VODSL
A Proposed Serialisation for VO-DML

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Motivation

- VO Data Modelling Language is a **Good Thing**™

  - encourages reuse, collaboration, patterns of good design style, code generation etc.

- However creation of VODML seems to have high activation energy (only a few people are doing it)

  - UML route

    - different tools have poor interoperability and are expensive

    - UML very general - profiles help

  - XML route

    - does not need fancy tool

    - much better constrained - can only express the concepts that are desired

    - but still not very human friendly for writing by hand

Domain Specific Language

reuse

- concise

- sensible defaults

- fully expressive

  - yet more constrained than XMI/UML

```
model example (0.1) "an example model"
include "IVOA.vodsl"

primitive float "a new primitive"
package apackage "example package"
{
    dtype fq extends quantity.AtomicValue {
        value : float "a new float"
    }
    abstract otype base
    {
        bv : boolean @? "Description"
    }
    otype derived extends apackage.base
    {
        sv : quantity.RealQuantity ""
    }
    otype another {
        f1 : apackage.fq @[10] "an array"
    }

    package nestedpackage
    {
        otype another "different package"
        {
            cc : apackage.another as composition ""
            rf references apackage.derived "a reference"
        }
    }
```

Primitives

Multiplicities

Description mandatory

3

Implementation Xtext

- Using <u>Eclipse Xtext</u> - a language development package

  - easy to create a domain specific language with full Eclipse editor functionality

    - syntax highlighting/formatting

    - auto-completion

    - validation

    - quick fixes

  - Just write the grammar and the above comes for free! (it can be further customised if the default behaviour is not quite what is desired).

  - compiles to the VODML XML form for compatibility with existing infrastructure

The Grammar

- Quite small

  - easy to change syntax

  - reasonably easy to add new concepts

- follows VODML concepts and naming

- some additional editor customisations have also been done

```
grammar net.ivoa.vodml.Vodsl with org.eclipse.xtext.common.Terminals

import "http://www.eclipse.org/emf/2002/Ecore" as ecore

generate vodsl "http://www.ivoa.net/vodml/Vodsl"

/*
 * DSL for VODML - Paul Harrison, Apr 2014.
 */

/**
 * The root model element, comprised of one optional include section
 * and the definition of any number of compound types.
 */
VoDataModel:
    model = ModelDeclaration
    ( includes += IncludeDeclaration ) *
    elements += AbstractElement+
    ;

ModelDeclaration:
    'model' name=ID '(' version=VERSION ')' description=STRING?
;

/* avoid terminals here as causes confusion in the LEXing which is greedy se
VERSION returns ecore::EString : INT ('.' INT)?;

IncludeDeclaration:
    'include' importURI=STRING
;

QualifiedName:
    ValidID (=>'.' ValidID)*;

QualifiedNameWithWildcard:
    QualifiedName '.*'?
;

ValidID:
    ID;

DefinitionType:
    ObjectType | Enumeration | DataType | PrimitiveType
```

