized permission system and maintained automatically by the system.

**COLLABORATION**  
Among Developers

**OUTPUT**  
Release to End Users

**CONTROL**  
For Managers

**AUTHENTICATION**  
Such as Corporate LDAP

**ACCESS**  
For HTML and SOAP

**SOURCE CODE**  
CVS, Sub-Version,

**Activity**

**Recently Registered Projects**

- (2011-02-10) [The Missing Link](#)
- (2011-02-09) [DROPS](#)
- (2011-02-04) [IRODS PHP](#)
- (2011-01-31) [IRODS Jargon trunk](#)
- (2011-01-26) [Sequencing](#)
- (2011-01-25) [Sarcomere](#)
- (2011-01-20) [Region III](#)
- (2011-01-19) [IRODS Fedora Repository Integration](#)
- (2011-01-19) [WRF](#)
- (2011-01-18) [Science of Open Source](#)

**Top Downloads**

**Browse Project Topics**



# GForge

## Projects in RENCi gforge

<https://code.renci.org/gf/project/>

		on TeraGrid, Open Science Grid, and RENCi resources. These resources are accessible via standard web services, JSR-168 compliant Portlets, or Java Swing desktop applications.
<a href="#">Region III</a>	<a href="#">region3</a>	Region III prototype development
<a href="#">Java Commons</a>	<a href="#">commons</a>	Assortment of Java based projects that are RENCi centric and highly reusable.
<a href="#">iRODS PHP</a>	<a href="#">irodsphp</a>	PHP client libraries and PRODS web browser for iRODS
<a href="#">iRODS Jargon trunk</a>	<a href="#">jargontrunk</a>	Classic Jargon API style as in iRODS trunk in SVN.
<a href="#">iRODS Jargon</a>	<a href="#">jargon</a>	Jargon-core and related libraries. This is the new core Java API for iRODS Jargon-core and related libraries are currently alpha, with an expected beta release in February. This code-base is differentiated from the current Jargon API style in the iRODS SVN trunk. These libraries may be used for development projects, but it is recommended to check in with the developers before proceeding.
<a href="#">iRODS iDrop</a>	<a href="#">irodsidrop</a>	iDrop consists of desktop and web GUI's for browsing and accessing iRODS data.
<a href="#">iRODS Fedora Repository Integration</a>	<a href="#">irodsfedora</a>	Tools and API for iRODS/DuraSpace integration projects
<a href="#">gForge@RENCi</a>	<a href="#">gforge_renci</a>	Project for tracking bugs/issues with the gForge installation at RENCi.
<a href="#">DROPS</a>	<a href="#">drops</a>	Orchestrating Distributed Resource Ensembles for Petascale Science. Sponsored by DOE ASCR.

[Add new Project](#) [Filter by category](#)

Search for projects in all categories

# GForge

## Tracking Feature Requests in Jargon Trunk

The screenshot shows the GForge web interface for tracking feature requests in the iRODS Jargon trunk. The page has a blue header with the GForge logo and navigation links: Home, My Stuff, Search, Projects (selected), and Snippets. There are also links for Log In and Register New Account. Below the header, a breadcrumb trail reads: Home » Projects » iRODS Jargon trunk » Tracker » Feature Requests » Browse Tracker Item. The main content area includes a search bar with fields for ID, Summary, Priority (set to Any), Assignee (set to Any), Status (set to Any), Sort By (set to ID), and Order (set to Ascending), followed by a Browse button. Below this is a table of feature requests with the following data:

ID	Summary	Priority	Assignee	Submitted By	Status	Open Date	Close Date	Last Modified Date
54	<a href="#">port over user modify password</a>	3	Nobody	<a href="#">Mike Conway</a>	Open	2011-02-01		2011-02-01
55	<a href="#">Davis conn sharing probs using miscServerInfo heartbeat ping</a>	3	Nobody	<a href="#">Mike Conway</a>	Closed	2011-02-01	2011-02-07	2011-02-07
56	<a href="#">verify new performance query values</a>	3	Nobody	<a href="#">Mike Conway</a>	Open	2011-02-01		2011-02-01
59	<a href="#">recursive metadata listing</a>	3	Nobody	<a href="#">Mike Conway</a>	Open	2011-02-01		2011-02-01

At the bottom right of the table is a button labeled "Add new Tracker Item". On the left side of the page, there is a sidebar with the "iRODS Jargon trunk" section, which includes links for Summary, Reporting, Search, and Forums. Below this is the "Tracker" section with links for Bugs, Feature Requests (selected), and Browse. A small number "1" is visible at the bottom left of the sidebar.

