

Information—Integration—Intelligence: Solutions



SEMANTIC SOLUTIONS FOR OIL & GAS: ROLES AND RESPONSIBILITIES

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Motherhood and Apple Pie

- Doing any complex task:
 - Multiple people
 - Doing different things
 - Needing different tools

 - A bit of planning
- Oh Wow, we can do
 - is not very helpful.



What are you trying to achieve?

- Some specific goals to do with better use of knowledge (i.e. information that is usable, adequately credible, actionable)
- Almost always involves:
 - A specialist who understands the knowledge: they help put the information together
 - A person who will act on the knowledge: needs a friendly usable tool, to see the knowledge.



Types of Semantic Solutions

- Information Integration/Mash-ups
- Linked Data Discovery with On-Demand Search and Analysis
- Enterprise Architecture
- Enterprise Metadata Management
- Vocabulary Management
- *Most involve mixing heterogeneous information*
- *Most involve mix of internal and Web information.*



Earthquake explorer

The screenshot displays the TopBraid Ensemble interface. At the top, the title bar reads "TopBraid Ensemble" and "TopQuadrant". Below the title bar, there are two main panels. The left panel, titled "Concept Navigator", shows a list of earthquake events. The right panel, titled "M 2.9, south of Alaska", displays details for the selected event. Below these panels is a map showing the location of the earthquake in the Gulf of Alaska.

Concept Navigator Results

- M 2.8, Rat Islands, Aleutian Islands, Alaska
- M 2.8, Southern Alaska
- M 2.8, Southern California
- M 2.9, Alaska Peninsula
- M 2.9, Andreanof Islands, Aleutian Islands, Alaska
- M 2.9, offshore Northern California
- M 2.9, Puerto Rico region
- M 2.9, Puerto Rico region
- M 2.9, Puerto Rico region
- M 2.9, Rat Islands, Aleutian Islands, Alaska
- M 2.9, south of Alaska**
- M 2.9, Southern California

M 2.9, south of Alaska Graph

Title
M 2.9, south of Alaska

Latitude
55.9526

Longitude
-153.0446

rss:guid

rss:pubDate
2008-09-25T08:16:40+00:00

Map | **Satellite** | **Hybrid**

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Exploring RSS earthquake feeds ...

TopQuadrant™



Key Roles

- Domain Expert
- Ontologist (practical, not theoretical)
- Semantic Web Specialist
- UI Team
- End user (acts on the information)

Goal is to encapsulate the knowledge of the domain expert for reuse by the end user.



Knowledge reuse and costs

- The main planks have been around for decades ...
- But not economically viable: because of the cost of maintaining high-quality information
- Cross-company, cross-industry collaboration needed to amortize costs



Areas for reuse

- Reuse of information framework, the Semantic Web technologies
- Reuse of information: both globally and within an enterprise
- Reuse of ontologies and schemas



Units and Measures

- For engineering types of applications, these are needed:

The screenshot shows a software interface for defining a class. The class name is 'property:StressProperty'. It has a description: 'Stress is a measure of the average amount of force exerted per unit area.' and a label: 'Stress property'. Under 'Class Axioms', it is a subclass of 'property:ElasticProperty', 'property:ForcePerUnitAreaProperty', and 'property:propertyCategory has property:StressPropertyType'. Below the interface is a table with three columns: 'rdf:type', 'rdfs:label', and 'property:symbol'.

rdf:type	rdfs:label	property:symbol
property:StressProperty, ...	Coef. Thermal Expansion	α
property:StressProperty	Critical Stress	σ_{cr}
property:CGNSProperty, ...	LaminaViscosity	M/(L.T)
property:ShearProperty, ...	Modulus Of Elasticity In She...	G
property:StressProperty	Normal Stress	$\sigma = F/A$
property:StressProperty	Normal Stress On Inclined P...	σ_{θ}
property:StressProperty	Norm. Stress On Planes Per...	$(\sigma_{x1}, \sigma_{y1})$



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- Domain Expert
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- Semantic Web Specialist
- UI Team
- End user (acts on the information)

- Data entry, data laundry
- On-going maintenance



TopQuadrant Products

- *Ontologist:*
 - **TopBraid Composer**
- *UI Team*
- *End user*
 - **TopBraid Ensemble**

