

Web Services for the Integrated Enterprise OMG's 2nd Workshop On Web Services Modeling, Architectures, Infrastructures And Standards	
<u>Europe</u> February 10-13, 2003 Munich, Germany	<u>USA</u> April 22-25, 2003 Philadelphia, PA USA
Sponsored by Microsoft	



Semantic Network Services*)

Sharing Ontology by Web Services

Wanda Kaye Jackson (US), Thomas Bandholtz (EU)

SchlumbergerSema

Austin (Texas) / Cologne (Germany)

The SNS use case in Germany

80 environmental authorities - one shared metadata registry



German Environmental Information Network (gein): Web crawler and automated search engine features. Distributed query (SOAP) to include database objects.

Umweltdatenkatalog (UDK): Manually edited metadata, includes off-line information.

Semantic Network Services (SNS): Web Services access to a shared ontology and automated indexing.

Means of Integration in *gein*[®]

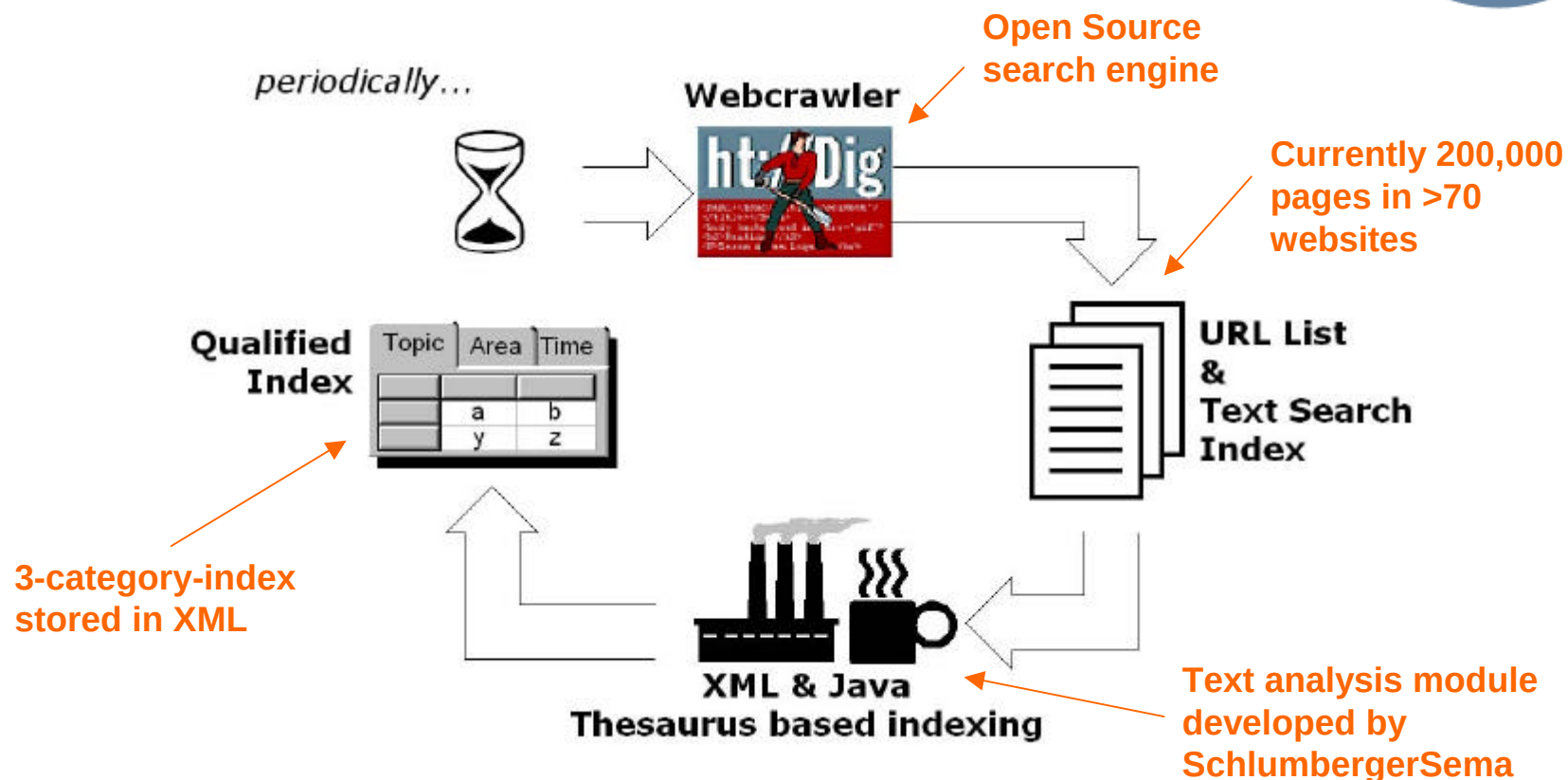


One portal interface for the public (<http://www.gein.de>)

1. **Search engine crawler** & full text index (ht://Dig)
specialized on the environmental domain.
2. **Distributed query** including nine databases.
XML via HTTP 1999
3. **Shared ontology** and automatic indexing.
Thesaurus – gazetteer - chronology

