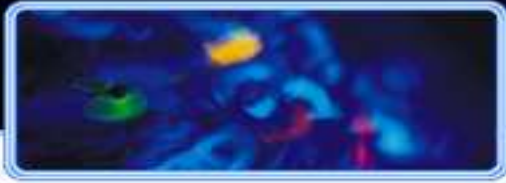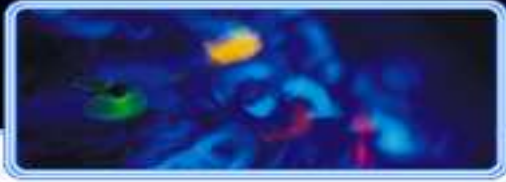# The NeOn Toolkit

Andreas Harth (for the NeOn Consortium)
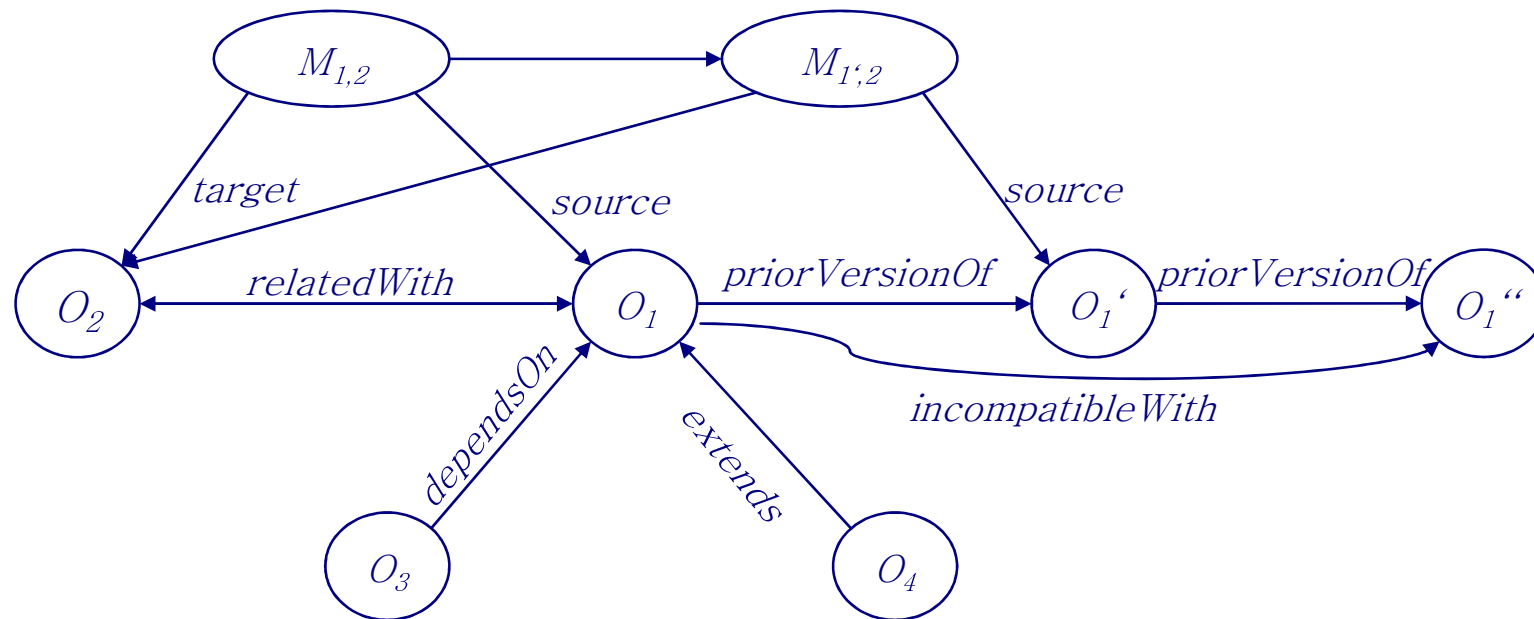*Karlsruhe Institute of Technology, Germany*
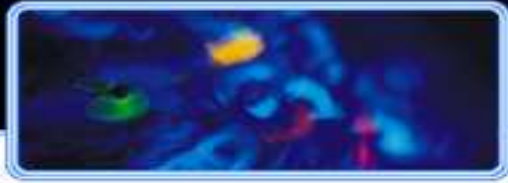
August 2010

Overview

- NeOn Project Introduction

- The NeOn Toolkit (Core and Plugins)

- Supported OWL2 Features

- The NeOn Foundation

- Conclusion

NeOn Project Overview

- "Lifecycle Support for Networked Ontologies"

