

# **The Bath Profile:**

**An International Z39.50 Specification for  
Library Applications and Resource Discovery**

**Release 2.0**

**Internationally Registered Profile  
ISO TC 46 SC 4, February 2004**

Developed by The Bath Group  
(Participants at the Bath Meetings, August 1999 -- April 2002)

Maintained by the Bath Profile Maintenance Agency  
Library and Archives Canada

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## **Revision History**

Release 2 of the profile includes all amendments and clarifications that were identified and endorsed up to April 2002. These include the results of discussions at Bath Profile meetings in September 2000 at St John's, Newfoundland; October 2001 at Boston Spa, UK; and April 2002 at Dublin, Ohio.

## **Chronology of Events**

June 2002 - Added text on Functional Area B to cover agreements made at Bath Profile Meeting in Dublin Ohio (Mark Needleman, Joe Zeeman)

April 2002 - Bath Meeting, Dublin Ohio

February 2002 -- Draft release 2 for discussion

October - December 2001 -- Discussion of recommended changes

October 2001 -- Bath Meeting, Boston Spa

February 2001 -- Profile released with minor modifications

October - December 2000 -- Discussion of recommended changes

September 2000 -- Bath Meeting, St. John's Newfoundland

June 2000 -- Release 1.1 released as International Registered Profile

March 2000 -- Stable draft released

January 2000 -- Bath Meeting, San Antonio Texas

November - December 1999 -- Review and discussion of draft

October 1999 -- Draft released for general comment

August 1999 -- Bath Meeting to draft profile, Bath, U.K.

## **Maintenance of the Profile**

The Library and Archives Canada (LAC) is the maintenance agency for the Profile and assumes overall responsibility for its development. LAC serves as Editor of the Profile. The Bath Profile Developer Group (a voluntary and informal group of interested librarians, Z39.50 developers, and vendors) serves in an advisory capacity to the Editor. The Profile will evolve in response to application needs and requirements of the international library communities and implementors of the Bath Profile.

See [www.nlc-bnc.ca/bath/](http://www.nlc-bnc.ca/bath/) for current information on the Profile and its development. For reporting defects, the form located at [www.nlc-bnc.ca/bath/mp-defectreportform.htm](http://www.nlc-bnc.ca/bath/mp-defectreportform.htm) must be used.

## **Acknowledgments**

This document reflects several years of implementing and profiling Z39.50 specification directed at solving interoperability issues when searching library catalogues. In August 1999, a group of people met in Bath, United Kingdom, to work out solutions that would improve semantic interoperability between Z39.50 systems used in library applications. The participants represented various initiatives, projects, interests, and key Z39.50 profiling efforts of the past several years. They also shared a common goal of developing an international specification for Z39.50 to be used in library applications. The first release of the Bath Profile was the result of those deliberations.

The following people attended the first Bath Meeting:

Makx Dekkers (PricewaterhouseCoopers) Affiliated with the European Commission DGXIII/E.  
Janifer Gatenby Representing GEAC, and affiliated with the Union Catalogue Profile  
Juha Hakala Representing the Helsinki University Library, and affiliated with the Finnish Z39.50 Profile, and the CENL Profile  
Poul Henrik Jorgensen Representing the Danish Library Center, and affiliated with the DanZIG Profile and the ONE2 Profile  
Carrol Lunau Representing Library and Archives Canada, and affiliated with the virtual Canadian union catalogue profile  
Paul Miller Representing the UK Office for Library and Information Networking (UKOLN) and its Interoperability Focus, and affiliated with the Models Profile  
Slavko Manojlovich Representing SIRSI, and affiliated with the Z Texas Profile  
William E. Moen Representing the Z Texas Project, and affiliated with the Z Texas Profile  
Judith Pearce Representing the National Library of Australia, and affiliated with the Union Catalogue Profile  
Joe Zeeman Representing CGI, and affiliated with the virtual Canadian union catalogue profile.

