

# Standardization for the Semantic Web

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- Scenario: Someone needs to see a doctor.
  - Tim Berners-Lee, Scientific American 2001
  - Handheld devices with “agents” negotiate:
    - Doctor’s agent knows prescribed treatment
    - List of doctors, rated at least “very good”, within 20 miles, accepted by insurance plan.
    - Devices match calendars to fix appointment.
  - Semantic Web challenge: provide language that expresses both data and rules for reasoning about that data

From a presentation of Thomas Baker

- The Web of Data
  - Integration of multiple sources of data and services to draw new conclusions.
  - Describe and manage objects (items, collection, processes etc.) so they can be reused at various scale.
  - Build structure behind the content, to allow preservation and retrieval by making the implicit structures explicit.

# Semantic Web – the vision

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## – The Web of Data

- HTML and URL
- Text-level

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**News**

► **W3C Co-Sponsors 26th Internationalization & Unicode Conference**

2004-09-02: The 26th Internationalization & Unicode Conference will be held 7-10 September in San Jose, CA, USA. Presenters include Team members Martin Dürst and Richard Ishida and participants in the W3C Internationalization Working Group. The event is the premier technology conference for internationalization and the Web.

► **Dead Works Adapted**

2004-09-02: extended q Workshop in Dublin, Ireland, to address user needs and feedback about work

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W3C Technology and Society domain

**Semantic Web Activity**

**Semantic Web**

The **Semantic Web** provides a common framework that allows **data** to be shared and reused across application, enterprise, and community boundaries. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming.

"The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation." -- Tim Berners-Lee, James Hendler, Ora Lassila, *The Semantic Web*, Scientific American, May 2001

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**News and Events**

- **RDF Data Access Use Cases and Requirements Updated** 2004-08-04. The RDF Data Access Working Group has released an updated Working Draft of [RDF Data Access Use Cases and Requirements](#). The draft suggests how an RDF query language and data access protocol could be used in the construction of novel, useful Semantic Web applications in areas like Web publishing, personal information management, transportation and tourism.
- **Representing Specified Values in OWL** 2004-08-03. The Semantic Web Best Practices and Deployment (SWBPD) Working Group has released the First Public Working Draft of [Representing Specified Values in OWL](#), "[value partitions](#)" and "[value sets](#)". Comments are welcome. The draft presents methods for representing modified values and collections of values in the [OWL Web Ontology Language](#).
- **Call for Participation, Public Workshop on Semantic Web for Life Sciences** 2004-07-28. Position papers are due 6 September for the [W3C Workshop on Semantic Web for Life Sciences](#) to be held in Cambridge, MA, USA on 27-28 October. Attendees will discuss how Semantic Web technologies such as [RDF](#), [OWL](#), and the [Life Sciences Identifier](#) (LSID) help to manage modern life sciences research, enable disease understanding and accelerate the development of therapies.
- **RDF Data Access Working Group Meets to Select Initial Design** 2004-07-26. The [RDF Data Access Working Group](#) reviewed use cases for ebXML and XQuery integration and selected an initial design at its [second face-to-face meeting](#) in Carlsbad, California, hosted by [Network Inference](#).

<a href = "...">

# Semantic Web – the vision

## – The Web of Data

- RDF, OWL, URI
- Below Text-level
- Data-level

The image shows a screenshot of the W3C Semantic Web domain page. At the top, there are logos for W3C, Technology and Society domain, and Semantic Web Activity. The main heading is "Semantic Web". Below it, there is a paragraph defining the Semantic Web as a common framework for sharing and reusing data across application, enterprise, and community boundaries. A quote from Tim Berners-Lee is also present. There are navigation links for "On this page" and "Nearby". The page is divided into sections: "News and Events" and "Organizational". The "Organizational" section is partially obscured by a green grid diagram. The "News and Events" section contains two bullet points about RDF Data Access Use Cases and OWL value sets. A "People" section is partially visible at the bottom left, obscured by a blue grid diagram. A "News" section is partially visible at the bottom right, obscured by a pink grid diagram. Arrows point from the grid diagrams to specific text elements on the page.

