Introduction

Restful Objects provides a RESTful API to Naked Objects[1]. In effect, for a given domain application it exposes both the Naked Objects meta-model and the objects managed by the Naked Objects runtime.

The representation language used by RestfulObjects is XHTML, therefore viewable in a web browser (eg Firefox or IE7). This XHTML isn't pretty to look at; the content is intended to be consumed by a client-side program. Nevertheless, it is useful from a development perspective to be able to easily view the representations created by the Restful Objects codebase.

Restful Objects goes further than this though. In usual RESTful style, the resources (i.e. domain objects) are manipulated using HTTP GET, PUT, DELETE and POST. The XHTML representations generated include XHTML FORM elements to invoke set properties, add/remove objects to collections, and to invoke actions. Because current browsers cannot perform PUT and DELETE methods, the XHTML forms invoke simple Javascript to make the HTTP calls. A dedicated client-side program is expected to ignore these XHTML FORMs and to invoke the HTTP resources directly.

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[1] www.nakedobjects.org

Relationship with Naked Objects

Restful Objects is a sister project to Naked Objects, and as such conforms to the general architecture defined by Naked Objects. Specifically, it provides a viewer component, analogous to Naked Objects' own HTML viewer or indeed to the viewer provided by Scimpi[2] (another sister project).

Like those other viewers, Restful Objects ultimately consists of a set of servlets and servlet filters. For a production deployment these need to be assembled into a webapp; the intent is to provide an archetype to assist with this.

For development a less heavyweight approach is appropriate. Restful Objects therefore uses some of the infrastructure provided by Naked Objects, deploying its servlets within a standalone Jetty server. This is implemented a (Naked Objects) *ServletListener*. Bottom line is that Restful Objects can be run as a standalone command line program that bootstraps the Jetty webserver. More on this below.

Building from Source

If you are thinking about modifying or contributing to Restful Objects, then you'll want to be able to build the code from source and to deploy in a development environment.

Both Restful Objects and Naked Objects are built using Maven 2. We recommend that you build Naked Objects itself from source, installing the Naked Objects modules into your local Maven repository. Then, you can build Restful Objects.

Although you can just use Maven from the command line, you'll almost certainly want to use an IDE for proper development. We use Eclipse IDE with the M2Eclipse plugin. The maven-eclipse-plugin can be used to generate the Eclipse .project and related files; that's why they aren't checked into source code. If you use another IDE, then you may well find a similar Maven plugin.

Prerequisites

Install a Subversion client, for example TortoiseSVN[3].

Install Java 5, setup JAVA_HOME

Install Maven 2.0.9 or later, setup MAVEN_HOME, add *mvn* to PATH.

Install Eclipse 3.4 (JEE edition recommended).

Also highly recommended are the M2Eclipse and the Subclipse plugins[4].

Source Code Repository

Restful Objects is hosted at https://restfulobjects.svn.sourceforge.net/svnroot/restfulobjects.
Naked Objects is hosted at https://nakedobjects.svn.sourceforge.net/svnroot/nakedobjects.

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[2] www.scimpi.org. Another sister project of Naked Objects, providing a collection of taglibs to build Naked Objects web applications.

[3] http://tortoisesvn.tigris.org

[4] http://m2eclipse.codehaus.org/ and http://subclipse.tigris.org/

Building Naked Objects

Building from the Command Line

The Naked Objects framework is at .../framework/trunk. Check out that directory. Then build using:

```
$ mvn clean install
```

Building in Eclipse

First, at the command line, use

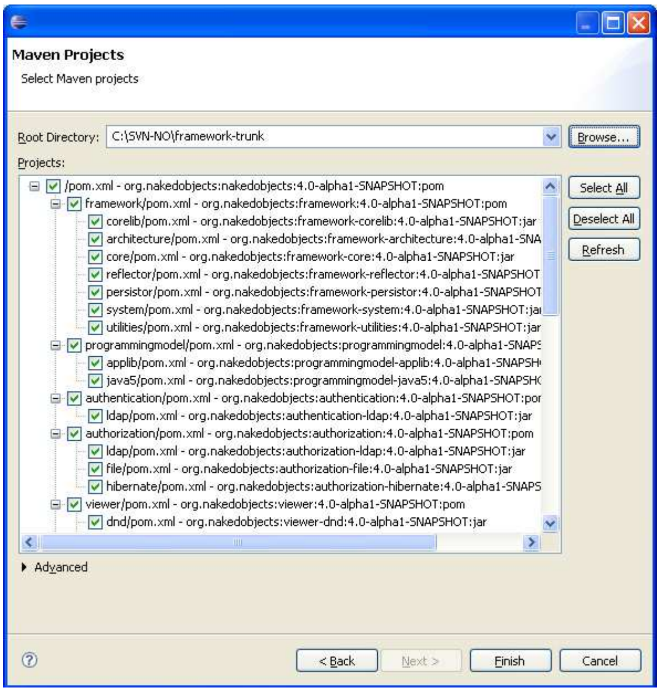
```
$ mvn eclipse:m2eclipse
```

This (re)generates the Eclipse project files from the pom.xml files.

Then, in Eclipse create a new empty workspace outside the SVN directory tree. Then import all the projects using:

File > Import > General > Maven Projects

Specify the framework/trunk as root directory. The M2Eclipse plugin will locate all the Maven projects referenced:



Root Directory: C:\SVN-NO\framework-trunk

Projects:

- ☑ /pom.xml - org.nakedobjects:nakedobjects:4.0-alpha1-SNAPSHOT:pom
  - ☑ framework/pom.xml - org.nakedobjects:framework:4.0-alpha1-SNAPSHOT:pom
    - ☑ corelib/pom.xml - org.nakedobjects:framework-corelib:4.0-alpha1-SNAPSHOT:jar
    - ☑ architecture/pom.xml - org.nakedobjects:framework-architecture:4.0-alpha1-SNA
    - ☑ core/pom.xml - org.nakedobjects:framework-core:4.0-alpha1-SNAPSHOT:jar
    - ☑ reflector/pom.xml - org.nakedobjects:framework-reflector:4.0-alpha1-SNAPSHOT
    - ☑ persistor/pom.xml - org.nakedobjects:framework-persistor:4.0-alpha1-SNAPSHOT
    - ☑ system/pom.xml - org.nakedobjects:framework-system:4.0-alpha1-SNAPSHOT:ja
    - ☑ utilities/pom.xml - org.nakedobjects:framework-utilities:4.0-alpha1-SNAPSHOT:jar
  - ☑ programmingmodel/pom.xml - org.nakedobjects:programmingmodel:4.0-alpha1-SNAPS
    - ☑ applib/pom.xml - org.nakedobjects:programmingmodel-applib:4.0-alpha1-SNAPSH
    - ☑ java5/pom.xml - org.nakedobjects:programmingmodel-java5:4.0-alpha1-SNAPSH
  - ☑ authentication/pom.xml - org.nakedobjects:authentication:4.0-alpha1-SNAPSHOT:po
    - ☑ ldap/pom.xml - org.nakedobjects:authentication-ldap:4.0-alpha1-SNAPSHOT:jar
  - ☑ authorization/pom.xml - org.nakedobjects:authorization:4.0-alpha1-SNAPSHOT:pom
    - ☑ ldap/pom.xml - org.nakedobjects:authorization-ldap:4.0-alpha1-SNAPSHOT:jar
    - ☑ file/pom.xml - org.nakedobjects:authorization-file:4.0-alpha1-SNAPSHOT:jar
    - ☑ hibernate/pom.xml - org.nakedobjects:authorization-hibernate:4.0-alpha1-SNAPS
  - ☑ viewer/pom.xml - org.nakedobjects:viewer:4.0-alpha1-SNAPSHOT:pom
    - ☑ dnd/pom.xml - org.nakedobjects:viewer-dnd:4.0-alpha1-SNAPSHOT:jar

Hit Finish. You'll end up with a bunch of projects. You might then want to organize into working sets. We tend to organize by the top-level modules.

At the time of writing there seems to be one slight issue with the M2Eclipse: the classpath is incorrect for any webapp projects. There is currently only one such project: bootstrap-webapp. There is a howto doc in the root of that project that explains how to fix the classpath (basically: add the 'Web App Libraries' to the Java Build Path).

Building Restful Objects

The Restful Objects codebase lives in trunk/restfulobjects. The modules are:

- viewer – the servlets that generates the representations using the services of Naked Objects
- server-jetty - implementation of a Naked Objects ServerListener, running Restful Objects within an embedded Jetty servlet container.

To try out the code we also need a domain application; we'll use the example project in trunk/examples/carserv. Its modules are:

- carserv-dom is the domain model. The domain is a car servicing application (Customer, Car and Service).
- carserv-fixture is initial fixture set
- carserv-bootstrap is used to run up Restful Objects as a Naked Objects server listener using in-built Jetty.

This example is only intended for use with in-memory or xml object stores; there are no hibernate mappings or hibernate implementations of repositories. It's good enough for testing purposes though. The example has one additional dependency on a non-Maven library. Further details on installing this below.

The process for building Restful Objects is exactly the same as for Naked Objects.