Release two of the profile benefited from the work of ONE2/DanZIG and NISO SC AV on holdings retrieval, the efforts of Larry Dixon Library of Congress (ldix@loc.gov) in drafting Functional Area D, and Joe Zeeman RLG and Mark Needleman Sirsi Corporation (markn@sirsi.com) in drafting the new Functional Area B.

## 1. Introduction to the Profile

This document identifies a subset of specifications from the Z39.50 Information Retrieval Protocol (ANSI/NISO Z39.50/ISO 23950) for use in Z39.50 client and server software. Conformance to this profile's specifications will improve international or extranational search and retrieval among library catalogues, union catalogues, and other electronic resource discovery services worldwide. The profile will evolve as the environment and the standard change, and is intended to facilitate global resource sharing.

This profile builds upon the experience of other profiling efforts addressing interoperability for library catalogue searching and the development of virtual union catalogues. In particular, the following efforts informed the profile:

- ATS-1 Profile
- CENL Profile
- DanZIG Profile
- MODELS Profile
- ONE Profile
- The Z Texas Profile
- Virtual Canadian Union Catalogue Profile
- U.S. National Z39.50 Profile

An earlier document by Carrol Lunau and Joe Zeeman, *Z39.50 Basic Searching of Bibliographic Systems: A Discussion Document*, outlined the issues and need for an international profile for searching library catalogues.

The structure of the profile is modular and allows the future specification of separate but compatible functional requirements involving a range of applications useful to librarians and library users. The profile is structured into *Functional Areas* that group similar functional requirements, Z39.50 specifications, and levels of conformance. Z-clients and Z-servers may claim conformance to the profile at one or more *Conformance Levels* within one or more Functional Areas.

This release of the profile defines four Functional Areas:

- **Functional Area A for Bibliographic Search & Retrieval, with Primary Focus on Library Catalogues:** A definition of a core set of searches (and the associated attributes and attribute combinations) required for basic search and retrieval mechanisms needed by library users and a definition of additional searches required for more precise searches to support other information retrieval needs.
- **Functional Area B for Bibliographic Holdings Retrieval and Search:** A definition of search and retrieval requirements to provide bibliographic and holdings information adequate to identify a library's holdings.
- **Functional Area C for Cross-Domain Search & Retrieval:** A definition of searches and retrieval mechanisms to address cross-domain information retrieval.
- **Functional Area D for Authority Record Search & Retrieval:** A definition of a core set of searches and retrieval mechanisms for searching for authority file records from online catalogues.

Other functional areas may be defined in future releases of this profile such as a functional area for union catalogue updating and a functional area for item order and document delivery.

In addition, Conformance Levels are specified separately for each Functional Area, but generally:

- **Conformance Level 0** defines requirements for a limited number of searches to improve semantic interoperability, and is intended to encompass as many existing Z39.50 products as possible; conformance with Level 0 may require the reconfiguring of existing implementations.
- **Conformance Level 1** defines requirements to improve semantic interoperability; these requirements can be configured in systems currently under development. It is anticipated that those specifying new or enhanced Z39.50 systems should require adherence to at least this Conformance Level.
- **Conformance Level 2** defines a number of functions which may be currently infeasible to require across the board but towards which effort should be directed.

Each Conformance Level defines required Z39.50 client and server specifications and behavior.

## 2. Purpose and Scope

The purpose of the Bath Profile is to identify those features of the Z39.50 standard that are required to allow effective use of Z39.50 software in a range of library applications, including search and retrieval of bibliographic data from library catalogues; transfer of holdings information; cross-domain searches between libraries, museums and archives; search and retrieval of authority records from online catalogues; updating union catalogues; item ordering and document delivery.

Implementation of this profile by systems developers will improve interoperability among diverse systems and improve search and retrieval results within specific Functional Areas.

The usefulness of the profile is twofold. First, it is intended to define a core set of functionality and Z39.50 specifications to enable *international* or *extranational* search and retrieval, especially when a Z-client does not have detailed information about one or more Z-servers. Second, the profile specifications provide the foundation for interoperability between Z-clients and Z-servers outside of the primary jurisdiction of regional, national, state, local, and project groups when their individual profiles incorporate the Bath Profile specifications. The core functionality and specifications defined in this profile are intended to serve as a true subset of regional, national, state, local, or project profiles. Where these do not contradict the specifications of this Profile, conformant clients and servers may additionally support searches and other functionality defined elsewhere.