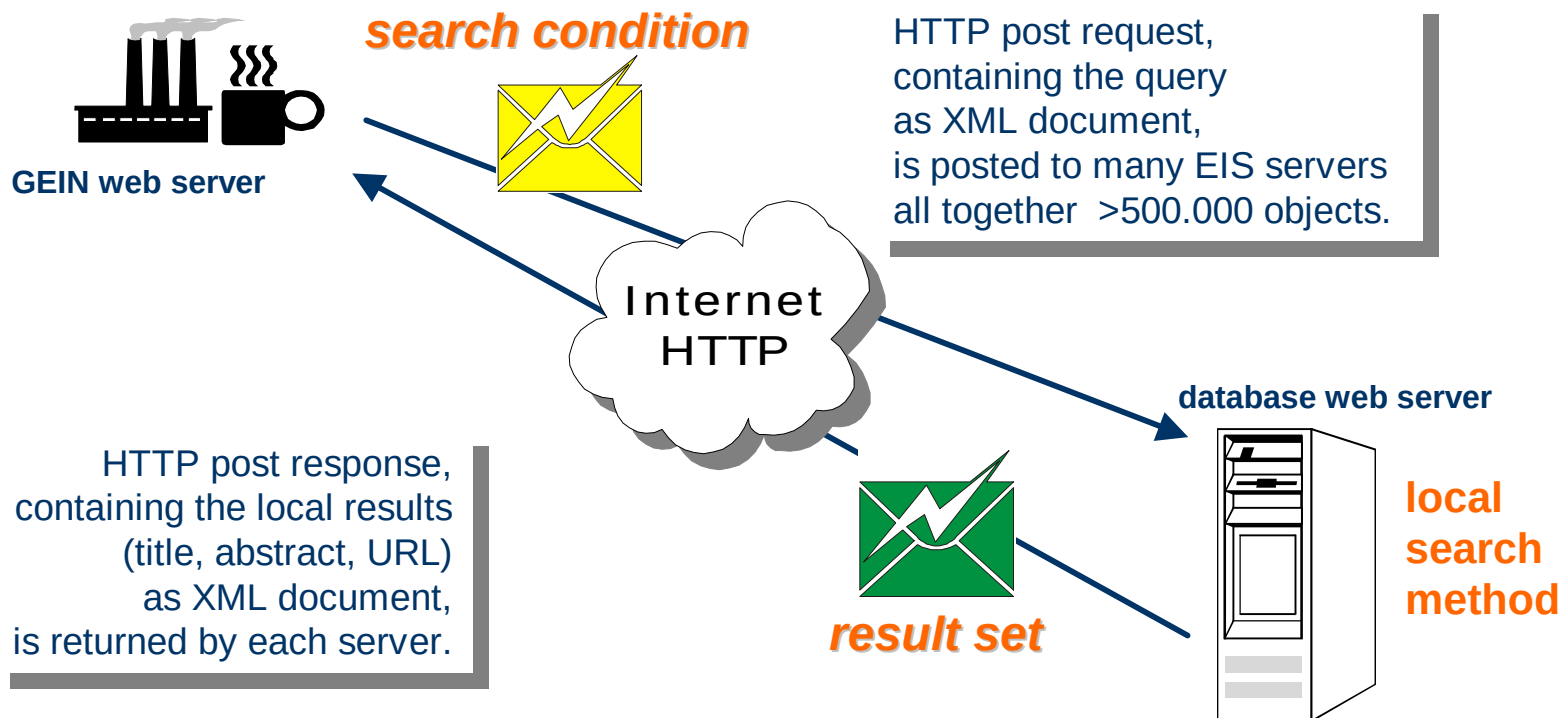


1. Search engine crawler & full text index



Running since 1999.

2. Distributed query including nine databases (since 1999)



Currently discussed to use Web Services here also.

3. Shared ontology

Bi-lingual German/English



1. a **thesaurus** of currently 39,143 environmental terms (UMTHES[®], German source of GEMET)
2. a **gazetteer** including the intersections between 48,213 geographical objects of all kinds;
3. a **chronology** of historical and contemporary events that have affected the environment, currently 544 events.

"daphnia" "direct discharger" "permit for the use of water" "deep water" "water aeration" "snow water" "terms of waste water" "agricultural effluent" "boiling water reactor" "water pollution load" "combined waste water" "waste water composition" "black water" "grey water" "river works" "water board law" "water supervision" "protection area for water regulation" "groundwater resources" "salamander" "agriculture" "tertiary purification of sewage" "sewage purification close to nature" "persistent chemical substance" "primary treatment" "flood" "chemical sewage purification" "secondary treatment of sewage" "industrial effluent" "lowering of groundwater level" "waste water purification" "bathing waters" "water protection" "waste water reclamation" "surface water" "water privilege" "industrial discharge of waste water" "water rate" "water rate levy act" "hydro-isobath" "groundwater flow" "groundwater storey" "public goods" "hot water storage" "hot water heating system" "groundwater" "waste water legislation" "water quality management" "water heating" "separate waste disposal" "hot water" "saline water intrusion" "industrial water" "mineral water" "stocktaking" "municipal water management" "hydraulic and sanitary engineering" "waste water examination" "groundwater table" "void water" "seepage water treatment" "percolating water" "waste water reduction" "sewage flow" "deep sea" "sewage lagoon" "waste water statistics" "water protection policy" "well" "water quality directive" "salts" "surface water" "river water" "wastewater load" "indirect discharger" "back water" "waste water register" "river" "impregnation (materials)" "municipal sewage" "waste water sludge" "ordinance on parameters of noxiousness of waste water" "sludge" "harmfulness of wastewater" "aquifer" "impregnating agent" "sewer" "desalination of brackish water" "waste water decontamination" "brackish water" "Waste Water Origins Ordinance" "intertidal area" "feed water" "groundwater contour line" "ground water conservation" "soil moisture regime" "soil water" "small body of water" "waste water charge legislation" "waste water charge code" "human settlement" "stagnant water" "waste water charge fixation" "state water law" "waters (geographic)" "water sciences" "waste water charge" "environmental quality objective" "turtle" "residue" "water works" "waste water disposal" "proprietary right" "water course regulation" "sewage decontamination" "liquid manure" "industrial installation" "waste water disposal embargo" "wastewater discharge" "rinse water" "EU Water Protection Directive" "industry" "Framework Water Directive" "river filtrate" "waterfowl" "water pollution" "rhizosphere" "dump impounded water" "turbomachine" "water supply" "water pollution prevention" "raw water" "deep water" "sea water protection" "outfall" "water evaporation" "water consumption" "water board decree" "biological water testing" "sea water fish" "water analysis" "sea water desalination" "material insoluble in water" "shore belt bird" "waste water disposal embargo" "waste water disposal scheme" "sea water" "drinking water preparation regulation" "sewage treatment plant" "turbidity of water" "drinking water" "water management plan" "general planning on water resources development" "sewage disposal" "residual amount of water" "flowing waters" "water management" "wastewater quality" "tail water" "condensate" "under water coating" "planning permission" "aquatic animal" "water temperature" "water reuse" "tide" "waste water treatment plant" "physical sewage treatment" "mechanical sewage treatment" "water resources" "international convention" "electrochemical sewage treatment" "chemical sewage treatment" "rural area" "anaerobic sewage treatment" "aerobic sewage treatment" "water mite" "permit" "drinking water supply" "drainage" "drinking water regulation" "water quantity management" "water volume" "water market" "water statistics" "water level" "water sports" "reservoir" "waste water treatment" "drinking water examination" "drinking water protection area" "water shortage" "solubility in water" "drinking water quality" "water line" "water conductivity" "low water" "regulation on securing of enough water" "law on the securing of enough water" "securing enough water" "shallow water" "protected water catchment area" "Act Pertaining to Charges Levied for Discharging Waste Water into Waters" "wastewater levy" "water cooling system" "discharged water" "water cycle" "hydroelectric power plant" "water power" "water partition" "waterborne sound" "water pollutant" "rainwater" "flood runoff" "drinking water treatment plant" "drinking water treatment" "pollution of waters" "sewerage system" "water contents" "vapour" "Water Hygiene Act" "water purification" "water act" "water association" "vadose water" "inland water way" "water hygiene" "water resources policy act" "biological water balance" "water hardness" "water pollution monitoring" "water sample" "water price" "water flow" "aquatic plant" "increasing water hardness" "water penny" "water surface" "surface runoff" "water utilization" "PWR-type reactor" "deep sea fishing" "inland waters" "algae bloom" "hydrologic balance" "water movement" "water bottom" "water quality model" "water deposit" "water protection directive" "water protection legislation" "water pollution control measure" "water pollution control act" "water pollution control deputy" "toilet" "pelagial" "water demand" "hydraulic construction" "water treatment" "water quality" "long distance water supply" "water catchment" "restoration of waters" "impounded water" "water act" "water company" "regulation of waters" "water content" "bilge water" "water ouzel" "water runoff" "water endangering" "regulation concerning water endangering matter" "wet-type cooling tower" "permit to exploit water" "reject water" "fresh water fish" "utilization of waters" "Framework Waste Water Administrative Regulation" "condition of water" "softening" "fresh water" "groundwater characteristics" "water fall" "administrative regulation on substances hazardous to water" "water prospecting" "water desalination" "lime water" "salt water" "black water" "drainage water" "Ground Water Ordinance" "Waste Water Ordinance" "Light water reactor" "washing water" "water sterilization" "ground water charges" "water softening" "quality of waters" "clarification basin planted with water plants" "endangering of water" "water saving" "water permeability" "cooling water" "available water supply" "steam" "water pool" "ecological assessment"