# GForge

## Tracking Project Activity in Jargon Trunk

**iRODS Jargon trunk**

- >> Summary
- **Reporting**
- Development Roadmap
- Project Activity
- Disk Usage
- Tracker Report
- Time Tracking Report
- >> Search
- >> Forums
- >> Tracker
- >> Docs
- >> News
- >> Wiki

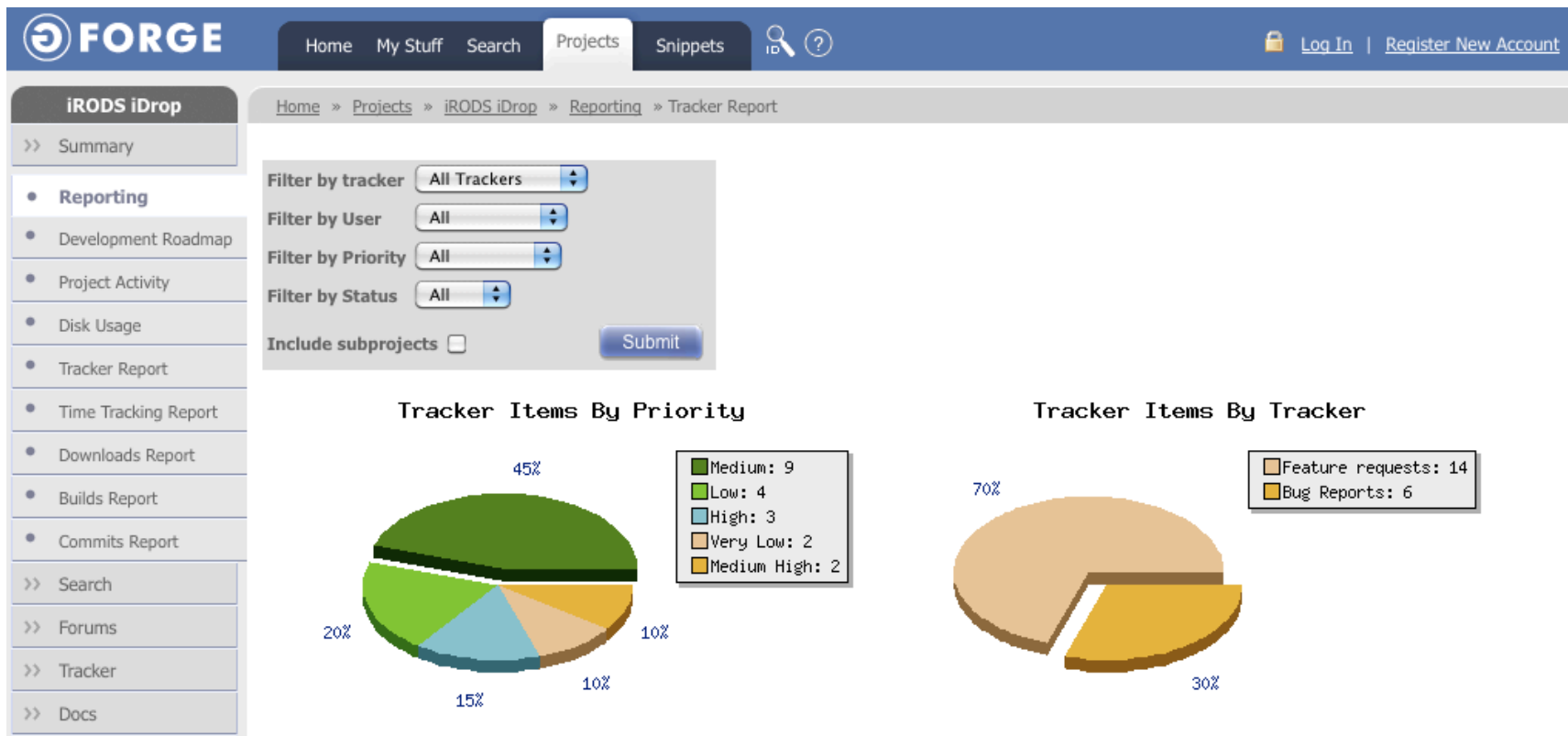
Home » Projects » iRODS Jargon trunk » Reporting » Project Activity

