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Introduction

The Z39.50 Information Retrieval Service Definition and Protocol Specifications for Library Applications, published by the National Information Standards Organization (NISO) in 1988, defines a mechanism to be used by a computer system to search for and retrieve information from another computer system, not necessarily made by the same vendor. While the standard is geared to the manipulation of bibliographic data, it is general enough to support a large range of information types. The standard was written to be an application level protocol of the ISO Open Systems Interconnection model (OSI) and as such appeared to be inextricably intertwined with the evolution of the entire OSI suite of protocols. Recently, there has been interest in building OSI applications on top of the well-established Department of Defense TCP/IP protocols running in the Internet. In addition, at least two major vendors (DEC and IBM) have released full OSI protocol stack support. These two trends have combined to make Z39.50 implementation feasible in the immediate future.

Z39.50 Implementation Meeting

On March 12, 1990, representatives of fourteen institutions that were either implementing or on the verge of implementing Z39.50 met at the Library of Congress to discuss the various questions that needed to be resolved to ensure that their implementations would "interoperate." Interoperability is an OSI term that is stronger than intercommunication or interconnectability. Interoperability assures that both ends of the connection operate in a well-defined manner that ensures that the purpose of the connection, i.e., the transmission of a search request and the results of the search, will be performed as expected. Interconnection only ensures that they will talk at some lower layer in the protocol suite, perhaps only at the lowest level, the physical level.

While one might think that by following the directions in the Z39.50 standard interoperability would be ensured, this is not the case. OSI standards are formed in a political environment, and it is often impossible to gain consensus. In these situations, the standard will usually offer options. Two systems choosing different options may not be able to interoperate even

though both are correct and conform to the standard. This situation exists at all layers of the OSI protocol suite. Therefore, interoperability requires agreement on the choices of options. These agreements are often known as Profiles or Stable Implementation Agreements.

The situation with Z39.50 is further complicated by the existence of the Internet, which uses the TCP/IP protocol. Use of the Internet as the underlying protocol stack is attractive for two reasons. The Internet is currently seen as a free service to the end user. While the government is talking privatization, this has not yet happened. The Internet and its underlying protocols are mature. There are thousands of nodes running a large number of products. OSI, on the other hand, is in its infancy in the U.S., although it has been used extensively in Europe.

The institutional representatives who met in Washington were divided about the best protocol stack to use, with roughly half being in favor of OSI and the other half being in favor of TCP/IP. For these institutions, interoperability takes on the additional aspect of working over disparate protocol stacks.

So, where is Z39.50? At the meeting, we agreed to what services will be offered at the session and presentation layers. We also agreed on the use of query types and elements. We did not agree on what types of information should be returned as the result of a query, but we did establish a subcommittee to work on this issue. We also established a subcommittee to discuss and hopefully resolve the question of whether or not an Abstract Syntax Notation is necessary for MARC records that are to be transmitted via Z39.50.

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Institutional Plans for Implementing Protocol Stacks

Table 1 shows the protocol stack implementation plans of the institutions that attended the March meeting. In the long run, many of the organizations plan to implement both protocol stacks.

Table 1. Protocol Stack Implementation Plans

INSTITUTION	STACK
University of California at Berkeley	TCP/IP
University of California (Division of Library Automation)	TCP/IP
Carnegie-Mellon University	TCP/IP
Dartmouth College	TCP/IP

Data Research Associates, Inc.	TCP/IP
Florida Center for Library Automation	OSI
Library of Congress	OSI
National Library of Canada	OSI
OCLC Online Computer Library Corporation, Inc.	OSI
Pennsylvania State University	TCP/IP
Research Libraries Group	OSI
State University of New York (SUNY)	TCP/IP
Thinking Machines Corporation	TCP/IP
Virginia Polytechnic Institute and State University	TCP/IP

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Although several of the institutions are running a version of Z39.50 in a prototype mode, all agreed to migrate to the planned new version of the protocol, which will bring Z39.50 very close to the OSI Search and Retrieval Protocol (DP 10162/10163). The institutions that are running different stacks will test interoperability amongst themselves, and then we will tackle the much more difficult issue of crossing protocol stacks. The time table for all of this is relatively short. Some of the institutions plan to use Z39.50 in production systems by early autumn of 1990. Others plan to use it within the next year.

Z39.50 Computer Conference

To facilitate the work of the group, a computer conference has been established. If you are interested in implementing Z39.50, you may subscribe to the list, Z3950IW@NERVM. Since this is an older version of LISTSERV, the SUBSCRIBE command does not work. If you are on BITNET, send the following command in an e-mail message to LISTSERV@NERVM: ADD First_Name Last_Name. If you are on Internet, you can subscribe by sending me a request at FCLMTH@NERVM.NERDC.UFL.EDU.

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