

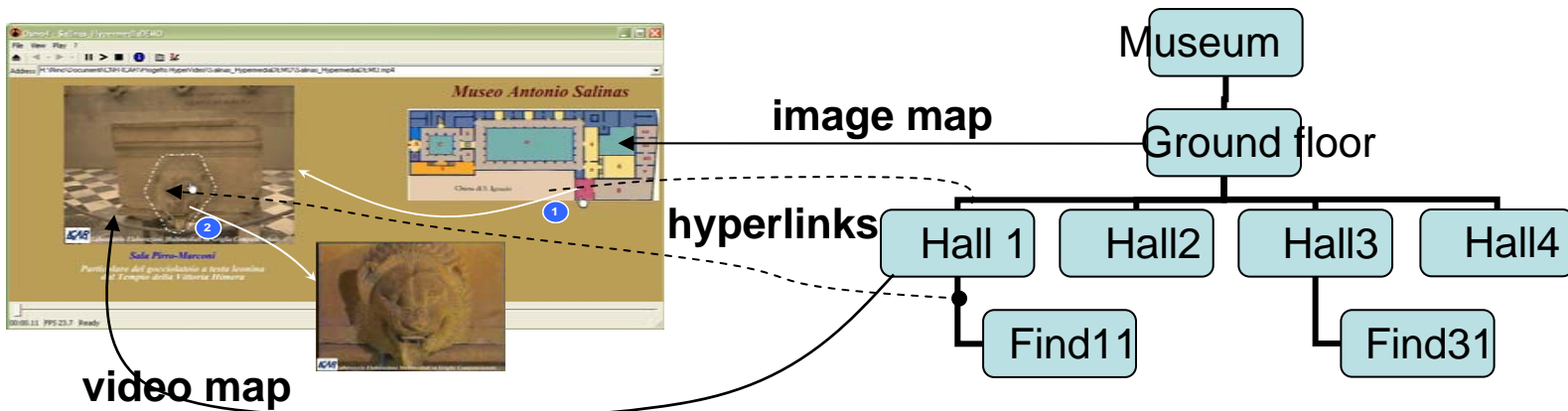
# A System of ontologies and services for Hypermedia authoring on the web

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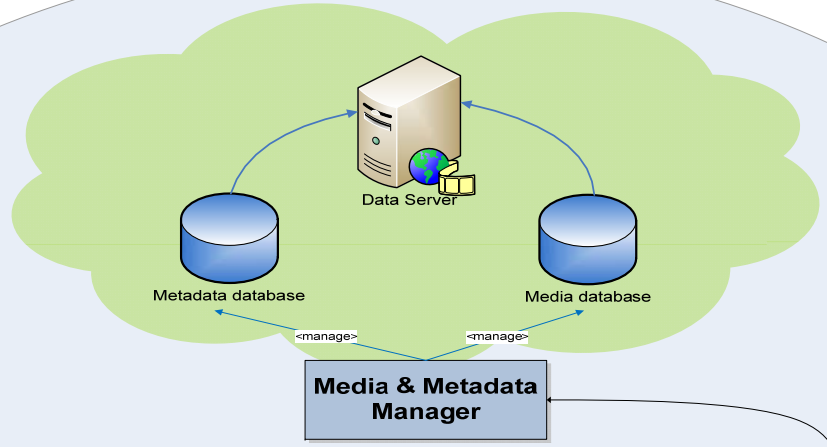
Medialab ICAR-CNR  
Palermo, Italy

