

Towards the Policy-Aware Web



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About NICTA

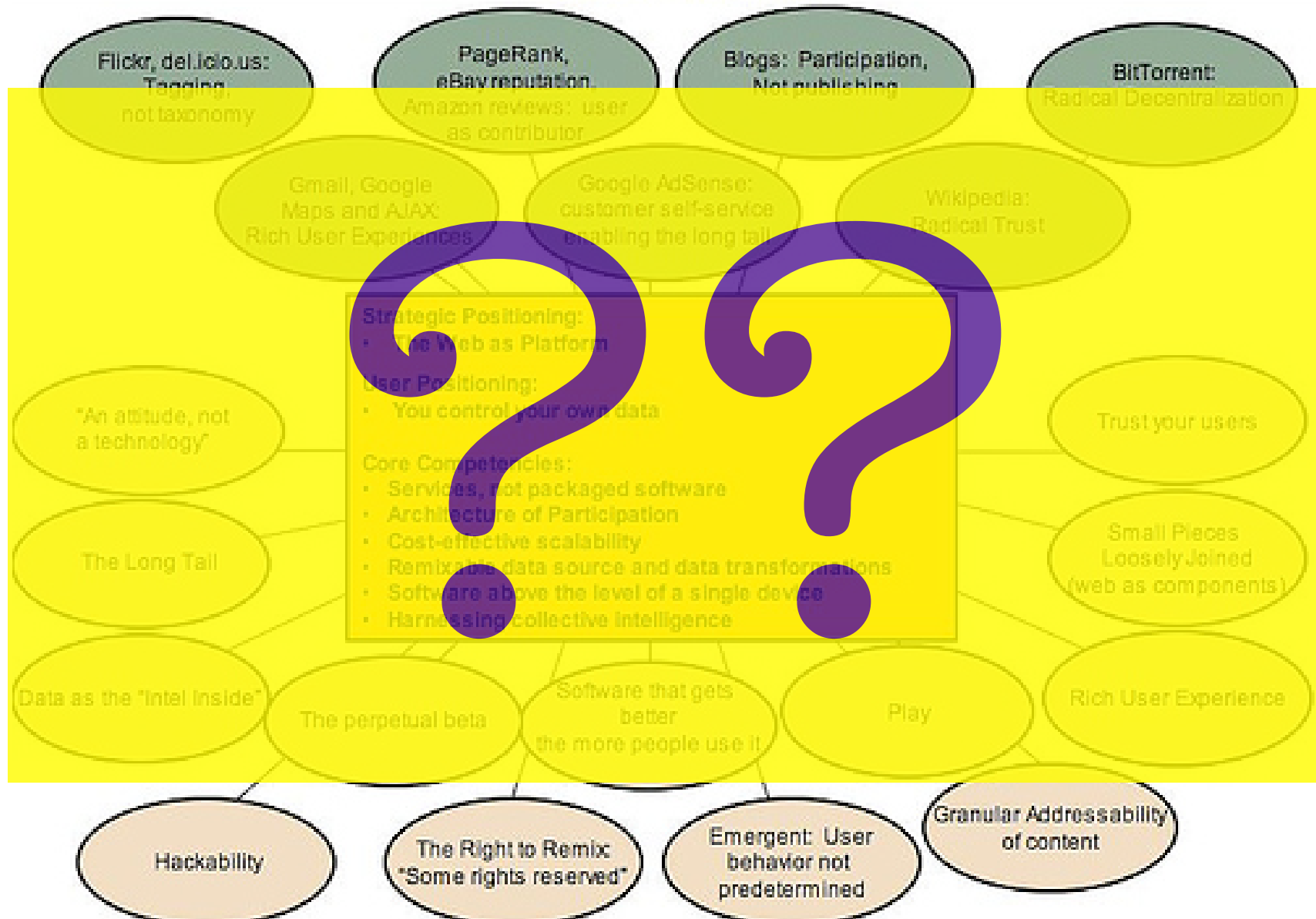
- Federally funded ICT research institute
- 5 Labs (SYDx2, CAN, MEL, BNE)
- 2 Offices (ADE, PER)
- 500+ Staff (includes 200+ PhD Students)
- Research
 - Strategic: Water, Traffic, Public Safety
 - 50+ Research Projects
 - Policy Information Systems Architecture (PISA)
- Education, Linkages, Commercialisation

Web History

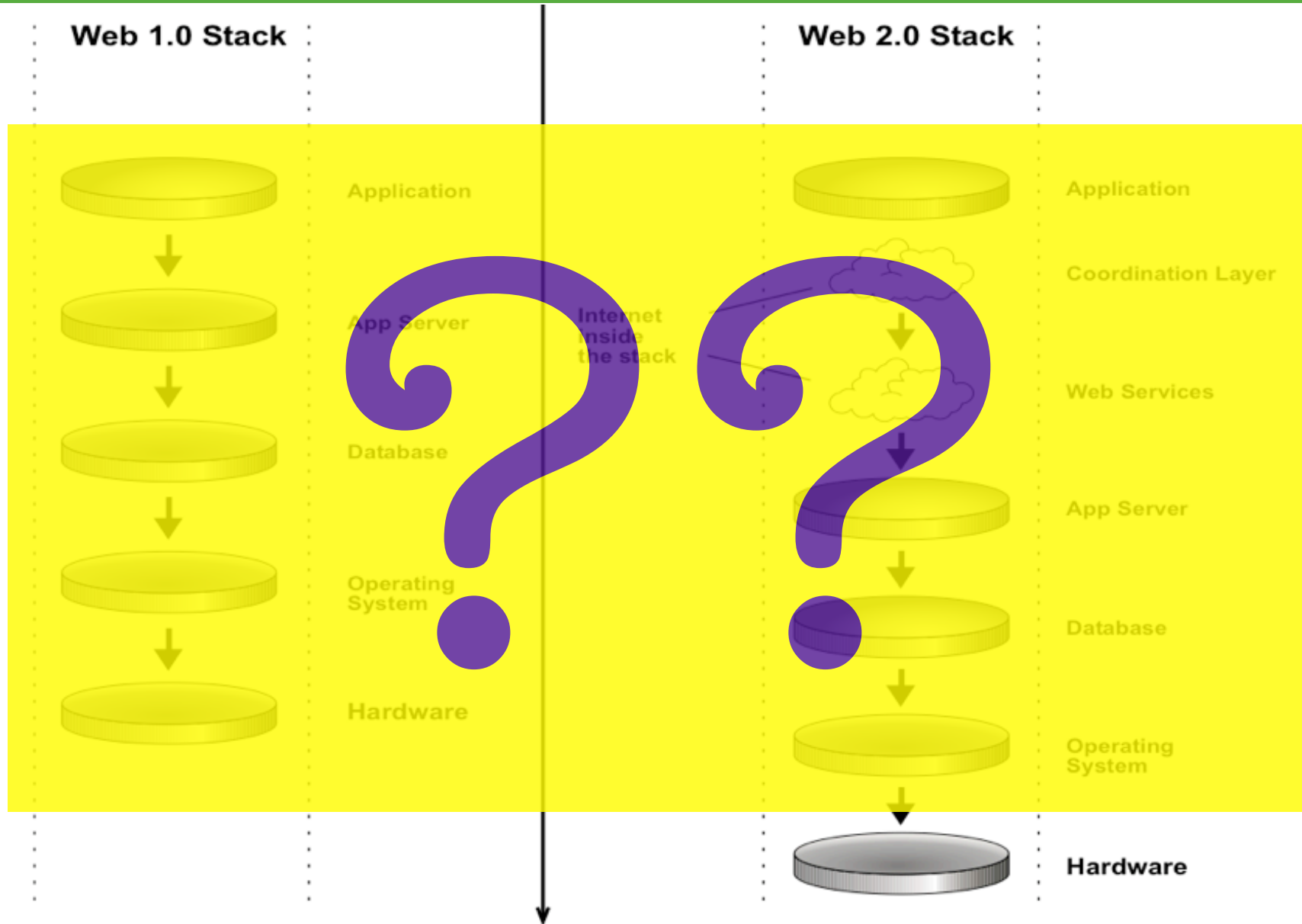
- **Web (1.0)**
 - **Simple (yet effective) infrastructure**
 - **HTTP, HTML, URI**
 - **Web Server, Web Browser**
- **Point Upgrades:**
 - **XML, SOAP, Web Services, Semantic Web**
- **Next?**

Web 2.0

Web 2.0 Meme Map



Web 2.0



User Experience...