**W3C** Technology and Society domain **Semantic Web Activity**

### Semantic Web

The **Semantic Web** provides a common framework that allows **data** to be shared and reused across application, enterprise, and community boundaries. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (**RDF**), which integrates a variety of applications using XML for syntax and URIs for naming.

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### News and Events

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- [Representing Specified Values in OWL 2004-08-08](#). The Semantic Web Best Practices and Deployment (SWBPD) Working Group has released the First Public Working Draft of [values in OWL: "value partitions" and "value sets"](#). Comments are welcomed for representing modified values and collections of values in the [OWL Web Ontology Language](#).

### Organizational

### People

### News

- RDF – Resource Description Framework
  - See <http://www.w3.org/TR/rdf-primer/>
- OWL Web Ontology Language
  - See <http://www.w3.org/TR/owl-features/>
- Core specifications are W3C Recommendations as of February 2004:
  - See <http://www.w3.org/2001/sw/>

- OMDoc [www.openmath.org/omdoc](http://www.openmath.org/omdoc) generate semantic MathML from LaTeX-like sources
- CML [www.xml-cml.org](http://www.xml-cml.org) describe Objects in Chemistry giving their bindings and reaction parameters
- $E = m c^2$  ??? Need for Physics Semantic Markup!
- Some nice examples from [www.vs-c.de](http://www.vs-c.de) ...

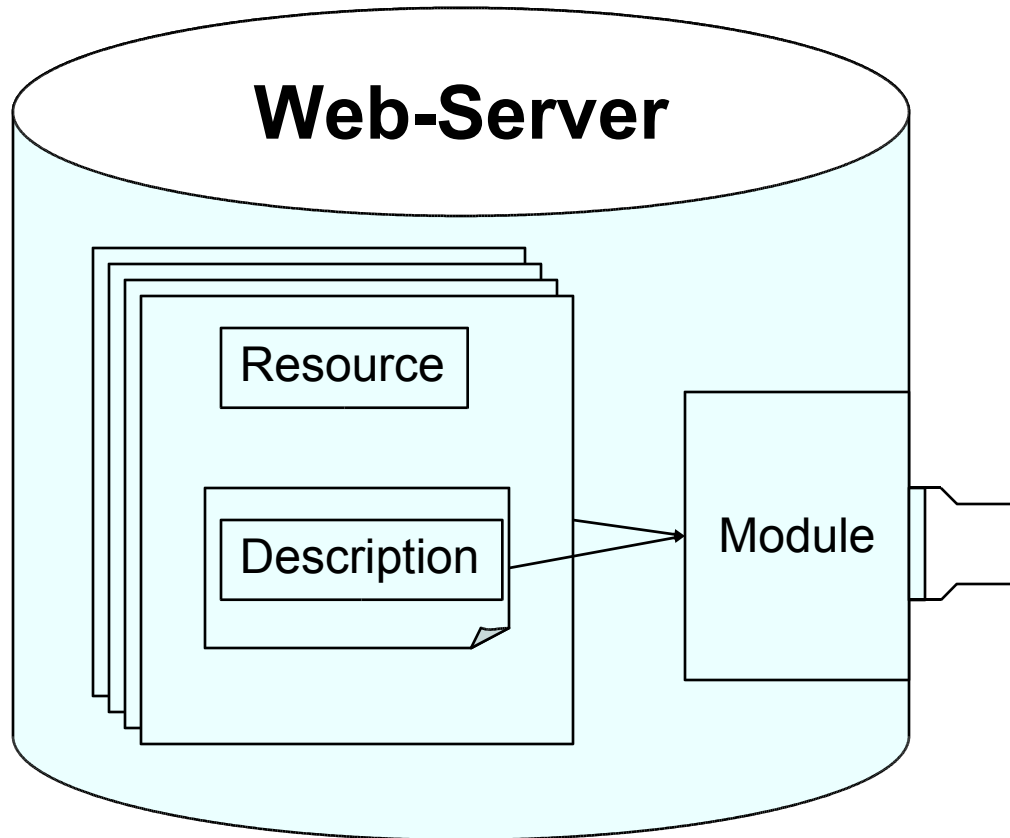
- Repositories contain Metadata, describing objects.
- User wants to retrieve the Metadata, without asking for the fulltext.
- Content vs. Description
- Full text search vs. Metadata retrieval