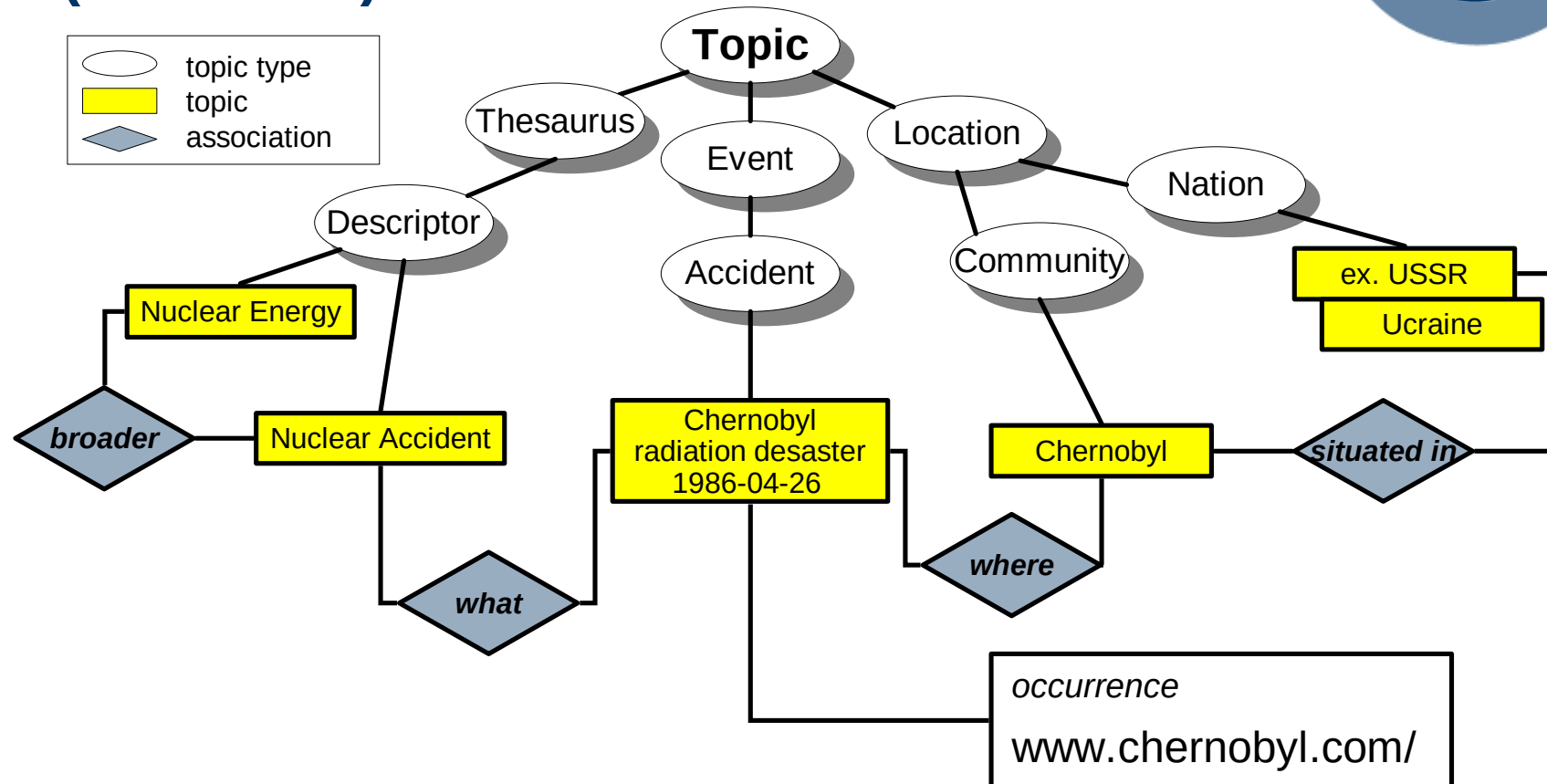
terms about "water" from the UmThes® Thesaurus