Activity Type	Start Date	End Date	
Commit	Jan 16 2011	Feb 15 2011	Submit
Tracker item activity			
Forum post			

Time	Activity Type	By
2011-Feb-09		
13:43:08	<a href="#">Tracker item "io exception on rule execution" opened</a>	<a href="#">Mike Conway</a>
2011-Feb-07		
10:54:08	<a href="#">Tracker item "fixup 2.5 rods server level checks before release and test" opened</a>	<a href="#">Mike Conway</a>
10:52:31	<a href="#">Tracker item "Davis conn sharing probs using miscServerInfo heartbeat ping" changed status to Closed</a>	<a href="#">Mike Conway</a>
2011-Feb-01		
11:38:40	<a href="#">Tracker item "irodsAccount mod password results in leaking db conns?" opened</a>	<a href="#">Mike Conway</a>
11:33:51	<a href="#">Tracker item "recursive metadata listing" opened</a>	<a href="#">Mike Conway</a>
11:11:39	<a href="#">Tracker item "verify new performance query values" opened</a>	<a href="#">Mike Conway</a>
11:02:48	<a href="#">Tracker item "Davis conn sharing probs using miscServerInfo heartbeat ping" opened</a>	<a href="#">Mike Conway</a>
11:00:54	<a href="#">Tracker item "port over user modify password" opened</a>	<a href="#">Mike Conway</a>
10:50:09	<a href="#">Tracker item "review permissions queries for file and dir/overhead on recursive set perm on coll" opened</a>	<a href="#">Mike Conway</a>
10:23:49	<a href="#">Tracker item "Bug 120 - -4000 errors when using IRODSFile " opened</a>	<a href="#">Mike Conway</a>
10:16:51	<a href="#">Tracker item "max parallel threads checks get/put" opened</a>	<a href="#">Mike Conway</a>
10:16:00	<a href="#">Tracker item "fix client side get/put rule execution" opened</a>	<a href="#">Mike Conway</a>
10:14:46	<a href="#">Tracker item "fix put to use single call if length &lt; max size for one buf" opened</a>	<a href="#">Mike Conway</a>

# GForge

## iDrop Tracker Report Activity



# GForge

## Project Summary for iRODS PHP

**iRODS PHP**  
• **Summary**  
» Reporting  
» Search  
» Forums  
» Tracker  
» Docs  
» News  
» Wiki  
» Build  
» Git

Home » Projects » iRODS PHP » Home

**Recent News**  
**Now testing fix for "auth error using PRODS web browser"**  
[Lisa Stillwell](#)  
2011-02-15  
This fix involves a change to the PHP web client to require zone name when logging on. The fix is currently being tested and will be submitted soon.

Time	Activity Type	By
2011-Feb-15		
15:31:18	<a href="#">Tracker item "Max Results set too low when retrieving RODS File Stats" opened</a>	<a href="#">Lisa Stillwell</a>
15:13:28	<a href="#">Tracker item "Takes too long to populate pull-down menu of attribute names when collections with many AVUs" opened</a>	<a href="#">Lisa Stillwell</a>
14:39:43	<a href="#">Tracker item "Problem authenticating when federations exists with same user names" deleted</a>	<a href="#">Lisa Stillwell</a>
2011-Feb-04		
14:13:28	<a href="#">Commit: This is the initial commit to git. This code was pulled form here: <u>svn checkout http://extrods.googlecode.com/svn/trunk/ extrods-read-only</u></a>	<a href="#">Lisa Stillwell</a>
10:45:24	<a href="#">Tracker item "auth error using PRODS web browser" opened</a>	<a href="#">Mike Conway</a>

**Activity**  

Request to join project

**Description**  
PHP client libraries and PRODS web browser for iRODS

**Developer Info**  
[Mike Conway](#)  
[Lisa Stillwell](#)

**Trove Categorization**

- Development Status: 1 - Planning
- Intended Audience: Developers, End Users/Desktop
- License: BSD License
- Programming Language: PHP

# Hudson

<https://ci-dev.renci.org/hudson/>

## Build automation:

- Continuous build/test of software projects
  - easier for developers to integrate changes to the project
  - easier for users to obtain a fresh build
- Notification of failures to help keep systems healthy
- Monitor executions of externally-run jobs
  - cron jobs and procmail jobs, even running remotely
  - Hudson keeps job outputs and makes it easy to notice when something is wrong

