# Z39.50-2001
# Maintenance Revision

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## Introduction

NISO Z39.50-2001 is proposed as a maintenance revision of Z39.50-1995. This memorandum is intended as a cover letter to the draft ballot; its primary purpose is to describe how this new version differs from Z39.50-1995, and the reasons for these changes. If you're familiar with Z39.50 and its historical development, please feel free to skip the following historical background (skip to ACollaborative Work of The ZIG and Maintenance Agency since 1995@).

## Historical Background

Momentum to standardize an information retrieval protocol heightened in the early >80s with the Linked Systems Project. LSP implementation began in >82 and it became operational in >85. Its primary application was a nationwide database of name authority records; searching of authority records was a subsidiary application. Two application protocols, Record Transfer and Information Retrieval, were developed to support these two applications, record exchange and search, specifically to support *authority* record exchange and search, but with sufficient generality to support the two functions regardless of record type.

In 1983 the LSP participants B LC, RLG, OCLC, and WLN B submitted both protocols to ANSI/NISO for consideration as American National Standards. Attempts to standardize Record Transfer were eventually abandoned (eventually the Record Transfer protocol was replaced by FTP for LSP). There was however considerable U.S. interest in standardizing an information retrieval protocol, and the LSP Information Retrieval protocol was assigned to the NISO committee on application protocols who prepared it for ballot, in 1984. It was designated by NISO as "Z39.50", as it is known today. (NISO was formerly named Z39, and continues to use that designation for its standards.)

The 1984 ballot failed within NISO, primarily because it was not yet sufficiently well-developed. There was significant further development over the next three years; Z39.50 was re-balloted in 1987, this time successfully, and it was approved by ANSI and published in 1988. Thus the first published version was Z39.50-1988.

Independently, in 1984, a work item was approved in ISO for a "Search and Retrieve" protocol, SR. There were several drafts of the SR standard between 1984 and 1991 when it was finally approved. The two standards, Z39.50-1988 and SR, shared considerable common functionality, but they were not bit-compatible.

**The ZIG and Maintenance Agency**

In 1990 the *Z39.50 Implementors Group* (ZIG) was established, initially to share Z39.50 implementation resources. Over the past 12 years the ZIG=s role has evolved, and during much of that period its primary activity has been to develop and recommend enhancements to the standard.

Also in 1990 a *Maintenance Agency* for Z39.50 was established, at the Library of Congress. In late 1991 the Maintenance Agency put forth version 2 for ballot; it was approved in 1992. Version 2, developed by the Maintenance Agency in collaboration with the ZIG, replaced and superseded the 1988 version.

There were two broad categories of change in version 2: changes necessary for alignment with SR, and the addition of features deemed necessary by implementors, to provide sufficient functionality so that implementation would be economically justified. Thus Z39.50-1992 was not identical to but was a compatible superset of SR.

### Development of Z39.50-1995 (Version 3)

Many additional enhancements had been proposed by ZIG members for the 1992 version, beyond those that were actually adopted. Several features not yet fully developed or which had not achieved consensus were deferred. Their adoption would have caused significant delay, which was unacceptable because the Maintenance Agency had been assigned as its top priority to revise Z39.50-1988 to achieve bit-compatibility with SR, and to do so quicky, for the credibility of both efforts. The ZIG agreed to defer the proposed new features in return for a commitment from the Maintenance Agency that their development would proceed immediately, and that the resultant subsequent version would be a compatible superset of the 1992 standard.

Thus began in late 1991 an intensive collaboration between the ZIG and Maintenance Agency towards Development of (what eventually became) Z39.50-1995. The ZIG met roughly four times per year during that period; for each meeting the Maintenance Agency prepared a new iterative draft (there were a total of ten or so). Each was carefully scrutinized by implementors and discussed at length both over the ZIG listserv and at the ZIG meetings. In April 1994, the ZIG recommended that the draft be finalized. It was balloted successfully in 1995.

The 1992 version came to be known as *version 2*, and the 1995 version, *version 3*. Z39.50-1992 replaced and superseded Z39.50-1988, which became obsolete. Z39.50-1995 is a compatible superset of the 1992 version.