User Rules...

The Policy Aware Web...

A bit of History...

W3C PICS - Late 90s

W3C P3P - 2000



W3C Digital Rights
Management Workshop
Sophia Antipolis, France
22-23 January 2001



Open Digital Rights Management

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Policies Everywhere

- **Privacy**
- **Rights**
- **Identity**
- **Access Control**
- **Context**
- **Preference**
- **QoS**
- **...**

State of Policies

- Numerous Formal and Informal efforts
- W3C: P3P
- EU Projects: PRIME
- ODRL Initiative
- OASIS: XACML
- All have addressed the needs of their target communities
- Need to now take a step back...otherwise...

PICS Example

**(PICS-1.1 "http://www.gcf.org/v2.5"
by "John Doe"
labels on "1994.11.05T08:15-0500"
until "1995.12.31T23:59-0000"
for "http://w3.org/PICS/Overview.html"
ratings (suds 0.5 density 0 color/hue 1)
for "http://w3.org/PICS/Underview.html"
by "Jane Doe"
ratings (subject 2 density 1 color/hue 1))**

P3P Example

<STATEMENT>

<CONSEQUENCE>

We use this information when you make a purchase.

</CONSEQUENCE>

<PURPOSE><current/></PURPOSE>

<RECIPIENT><ours/></RECIPIENT>

<RETENTION><stated-purpose/></RETENTION>

</DATA-GROUP>

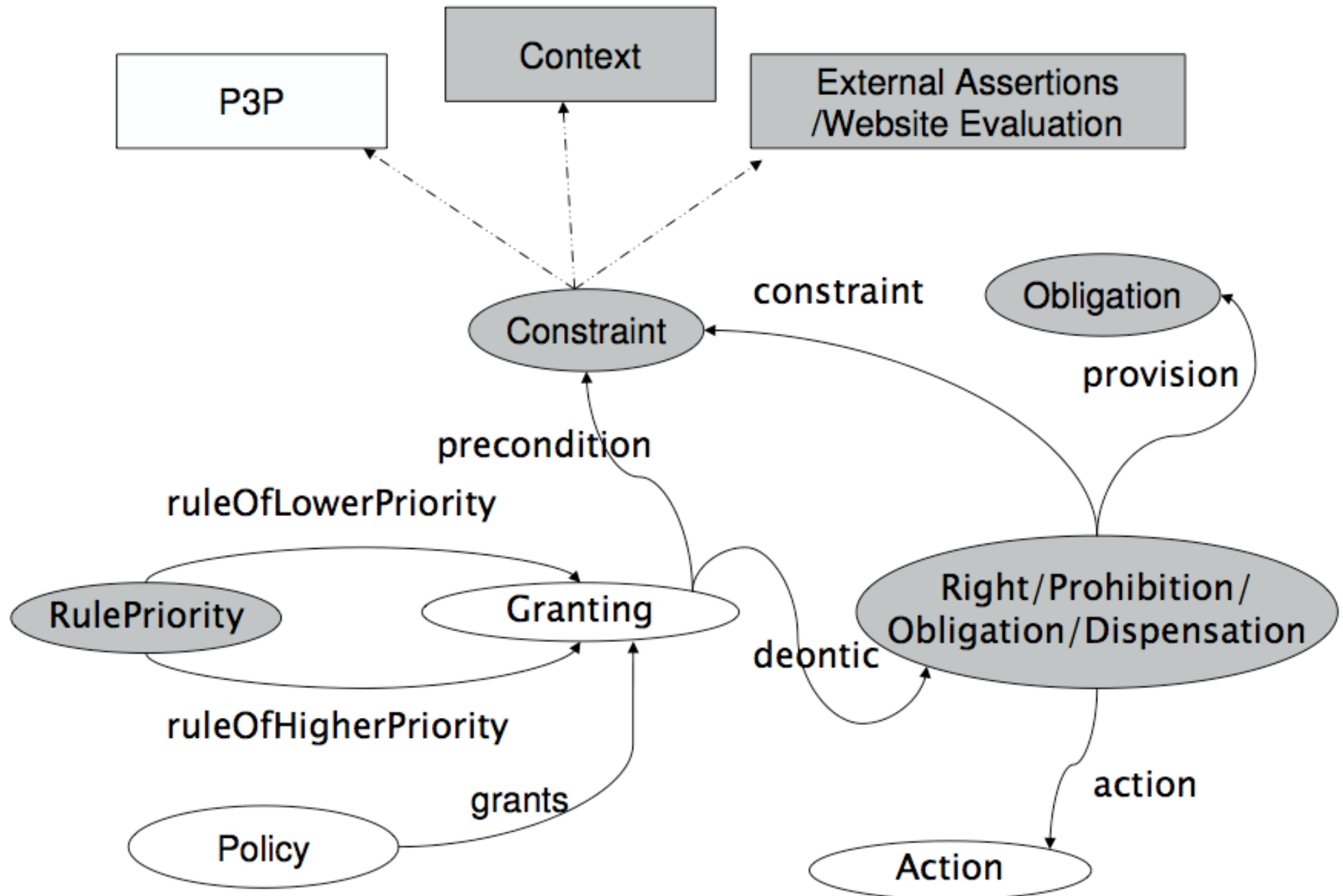
<CATEGORIES>

<purchase/>

</CATEGORIES>

</DATA-GROUP>

</STATEMENT>



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```
<License rdf:about="http://creativecommons.org/licenses/by-nc-nd/2.5/">
  <permits rdf:resource="http://web.resource.org/cc/Reproduction"/>
  <permits rdf:resource="http://web.resource.org/cc/Distribution"/>
  <requires rdf:resource="http://web.resource.org/cc/Notice"/>
  <requires rdf:resource="http://web.resource.org/cc/Attribution"/>
  <prohibits rdf:resource="http://web.resource.org/cc/CommercialUse"/>
</License>
```

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1. Definitions