Demonstration

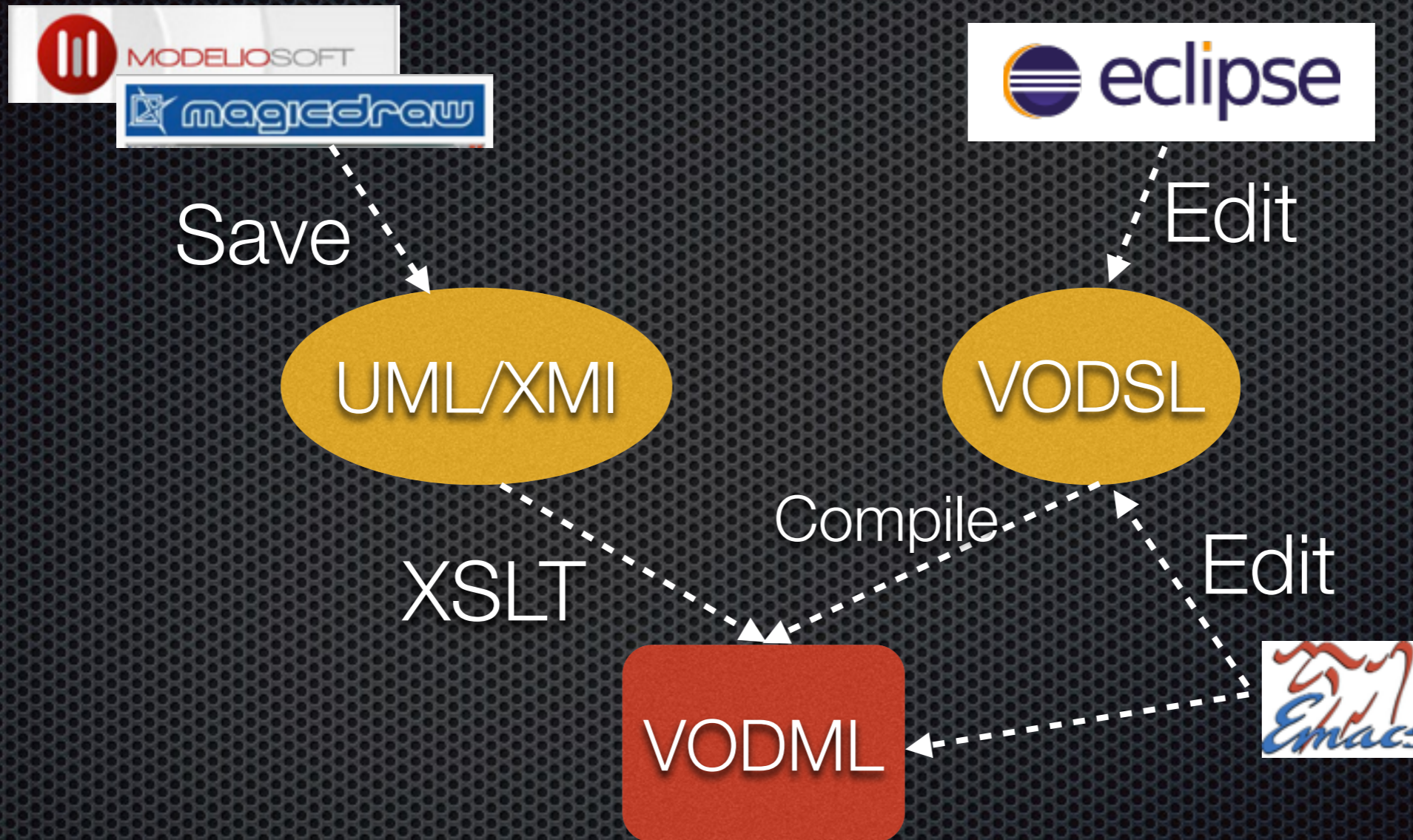Although only a proof of concept, already as easy as other routes to VODML

Features

- Can be distributed as an eclipse plug-in - free and easy editing of data models.