### Disposition of SR

Z39.50-1992 had been a compatible superset of SR (it included features not in SR such as resource control, access control, and proximity searching). In addition, widening the gap between SR and Z39.50 were the new features developed for Z39.50-1995 (e.g. Sort, Scan, Explain, Segmentation, Concurrent Operations, and Extended Services).

Beginning in1992, ISO advanced several proposals intended to narrow or eliminate that gap, by process of alignment by individual amendment. In 1994, however, ISO decided that that process was excessively burdensome, and instead adopted (by fast-track ballot) the text of Z39.50 verbatim as an ISO standard, ISO 2950-1998.

## Collaborative Work of The ZIG and Maintenance Agency since 1995

The Library of Congress maintains a Web page (http://lcweb.loc.gov/z3950/agency) for matters pertaining to the maintenance, ongoing development, and implementation of Z39.50. Available via

this page are various categories of information, including the text of Z39.50, definitions of registered objects, and register of implementors. Of particular relevance pertaining to the 2001 revision are: clarifications, commentaries, defect reports, amendments, and implementor agreements.  These latter categories of information represent much of the collaborative work of the ZIG and Maintenance Agency since publication of Z39.50-1995, and it is this work primarily that is incorporated into the proposed revision.

## Purpose and Scope of Revision

The historical background provided above describes the circumstances and reasons for the revisions in 1992 and 1995. Those circumstances and reasons do not apply to this (2001) revision.

There are two primary purposes for this 2001 revision.  First, ANSI standards undergo periodic review/re-affirmation, every five years of so. Thus  re-affirmation of Z39.50 is appropriate in the 2000-2002 timeframe.

The second objective is to integrate the above mentioned information into the standard=s text. These clarifications, amendments, etc., have been approved by the ZIG, but have not undergone formal approval beyond that; they have never been approved by a standards body.  Many of the ZIG participants feel that for the credibility of the standard, the Maintenance Agency, and the ZIG, this body of work needs formal approval, and that these individual elements need to be integrated into the standard=s text.

A re-affirmation is usually very limited in scope; references may be updated, errors and defects corrected, etc.  This revision therefore constitutes more than a re-affirmation. On the other hand it does not represent a new version (i.e. AVersion 4"). So we refer to this as a Amaintenance revision@.

## Revision in Perspective

This effort to revise Z39.50 has caused some confusion, given the wide discussion of various other aspects of Z39.50's future.

There has been ongoing discussion of a new protocol version, Aversion 4", not compatible with version 3 (or with Z39.50-1995). Version 4 might incorporate new models and mechanics,  include new functionality, and attempt to address  intersystem-search requirements for the next decade or so. Discussion has included decoupling the mechanics (syntax and underlying protocol) from the topological, data, and semantics/service models, thus allowing the possibilities of rendering the protocol for instance into XML rather than ASN.1.

In addition, in recent years there has been substantial interest among implementors in evolving Z39.50 to a more mainstream protocol, lowering the barriers to implementation while preserving the existing intellectual capital of Z39.50. This interest has resulted in a new  initiative known as  ZING (Z39.50-International: Next Generation),  described at http://www.loc.gov/z3950/agency/zing/zing.html.

This revision, Z39.50-2001, is not related to either of these two efforts, neither of which would be compatible with Z39.50-1995 (i.e. version 3). Z39.50-2001 is a compatible superset of Z39.50-1995.  The three efforts:

X   version 4
X   ZING

X    2001 revision

can be seen as complementary, independent initiatives which collectively address the near-to-mid-term future of Z39.50.

## Summary of Changes in Z39.50-2001

The following web pages describe much of the changes that have been integrated into the revision:

S    **Implementor agreements.**  See: http://lcweb.loc.gov/z3950/agency/agree/agree.html
S    **Amendments**. See http://lcweb.loc.gov/z3950/agency/amend/amend.html including:
    X    Duplicate Detection Service: See  http://lcweb.loc.gov/z3950/agency/amend/am2.html, and
    X    Encapsulation. See: http://lcweb.loc.gov/z3950/agency/amend/am3.html
S    **Defect reports**. See http://lcweb.loc.gov/z3950/agency/defects/defects.html
S    **Commentaries**. See http://lcweb.loc.gov/z3950/agency/wisdom/wisdom.html
S    **Clarifications**. See http://lcweb.loc.gov/z3950/agency/clarify/clarify.html
S    **Version 3 Baseline Requirements**. See http://lcweb.loc.gov/z3950/agency/v3base.html
S    **Z39.50 Attribute Architecture**. See http://lcweb.loc.gov/z3950/agency/attrarch/attrarch.html
S    **Negotiation Model** (Model for Z39.50 Negotiation During Initialization). See
    http://lcweb.loc.gov/z3950/agency/nego.html