Building from the Command Line

To build Restful Objects, use:

```
$ cd .../trunk/restfulobjects
$ mvn clean install
```

To build the CarServ example, first download the timeandmoney[5] JAR file (v0.5.1) from (the non-Maven dependency). Then, install into local repository using:

```
$ mvn install:install-file -D file=timeandmoney-v0_5_1.jar -D groupId=com.domainlanguage
 -D artifactId=timeandmoney -D version=0.5.1 -D packaging=jar -D generatePom=true
```

You can then build the CarServ example:

```
$ cd .../trunk/examples/carserv
$ mvn clean install
```

Building within Eclipse

To generate the Eclipse project files, use:

```
$ mvn eclipse:m2eclipse
```

Do this for trunk/restfulobjects, and then for trunk/examples/carserv.

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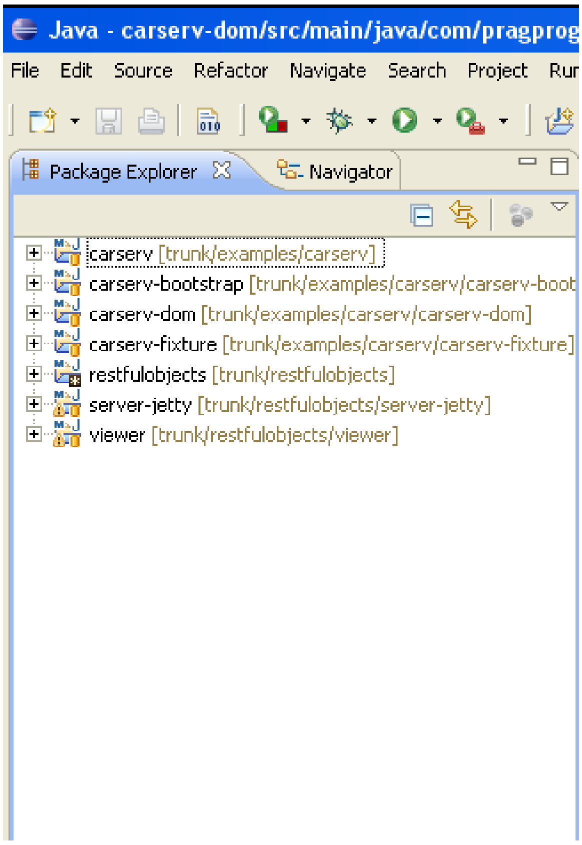
[5] The timeandmoney library is hosted at: http://sourceforge.net/projects/timeandmoney/.

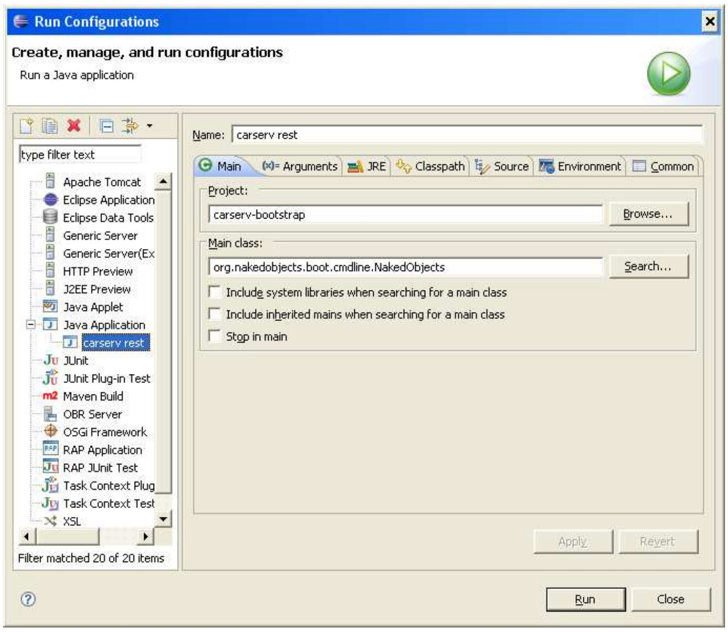
Then, in Eclipse, create a new workspace and import first Restful Objects and then the CarServ example. You should end up with:



carserv [trunk/examples/carserv]
carserv-bootstrap [trunk/examples/carserv/carserv-boot
carserv-dom [trunk/examples/carserv/carserv-dom]
carserv-fixture [trunk/examples/carserv/carserv-fixture]
restfulobjects [trunk/restfulobjects]
server-jetty [trunk/restfulobjects/server-jetty]
viewer [trunk/restfulobjects/viewer]

Running the Example

The application is run using org.nakedobjects.boot.cmdline.NakedObjects (which contains the main(...) method), specifying the RestfulObject's ServerListener. The easiest approach is to create the following Eclipse launch configuration:



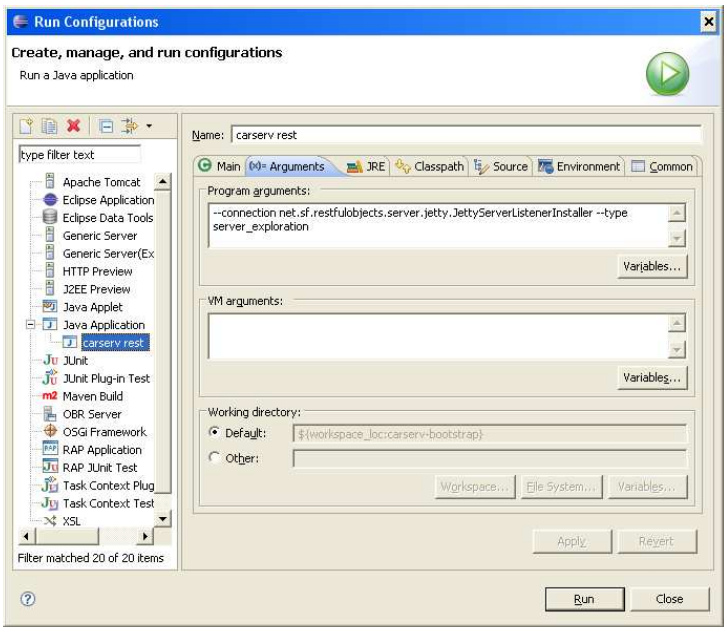
Name: carserv rest

Project: carserv-bootstrap

Main class: org.nakedobjects.boot.cmdline.NakedObjects

☐ Include system libraries when searching for a main class
☐ Include inherited mains when searching for a main class
☐ Stop in main

The main class is: *org.nakedobjects.boot.cmdline.NakedObjects*



Name: carserv rest

Program arguments: --connection net.sf.restfulobjects.server.jetty.JettyServerListenerInstaller --type server_exploration

VM arguments:

Working directory:
● Default: ${workspace_loc:carserv-bootstrap}
○ Other:

The arguments are:

--connection net.sf.restfulobjects.server.jetty.JettyServerListenerInstaller --type server_exploration

This will run Naked Objects in (server-side) exploration mode, meaning no authentication is performed, using an in-memory object store.

It is also possible to run in prototype mode (requiring authentication, but still with an in-memory object store), or to run in regular "production" mode. The table below summarizes the options:

Table 1: Type options

Type	--type	Object Store	Authentication
Exploration	server_exploration	In-memory	No
Prototype	server_prototype	In-memory	Yes; see config/passwords
Production	Server	XML ; change using --persistor	Yes; uses config/passwords

NB: to run up the DnD (to compare/contrast), the arguments are --type exploration --viewer dnd.

Using Restful Objects from a Web Browser

The representations of the meta-model and domain objects generated by Restful Objects are intended to be consumed by a client-side program. However (as discussed earlier), because the representations are XHTML plus some Javascript, it is possible to use a Web browser.

The representations fall into the following categories:

- /services
  all of the registered services (corresponding to icons in the DnD viewer)
- /object/*encoded_OID*
  shows a specific object. Note that services are singleton objects
- /specs/
  lists all known NakedObjectSpecifciations
- /specs/*fullyQualifiedClassName*
  shows a specific NakedObjectSpecifciation.
- /user
  shows the currently logged-on user.

Each is generated by corresponding XxxResource classes. So for example /services is generated by ServicesResource, /specs by SpecsResource. Each also supports various subresources.

