WWW2: Second Generation Web – Semantic Web

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Abstract. The World-Wide Web (WWW) has ever been evolving since its inception in 1989 not in regards to the wealth of knowledge that is deposited and stored on server machines scattered across the evergrowing network of online servers, better known as the Internet, but in regards to its functionality, potential use, and capabilities. In this paper we investigate this evolution with the aim to better understand the natural transition to the next generation WWW — the Semantic Web.

Overview

The Internet is the World-Wide network of computers that began in the 1970s as a communications network between American government defence organisations. In 1984 control over the network was handed to the private sector and by 1989 the WWW, often referred to as the web, was developed. The WWW, which came out of work by the British scientists Berners-Lee et al. [1] working at the European particle physics research establishment, CERN in Geneva, is the whole constellation of resources available on the Internet. The main idea is to merge the techniques of computer networking and hypertext into a powerful and easy to use global information system. Hypertext is text or graphics with links to further information, on the model of references in a scientific paper or cross-references in a dictionary. With electronic documents, these cross-references can be followed by a mouse-click, and in the case of the WWW, the staggering wealth of knowledge and experience, deposited and stored on server machines scattered across the Internet, is available to its on-line world.

When people access the web, they are either searching for specific information, or they are simply browsing, i.e. looking for something new or interesting (by a process often referred to as *surfing*). These two activities, searching and browsing, have associated applications over the WWW to access and help identify resources within the electronic documents respectively. The main difference between browsing and searching is that while no search statement or query is specified during the browsing activity, users explicitly express a search statement by submitting a query defining their information requirement to a web-search application, better known as a search engine. Links to potentially relevant information is presented by these search engines to the users, who can access and browse the information using a web browser.

In this paper we investigate the evolution from simple web-page browsing and surfing using plain Hypertext Markup Language (HTML) in the next section to slightly more complicated Extensible Markup Language (XML). A whole plethora of events characterised this path but a natural evolution justifies why the Semantic Web is the next sensible step within this sequence of technological development to maximise and enhance the use of the WWW. Topics will be discussed in this order:

- HTML and its limitations
- HTML+
- XML
- XML+
- Semantic Web

References

1. T Berners-Lee, R Caillian, A Luotonen, H F Nielsen, and A Secret. The World-Wide Web. *Communications of the ACM*, 37(8):76–82, 1994.