- Tying it altogether
 - **TopBraid Live**





TopBraid Ensemble

Mozilla Firefox

file:///C:/TQ/TBL/workspace/flex.topbraidlive.tbe/bin/TBE.html

TopBraid Ensemble

User : aldi Logout Nodes: 391 Triples: 564 TopQuadrant

Project : reau1000.owl

Reviewing

Concept Navigator

- Address
- Agent (359)
- Area
- Country (5)
- Person (1)
- Query
- Real estate
 - Apartment (113)
 - House (347)
 - Townhouse
- State

Results

Name	Location	Bedroom	Bathroom	Price (SA)
MIDDLE_RIDGE(QLD) Apar	MIDDLE RIDGE	3	2	595000.0
WENTWORTHVILLE(NSW)	WENTWORTHV	2	1	345000.0
MIDDLE_RIDGE(QLD) Apar	MIDDLE RIDGE	3	2	595000.0
REDCLIFFE(QLD) Apartmer	REDCLIFFE QLE	3	1	315000.0
MALANDA(QLD) Apartment	MALANDA QLD	3	1	460000.0
POMONA(QLD) Apartment-	POMONA QLD	3	2	549000.0

Geography

Graph

RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse

RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse:Apartment

Label: RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse

Bedrooms	Bathrooms	Carports
3	3	2

Price (\$AU): 759000.0

Location: RUNAWAY BAY QLD

Description:

```

graph TD
    A((RUNAWAY BAY QLD)) -- location --> B((Queensland))
    B -- state --> C((Queensland))
            
```

Search Basket

Location:

Bedrooms: Min Max

Bathrooms: Min Max

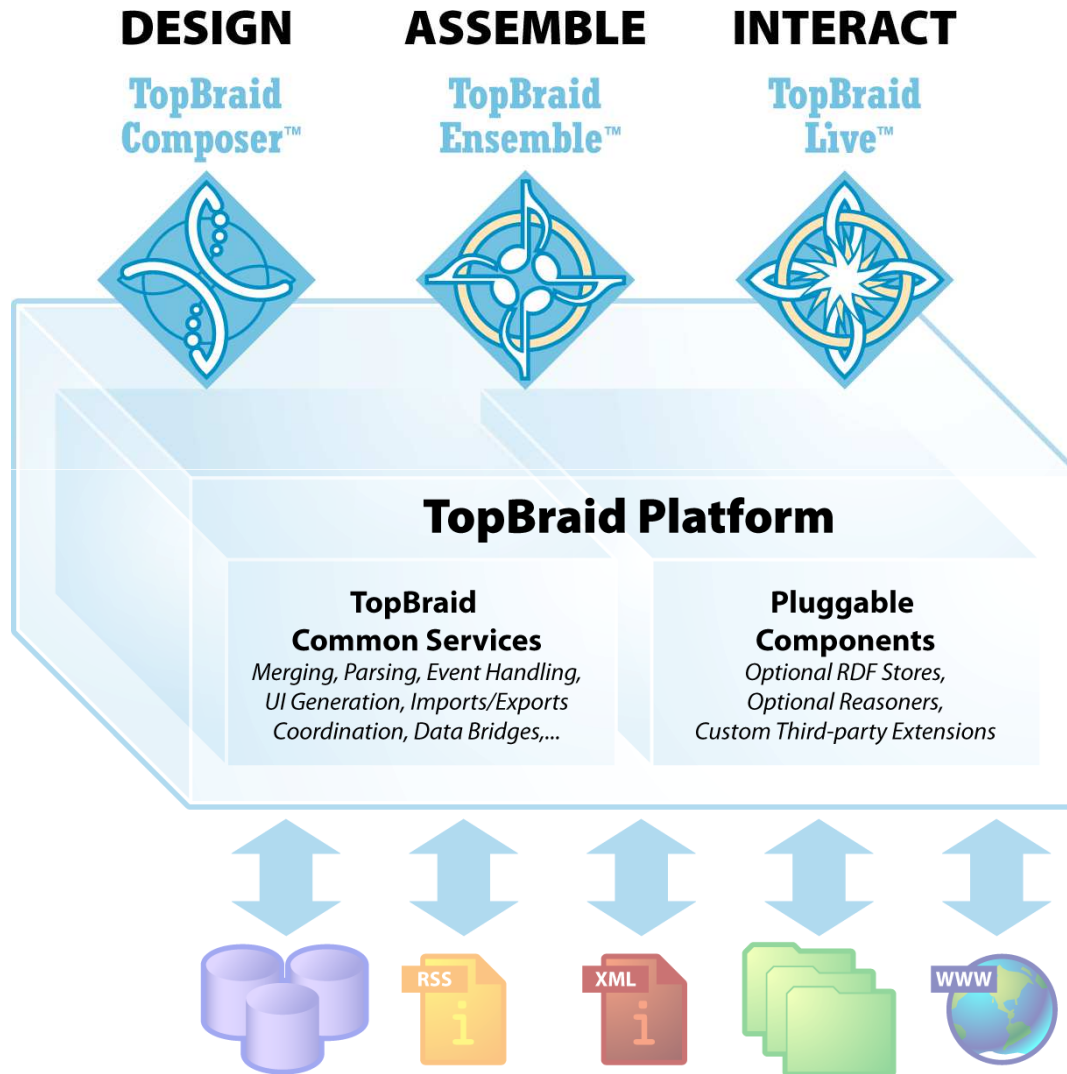
Price (\$AU): Min Max

Search

Transferring data from localhost...

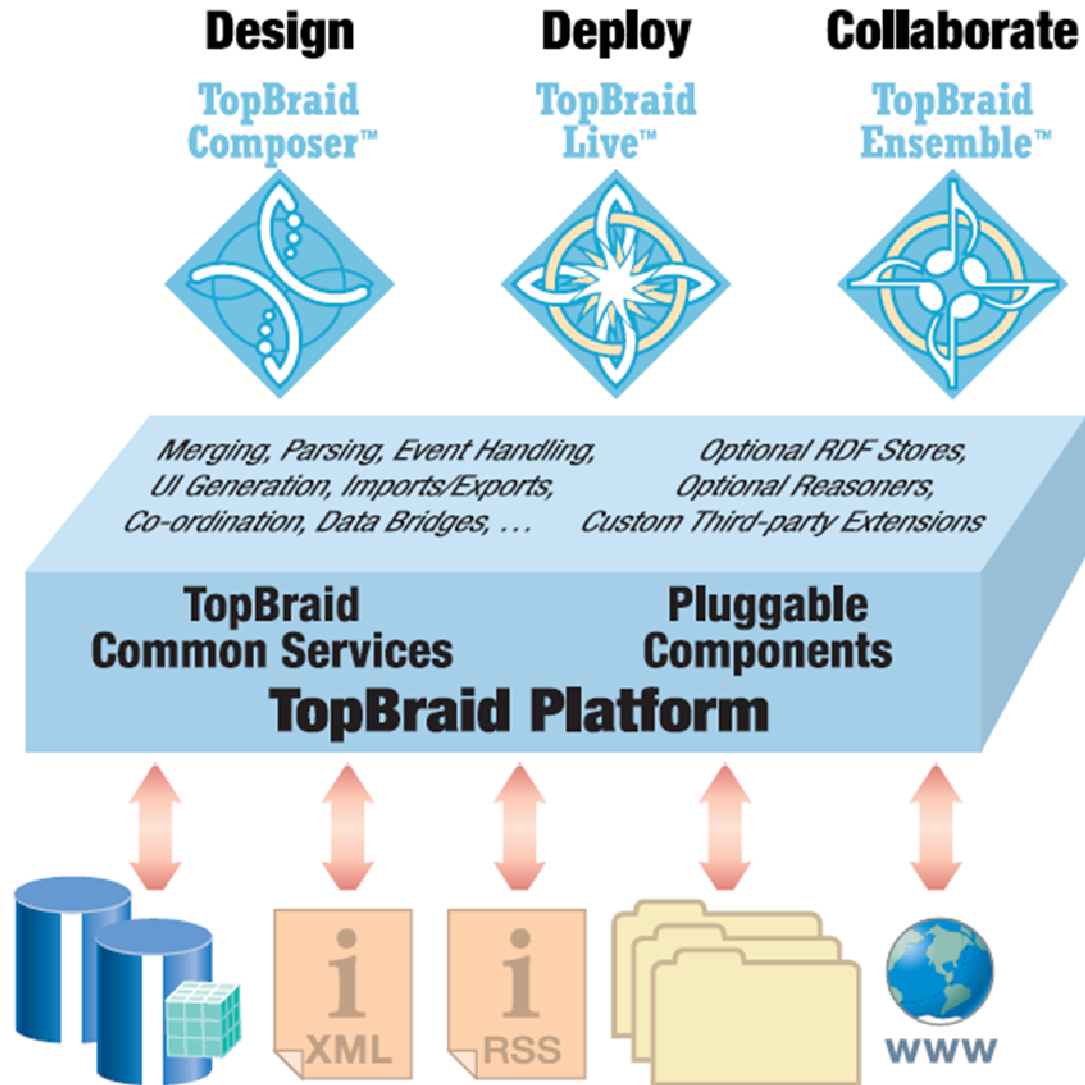


TopBraid Suite





(old version)



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Motherhood and Apple Pie

- Doing any complex task:
 - Multiple people
 - Doing different things
 - Needing different tools
- Worth buying appropriate tools, and getting consultancy on areas outside your expertise.