# a Simple hypermedia: a museum Hyperatlas

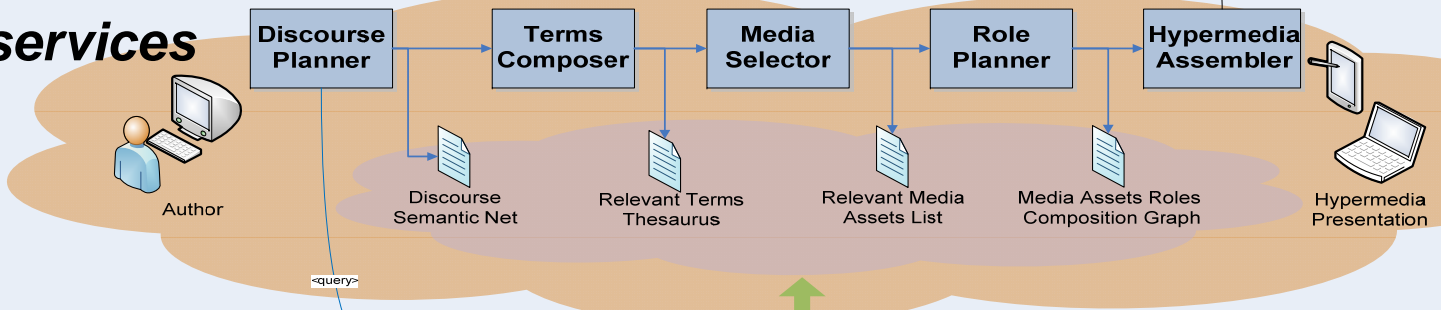
- An Hyperatlas allows to browse representations of concepts organized in classification tree.
- In a museum hypeatlas the structure of the hyperlinks suggests to the user a logical organization of museum parts (s)he can browse
- Each scene describes and/or represents a single museum item and its position in the proposed museum logical organization



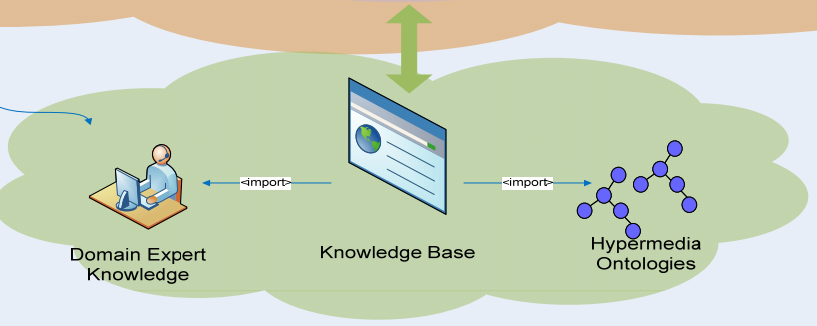
### Media & XML metadata



### Authoring services



### Media assets index, KB, & process descriptors



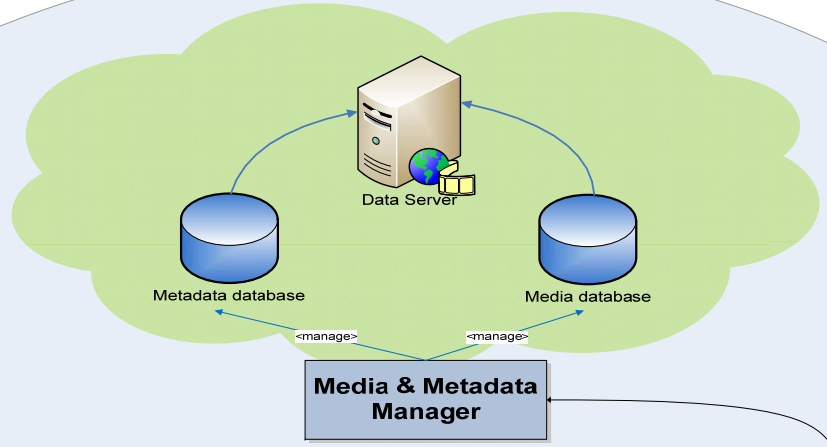
## THE MEDIA & METADATA REPOSITORY

A media and XML metadata repository, managed by the *MILOS* Multimedia CMS and accessed via the *MILOSBridge* WS.

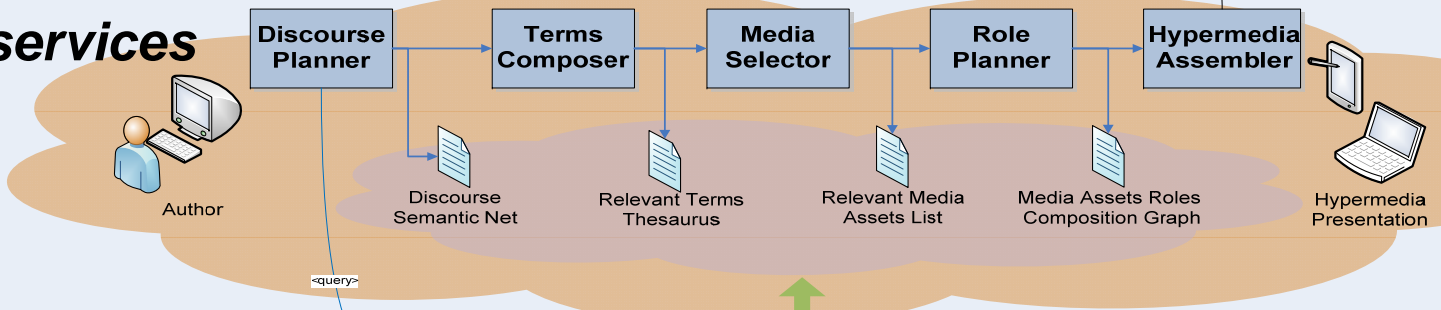
To maintain *MILOS* indexing efficiency on XML data, metadata on media assets are encoded in the MPEG-7 format according to the *DAVP* profile and retrieved via XQUERYS.