- Methods **and** tools for ontology engineering
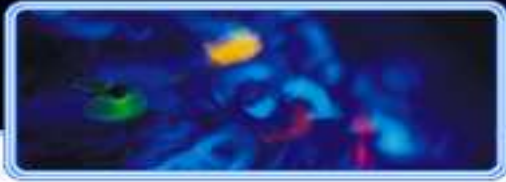
- Focus on networked ontologies

NeOn Toolkit

- Built on Eclipse and the OWL API (v3) in Java

- Platform-independent (builds for Windows, MacOS, Linux)

- Complete ontology development functionality

- Extensible via plugins

- Available plugins cover the entire ontology engineering lifecycle

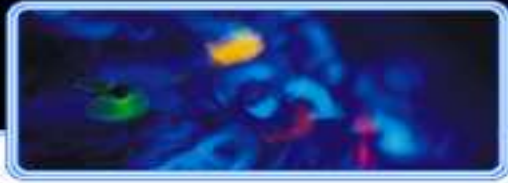- Business-friendly Eclipse Public License (EPL)
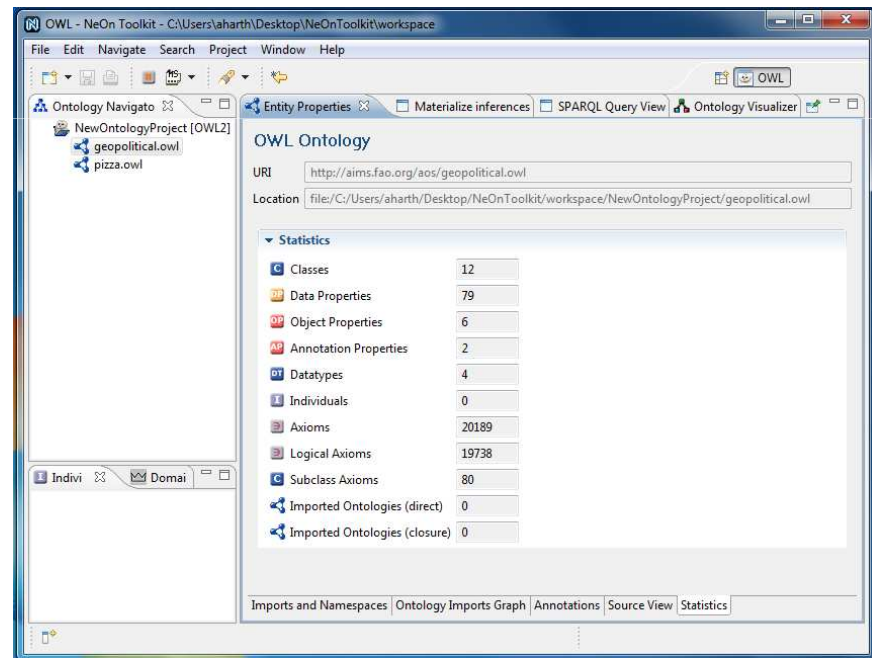
Ontology Engineering Lifecycle

- Project management involved in creating ontologies

- Methodological guidelines for ontology engineering activities

- Implemented in gOntt plugin

- Scheduling ontology projects

- Helping in the execution of ontology projects
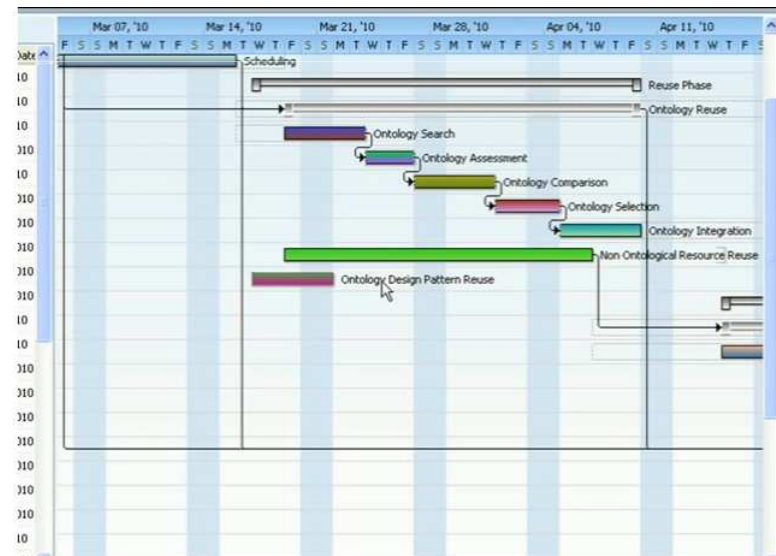
# Ontology Design Patterns (ODPs)

- Patterns are used in many areas as "templates" or abstract descriptions encoding best practices of some field.