## Miscellaneous changes

**OSI**.
All references to OSI (Open System Interconnection) are purged. Purging began in the 1995 version, and is now complete. Thus such concepts as Application Contexts and Presentation Contexts are gone; Aorigin@ and Atarget@ are completely replaced by Aclient@ and Aserver@.

**ASN.1**
All of the ASN.1 has been consolidated into a single appendix. This includes APDU as well as object definitions.

**State Tables**
State tables have been removed, along with accompanying prose and supporting definitions.

## Appendices

The following table summarizes  changes in the appendices.

| Appendix in Z39.50-1995 | Corresponding Appendix in Z39.50-2001 | Changes |
|---|---|---|
| Appendix 1: OID (object Identifiers) | Appendix 1 | No additional substantial changes. See note 1. |
| Appendix 2: CTX | | |

| (application contexts) | none | removed entirely |
|---|---|---|
| Appendix 3:ATR (attributes) | Appendix 2 | Bib-1 removed. See note 2. |
| Appendix 4: ERR (diagnostics) | Appendix 3: DIAG (name change) | X  bib-1 renamed ⌐general diagnostic set@.<br>X  Diag-1 removed.<br>X   ⌐General Diagnostic Container@ added.<br>X  ⌐Returning Diagnostics in an Init Response@ added. |
| Appendix 5: REC (record syntaxes) | Appendix 4. | X  The list of syntaxes and their oids is removed.<br>X   OPAC and Summary removed. |
| Appendix 6: RSC (resource reports | Appendix 5 | Resource-1 removed. See note 3. |
| Appendix 7:ACC (access control) | Appendix 6 | No additional substantial changes. See note 1. |
| Appendix 8: EXT (extended services) | Appendix 7 | No additional substantial changes. See note 1. |
| Appendix 9: USR (user information formats) | Appendix 8 | X  Old USR.2 (negotiation records) has been removed, superceded by new appendix 14.<br>X  New section ⌐use of Init Parameters for User Information@<br>X  New section ⌐General User Information format, User-1". |
| Appendix 10: ESP (especs) | Appendix 9 | X  eSpec-2 replaces eSpec-1.<br>X  eSpec-q added. |
| Appendix 11:VAR (variant sets) | Appendix 10 | No additional substantial changes. See note 1. |
| Appendix 12:TAG (tagSets & schemas) | Appendix 11 | No additional substantial changes. See note 1. |
| Appendix 13:ERS (result set model) | Appendix 12 | Unchanged |
| Appendix 14:RET (retrieval) | Appendix 13 | No additional substantial changes. See note 1. |
| Appendix 15:PRO (profiles) | Appendix 16 | completely re-written |

| Appendix 16 (maintenance agency) | None. | |
|---|---|---|
| | Appendix 14: NEGO (Negotiation model) | New in Z39.50-2001 |
| | Appendix 15: NEGO2 (negotiation records) | New in Z39.50-2001 |
| | Appendix 17 (attribute architecture) | New in Z39.50-2001 |

Notes:

1.  ⒜No substantial changes@ above mean none other than (perhaps) changes made in accordance with changes listed above before the table (which themselves may be substantial).
2.  Bib-1 attributes are no longer maintained within the text of Z39.50. They will continue to be maintained on the web site.
3.  Originally there was resource-1, which listed 16 categories of resources, with no provision of extensibility. Resource-2 was added in 1995, inheriting the original 16 categories, with provision for extensibility. Thus Resource-2 is a compatible superset of resource-1. Thus resource-1 is dropped resource-2 retained (with a comment to the effect that a client might want to be prepared to recognize the resource-1 object identifier.)