If running in server_prototype mode, then the user/password should be specified as parameters:

http://localhost:7070/services?user=rcm&password=pass

where config/passwords contains:

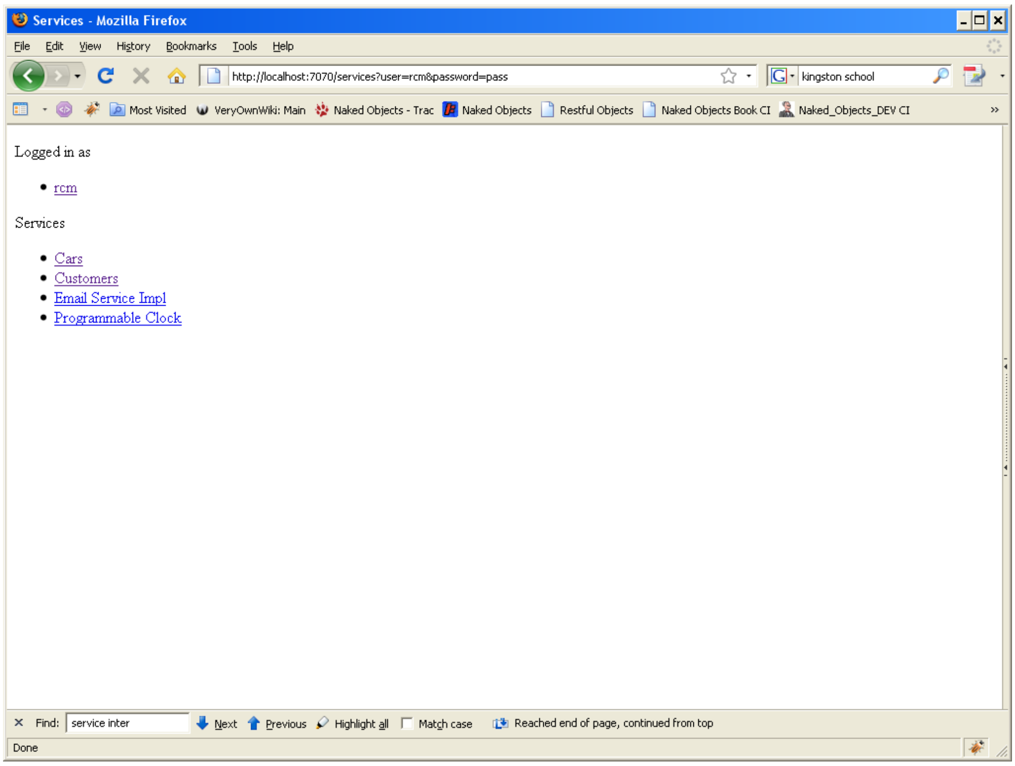
```
fbloggs:pass
rcm:pass:role1|role2|role3
dgs:pass
```

This admittedly isn't very secure, but it's something to look at later. (Would SSL be sufficient, passing the parameters as HTTP headers?)

Walkthrough

(You could also run through this using the DnD viewer).

List services:


Services - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/services?user=rcm&password=pass
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

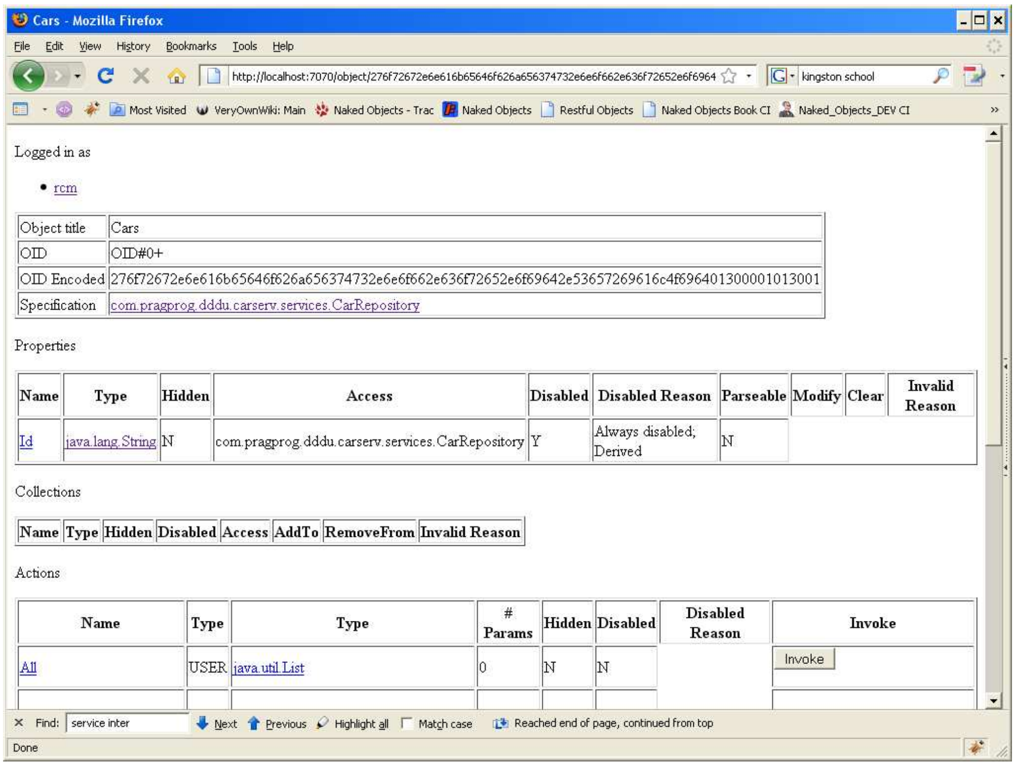
Logged in as

- rcm

Services

- Cars
- Customers
- Email Service Impl
- Programmable Clock

Click on Cars link, to bring up the CarRepository service:


Cars - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

Logged in as

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Object title	Cars
OID	OID#0+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f696401300001013001
Specification	com.pragprog.dddu.carserv.services.CarRepository

Properties

Name	Type	Hidden	Access	Disabled	Disabled Reason	Parseable	Modify	Clear	Invalid Reason
Id	java.lang.String	N	com.pragprog.dddu.carserv.services.CarRepository	Y	Always disabled; Derived	N			

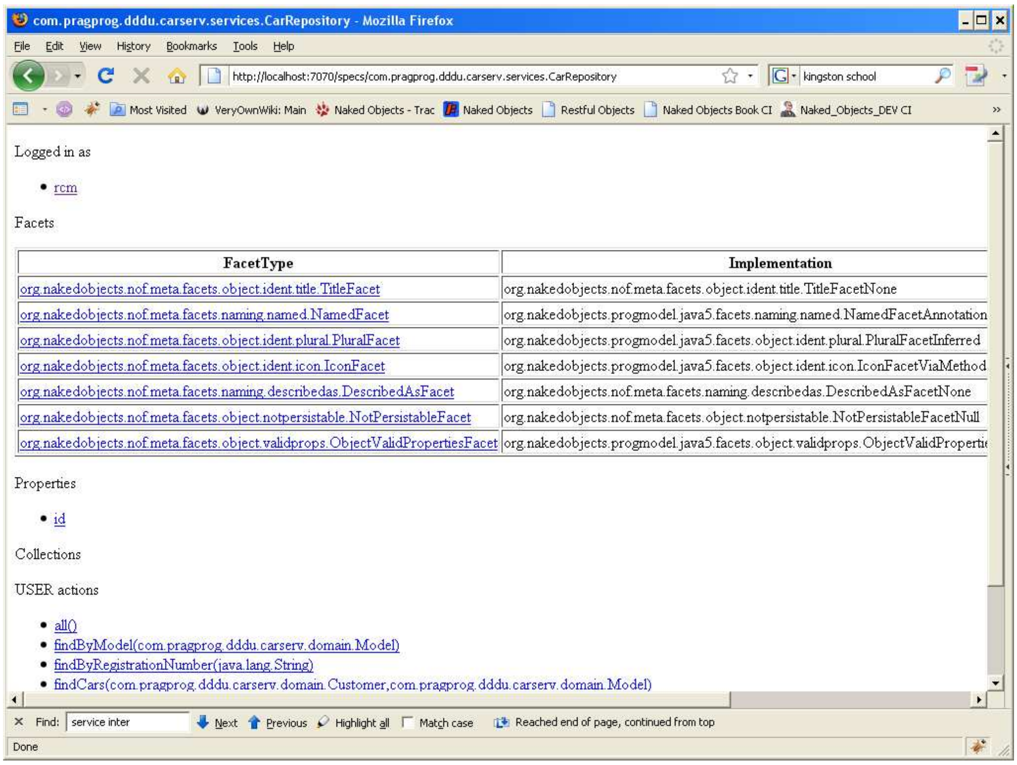
Collections

Name	Type	Hidden	Disabled	Access	AddTo	RemoveFrom	Invalid Reason

Actions

Name	Type	Type	# Params	Hidden	Disabled	Disabled Reason	Invoke
All	USER	java.util.List	0	N	N		Invoke

Click on the Specification link to view the structure of CarRepository:


com.pragprog.dddu.carserv.services.CarRepository - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/specs/com.pragprog.dddu.carserv.services.CarRepository
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Most Visited
VeryOwnWiki: Main
Naked Objects - Trac
Naked Objects
Restful Objects
Naked Objects Book CI
Naked_Objects_DEV CI
Find: service inter
Next
Previous
Highlight all
Match case
Reached end of page, continued from top
Done

Logged in as

- rcm

Facets

FacetType	Implementation
org.nakedobjects.nof.meta.facets.object.ident.title.TitleFacet	org.nakedobjects.nof.meta.facets.object.ident.title.TitleFacetNone
org.nakedobjects.nof.meta.facets.naming.named.NamedFacet	org.nakedobjects.progmodel.java5.facets.naming.named.NamedFacetAnnotation
org.nakedobjects.nof.meta.facets.object.ident.plural.PluralFacet	org.nakedobjects.progmodel.java5.facets.object.ident.plural.PluralFacetInferred
org.nakedobjects.nof.meta.facets.object.ident.icon.IconFacet	org.nakedobjects.progmodel.java5.facets.object.ident.icon.IconFacetViaMethod
org.nakedobjects.nof.meta.facets.naming.describedas.DescribedAsFacet	org.nakedobjects.nof.meta.facets.naming.describedas.DescribedAsFacetNone
org.nakedobjects.nof.meta.facets.object.notpersistable.NotPersistableFacet	org.nakedobjects.nof.meta.facets.object.notpersistable.NotPersistableFacetNull
org.nakedobjects.nof.meta.facets.object.validprops.ObjectValidPropertiesFacet	org.nakedobjects.progmodel.java5.facets.object.validprops.ObjectValidPropertie