**Denotation** (description) of media segments via MPEG-7 descriptors, **connotation** (semantic annotation) via **glossaries of controlled terms** inserted in MPEG-7 semantic descriptors and referencing RDF resources.

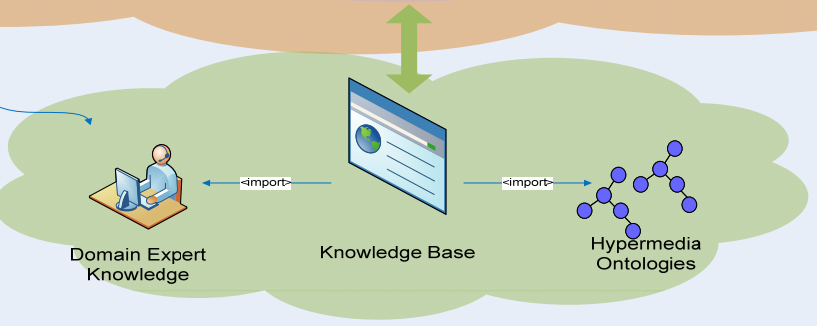
**Media & XML metadata**



**Authoring services**



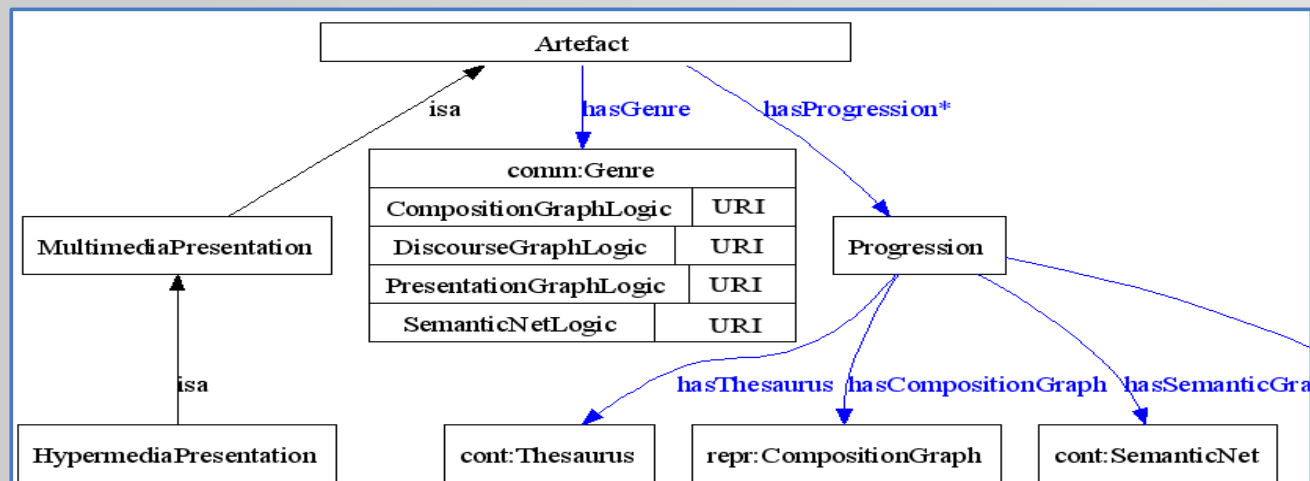
**Media assets index, KB, & process descriptors**



# THE SEMANTIC LAYER

A repository of RDF/OWL graphs containing platform-specific **ontological descriptions** of media assets, of **semantic contents**, of genre-dependent contents representation roles and relations, of the authoring process and, finally a thesaurus of mappings among classes and properties of known ontologies named *ontopedia*.

