Interoperability between Hypermedia Systems: The Standardisation Work of the OHSWG

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CONTENTS OF THE TECHNICAL BRIEFING

The Open Hypermedia Systems Working Group (OHSWG) was formed at the second workshop on open hypermedia systems (OHS), held in April, 1996, in Washington, DC, in conjunction with the 1996 ACM Conference on Hypertext. The original purpose of defining an open hypermedia protocol for OHS clients has evolved into an effort to standardise general hypermedia systems work. This broader effort is driven by the desire to maximise the applicability of the last decade of hypermedia systems and infrastructure research.

This technical briefing will provide attendees with an overview of the state of the art of the OHSWG standardisation effort. This covers important areas such as communication interfaces (protocols), reference architectures and data models.

The OHSWG is proposing a set of services for different hypermedia domains, published as interface specifications. Several prototypic implementations for retrieving and navigating hypermedia objects using a standardised set of services (named the Open Hypermedia Protocol Navigational Interface, or simply OHP-Nav), are already operable. A first demonstration of interoperability was presented at the ACM Hypertext '98 Conference in Pittsburgh.

The aim of this technical briefing is to be present the most recent work of this effort including support for collaboration and dynamic service discovery and invocation allowing multi-user and/or computational systems.

A PROTOCOL FOR OPEN HYPERMEDIA SYSTEMS

Open hypermedia systems have been around for some time [9, 15]. However, despite the fact that these systems are characterised by openness, interoperability is still an unsolved issue [17].

The OHSWG originally envisaged a protocol, called the Open Hypermedia Protocol (OHP), as a standard way of allowing any OHP-aware client to communicate with any OHP-aware linkserver by using protocol shims as translators [2]. The idea was to establish a lightweight protocol that would serve as a testbed for interoperability and avoid the effort of having to re-implement viewers.

Soon, the development of the protocol was seen as one part of a larger effort of the OHSWG to address interoperability [16]. This ambitious objective raised a number of issues, including the following:

- the domain of the protocol;
- the underlying data model;
- the assumed architecture (infrastructure); and
- the communication mechanisms to be used.

The Domain of the Protocol

The domain of the protocol as well as its functionality have been criticised [1, 13] and the protocol was subsequently considerably changed and targeted towards a set of services for navigating hypermedia objects. Besides the navigational domain other domains such as spatial hypertext [8] or taxonomic hypertext [14] are envisaged and included in the OHSWG's efforts.

The Underlying Data Model

The hypertext community has invested much time and effort in attempting to define hypermedia. Probably the most successful result is the Dexter model [3, 7]. The OHSWG has built on these ideas and has proposed a common data model [5] that attempts to be as inclusive as possible in the sense that it is capable of representing the link models assumed by most existing hypermedia systems.

A Reference Architecture

Addressing interoperability not only requires some common understanding of the data model. It also demands

that the basic underlying architecture be investigated and agreed upon. This is both because the data model makes assumptions about the architecture and also because the architecture defines interfaces, functionality and behaviour of the involved components. Therefore, the issue of a reference architecture has been put onto the agenda of open hypermedia research and relevant proposals thereof exist [4, 6, 13].

The Communication Mechanisms

Various communication mechanisms for OHP are envisaged [10]: a simple ASCII type tagged protocol using XML for encoding and implemented using sockets (as originally proposed and demonstrated at ACM Hypertext '98); a CORBA compliant implementation using IIOP; or a version for the Web using the proposed standardised extension to HTTP, PEP [11], or HTTP-NG [18]. These issues are discussed by the OHSWG within the context of frameworks. It is a main goal for the specification of the protocol to be independent of the actual communication mechanism used.

WHAT WE WOULD LIKE OHP TO BE

The issues of communication mechanisms and reference architectures guide us to the more general question of how users will benefit from OHP in the future and accordingly what role OHP will play.

It has often been stated that hypermedia functionality should be available to all applications on the users' desktops (see e.g. [12]). Presently, the browser acts as a nexus for navigating hypermedia structures, but clearly we do not want to use dedicated browsers for different hypermedia systems. Ideally, therefore, functionality as specified in OHP should be available and incorporated into *all* applications on the users' desktops. It should be flexible and open enough to allow users the usage of arbitrary document formats — similar to today's open hypermedia systems.

We believe that OHP has the potential of being such a standard for hypermedia applications as demonstrated by the various prototype implementations to date.

ON-LINE RESOURCES

The Open Hypermedia Systems Working Group pages are available as <http://www.ohswg.org/>.

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