Properties

- id

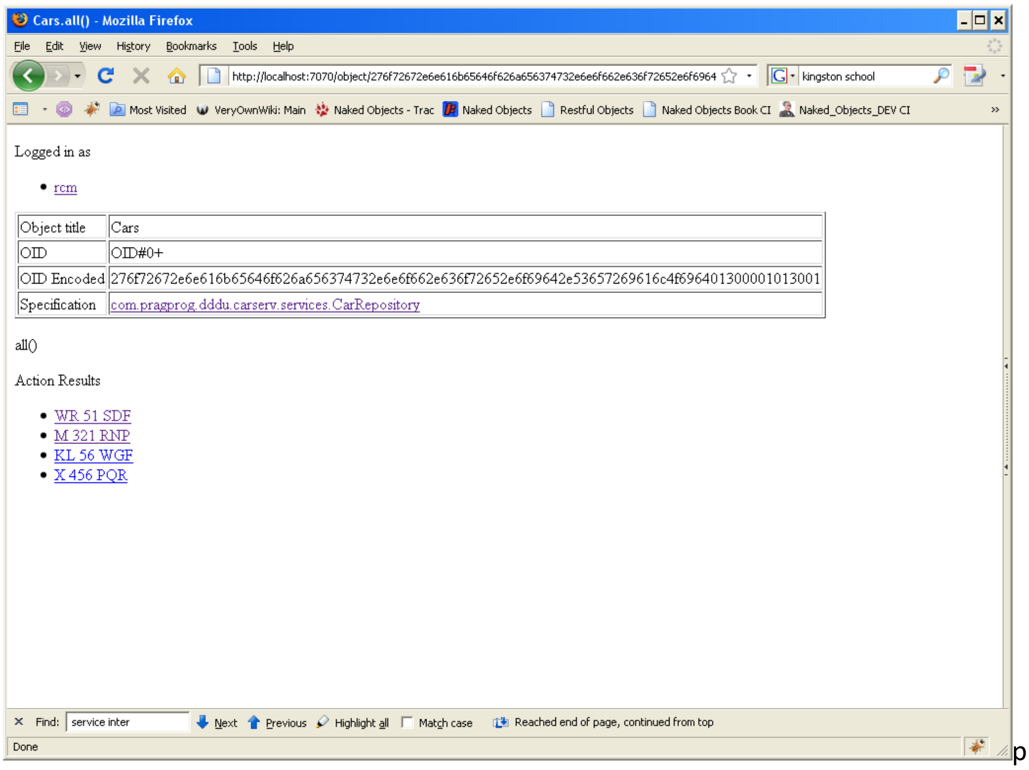
Collections

USER actions

- all()
- findByModel(com.pragprog.dddu.carserv.domain.Model)
- findByRegistrationNumber(java.lang.String)
- findCars(com.pragprog.dddu.carserv.domain.Customer,com.pragprog.dddu.carserv.domain.Model)

Navigate back to the CarRepository object.

Click on the "All" actions Invoke button (this performs a POST):


Cars.all() - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited
VeryOwnWiki: Main
Naked Objects - Trac
Naked Objects
Restful Objects
Naked Objects Book CI
Naked_Objects_DEV CI
Find: service inter
Next
Previous
Highlight all
Match case
Reached end of page, continued from top
Done

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Object title	Cars
OID	OID#0+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f696401300001013001
Specification	com.pragprog.dddu.carserv.services.CarRepository

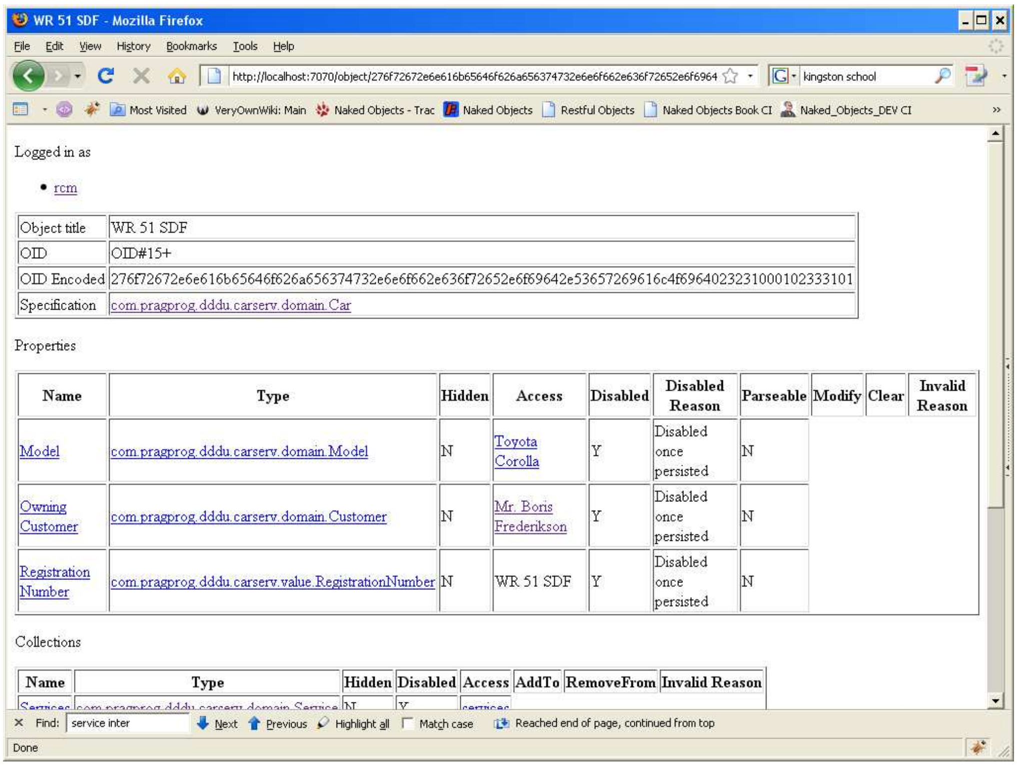
all()

Action Results

- WR 51 SDF
- M 321 RNP
- KL 56 WGF
- X 456 PQR

p

Click on "WR 51 SDF" link:


WR 51 SDF - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
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Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
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Object title	WR 51 SDF
OID	OID#15+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023231000102333101
Specification	com.pragprog.dddu.carserv.domain.Car

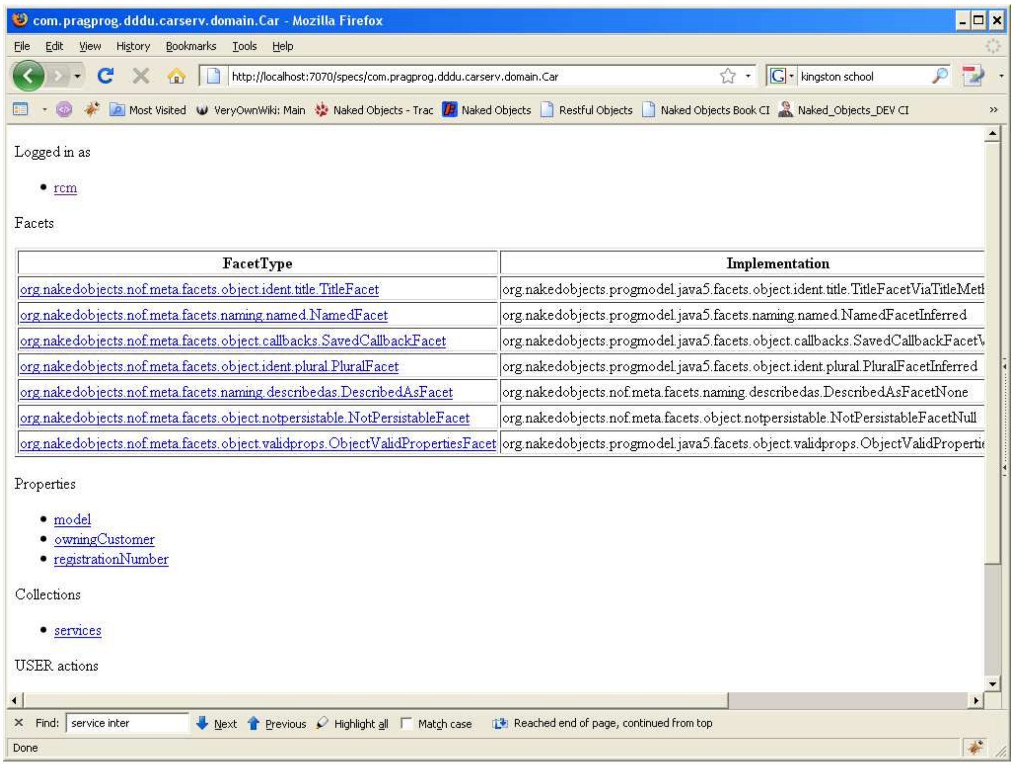
Properties

Name	Type	Hidden	Access	Disabled	Disabled Reason	Parseable	Modify	Clear	Invalid Reason
Model	com.pragprog.dddu.carserv.domain.Model	N	Toyota Corolla	Y	Disabled once persisted	N			
Owning Customer	com.pragprog.dddu.carserv.domain.Customer	N	Mr. Boris Frederikson	Y	Disabled once persisted	N			
Registration Number	com.pragprog.dddu.carserv.value.RegistrationNumber	N	WR 51 SDF	Y	Disabled once persisted	N			