RDF files are directly accessed on the web by services via Jena SPARQL processors.

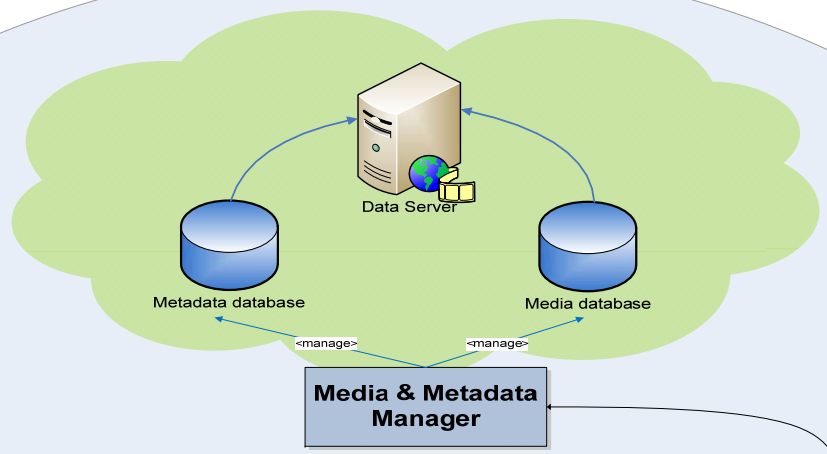


# Hyperatlas modelling

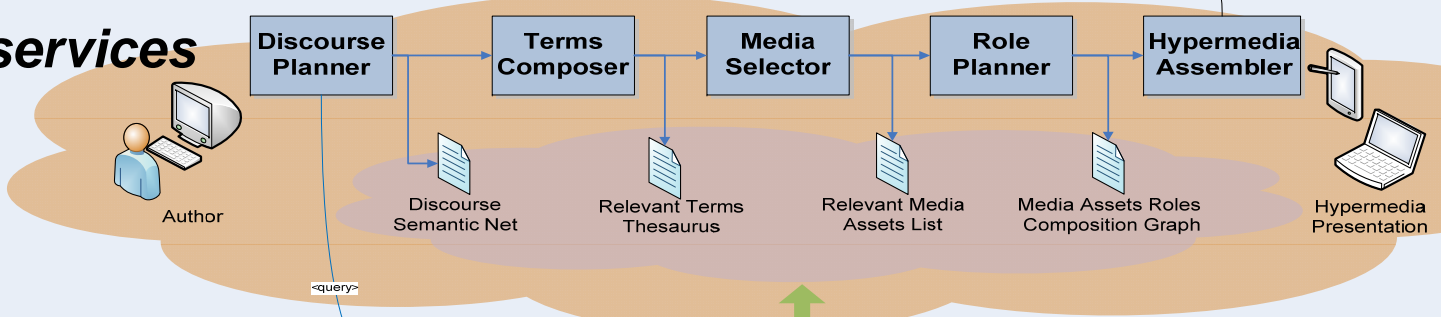
	<b>Meta</b> (concepts) <b>role/relation</b>	<b>Macro</b> (multimedia) <b>role/relation</b>	<b>Micro</b> (media asset) <b>role/relation</b>
<b>SemanticNet &amp;Thesaurus</b>	Domain/Topic/ Subject/Object broader/narrower		
<b>Composition Graph</b>		Summary/ Information summarize	Label,Description Represent/Icon/Index sibling,anchor
<b>Presentation Graph</b>		not modeled plays-with, exclusive, activates	MPEG4/XMT syntax



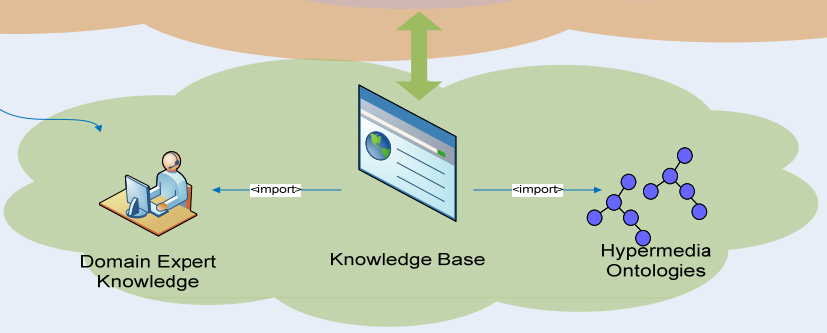
### Media & XML metadata



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# PLATFORM DEMO WEB APPLICATIONS