- The SemanticMediaWiki ODP portal
  - Various types of patterns
  - Exemplary ontologies

- XD NeOn plugin
  - Access to ODP registry
  - ODP selection, specialisation, and annotation
  - Ontology debugging against design patterns and good practices
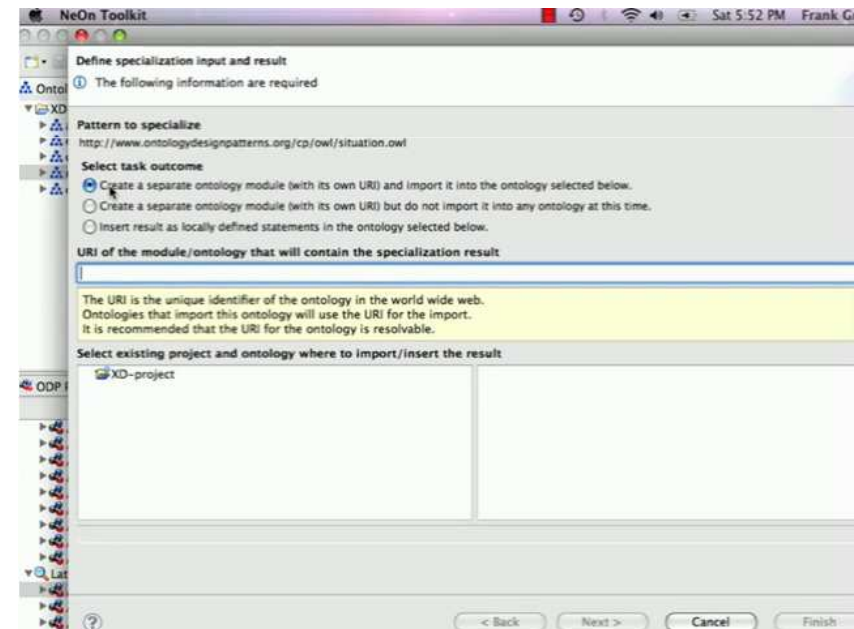
Ontology Modularisation
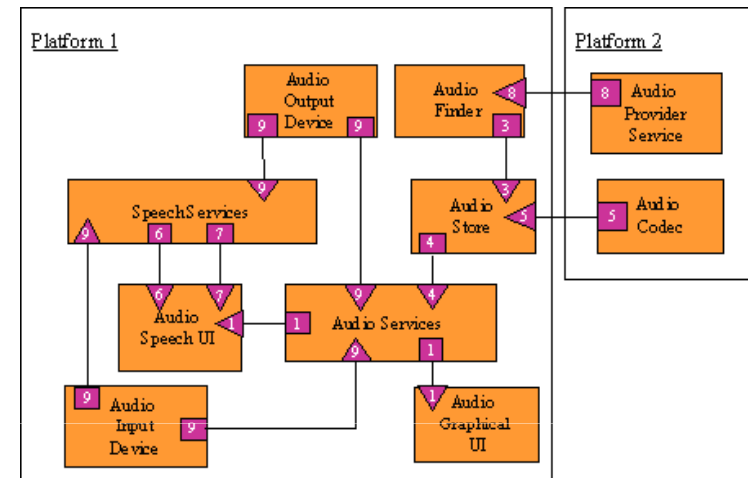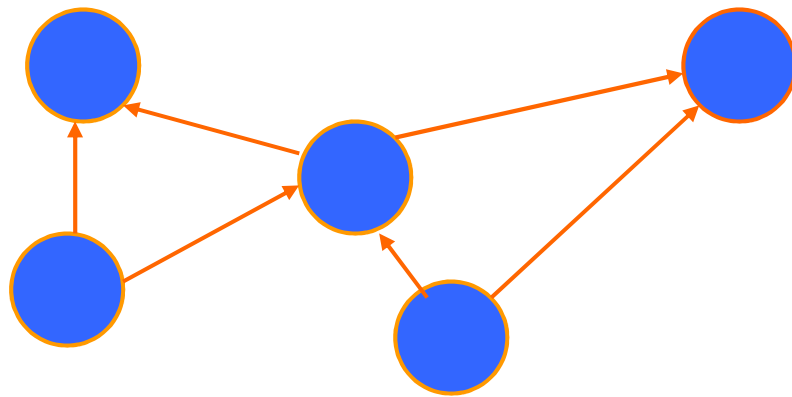
- Inspired from software engineering, ontology modularisation refers to the design of ontologies as sets of components that can be developed and managed independently.