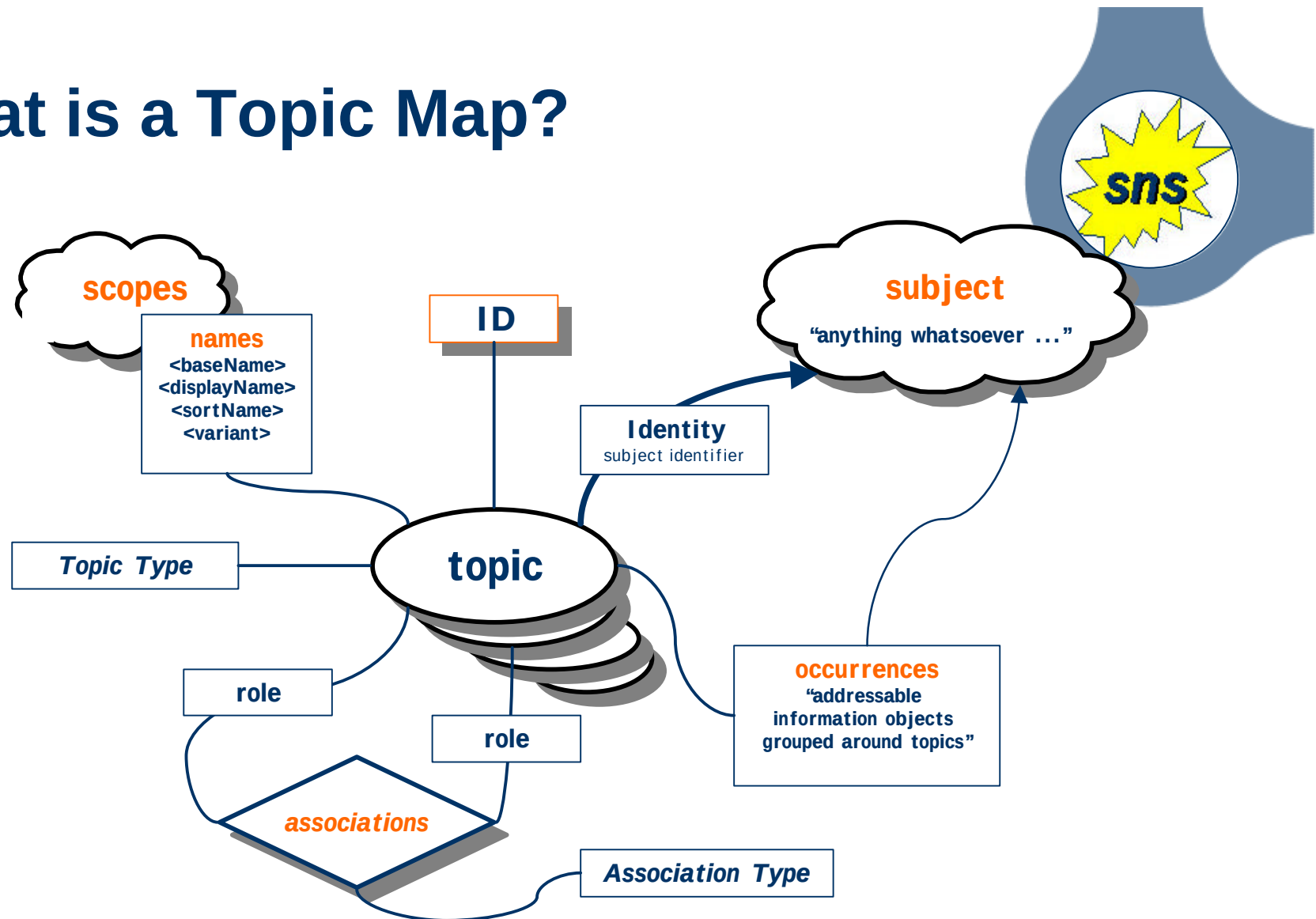


Integration in a Topic Map

(ISO 13250)



What is a Topic Map?



ISO/IEC FCD 13250:2000 - Topic Maps

Prepared by: ISO/IEC JTC1/SC34 - Document Description and Processing Languages



“In the most generic sense, a **subject** is anything whatsoever, regardless of whether it exists or has any other specific characteristics, about which anything whatsoever may be asserted by any means whatsoever.”

ISO/IEC FCD 13250:2000 - Topic Maps

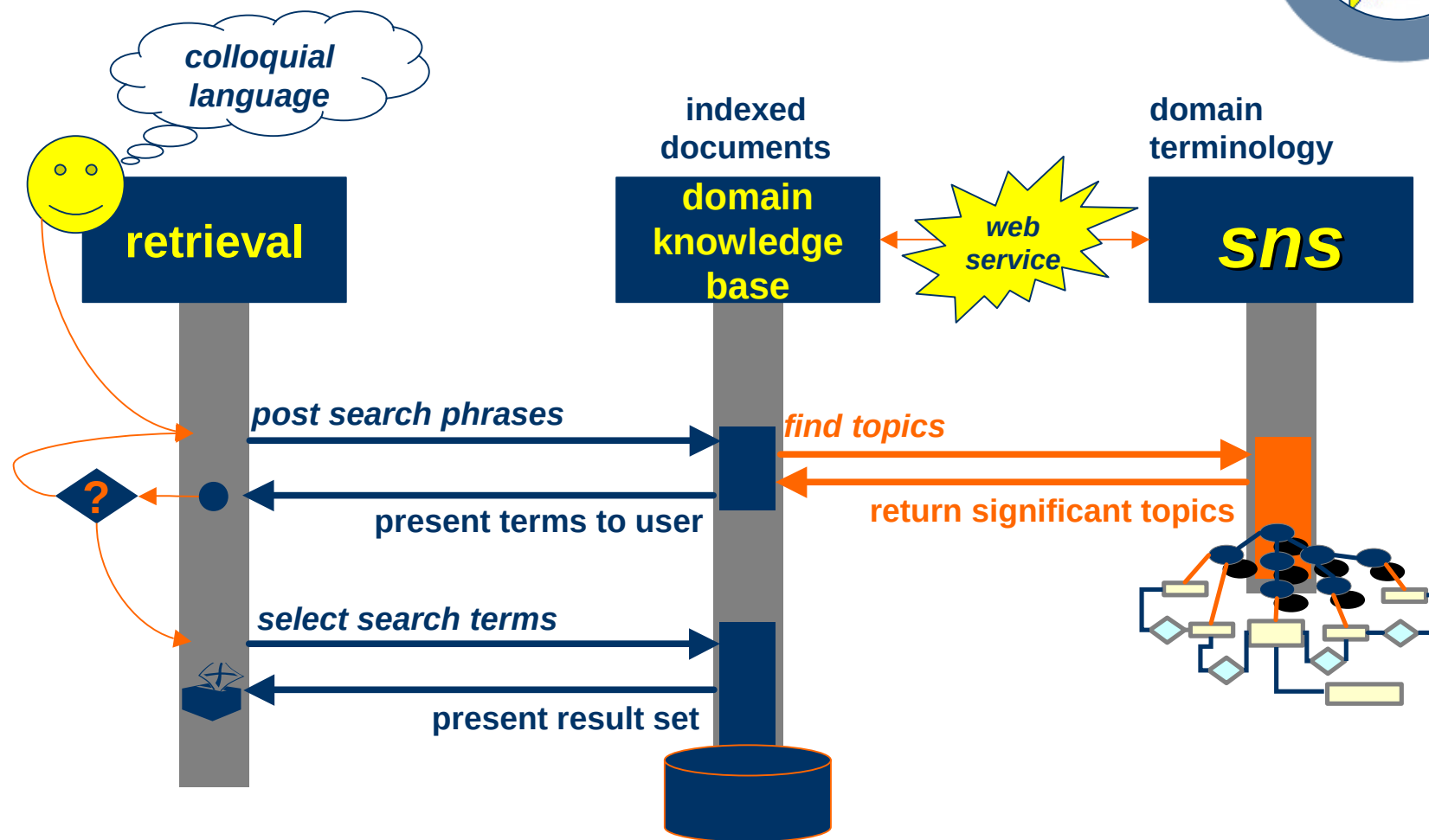
The Project Challenge:



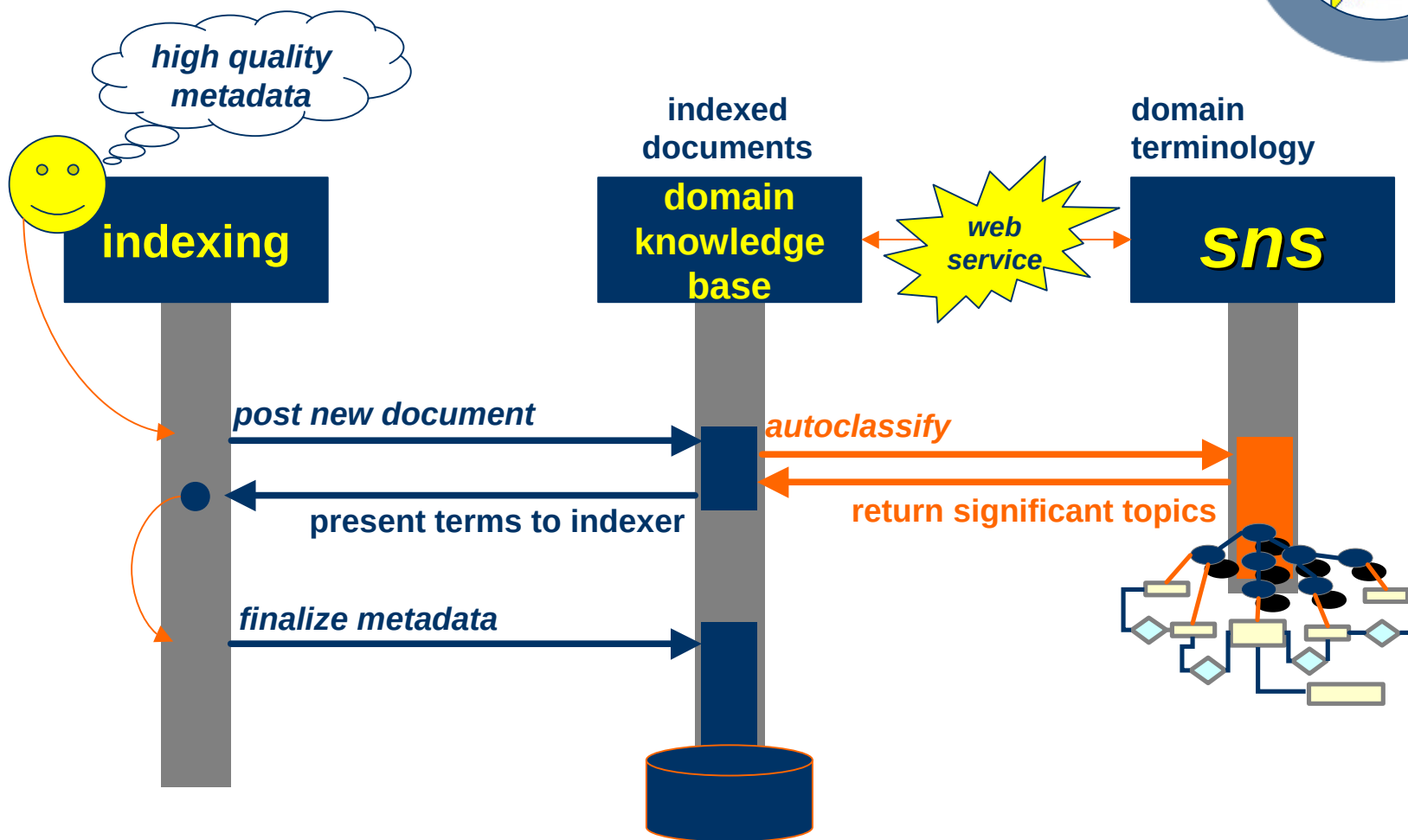
Today, the network members make *passive* use of the ontology
(only the *gein* broker can handle it).