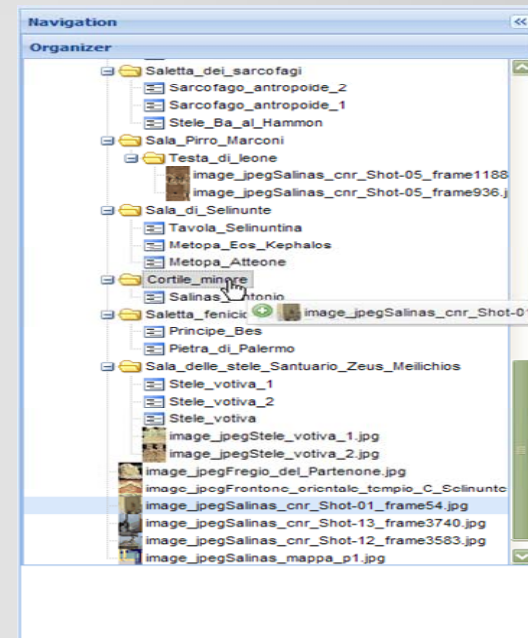
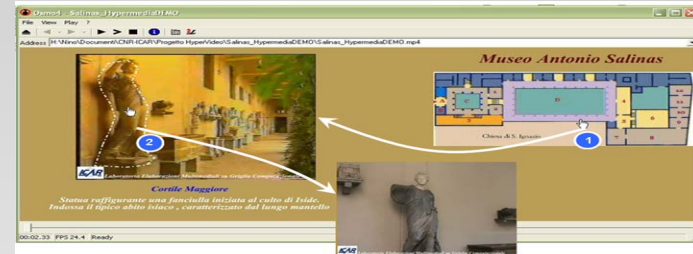
## HyperAtlas:

Automatic synthesis of an hypermedia representing a taxonomy of concepts.

## Semantic Image Gallery:

Tool for semantic image annotation in MPEG-7, and retrieval by visual similarity or by terms.

Virtual image organizer by contents: Images labeled with terms contained in a thesaurus are shown as organized in folders hierarchically organized as the thesaurus itself.



Thank you  
for your kind attention !

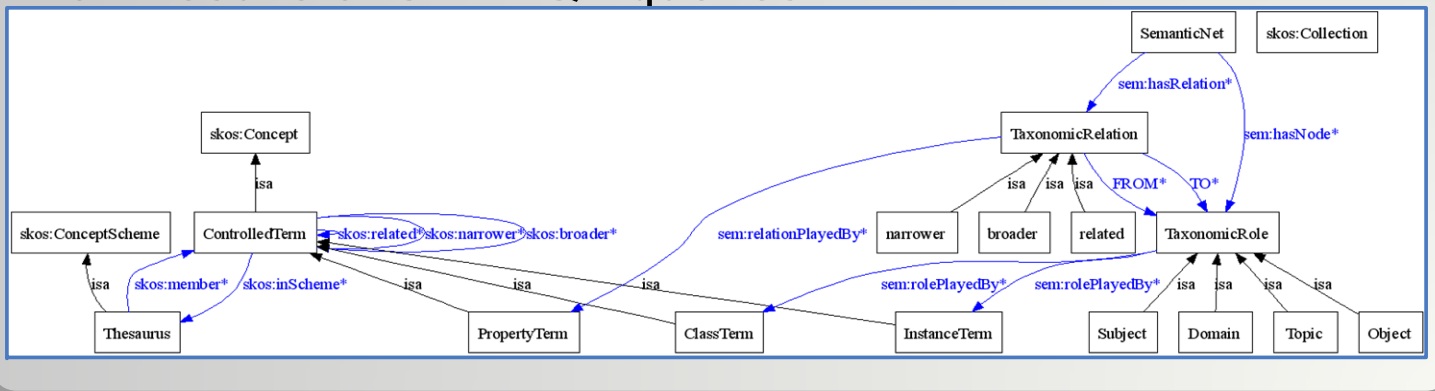
# FAQs

- **MPEG-7/XSD vs COMM/RDF**
  - Profiled MPEG-7 media descriptions are indexable and compatible with existing efficient XML MDB tools and MPEG-7 metadata repositories
  - We use an OWL index of descriptions of media assets structure & represented contents
  - moving to COMM & logical patterns for modeling n-ary relations (events/situations)
- **Scalability with respect to representation genres**
  - Scalability is provided at system level by the multilayer architecture and ontological based descriptions
  - Services are pluggable with procedural and inference rule modules
  - Structure modelling and generation tested at present just for taxonomic based presentations