- Models be written without Eclipse - more concise than XML

  - should be possible to package the compiler "stand-alone" to compile to XML serialisation on the command line.
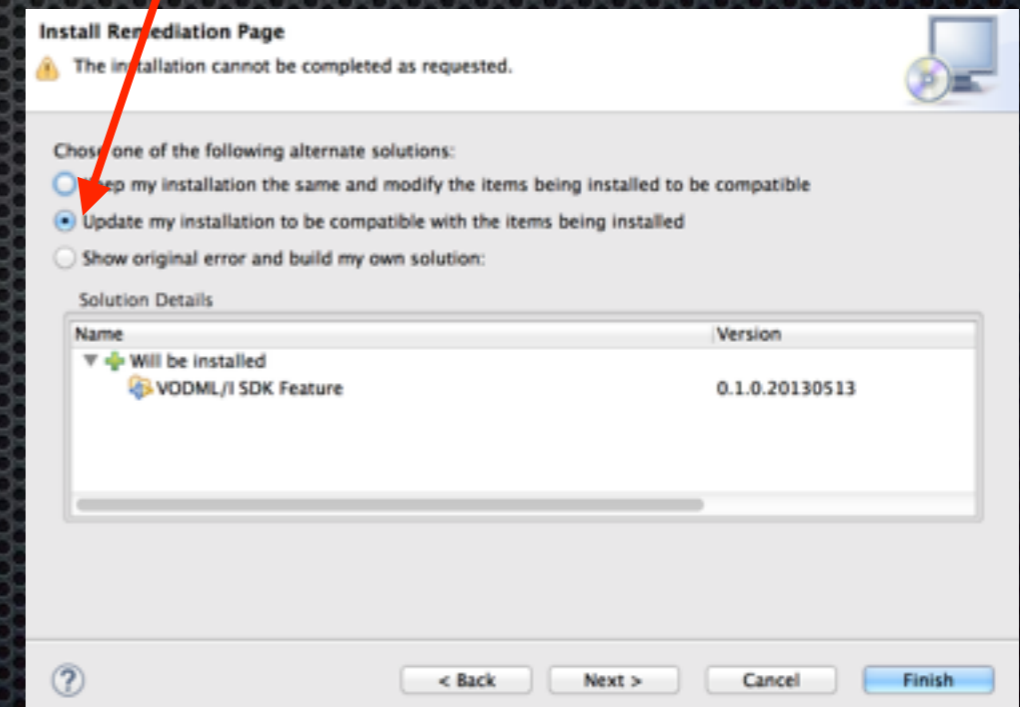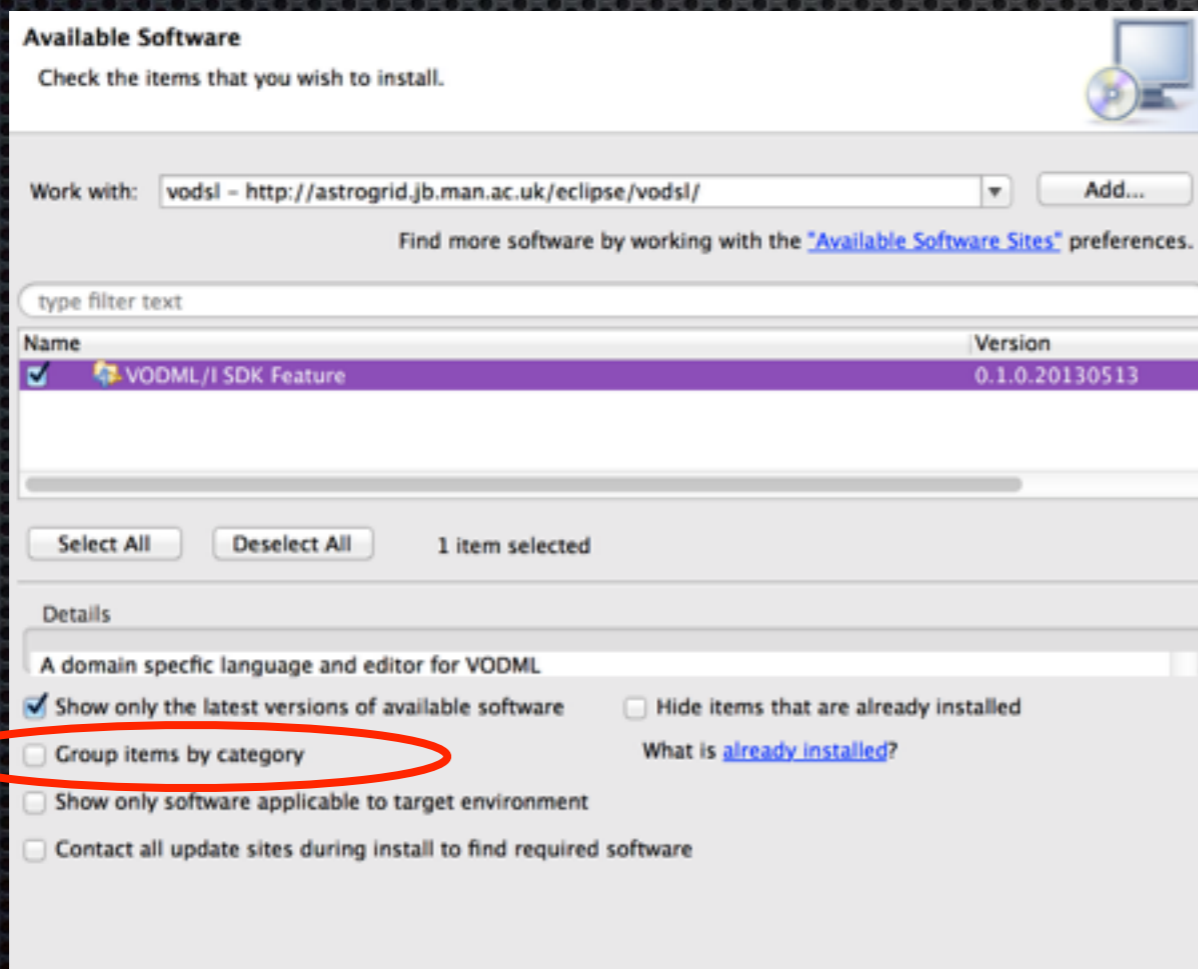
Futures

- Integrate with a graphical editor within Eclipse (initially as a view-only display)

- Add more validation (implement more of the rules of VODML) at the moment only type existence checking is done.

- Possibly compile directly to other forms (i.e. it might be easier than going via the XML intermediate)

  - Java classes

  - SQL etc.

- Could extend the language to include service interface definitions!

Ecosystem

Save

Edit

UML/XMI

VODSL

Compile

XSLT

Edit

VODML

Try it for yourself

- Need <u>Eclipse Luna</u> (4.4) - i.e. the upcoming or "developer" version as a base

- Use <u>http://astrogrid.jb.man.ac.uk/eclipse/vodsl/</u> as update site

- For installation remediation choose "update"