**make the shared ontology
accessible to any application
throughout the network**

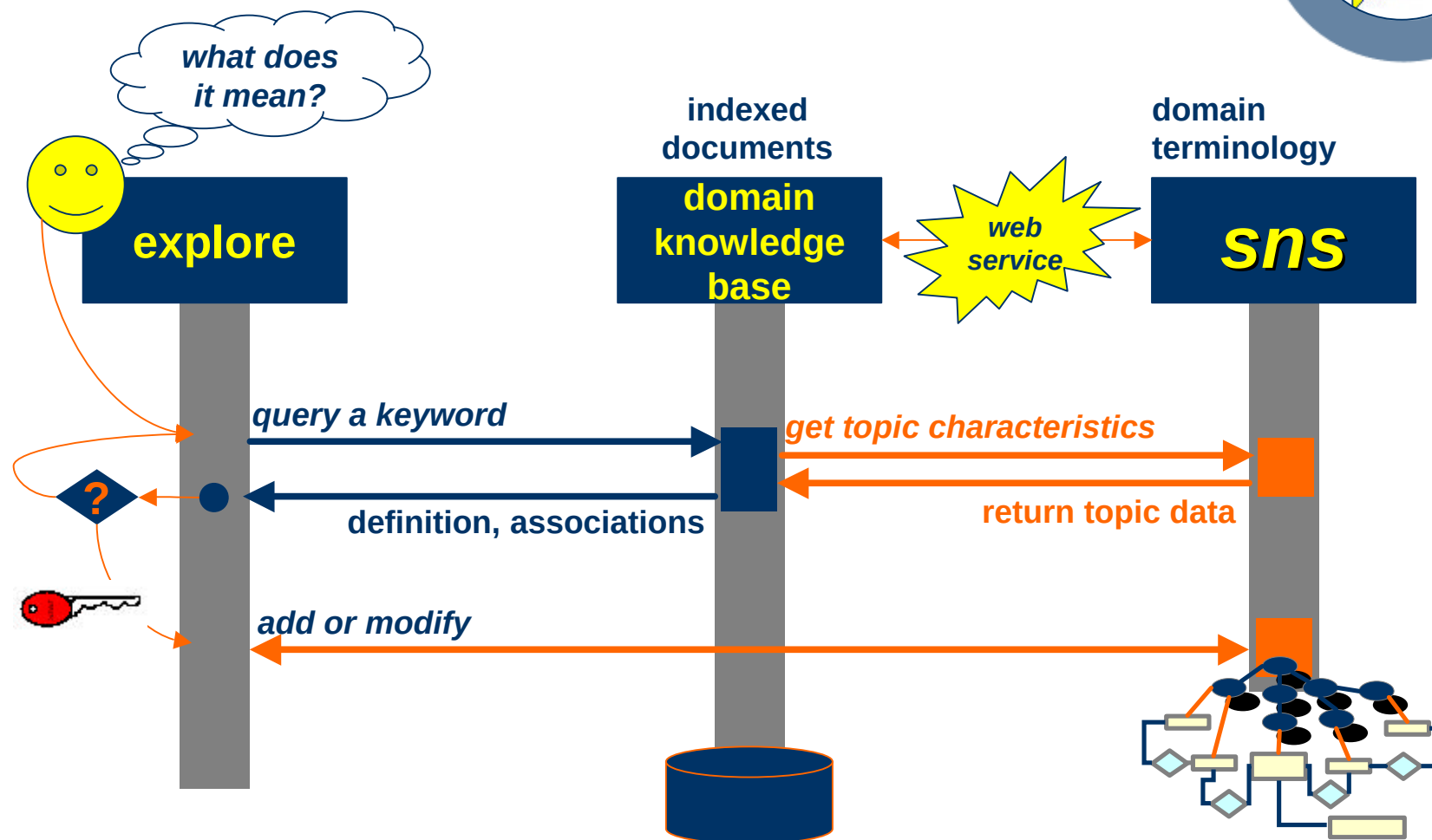
sns-ws use case (1): retrieval



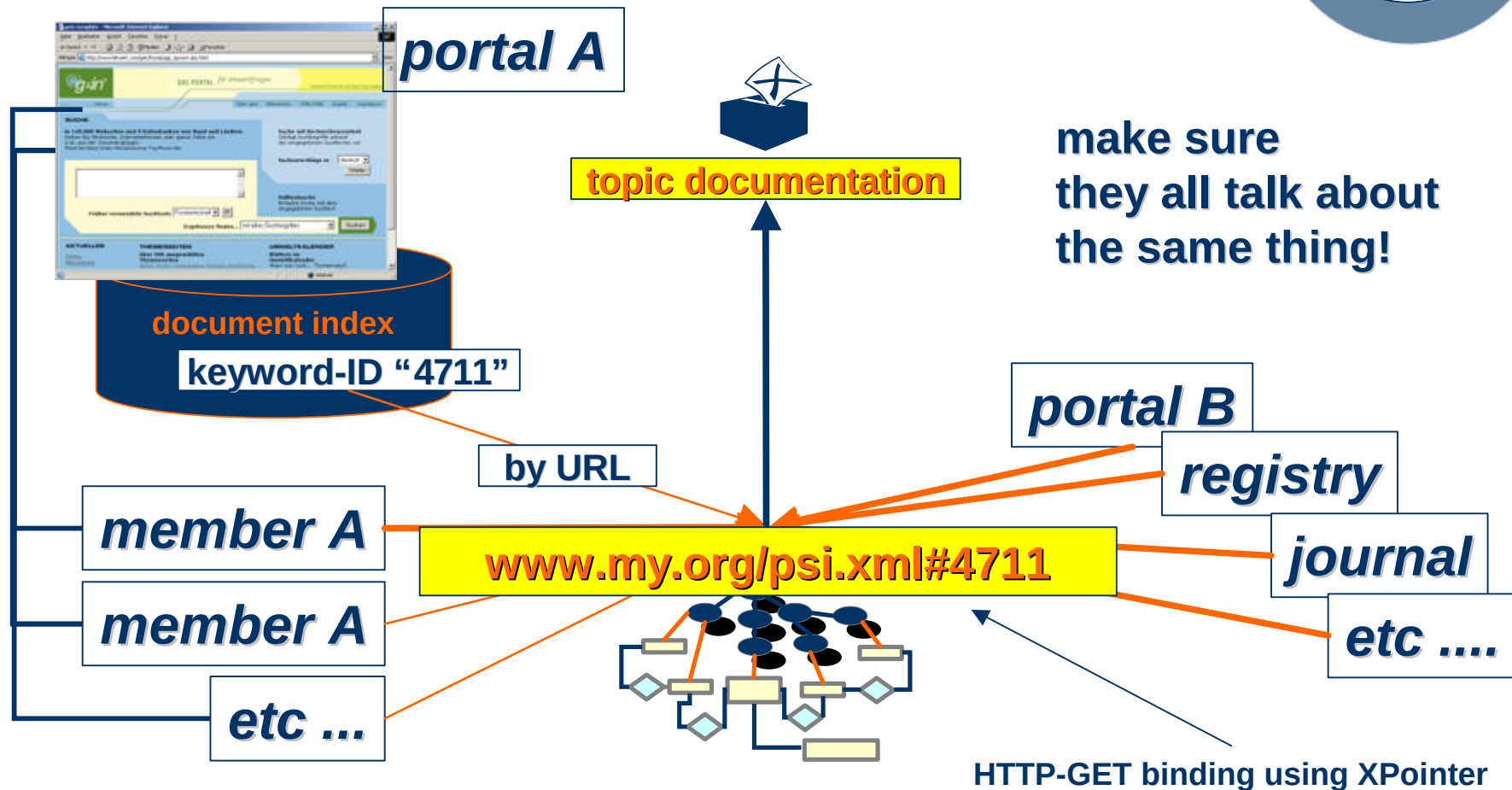
sns-ws use case (2): indexing



sns-ws use case (3): explore/edit



sns-ws use case (4): terminology reference



sns:findTopics



<findTopics>

<queryTerm>Mauersegler</queryTerm>

search term

<searchType>contains</searchType>

search method

<lang>de</lang>

<path>/event</path>

topic type path

<fields>names</fields>

fields to search

</findTopics>



results in a list of matching topics

sns:autoClassify



<autoClassify>

<document>... any text to be classified ...