# THE DISCOURSE PLANNER & TERMS COMPOSER WS

The *SemNet* WS and the *Snith* WS implement the *construct message* canonical process. In the abstract or conceptual step, the *SemNet* WS interactively aids the user in the selection of the concepts (categories) to be included in the desired hyper-atlas, and to structure them in a semantic net.

In the terminological step, the *Snith* service builds a **thesaurus of controlled terms** (and synonyms) related to the concepts inserted in the user-defined semantic net. It queries known KBs and infers implicit relations from results of SPARQL queries.

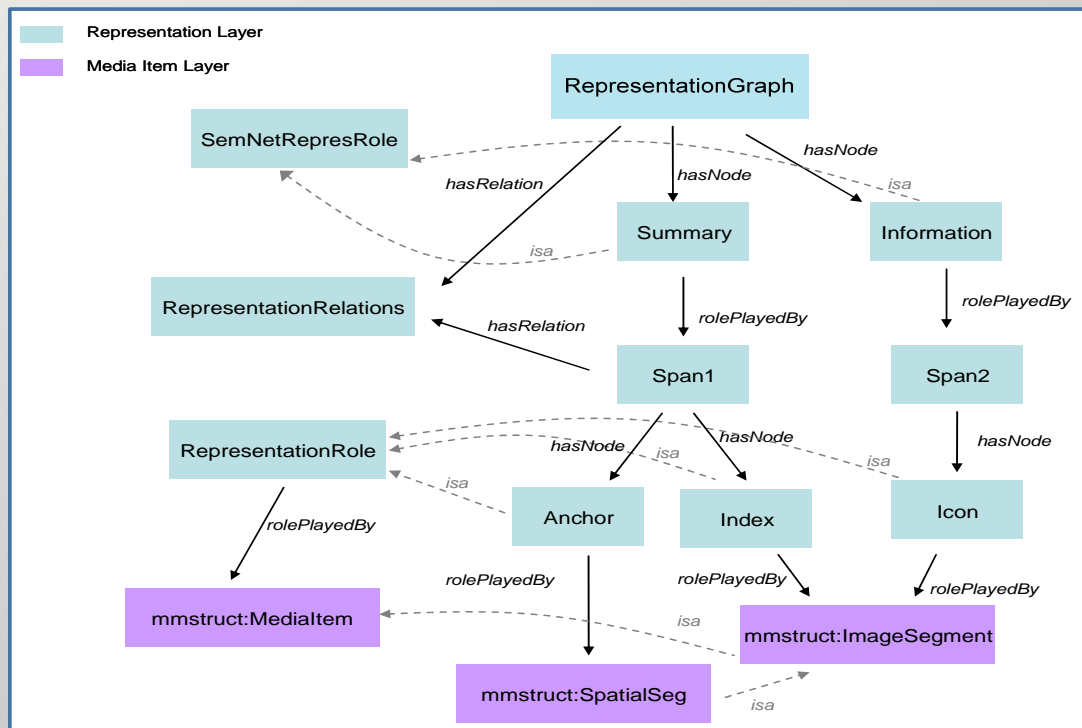


## THE MEDIA SELECTOR WS

The *Selit* service implements the *query* canonical process. It produces an **index of relevant media assets** annotated with terms included in the input thesaurus.

# THE REPRESENTATION ORGANIZER WS

The *Ithen* service implements the *organize* canonical process. According to genre-dependent rules it selects the **media assets best suited to play a role** in the discourse structure and builds a role *Representation Graph*.



# THE HYPERMEDIA ASSEMBLER WS

The *HyperJessSyn* service finally implements the *publish* canonical process. It **synthesize the final hypermedia** presentation by translating, via XSL transformations, representation roles into synchronization primitives of the publishing format. XSLT templates are used also to adapt the presentation layout.