Backup

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Slide 17

The Themes

- (undigested) information vs. (usable, adequately credible, actionable) knowledge
- From undirected mash-up to considered information merging
- Web presentation of (digested) Semantic Web information to enable action
- TopBraid Suite (or similar) to bridge from Semantic Web to the Web



The Players

- **Ontologist**
 - Assesses information sources (both SW and enterprise): fitness for purpose
 - Designs ontologies transforms
 - Merges information
- **Rich Client Designer**
 - Designs information presentation
 - Configures/extends rich client platform
- **Server administrator**
 - Permits appropriate access to enterprise information
 - Manages reliability



The Tools

- **An Ontologist Workbench**
 - E.g. TopBraid Composer
- **A Semantic Web enabled Rich Client Platform**
 - E.g. TopBraid ensemble
- **A Semantic Web enabled Web Server**
 - E.g. TopBraid Live
- **An integrated framework**
 - E.g. TopBraid Suite



TopBraid Composer

The screenshot displays the TopBraid Composer interface for editing an OWL resource. The main window is titled "TopBraid - www.topbraid.org/2007/05/reau1000.owl - Eclipse SDK". The "Resource Form" is the central focus, showing the following details:

- Name:** reau:REA103938651
- label:** RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse
- image:** <http://www.realestate.com.au/objects/props/8651/103938651mm1176446657.jpg>
- bedrooms:** 3
- bathrooms:** 3
- carports:** 2
- price (\$AU):** 759000.0
- location:** au:RUNAWAY_BAY_QLD
- Description:** You must inspect this stunning and very beautiful waterfront townhouse to appreciate the location and quality of the property. From the moment you enter you can see and feel the superb quality of inclusions including spotted gum timber floors, timber plantation shutters and the furnished elegant bathrooms which all happen to be ensuites. The kitchen is only 12 months old and is ergonomic and...

On the left, the "Classes" tree shows a hierarchy including owl:Thing, owl:Nothing, person:Person, realestate:Agent, realestate:RealEstate, realestate:Apartment (113), realestate:House (347), realestate:Townhouse, sparql:Query, world:Address, world:Area (15940), world:Country (5), and world:State (15). The "Instances" table at the bottom lists several real estate listings with their respective properties:

[Resource]	rdf:type	realestate:loc...	realestate:be...	realestate:bat...	realestate:pric...
reau:REA10...	realestate:Apa...	au:WOY_WOY...	3	2	399000.0
reau:REA10...	realestate:Apa...	au:WOY_WOY...	3	2	389000.0
reau:REA10...	realestate:Apa...	au:WOY_WOY...	3	2	389000.0
reau:REA10...	realestate:Apa...	au:FORSTER_...	2	1	395000.0
reau:REA10...	realestate:Apa...	au:LAKES_ENT...	3	2	365000.0
reau:REA10...	realestate:Apa...	au:COOLANGA...	2	2	599000.0
reau:REA10...	realestate:Apa...	au:WOY_WOY...	2	1	249000.0
reau:REA10...	realestate:Apa...	au:BUDERIM_...	2	1	285000.0
reau:REA10...	realestate:Apa...	au:MELBOURN...	2	1	399000.0



15 seconds 125/150

TopBraid Ensemble

TopBraid Ensemble

Reviewing

User: aldi Logout Nodes: 391
Project: reau1000.owl Triples: 564

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Geography

Map Satellite Hybrid

Graph RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse

RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse:Apartment

Label	Image
RUNAWAY_BAY(QLD) Apartment-3/3: Superb Waterfront Townhouse	

Bedrooms: 3 Bathrooms: 3 Carports: 2

Price (\$AU): 759000.0

Location: RUNAWAY BAY QLD

Description:

location

state

Queensland

Transferring data from localhost...

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Summary

- Building a SW Application on the Web
 - Diverse Problems
 - Integrating appropriate information
 - Presenting usable information
 - Linking it all together
- Easiest to use an integrated platform
 - TopBraid Suite



Technical Topics

- Please chat to me about:
 - Integrating ontologist workbench and server
 - Importance of client side caching
 - Choice of Rich Client Platform framework