Collections

Name	Type	Hidden	Disabled	Access	AddTo	RemoveFrom	Invalid Reason

Click on Specification link to view the structure of the Car class:


com.pragprog.dddu.carserv.domain.Car - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/specs/com.pragprog.dddu.carserv.domain.Car
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

Logged in as

- rcm

Facets

FacetType	Implementation
org.nakedobjects.nof.meta.facets.object.ident.title.TitleFacet	org.nakedobjects.progmodel.java5.facets.object.ident.title.TitleFacetViaTitleMet
org.nakedobjects.nof.meta.facets.naming.named.NamedFacet	org.nakedobjects.progmodel.java5.facets.naming.named.NamedFacetInferred
org.nakedobjects.nof.meta.facets.object.callbacks.SavedCallbackFacet	org.nakedobjects.progmodel.java5.facets.object.callbacks.SavedCallbackFacet
org.nakedobjects.nof.meta.facets.object.ident.plural.PluralFacet	org.nakedobjects.progmodel.java5.facets.object.ident.plural.PluralFacetInferred
org.nakedobjects.nof.meta.facets.naming.describedas.DescribedAsFacet	org.nakedobjects.nof.meta.facets.naming.describedas.DescribedAsFacetNone
org.nakedobjects.nof.meta.facets.object.notpersistable.NotPersistableFacet	org.nakedobjects.nof.meta.facets.object.notpersistable.NotPersistableFacetNull
org.nakedobjects.nof.meta.facets.object.validprops.ObjectValidPropertiesFacet	org.nakedobjects.progmodel.java5.facets.object.validprops.ObjectValidPropertie

Properties

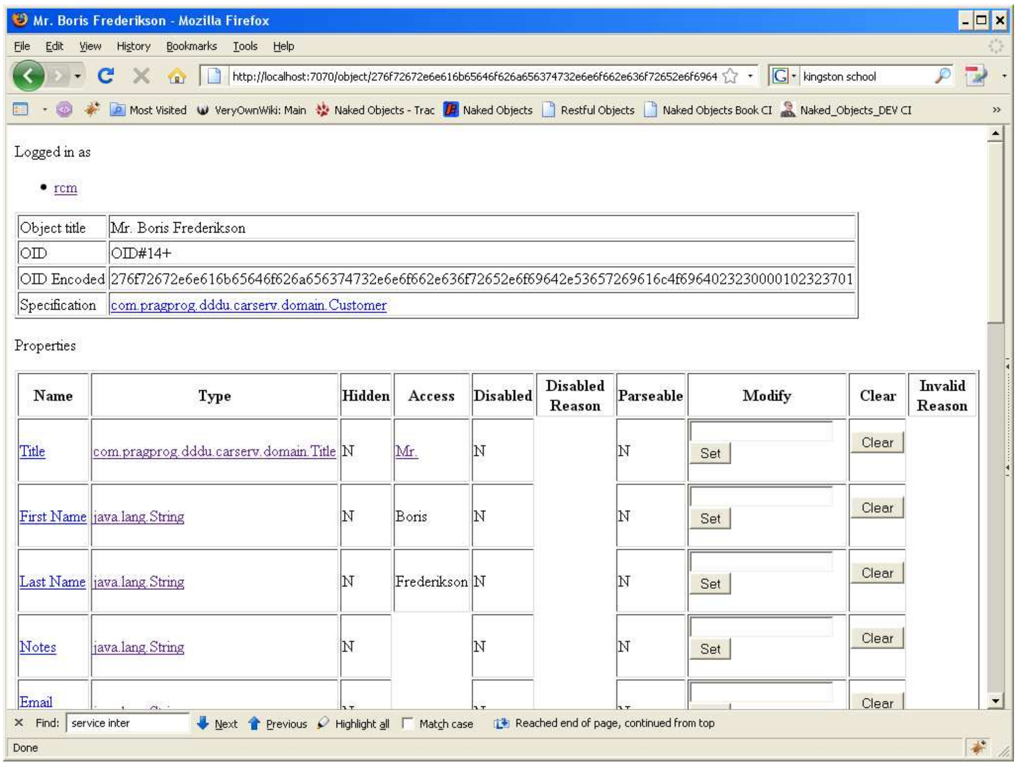
- model
- owningCustomer
- registrationNumber

Collections

- services

USER actions

Navigate back to the "WR 51 SDF" car.
Click on "Mr. Boris Frederikson" (referenced as the owning customer):



http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964

Logged in as

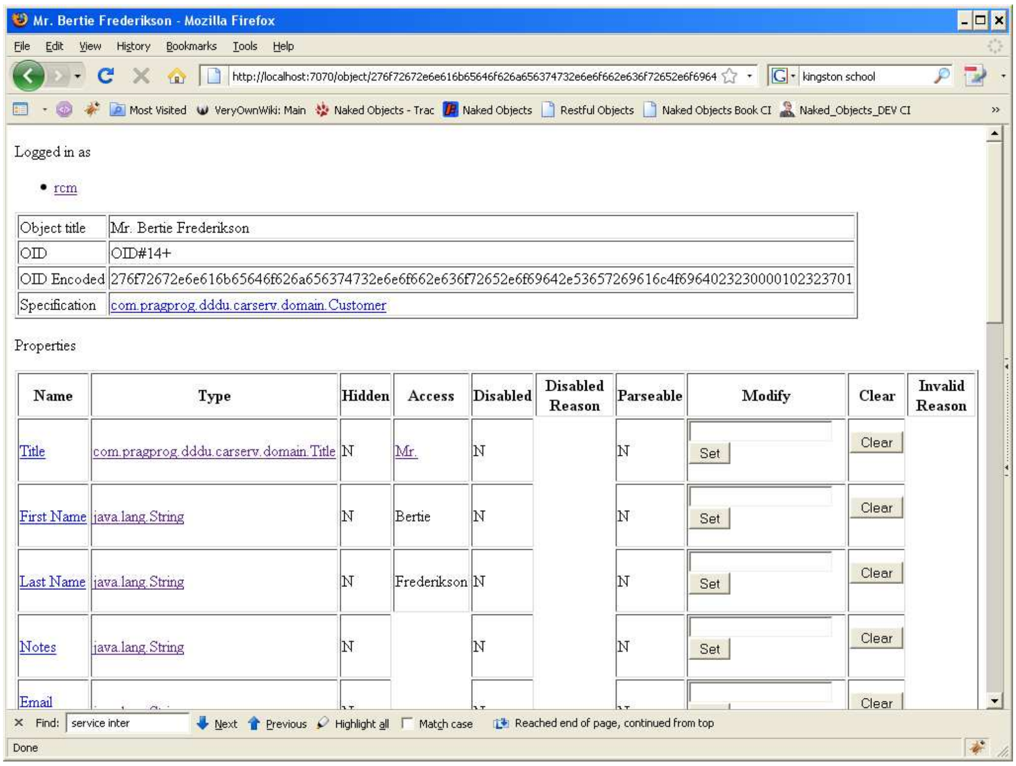
- rcm

Object title	Mr. Boris Frederikson
OID	OID#14+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023230000102323701
Specification	com.pragprog.dddu.carserv.domain.Customer

Properties

Name	Type	Hidden	Access	Disabled	Disabled Reason	Parseable	Modify	Clear	Invalid Reason
Title	com.pragprog.dddu.carserv.domain.Title	N	Mr.	N		N	Set	Clear	
First Name	java.lang.String	N	Boris	N		N	Set	Clear	
Last Name	java.lang.String	N	Frederikson	N		N	Set	Clear	
Notes	java.lang.String	N		N		N	Set	Clear	
Email								Clear	