The screenshot shows the Hudson web interface for the iRODS project. The browser address bar displays <https://ci-dev.renci.org/hudson/view/iRODS/>. The page title is "iRODS [Hudson]". The main content area shows a table of build history for the iRODS project. The table has columns for status (S), weather icon (W), job name, last success, last failure, and last duration. The table lists three builds: iRODS (5 days 3 hr, #98), irods-jargon (9 hr 51 min, #14), and irods-server-2.4.1 (11 hr, #25). The iRODS build is the most recent and successful. The left sidebar contains links for New Job, Manage Hudson, People, Build History, Edit View, Delete View, Project Relationship, Check File Fingerprint, and My Views. The bottom of the page shows the page generation time and version: "Page generated: Feb 15, 2011 9:17:18 PM Hudson ver. 1.383".

S	W	Job ↓	Last Success	Last Failure	Last Duration
●	☀	<a href="#">iRODS</a>	5 days 3 hr (#98)	N/A	28 sec
●	☁	<a href="#">irods-jargon</a>	9 hr 51 min (#14)	9 hr 52 min (#13)	7 min 51 sec
●	☀	<a href="#">irods-server-2.4.1</a>	11 hr (#25)	N/A	1 min 40 sec

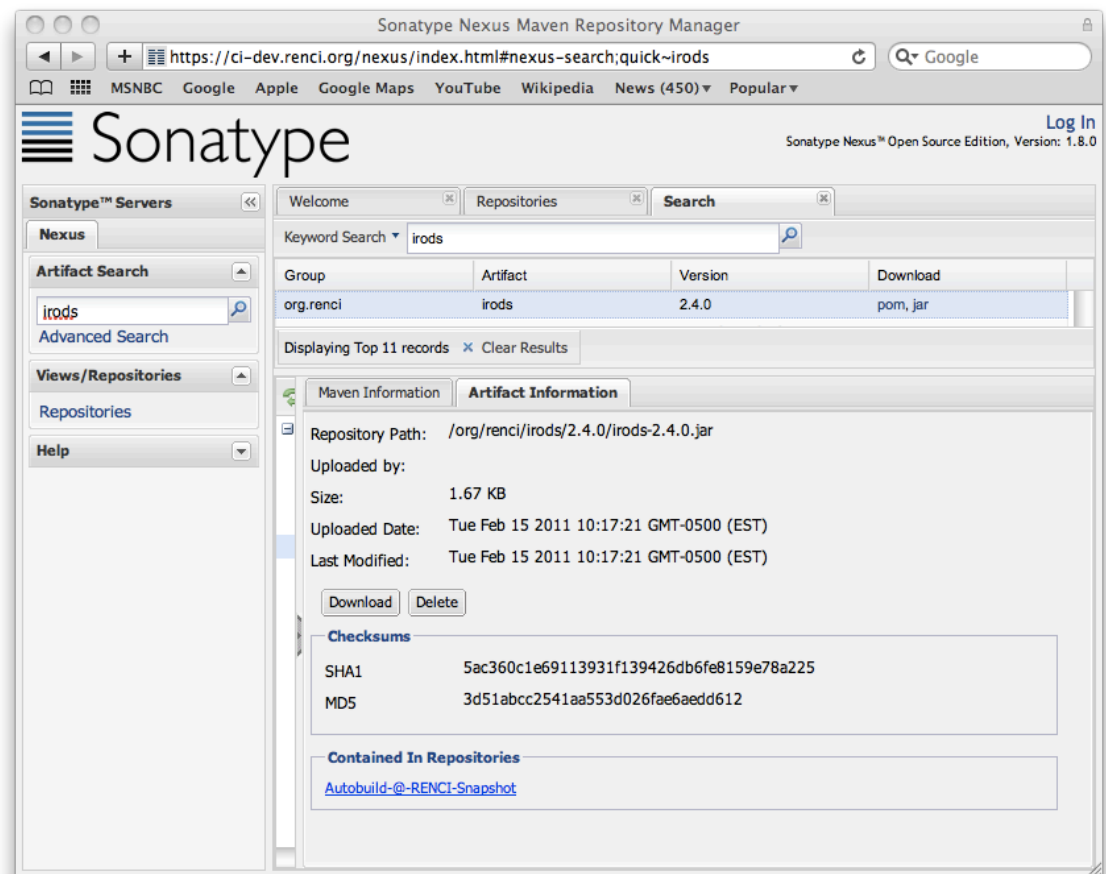


# Sonatype Nexus

<https://ci-dev.renci.org/nexus/>

## Nexus - Maven artifact repository

- Manages software artifacts for development, deployment, and provisioning
- Allows sharing of artifacts with other developers and end-users
- Centralized control of access and deployment of artifacts