- Module plugins implement methods and algorithms for module extraction, partitioning, and composition
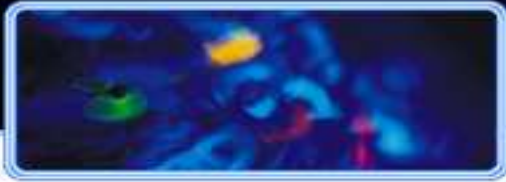
Reasoning

- NTK allows "pluggable" reasoners via the OWL API (we currently provide HermiT and Pellet)

- Plugins available for materialisation, querying, and resolving inconsistencies

- RaDON – Repair and Diagnosis in Ontology Networks: Implementation of novel scalable methods and algorithms for repair and diagnosis in ontology networks
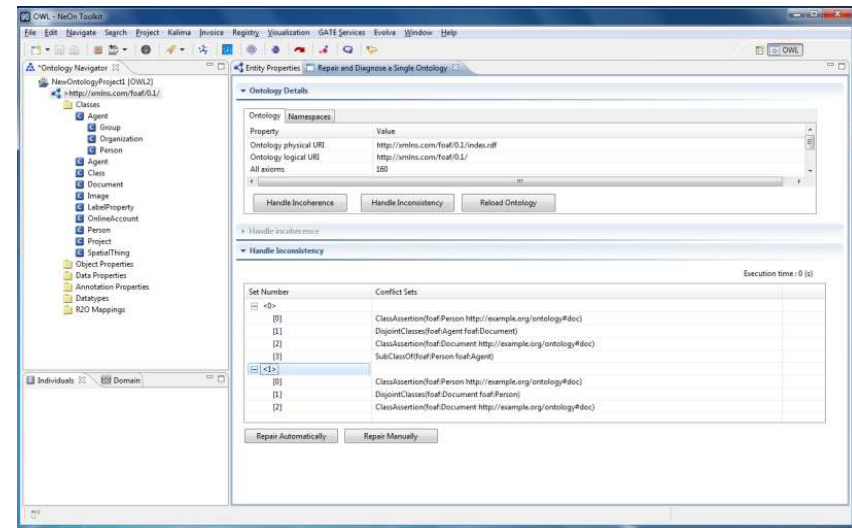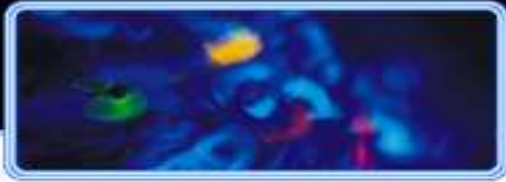
Visualisation: KC-Viz

- Investigate the value of ontology summarisation techniques based on key concepts to provide better visualisation and navigation of ontologies

- Key concept extraction: Integration of cognitive criteria with lexical statistics, formal and topological criteria

- Implemented in the KC-Viz plugin

NeOn Toolkit 2.3 Features

- **New OWL2 features**
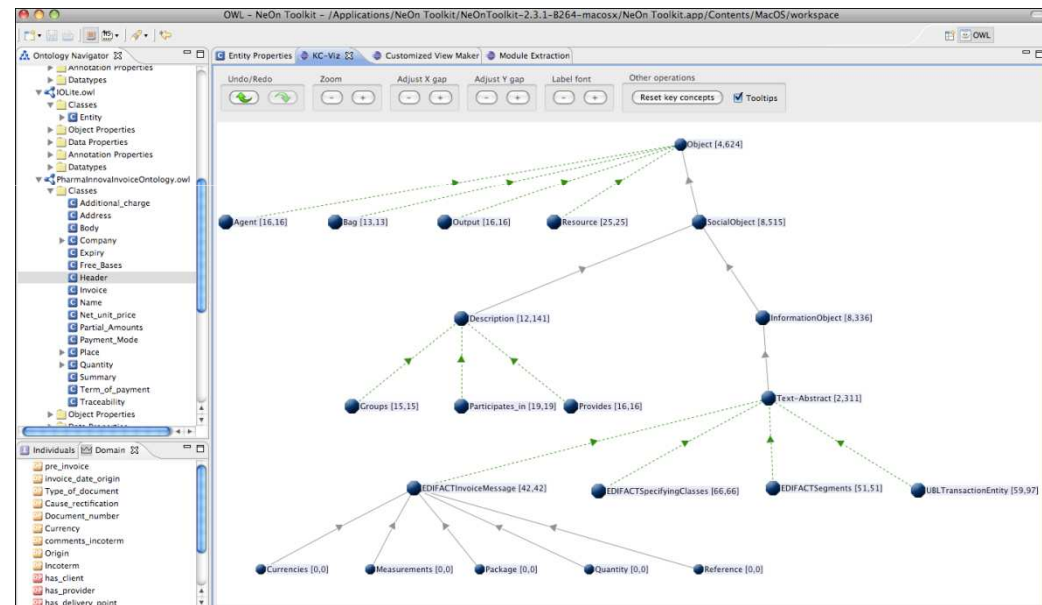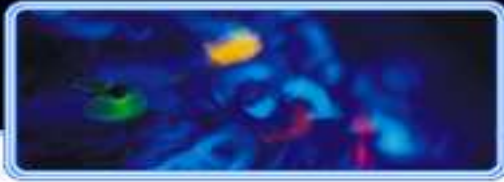 - Creation of new datatypes
  - AnnotationProperty taxonomy: creation and presentation in Navigator
  - Domain and range of AnnotationProperties
  - New ObjectProperty characteristics
  - Sub-property chains