For the "FirstName" property, in the "Modify" column, enter "Bertie", then hit "Set". This calls Javascript to perform a PUT. If OK (as in this case) then the Javascript then additionally reloads the same resource:



http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964

Logged in as

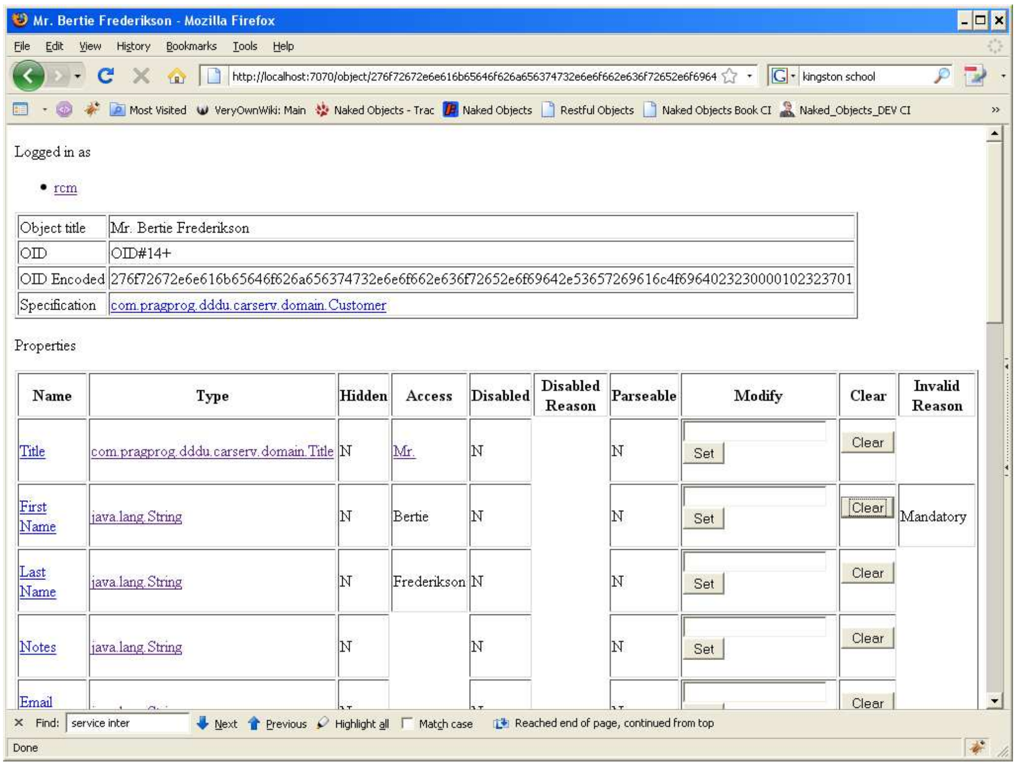
- rcm

Object title	Mr. Bertie Frederikson
OID	OID#14+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023230000102323701
Specification	com.pragprog.dddu.carserv.domain.Customer

Properties

Name	Type	Hidden	Access	Disabled	Disabled Reason	Parseable	Modify	Clear	Invalid Reason
Title	com.pragprog.dddu.carserv.domain.Title	N	Mr.	N		N	Set	Clear	
First Name	java.lang.String	N	Bertie	N		N	Set	Clear	
Last Name	java.lang.String	N	Frederikson	N		N	Set	Clear	
Notes	java.lang.String	N		N		N	Set	Clear	
Email								Clear	

For the “FirstName” property, select the “Clear” button. This calls Javascript to perform a DELETE. Since this isn’t valid, the DELETE (or it could have been a PUT) returns an error. The Javascript updates the InvalidReason DOM Id:


Mr. Bertie Frederikson - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited
VeryOwnWiki: Main
Naked Objects - Trac
Naked Objects
Restful Objects
Naked Objects Book CI
Naked_Objects_DEV CI
Find: service inter
Next
Previous
Highlight all
Match case
Reached end of page, continued from top
Done

Logged in as

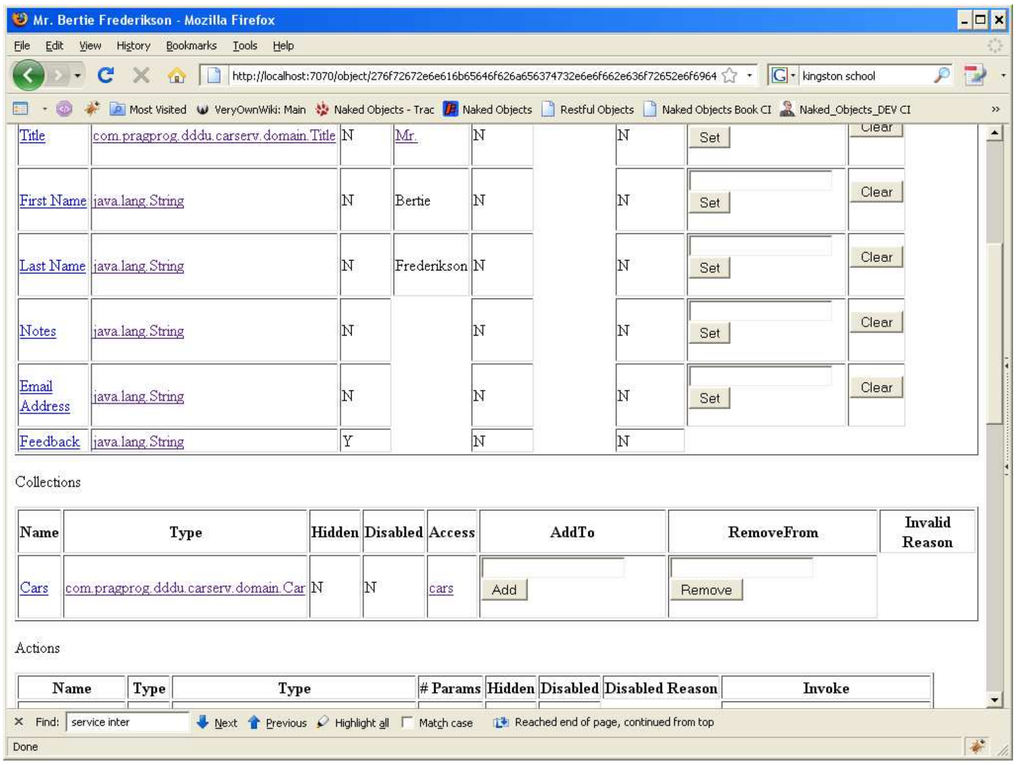
- rcm

Object title	Mr. Bertie Frederikson
OID	OID#14+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023230000102323701
Specification	com.pragprog.dddu.carserv.domain.Customer

Properties

Name	Type	Hidden	Access	Disabled	Disabled Reason	Parseable	Modify	Clear	Invalid Reason
Title	com.pragprog.dddu.carserv.domain.Title	N	Mr.	N		N	Set	Clear	
First Name	java.lang.String	N	Bertie	N		N	Set	Clear	Mandatory
Last Name	java.lang.String	N	Frederikson	N		N	Set	Clear	
Notes	java.lang.String	N		N		N	Set	Clear	
Email								Clear	

Scroll down to the customer’s “cars” collection ...


Mr. Bertie Frederikson - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited
VeryOwnWiki: Main
Naked Objects - Trac
Naked Objects
Restful Objects
Naked Objects Book CI
Naked_Objects_DEV CI
Find: service inter
Next
Previous
Highlight all
Match case
Reached end of page, continued from top
Done

Title	com.pragprog.dddu.carserv.domain.Title	N	Mr.	N		N	Set	Clear
First Name	java.lang.String	N	Bertie	N		N	Set	Clear
Last Name	java.lang.String	N	Frederikson	N		N	Set	Clear
Notes	java.lang.String	N		N		N	Set	Clear
Email Address	java.lang.String	N		N		N	Set	Clear
Feedback	java.lang.String	Y		N		N		

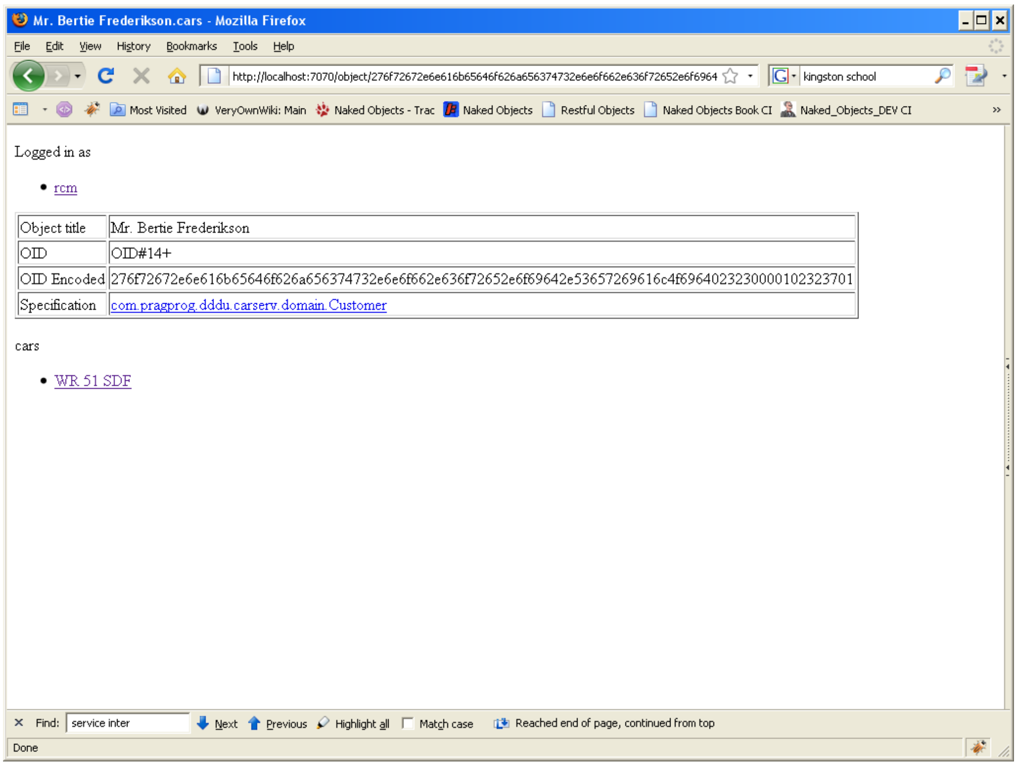
Collections

Name	Type	Hidden	Disabled	Access	AddTo	RemoveFrom	Invalid Reason
Cars	com.pragprog.dddu.carserv.domain.Car	N	N	cars	Add	Remove	