- "Collective Work"** means a work, such as a periodical issue, anthology or encyclopedia, in which the Work in its entirety in unmodified form, along with a number of other contributions, constituting separate and independent works in themselves, are assembled into a collective whole. A work that constitutes a Collective Work will not be considered a Derivative Work (as defined below) for the purposes of this License.
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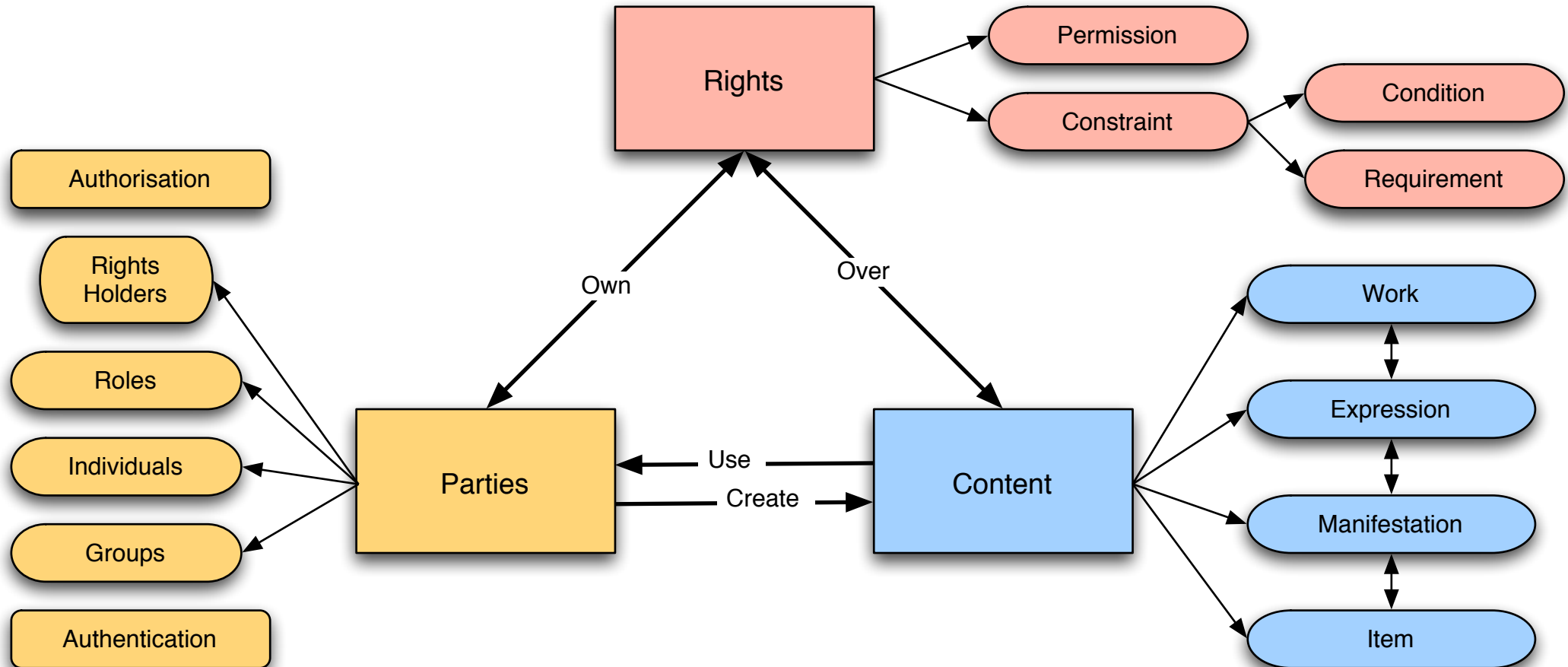


Advanced Search

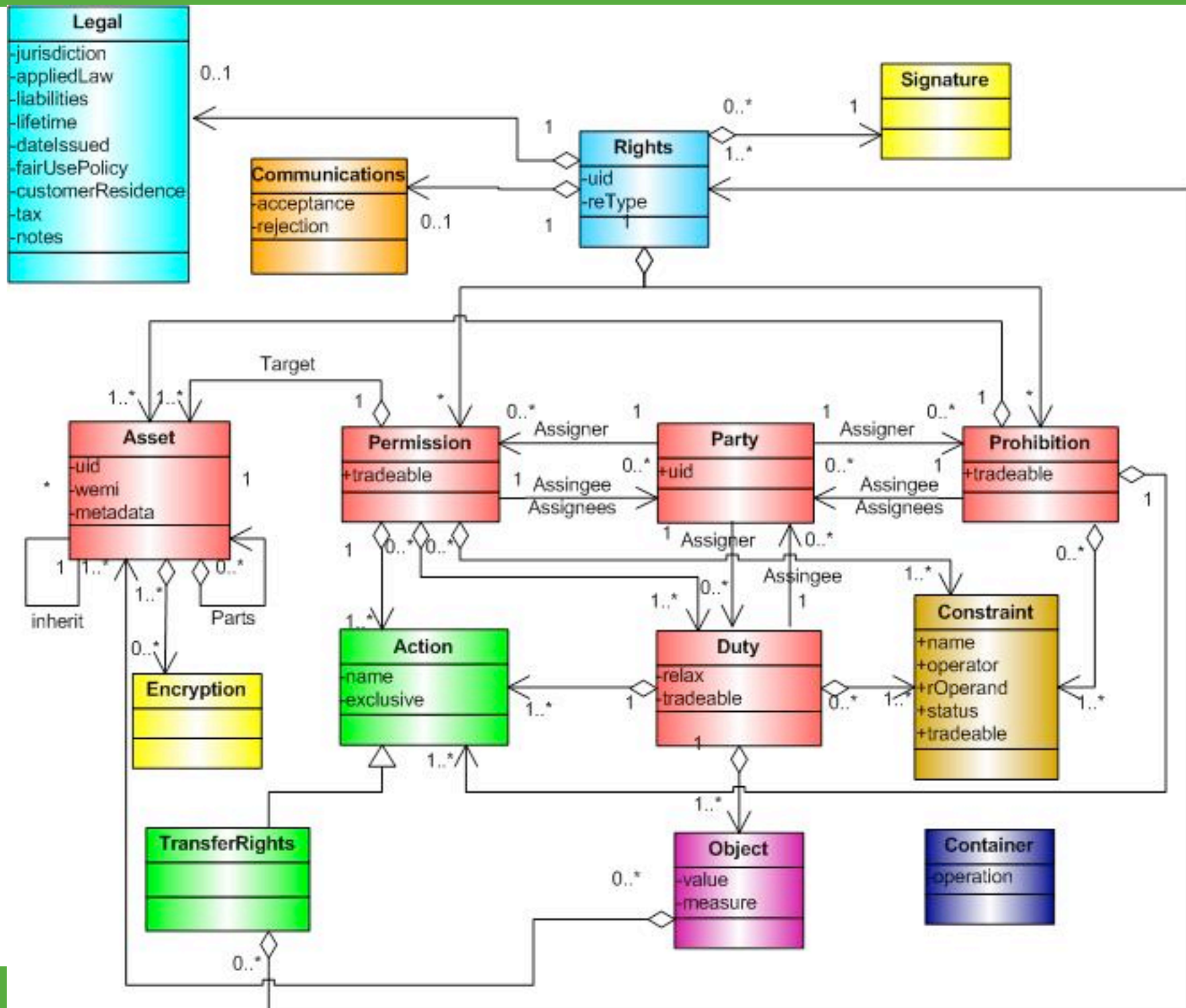
[Advanced Search](#)

Find results	with all of the words	<input type="text"/>	10 results	Google Search
	with the exact phrase	<input type="text"/>		
	with at least one of the words	<input type="text"/>		
	without the words	<input type="text"/>		
Language	Return pages written in	<input type="text" value="any language"/>		
File Format	<input type="text" value="Only"/> return results of the file format	<input type="text" value="any format"/>		
Date	Return web pages updated in the	<input type="text" value="anytime"/>		