- **Lots of usability enhancements**
  - Improved navigation/operation of toolkit with the keyboard
  - Indicate progress while restoring workspace after restart
  - Organization of views
  - Organization of plug-ins on update-site
  - Accessibility of plug-ins
  - Appearance of Preferences for NeOn Toolkit and plug-ins

- **Lots of improvements for the MAC**

- **Additional ontology tabs**
  - Source view for ontologies (Functional Syntax, Manchester Syntax, OWL/RDF, OWL/XML)
  - Ontology statistics panel
  - Graphical view of Import statements

- **Template for populating the properties of individuals**

- **Source view for entities**
  - Manchester Syntax

- **Import/export of ontologies to different formats**
  - Functional Syntax, Manchester Syntax, OWL/RDF, OWL/XML, Turtle

- **Domain view displaying applicable properties for a class**

- **Display number of direct/indirect individuals per class**

- **Improved search facility**
  - Incl. "Find References" for entities
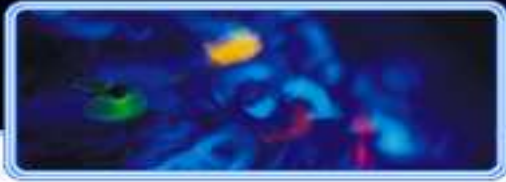
OWL2 Features

- Complete support of OWL 2 ontologies
  - Loading
  - Representation
  - Serialising
  - To the extent the OWL API v3.0.0 does

- Partial GUI-level coverage of OWL 2, some features are not implemented
  - N-ary data ranges (also not yet supported by OWL API v3.0.0)
  - Inverse object property expressions
  - Anonymous individuals
  - Complex data ranges
  - Disjoint union
  - Disjoint properties
  - Negative property assertions
  - HasKey axioms
  - Axiom annotations

- All other 88[*] OWL 2 features are supported by the NeOn Toolkit GUI

* According to http://www.w3.org/TR/2009/REC-owl2-quick-reference-20091027/
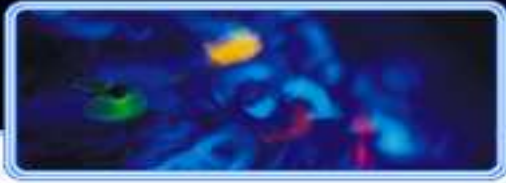
The NeOn Technologies Foundation Ltd.

- Incorporated July 2010

- Objectives
  - To develop and promote the uptake of advanced semantic technologies.
  - To promote high standards in ontology engineering and semantic application design and development through the development and release of robust methods and tools and examples of best practices.
  - To educate students, users and practitioners in semantic technologies through the publication of research outputs, learning resources and training events.

- The foundation offers partnerships with organisations which use the NTK or would like to contribute in its development

- Training and sponsoring opportunities available
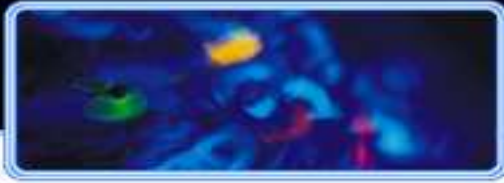
Conclusion

- Stable version NTK 2.3.2 available for download

- 30+ plugins available

- Enhanced version (with focus on usability) planned for Q4 2010

- Work underway on ontology design patterns for OWL2

- Business-friendly Eclipse Public License (EPL)

- NeOn Foundation up and running, partnerships possible

- Download the NTK at http://neon-toolkit.org/