</document>

<url>http://....doc.html</url>

<lang>de</lang>

</autoClassify>

text to be
classified may
be given by
value, or by
URI reference



results in a list of significant topics that
classify the document

sns:getPSI ^{*)}



<getPSI>

<id>4711</id>

<distance>2</distance>

</getPSI>

referenced topic ID

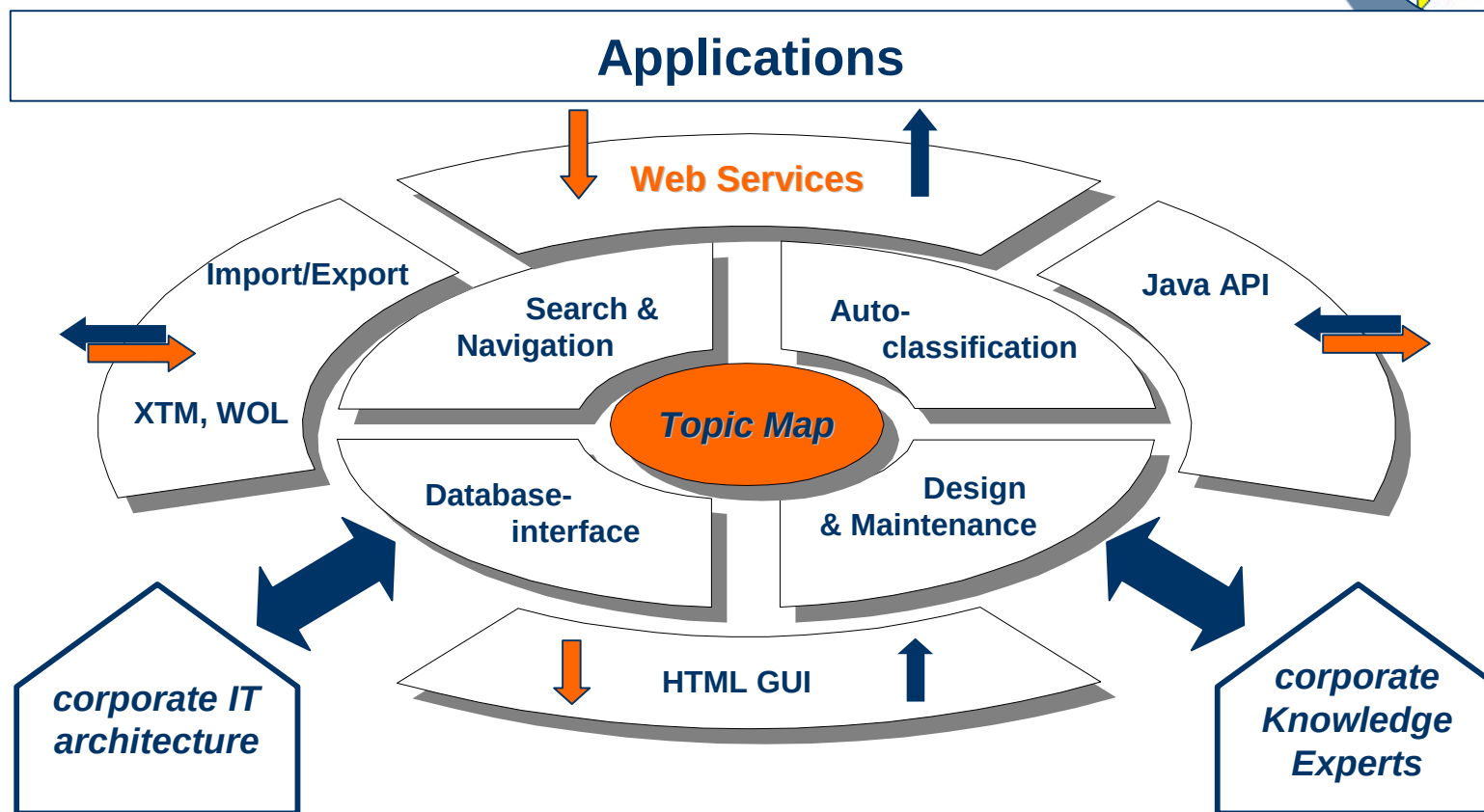
depth of tree to
be returned

➔ results in a tree of associated topics, with
<id> as root.

GET-request version: "http://sns.gein.de/getPSI?id=4711&distance=2"

***) Published Subject Identifier (PSI) is a topic map paradigm
about on-line accessible, "normative" topic definitions.**