Actions

Name	Type	Type	# Params	Hidden	Disabled	Disabled Reason	Invoke

... and click to view the Cars in this collection:


Mr. Bertie Frederikson.cars - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited
VeryOwnWiki: Main
Naked Objects - Trac
Naked Objects
Restful Objects
Naked Objects Book CI
Naked_Objects_DEV CI
Find: service inter
Next
Previous
Highlight all
Match case
Reached end of page, continued from top
Done

Logged in as

- rcm

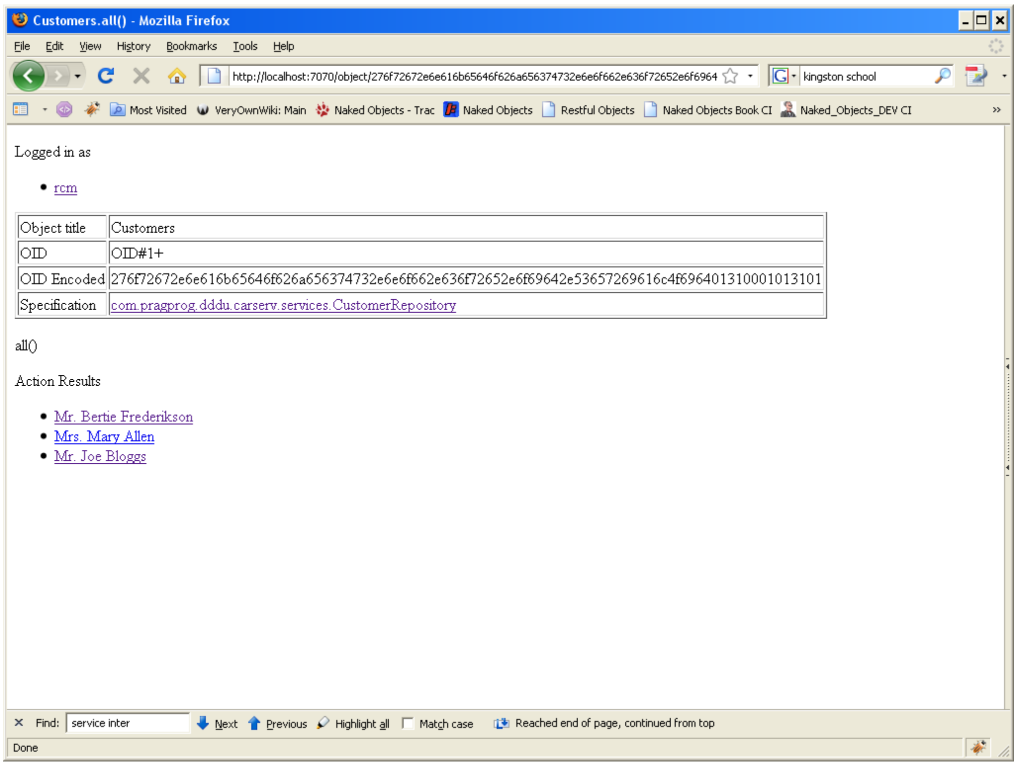
Object title	Mr. Bertie Frederikson
OID	OID#14+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f696402323000102323701
Specification	com.pragprog.dddu.carserv.domain.Customer

cars

- WR 51 SDF

Copy the "OID Encoded" string into the clipboard.

Now, navigate back to the /services resource, and click on Customers, then Invoke All():


Customers.all() - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited
VeryOwnWiki: Main
Naked Objects - Trac
Naked Objects
Restful Objects
Naked Objects Book CI
Naked_Objects_DEV CI
Find: service inter
Next
Previous
Highlight all
Match case
Reached end of page, continued from top
Done

Logged in as

- rcm

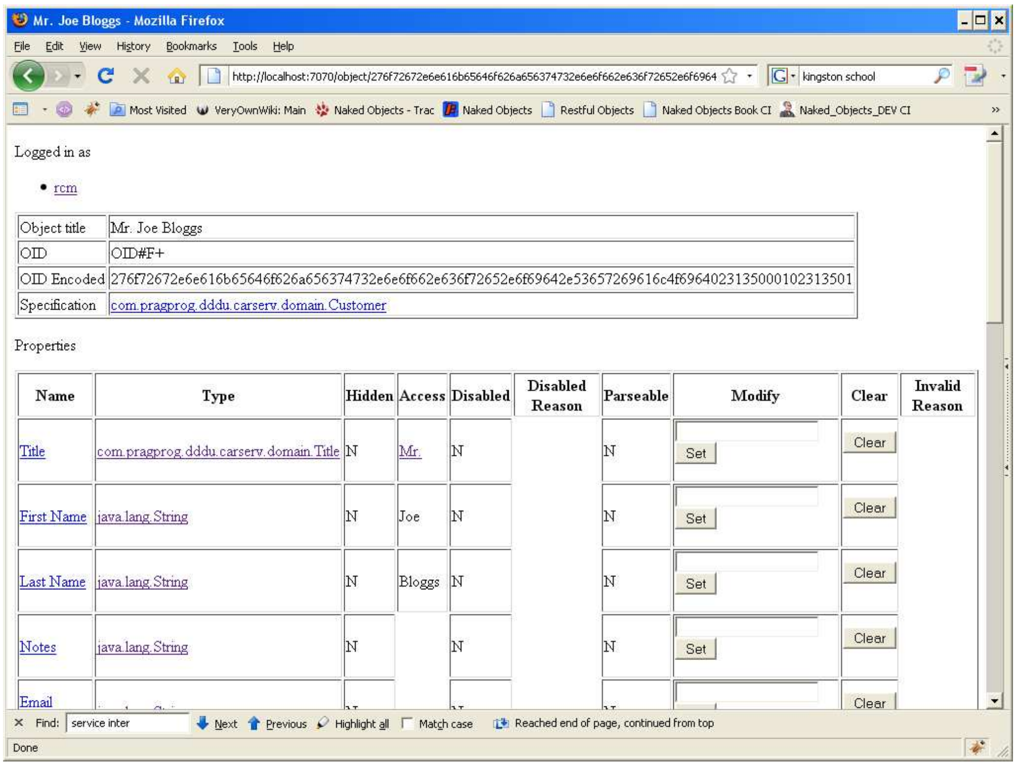
Object title	Customers
OID	OID#1+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f69640131000101310 1
Specification	com.pragprog.dddu.carserv.services.CustomerRepository

all()

Action Results

- Mr. Bertie Frederikson
- Mrs. Mary Allen
- Mr. Joe Bloggs

Select "Mr Joe Bloggs":


Mr. Joe Bloggs - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

Logged in as

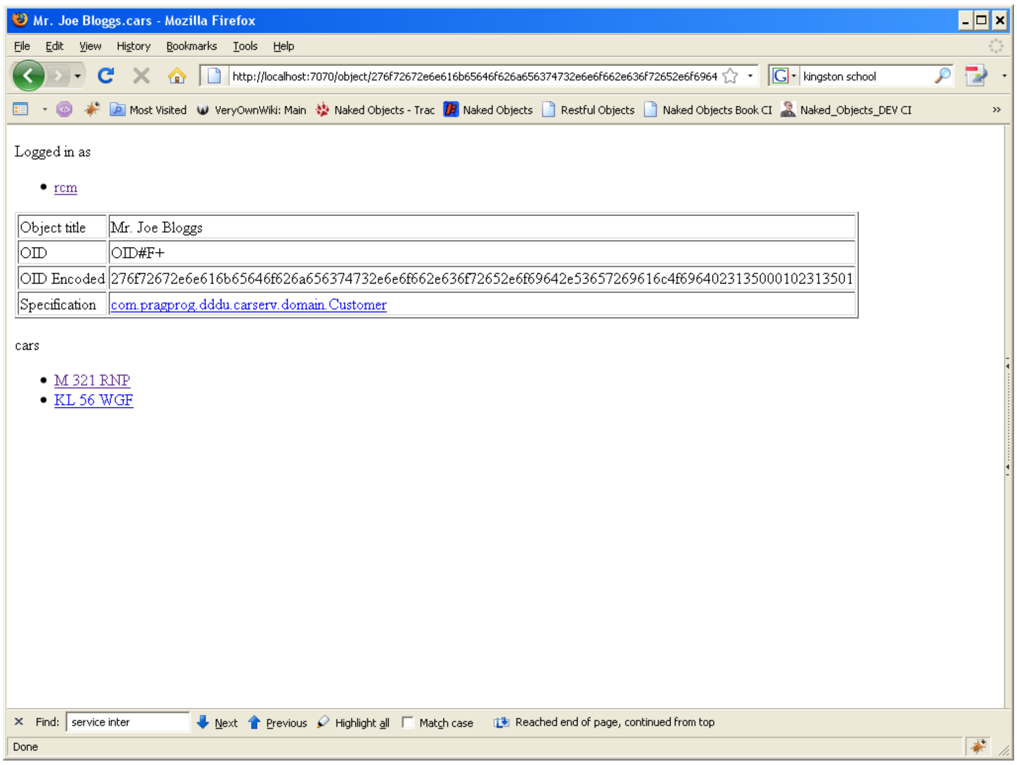
- rcm

Object title	Mr. Joe Bloggs
OID	OID#F+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023135000102313501
Specification	com.pragprog.dddu.carserv.domain.Customer