Occurrences	Return results where my terms occur	<input type="text" value="anywhere in the page"/>		
Domain	<input type="text" value="Only"/> return results from the site or domain			
Usage Rights	Return results that are	<div>not filtered by license free to use or share ✓ free to use or share, even commercially free to use share or modify free to use, share or modify, even commercially</div>		
SafeSearch	<input checked="" type="radio"/> No filtering <input type="radio"/> Filter using SafeSearch			

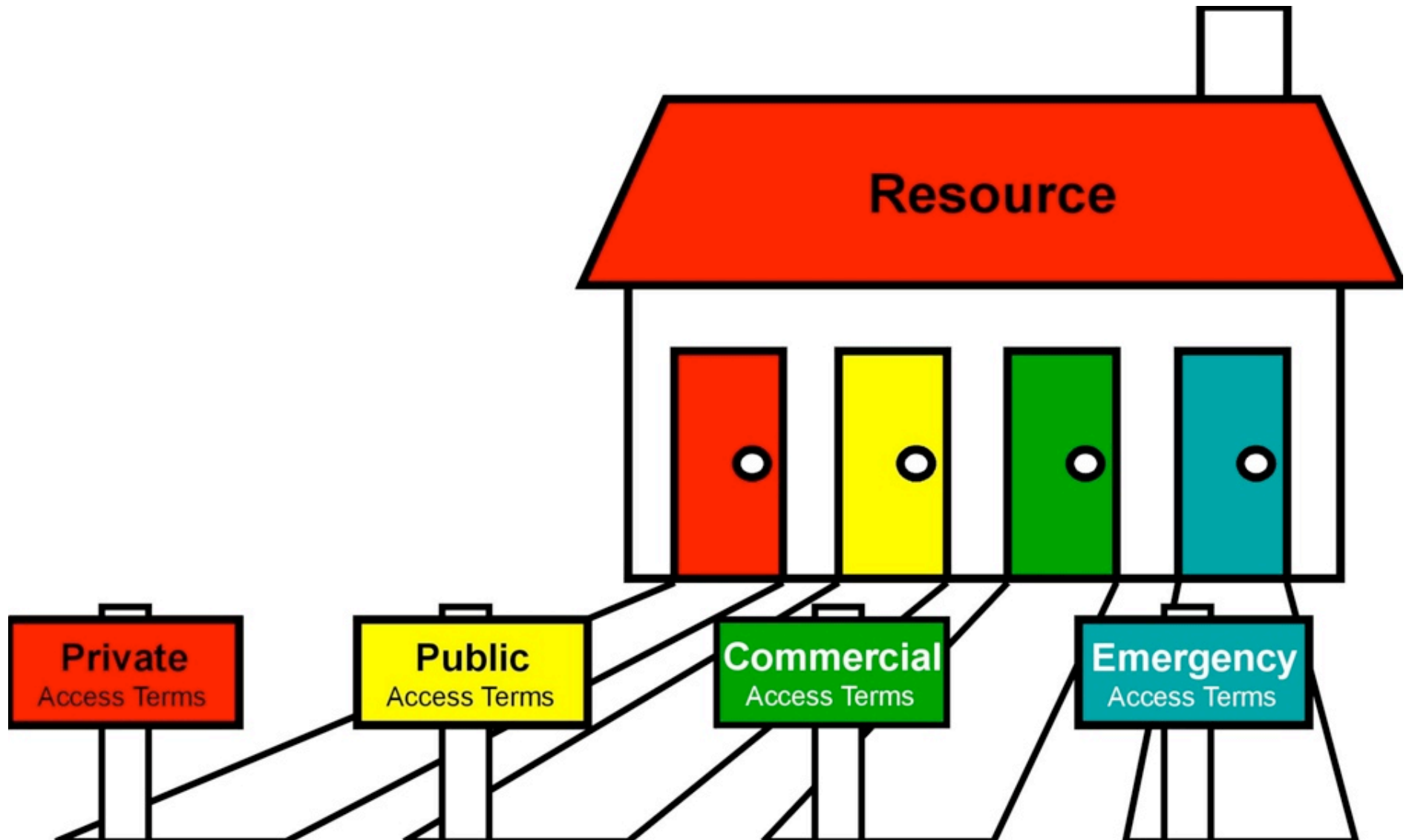
More Rights



Complex Rights



GeoDRM



Simple Rights



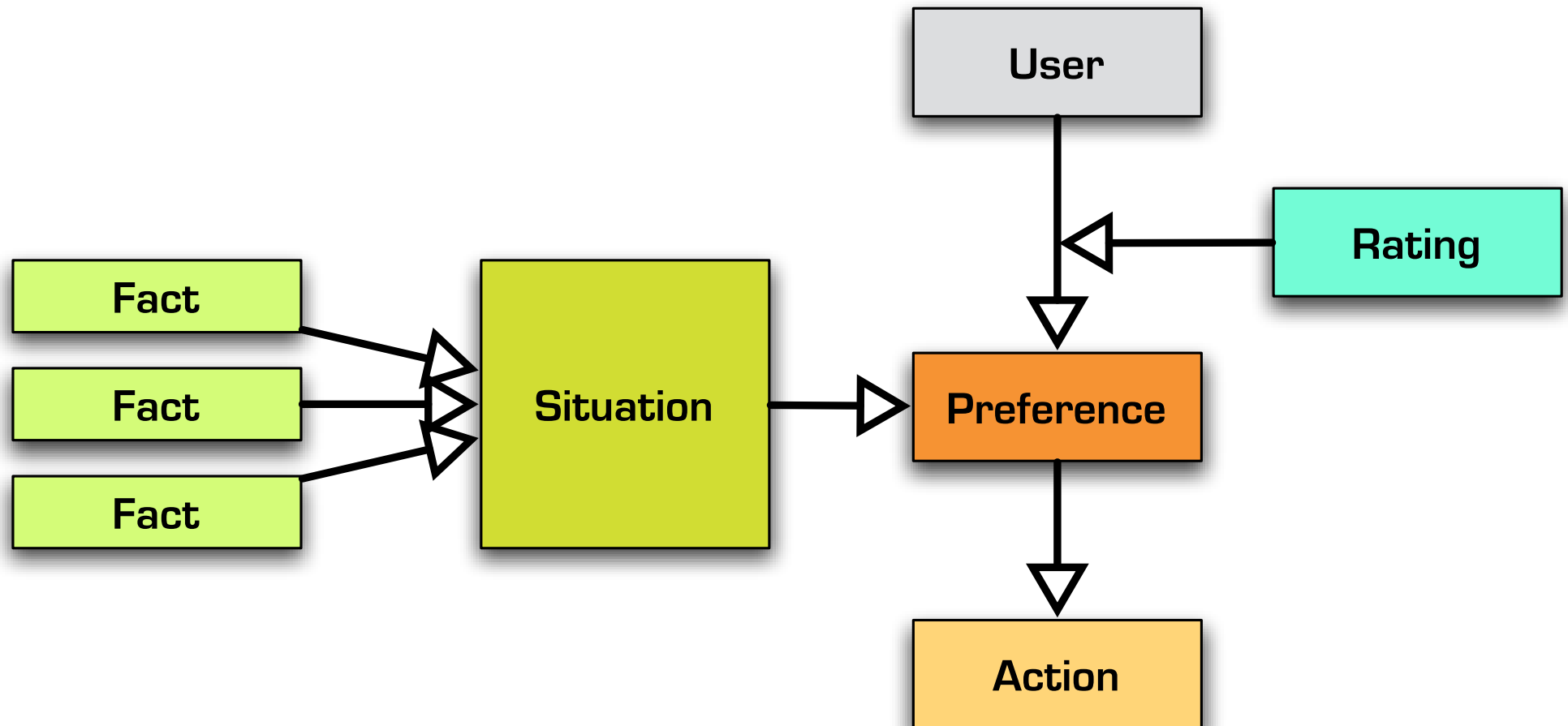
Key Points

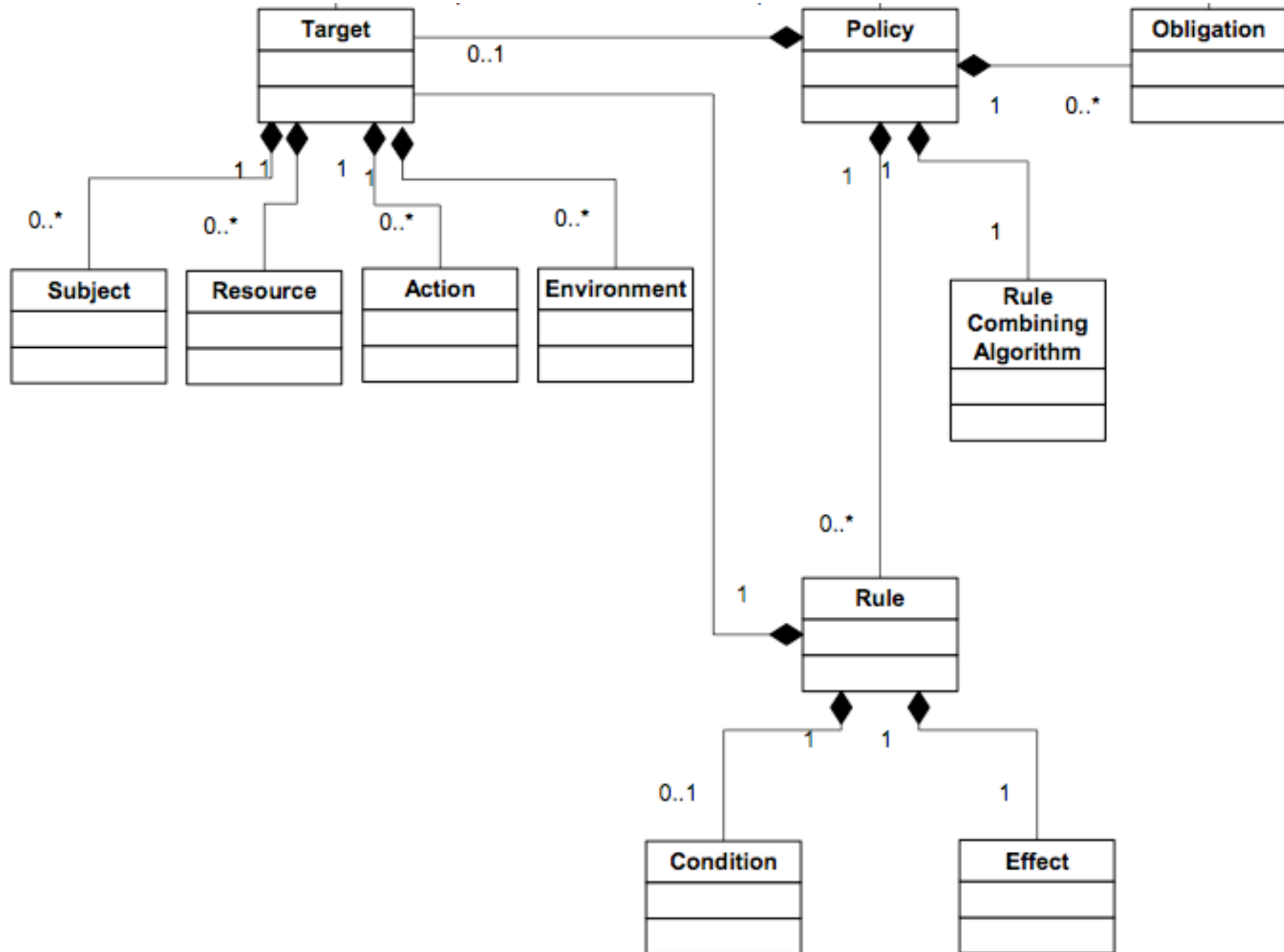
As the authorized rightholder of music you buy from the iTunes Music Store:

- You don't need an Internet connection to listen to your purchased music.
- You can include your purchased music in custom playlists and burn it to a CD.
- You can listen to your purchased music on an unlimited number of iPod devices.