=>





# Requested extension of Web-Server



- “HTTP (for HyperText Transfer Protocol) is the primary method used to convey information on the World Wide Web. The original purpose was to provide a way to publish and receive HTML pages.” [www.wikipedia.org](http://www.wikipedia.org)



# HTTP methods

- **GET:** request for a resource
- **POST:** request for a resource (with additional data)
- **PUT:** stores entity under the supplied Request-URI
- **DELETE:** requests that the origin server deletes the resource identified by the request-URI.
- **HEAD:** same as GET, without expecting a resource.
- **OPTIONS:** retrieves information about communication options.
- Other **TRACE, CONNECT.**

# HTTP methods



- **GET, POST, PUT, DELETE, HEAD, OPTIONS, TRACE, CONNECT**
- Do not distinguish between resource and its description
- Extension of the protocol is needed



# HTTP protocol extension

- Proposal
  - Extension of http protocol

MGET	Return a description of the resource denoted by the request URI
MPUT	Add the statements to the description of a resource denoted by the request URI
MDELETE	Remove the statements about the resource denoted by the request URI

MPUT and MDELETE usually only accessible for the web server administrator.

- NOKIA offers a commercial version for URIQA.
  - Interesting especially for mobile services
- Cashmere-int develops an open source version of URIQA, called RDS (Resource Description Server). Available as perl module.
- Cashmere-int wants to bring MGET MPUT MDELETE into HTTP standard.

Ziel des Vorhabens ist die **aktive Beteiligung** an ausgewählten Standardentwicklungen im Kontext **Semantic Web** und die kompetente **Transmission** in den Hochschulbereich der Bundesrepublik.

Damit wird eine schnellere und vertiefte **Umsetzung** von Standards in neue **Dienste** gefördert.

Ziel der Aktivitäten zur Transmission ist auch die Motivation **weiterer Wissenschaftler** ... zur aktiven Teilnahme an internationaler Standardisierung ... fortgeschrittener Webtechnologien.

*R. Schwänzl, Projektantrag*

- Semantic Web
  - Methoden und Werkzeuge zur maschinellen und intellektuellen **Aufbereitung von Information und deren Weiterverarbeitung** in search and retrieval.
  - **Beschränkung** auf ein relativ schmales Themengebiet, **exemplarisch** für die gesamte Breite offener Standardisierung.
- Preservation Metadata
  - Als eine vertikale Implementation der angestrebten Integration, beispielhaft an diesem Teilgebiet des Semantic Web



- Durch die **Entwicklung und Erforschung** neuer Dienste und Verfahren fokussiert Cashmere-int auf die
- **Beteiligung an internationalen Standardisierungsansätzen**, die auf innovativen Methoden und Werkzeugen
- zur maschinellen und intellektuellen **Aufbereitung von Informationen und deren Weiterverbreitung** in search and retrieval abheben.
- Dabei soll darauf hingewirkt werden, dass leistungsfähige Standards entstehen, also solche, die eine **reiche Produktentwicklung** entfalten können.

# Standardization Activities

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- Preservation Metadata
  - PREMIS
  - OAIS
  - METS
  - Format Registry
- Semantic Web
  - Qualified DC in RDF/XML
  - CARA Parser
  - XSLT and Application Profiles
  - RDF Data-Access / XQuery
  - Development of Tools (⇒ DC-Tools)
- WebServices
  - SOAP
  - URIQA
  - RSS

Member of W3C via IWI e.V.

Member of Dublin-Core Advisory Board



For further information and links to all the sources, just visit the CASHMERE-int homepage: [www.iwi-iuk.org/cashmere](http://www.iwi-iuk.org/cashmere)