

iRODS Policies

integrated Rule Oriented Data System

Reagan Moore

{moore, sekar, mwan, schroeder, bzhu, ptooby, antoine, sheauc}@diceresearch.org

{chienyi, marciano, michael_conway}@email.unc.edu



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



1

THE
NATIONAL
ARCHIVES
ARCHIVES.GOV

Computer Actionable Rules

- A policy implements a computer actionable rule
 - The rule is composed from micro-services
- Policies are stored in a rule base
 - `irods/server/config/reConfigs/core.irb`
- The `core.irb` file can be dynamically changed
 - Lists default rules for all policy-governed actions
 - First valid rules that are found from a top down search will be executed



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



iRODS Policy Hooks (64)

- Can list the default policies by executing
 - `irule -F showcore.ir`

```
1051 core.acPreProcForDeleteResource(*RescName)
```

```
{ nop }
```

```
1052 core.acPostProcForDeleteResource(*RescName)
```

```
{ nop }
```

```
1053 core.acPreProcForDeleteToken(*TNameSpace,*TName)
```

```
{ nop }
```

```
1054 core.acPostProcForDeleteToken(*TNameSpace,*TName)
```

```
{ nop }
```

```
1055 core.acPreProcForModifyResource(*ResourceName,*Option,*NewValue)
```

```
{ nop }
```

Most are defaulted to no operation, but can be modified to insert your policy



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



Implications

- A separate rule engine is installed at each storage location
- A separate rule base is located at each storage location
- To ensure uniform policies, need to update each rule base to contain the same policies
 - Can add policies to the rule base that are unique to the storage system



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



THE
NATIONAL
ARCHIVES
ARCHIVES.GOV

Rule Syntax

- Rules written as

Action-name | *Condition* | *Workflow-chain* | *Recovery-chain*

<i>Action-Name</i>	Linked to a specific hook in iRODS framework, executed each time that hook is reached
<i>Condition</i>	Criteria that must be met for the rule to execute
<i>Workflow-chain</i>	Chain of micro-services and rules that are executed
<i>Recovery-chain</i>	Chain of recovery micro-services that are invoked on a failure



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



Rule.ir File

- Consists of three lines:

1st line

Rule that is being applied

2nd line

Input parameters

3rd line

Output parameters



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



THE
NATIONAL
ARCHIVES
ARCHIVES.GOV

Interactive rule to list the core.irb file

List of showcore.ir file:

```
myTest||msiAdmShowIRB(*A)|nop  
null  
*A%ruleExecOut
```

- Very hard to debug for multi-step rules
- Rulegen program provides a more easily debugged syntax
- Rulegen -s showcore.r > showcore.ir



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



THE
NATIONAL
ARCHIVES
ARCHIVES.GOV

Rulegen Syntax

- One micro-service listed per line

```
myTest
{
    msiAdmShowIRB(*A);
}
INPUT *A=null
OUTPUT *A,ruleExecOut
```


Improvements to Rule Engine

- Hao Xu is developing an improved parser to track location of errors within a rule
- Example of new parser:



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



THE
NATIONAL
ARCHIVES
ARCHIVES.GOV