- You can share your music on four other computers.
- Your purchased music is yours forever; you don't need to subscribe to any service.
- You can use your purchased music in applications other than iTunes. For example, you can use it in a movie you make or in a presentation you create.

	Song Name	Price
1	<input checked="" type="checkbox"/> Hey Mama	\$0.99 <input type="button" value="BUY SONG"/>
2	<input checked="" type="checkbox"/> After the Tone	\$0.99 <input type="button" value="BUY SONG"/>
3	<input checked="" type="checkbox"/> Rome Wasn't Built in a Day	\$0.99 <input type="button" value="BUY SONG"/>

Context Model

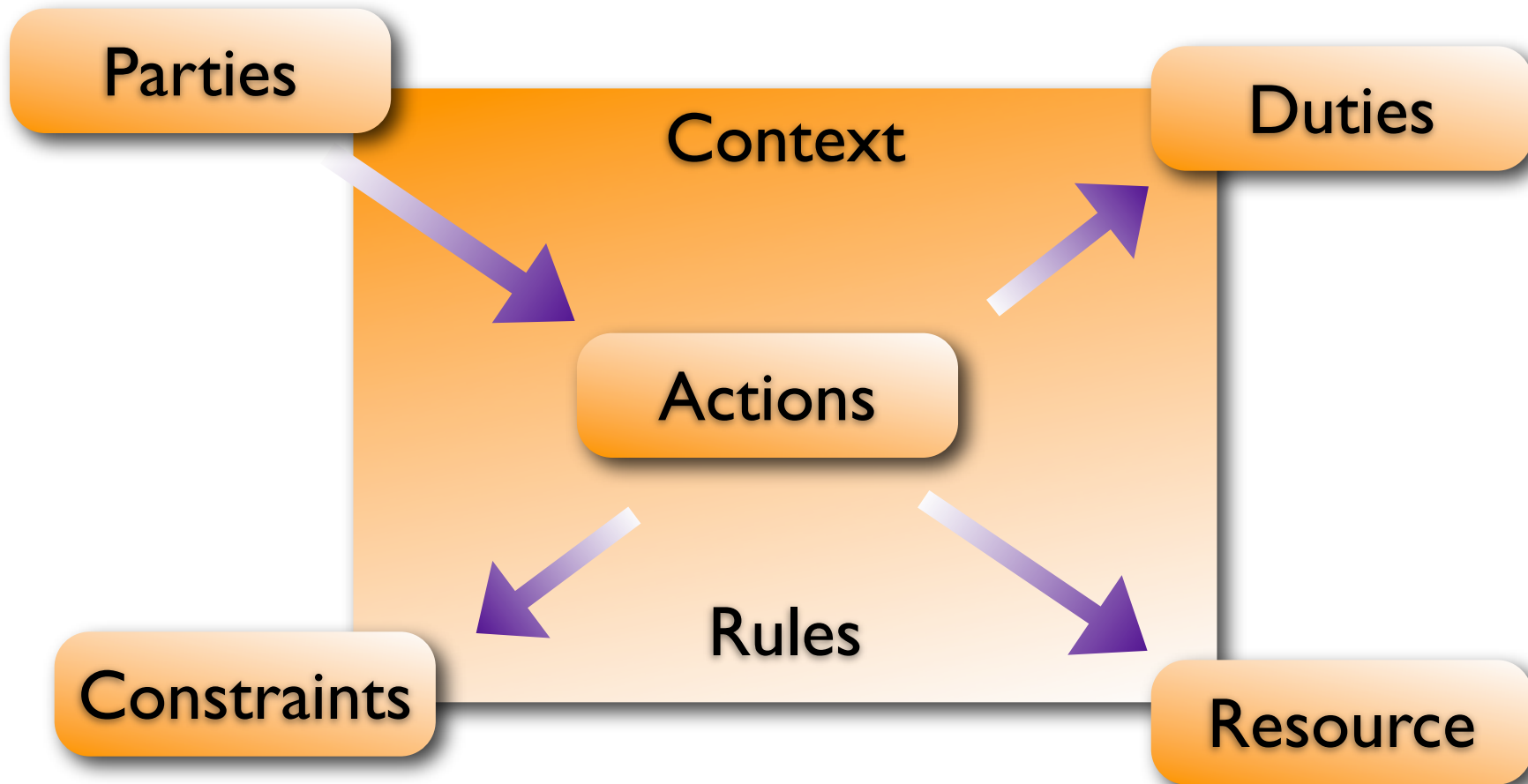




What is Common...

- **Content, Resource, Assets, Objects, Target**
- **Constraints, Condition, Ratings, Preferences**
- **Obligations, Requirements, Duties, Preconditions, Effect**
- **Actions, Permissions**
- **Prohibitions (“not”)**
- **Assertions, Facts, Context, Environment**
- **Parties, Users**