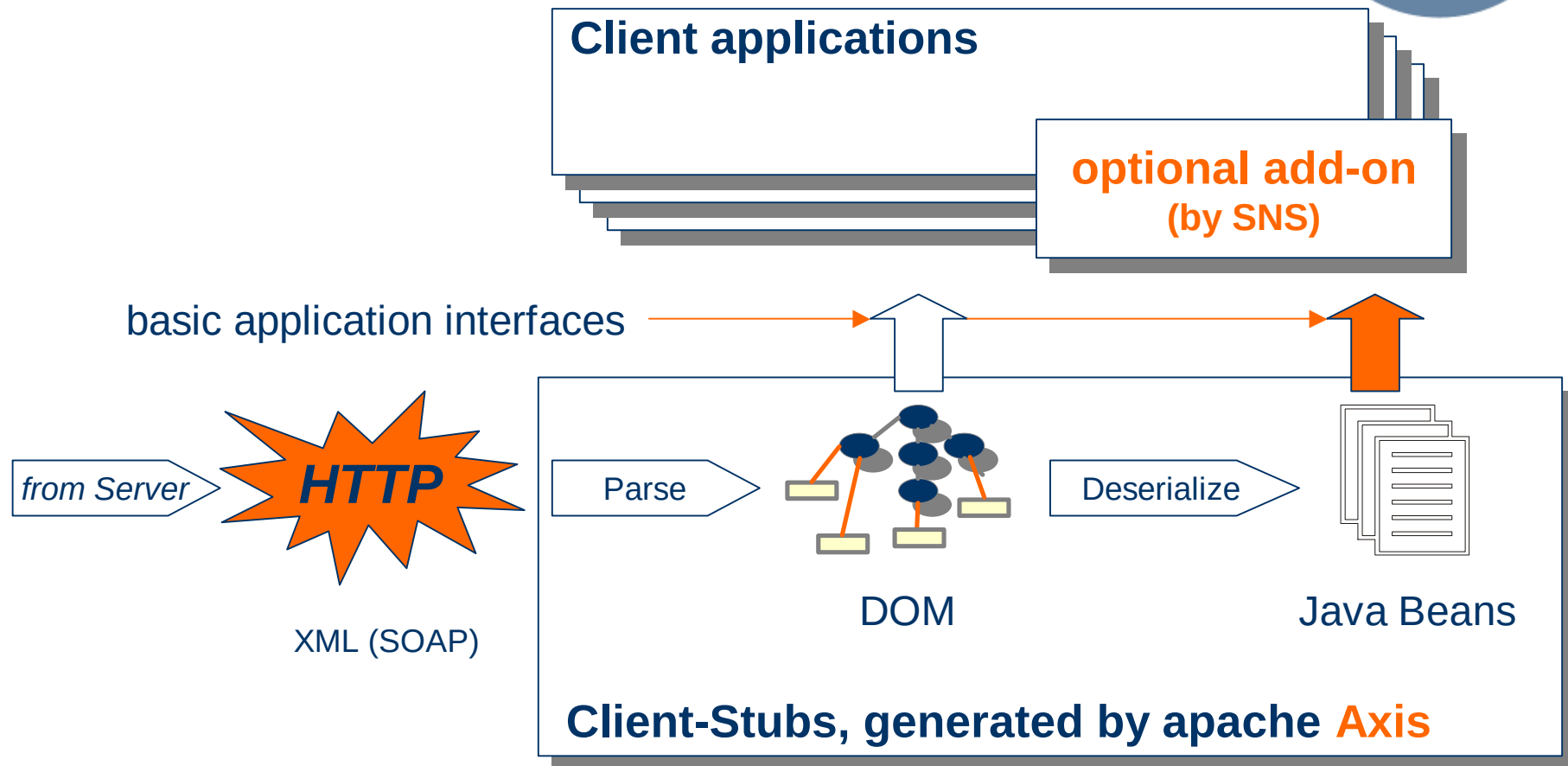
System Architecture



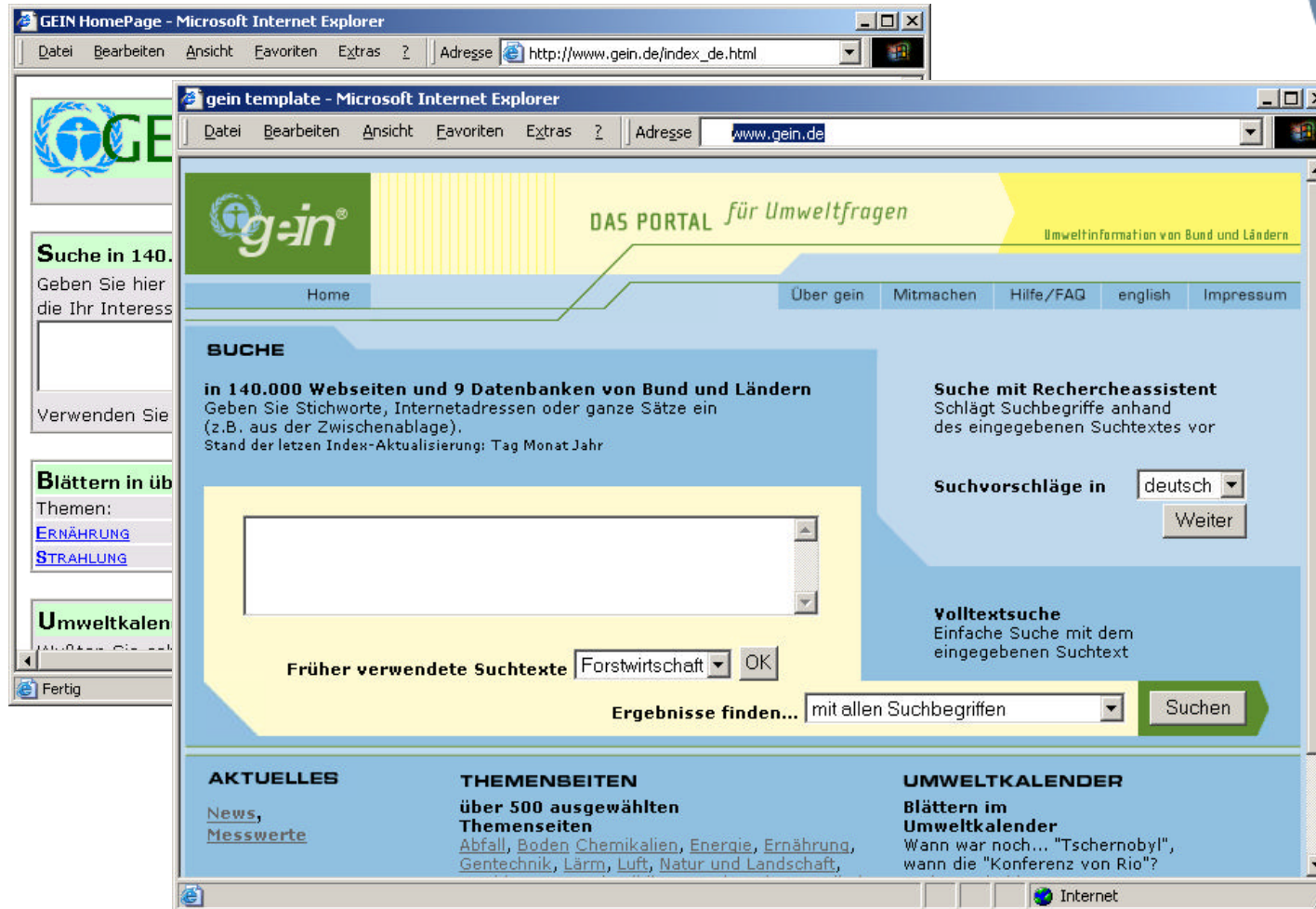
built on **XTME**, the XML Topic Map Engine

Client Interface Technology

example



Going live in Q1: *gein*[®] II*



* powered by **SNS** web services.





Benefits

- allows **active** usage of the ontology for any network member;
- avoids multiple platform porting and physical distribution of the ontology server application;
- makes local database search methods *understand* the topics to search for (in the *gein*® context);
- use the shared ontology in local Intranets and regional public information systems.