# Toward a Unified Cross-Platform Code

- Migrate platform-specific APIs and system calls away from server-level code
- Provide strategy for future support on other platforms
- Move to g++ for access to libraries such as Boost C++ libraries

## Targeted APIs and Functions:

- Threading
- Regular Expressions
- Character Encoding
- Signals
- Fork

## Current Status:

- port to g++ is done and build is passing devtest
- Move to boost::thread is almost complete and also passing devtest

# Windows Support

- Update of non-iCAT iRODS server
- Implementation of iCAT-enabled iRODS server:
  - Integration of MS SQL Server with iRODS
  - Builds of supported iCAT DBs for Windows
- Support of Windows iExplorer client

# iRODS.NET Client

- Connect to iRODS server from .NET platform
  - iRods.NET Client will perform most of the iRODS client operations
  - Native integration with .NET Framework
  - Supports .NET 3.5 and up
- Usage scenarios for iRODS.NET Client
  - LinqToIRods development to query iRODS server
  - Powershell commands to simulate icommands
  - Drive or folder mounted to iRODS
  - .NET web and windows application development

# Database Activities

- Database Resources Testing
  - DBR interaction with database instances: MySQL, Oracle, Postgres on Ubuntu 10.10
    - Local to iRODS server
    - Remote to iRODS server
- Developing MS SQL Server Interface to support iCAT Windows Implementation
- iCAT data redundancy and failover mechanisms
- iCAT Special Query Usage and Applicability with examples
- iCAT database performance tuning and recommended enhancements

# Java Rule Engine

- Analyze design and resource requirements for a Java-based rule engine
  - Determine best inter-process communication method between (next-gen) C engine and Java
  - Semantic synchronization with C engine
  - Integration with Jargon
- Analysis complete by summer 2011



# iRODS Clients: PHP API & Web Browser

## iRODS@RENCI Start-up:

- Assist DICE with ongoing support
- Monitor Chat discussion (already fixed 1 issue!)
- Pull most complete & up-to-date versions from DICE/Google Code/Community and merge
- Put in GForge, Git repository.
- Incorporate PHPUnit and Hudson continuous integration



# PHP API & Web Browser

## Community Involvement:

- Who is using PHP API/Web Browser?
- Who is contributing to source?
- Who would like to help maintain?
- What new features are needed?



# PHP API & Web Browser

## Long-Term Planning:

- Determine new feature set
- Investigate implementation technologies (i.e. PHP in JAVA VM)
- Standardization among client APIs (i.e. iRODS Server/Client compatibility versioning, and standardize function & parameter naming)
- Hardening