- **Policy, Rules**

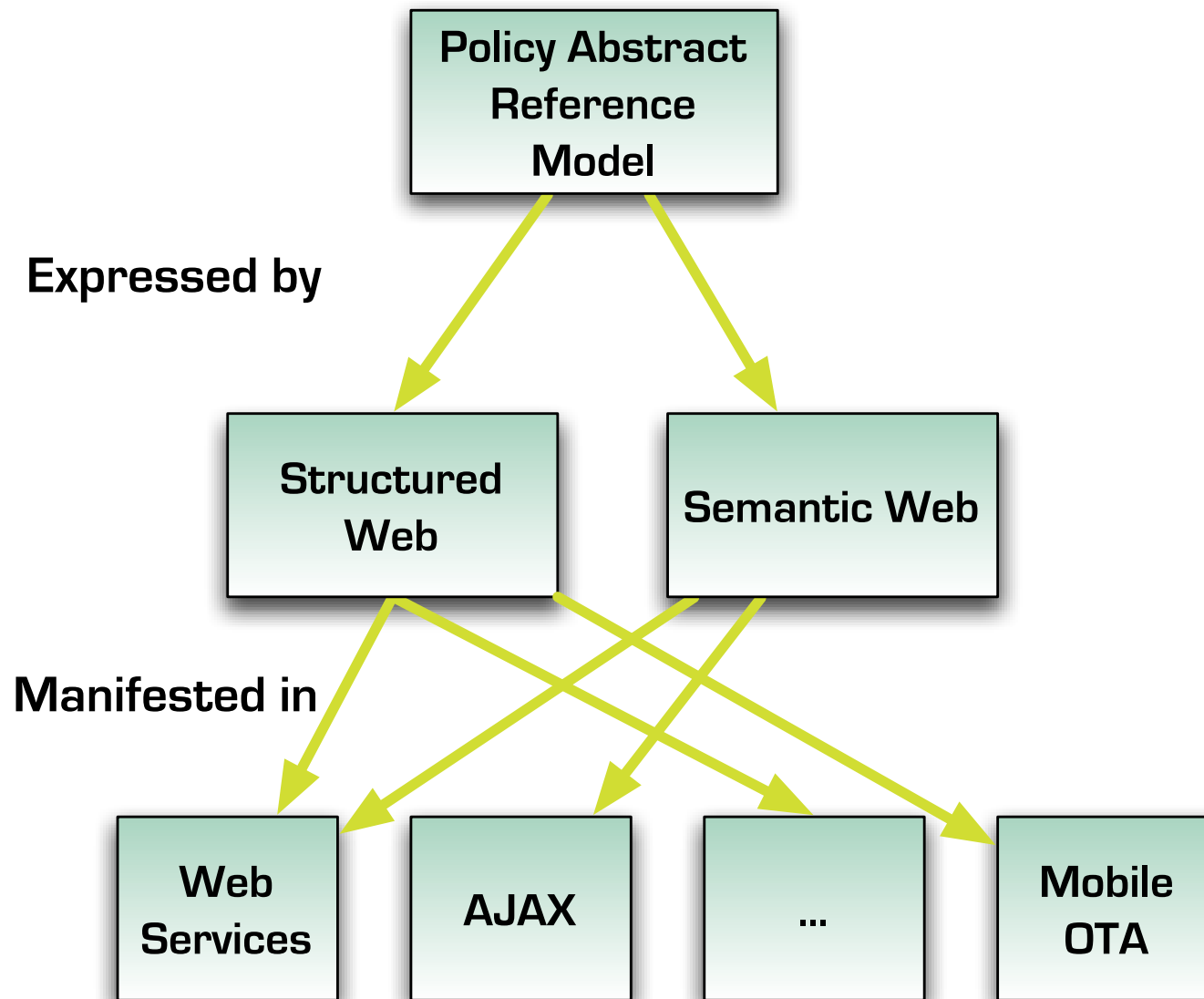
Common Model



Policy Framework

- **Web Policy Framework Path...**
 - **Policy Requirements**
 - **Policy Abstract Reference Model (PARM)**
 - **Expression(s) of the PARM**
 - **PARM Architecture(s)**
- **Community/Sector based Ontologies and Vocabularies**

Policy Framework



Policy Requirements

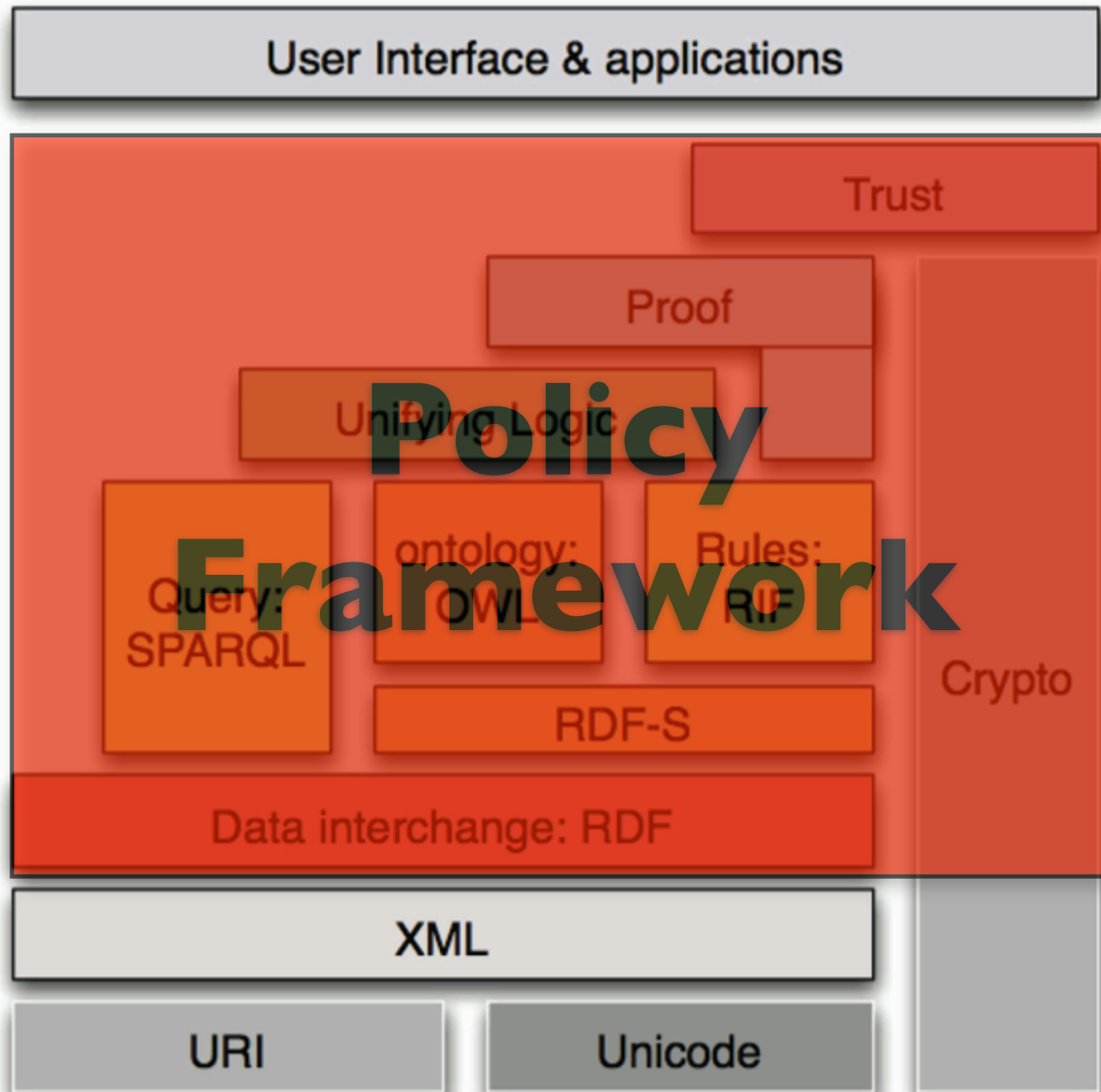
- **Transparency**
- **Compliance**
- **Accountability**
- **Trust**
 - **“enforcement” mechanisms V community acceptance**
- **Address Policy conflicts and preferences (priorities)**
- **Meet the dynamics of Context**

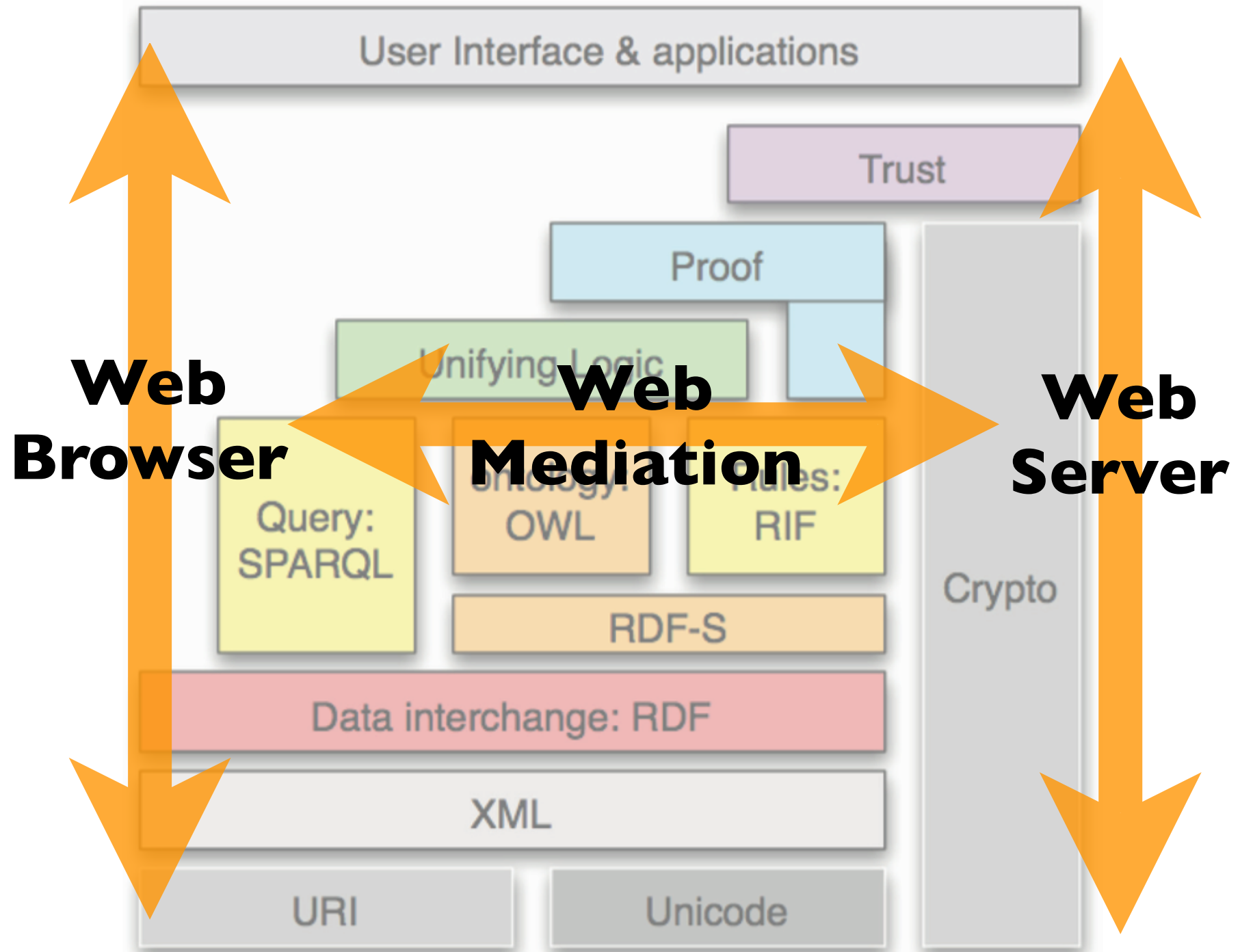
Policy Models

- **Capture the commonality of the community**
 - **Information Model**
 - **Negotiation Model**
 - **Enforcement Model**
 - **Consent Model**
 - ...
- **Support in the Web Infrastructure**

Research Challenges

- **How to Evaluate policies to make decisions**
- **How to enable Accountability for policy use and breaches**