Properties

Name	Type	Hidden	Access	Disabled	Disabled Reason	Parseable	Modify	Clear	Invalid Reason
Title	com.pragprog.dddu.carserv.domain.Title	N	Mr.	N		N	Set	Clear	
First Name	java.lang.String	N	Joe	N		N	Set	Clear	
Last Name	java.lang.String	N	Bloggs	N		N	Set	Clear	
Notes	java.lang.String	N		N		N	Set	Clear	
Email								Clear	

Scroll down to his cars collection, and click the link. Confirm there are two cars:


Mr. Joe Bloggs.cars - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

Logged in as

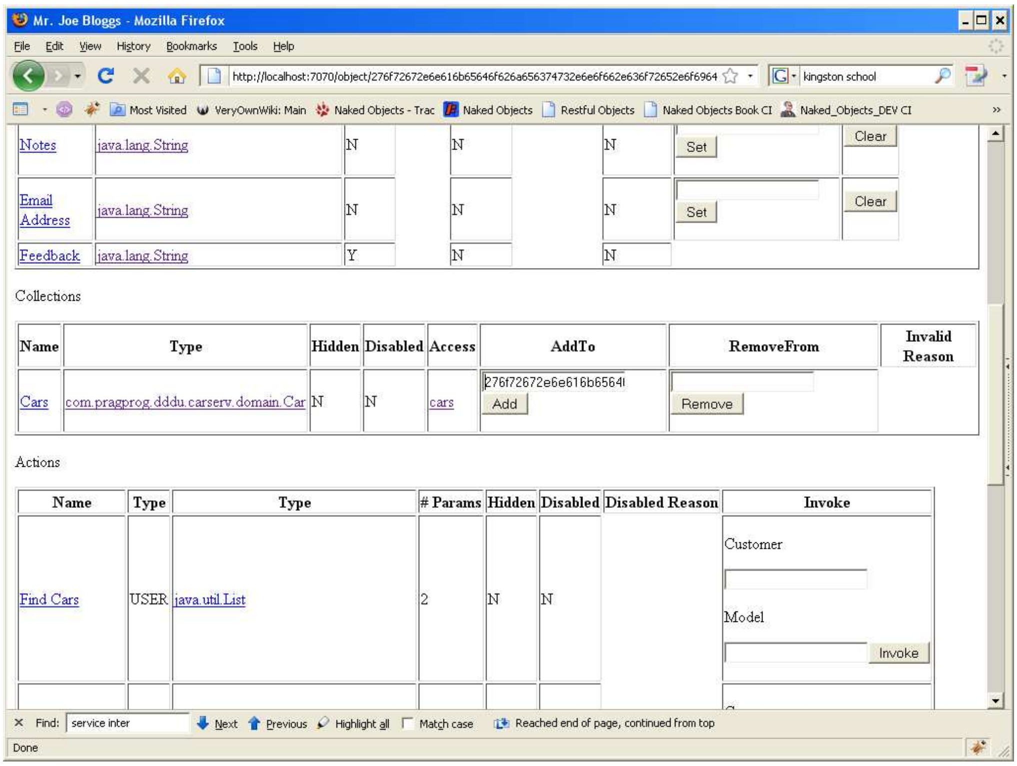
- rcm

Object title	Mr. Joe Bloggs
OID	OID#F+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023135000102313501
Specification	com.pragprog.dddu.carserv.domain.Customer

cars

- M 321 RNP
- KL 56 WGF

Navigate back to the customer.
Scroll down again to the cars collection, and this time paste the encoded OID of "WR 51 SDF" into the addTo form. This performs a PUT, and then reloads the resource.


Mr. Joe Bloggs - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

Notes	java.lang.String	N	N	N	Set	Clear
Email Address	java.lang.String	N	N	N	Set	Clear
Feedback	java.lang.String	Y	N	N		

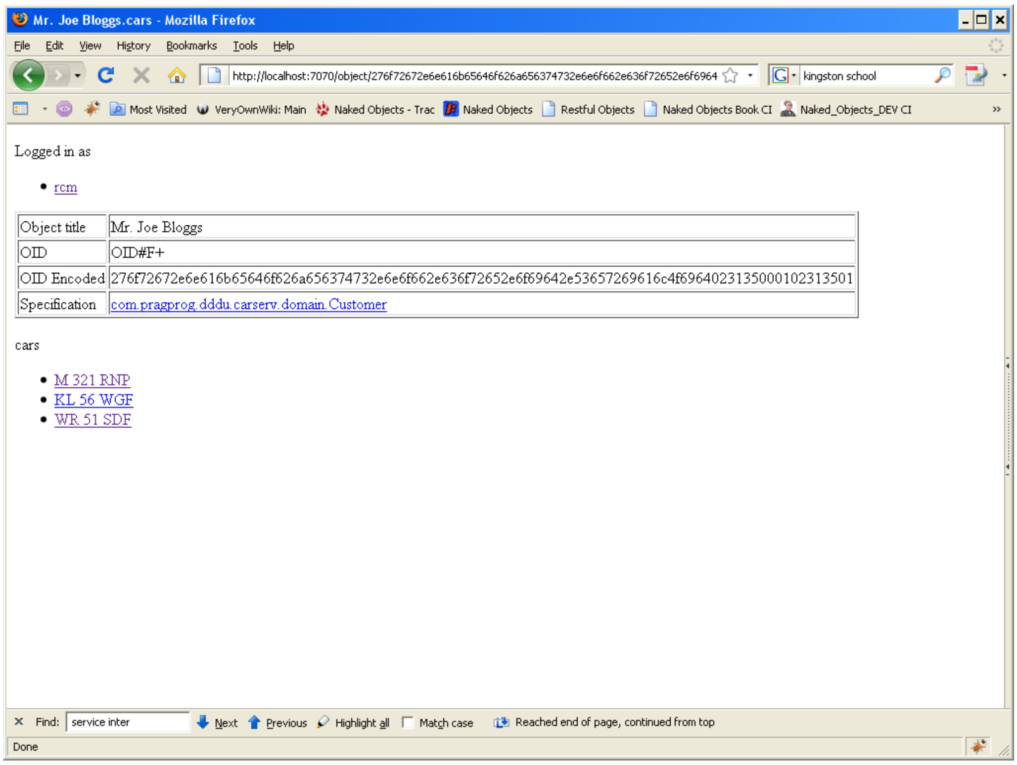
Collections

Name	Type	Hidden	Disabled	Access	AddTo	RemoveFrom	Invalid Reason
Cars	com.pragprog.dddu.carserv.domain.Car	N	N	cars	276f72672e6e616b65646 Add	Remove	

Actions

Name	Type	Type	# Params	Hidden	Disabled	Disabled Reason	Invoke
Find Cars	USER	java.util.List	2	N	N		Customer Model Invoke

Scroll down to the "cars" collection, and click the link. There should now be 3 cars in the collection.


Mr. Joe Bloggs.cars - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://localhost:7070/object/276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f6964
kingston school
Most Visited VeryOwnWiki: Main Naked Objects - Trac Naked Objects Restful Objects Naked Objects Book CI Naked_Objects_DEV CI
Find: service inter Next Previous Highlight all Match case Reached end of page, continued from top
Done

Logged in as

- rcm

Object title	Mr. Joe Bloggs
OID	OID#F+
OID Encoded	276f72672e6e616b65646f626a656374732e6e6f662e636f72652e6f69642e53657269616c4f6964023135000102313501
Specification	com.pragprog.dddu.carserv.domain.Customer

cars

- M 321 RNP
- KL 56 WGF
- WR 51 SDF

Developing in Eclipse

Coding Standards and so on

Restful Objects uses the same code formatting as Naked Objects. These are defined in terms of Eclipse config files, in .../framework-trunk/eclipse.

Import the Java formatting using:

Windows > Preferences > Java > Code Style > Formatter

and specify

.../framework-trunk/eclipse/java-format.xml

Import the cleanup profile (which references the Java formatting) using:

Windows > Preferences > Java > Code Style > Cleanup

and specify:

.../framework-trunk/eclipse/nakedobjects-cleanup-profile.xml

Currently there are no checkstyle, FindBugs or PMD checks.

Hints and Tips

When you invoke a build in Eclipse, m2eclipse delegates to the Maven builder. You can use the Maven console to see the builder do its thing. Behind the scenes this is just an embedded instance of the Maven runtime, so the output is pretty much the same as running Maven from the command line.

If you perform a Maven build (mvn clean install) from the command line, then all modules are picked up from the local repository. m2eclipse sets up the classpath slightly differently so that all Maven modules that are in the workspace are referenced locally, and everything else is picked up from your local repository. In practice this means that you can develop in Eclipse pretty much the same as before.

It is worthwhile performing builds occasionally using Maven command line; there are sometimes slight differences between the Sun javac and Eclipse's built-in Java compiler. If you perform a command-line build and it fails half-way, it's usually sufficient in Eclipse to do an perform a Project > Clean All followed by a build workdspace. On occasion I've found though that this doesn't work; M2Eclipse thinks that all class files are up-to-date and doesn't build anything. To force M2Eclipse to rebuild everything, you can try to File > Refresh, and also Project > Update All Maven Dependencies. This pretty much almost always does the trick.