# Special Projects

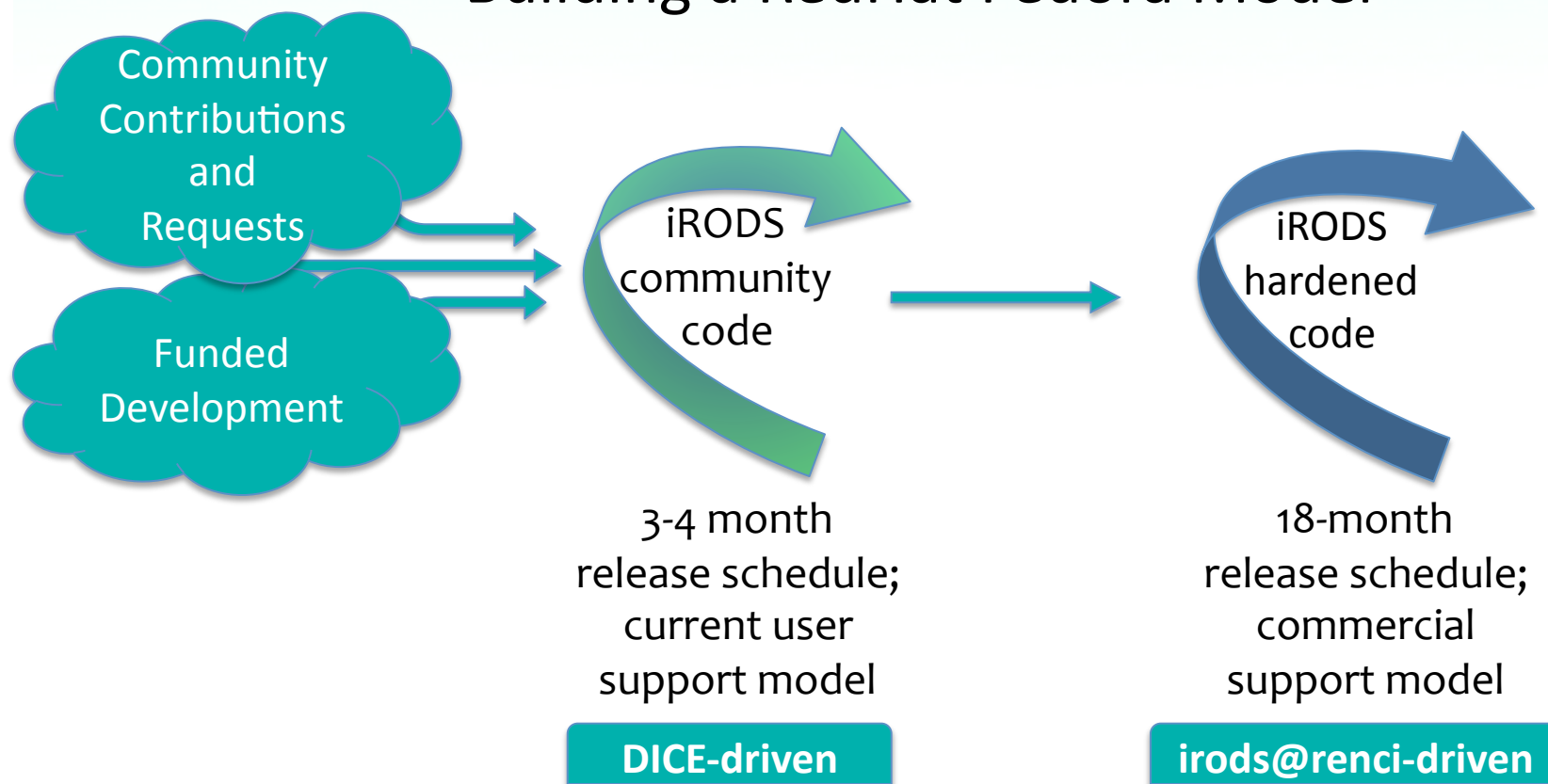
- NCDC use cases
- Hadoop driver - genomics
- TUCASI project – federated environment for the 3 Triangle universities (Duke, NCSU, UNC)
- Shibboleth Authentication – map external authenticated user to iRODS user (TUCASI project)
- NARA – Cyberinfrastructure for Billions of Records
- NC Bio Preparedness – distributed data access

# Sustainability – the Community Architecture Model

- Support and formalize the collaborative model for iRODS
  - Collaborative development environment
  - Agile development approach
- Red Hat Fedora model (Fedora Linux, not Fedora Digital Repository)
- Develop service level agreements for targeted user groups

# irods@renci

## Building a RedHat Fedora Model





# Differences Between Community and Hardened Releases

	Community Code	Hardened Code
Users	Technical enthusiasts using iRODS in non-critical computing environments	Users looking for stable, supported, and certified iRODS (business, government, etc)
Primary Benefits	Bleeding-edge technology released early and often.	Stable, reliable, and broadly supported. Easy to deploy and manage. Many certified applications available.
Feature Selection	DICE and developer community	DICE and irods@renci
Development Model	Open Source	Open Source

# Community Release vs. Hardened Release

	Community Code	Hardened Code
Certifications	None	Hardware, software
Support Options	None (community supported)	Many, including 24x7 with 1 hour response. Unlimited incidents. Include upgrades
Maintenance & Updates	Community & 3rd party driven	Complete update and management
Testers	Developer Community	irods@renci, DICE, partners, beta team
Price	Free download	Annual subscription, multiple offerings

# Service Level Agreements

The extension of the community code

- hardened code base
- certifications
- specialized services for target groups

will lead to service level agreements tailored to target user needs.