- **How to deal with Inconsistencies across policies at the data and rule level**
- **How to Visualise large inter-related policies**
- **How to Reason across policies**
- **How to ensure Compliance to policies**
- **How to enable Transparency across policies and**
- **How to Standardise a policy framework**

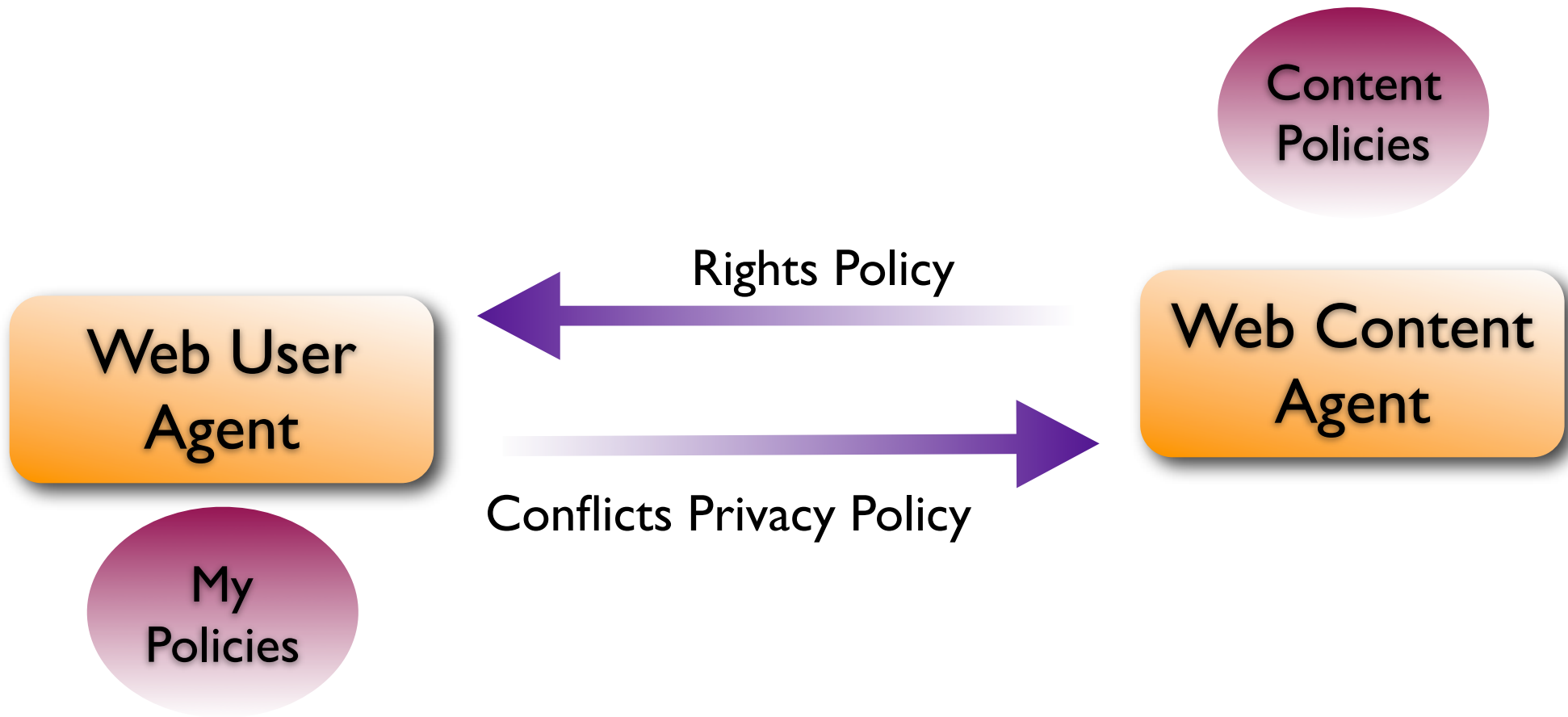




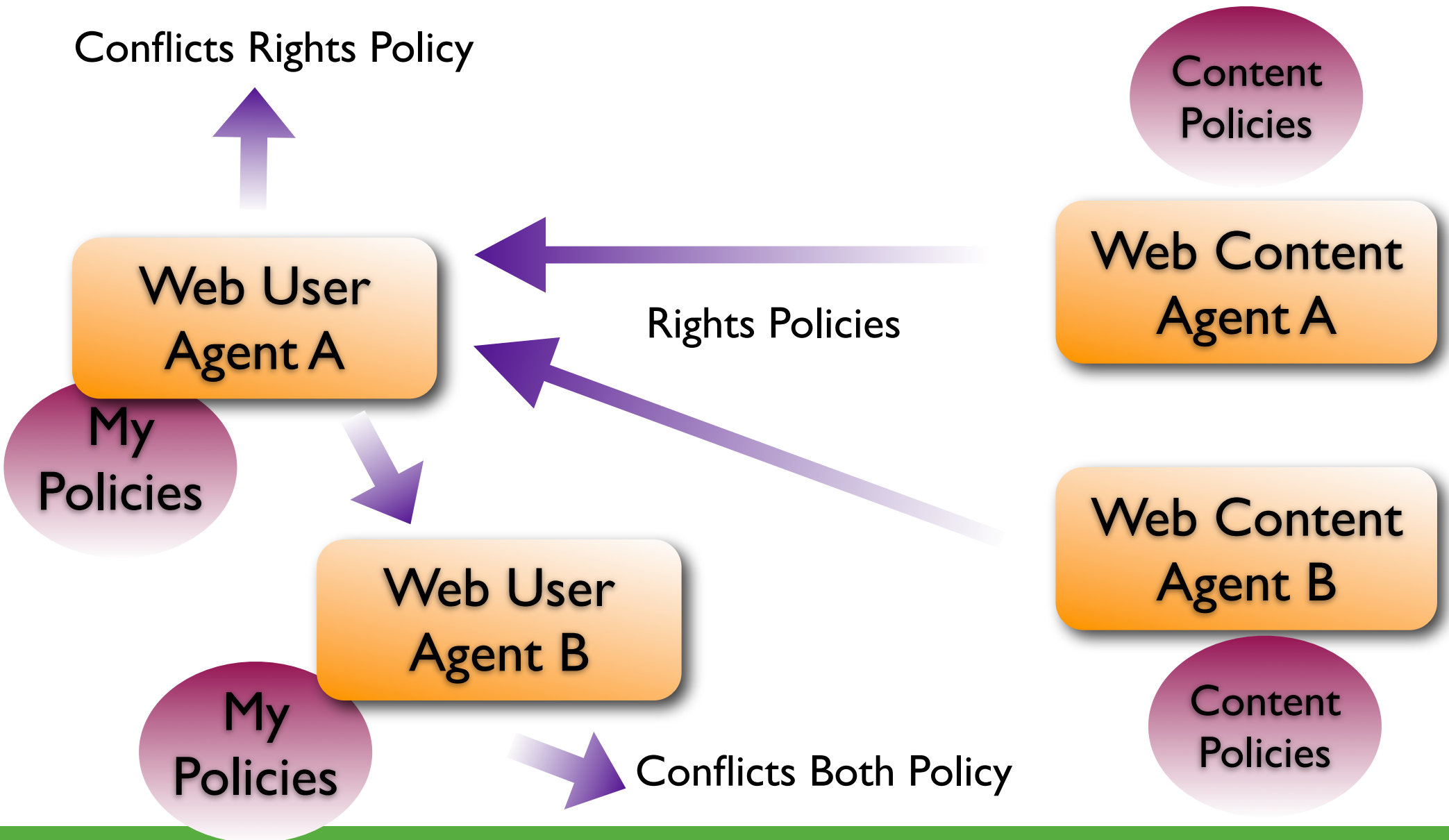
Growing Up

- **Web Browser ⇒ Web User Agent**
 - **Manage User Policies**
 - **Trusted Behaviour**
- **Web Server ⇒ Web Content Agent**
 - **Manage Content Policies**
 - **Trusted Behaviour**

Use Case #1



Use Case #2



Policy-Aware Web

- This is the **real** Web 2.0
 - This will truly move towards W3C “Leading the Web to Its Full Potential...”
 - New Web Infrastructure = New Opportunities
- Huge Opportunity
 - Numerous communities working on Policy Languages
 - Vertical nightmare...
- Huge Interest...Major Impact...

Questions...

What do you
want from it?