Information retrieval is not an end unto itself but rather one step within a larger activity such as interlibrary loan, cataloguing, reference, acquisitions or catalogue updating. For this reason, the profile will be developed incrementally to incorporate richer functionality that can address additional library applications.

The primary goal of the profile is to increase the semantic interoperability between disparate systems so that end-users can use Z-clients to search catalogues and be confident that they have retrieved valid result sets.

A key component of this profile is the characterization of the types of searching required by librarians and library users. To this end, the profile defines specific searches and how the semantics of those searches are to be expressed in the vocabulary of Z39.50. The profile does not prescribe local indexing decisions or practices, however, semantic interoperability may be threatened by local indexing decisions that serve local needs. Because the profile defines a core set of searches desired by users, implementors may use these searches to guide local indexing decisions.

Terminology issues are ever-present in a document such as this. An example of such an issue is with terms such as "access points," "indexes," "fields," and "data elements." Often, the library community uses the phrase "search a particular field or fields," when at the system level, the search may be executed by matching the search term with entries in a system-generated index. Access points can be considered searchable fields of a record as represented by the index created from data from those fields. For Cross-

Domain searching, the concept of "field" may be completely absent. In defining searches for library catalogs, the description references fields and indexes. In defining cross-domain searches, the description references data elements and indexes.

It is anticipated that subsequent releases of the profile may incorporate, but not necessarily be limited to, the addition of the following functions:

- A definition of attributes and attribute combinations required for more advanced searching and retrieval of library catalogues, such as might be used by library technical service staff or reference staff.
- A definition of requirements and specifications to support the updating of union catalogues to report new bibliographic and holdings information.
- A definition of requirements and specifications for item order and document delivery.

### **3. Functional Requirements**

This section identifies the functional requirements informing the Z39.50 specifications in this release. These requirements focus on search and retrieval between library catalogues, the search and retrieval of bibliographic holdings information, cross-domain search and retrieval for resource discovery, and the search and retrieval of authority information. The requirements detailed in the sections below comprise four Functional Areas:

- **Functional Area A** for Bibliographic Search & Retrieval, with Primary Focus on Library Catalogues
- **Functional Area B** for Bibliographic Holdings Retrieval & Search
- **Functional Area C** for Cross-Domain Search & Retrieval
- **Functional Area D** for Authority Record Search & Retrieval in Online Library Catalogues.

**Section 5, Conformance, details the specifications for each Functional Area and Conformance Level.**

#### **3.1. Bibliographic Search and Retrieval**

Library users conduct a variety of search and retrieval transactions. The functional requirements for bibliographic search and retrieval delineate a limited number of core searches, the browsing of indexes, and the appropriate retrieval mechanisms needed by library users when interacting with library catalogues and other electronic resources discovery services.

##### **3.1.1. Bibliographic Search**

Librarians and library users engage in a wide range of searching behaviors. Agreements on a core set of bibliographic searches have evolved through various Z39.50 profiling efforts:

- *Author* searches that include searching for an established name heading, searching for names not under any authority control, and searching where only part of a name is used as a search term

- *Title* searches that include searching for the entire title, the first part of a title, and searching using one or more words from a title
- *Subject* searches that include searching for a complete subject heading, the first part of a subject heading, and searching using one or more subject words as search terms
- *Keyword* searches that include high recall searches using one or more words from author, title, subject, and other common access points
- *Boolean* searches that include combining search terms with the Boolean operators of AND, OR, NOT
- *Truncation* searches where the final word of an expression may contain additional characters

Given these bibliographic search behaviors, Section 5.A. Functional Area A: Bibliographic Search and Retrieval, with Primary Focus on Library Catalogues, details three levels of searching.

Level 0 can be considered a set of core searches with a general focus on recall rather than precision. Level 0 searches provide basic functionality for common author, title, subject searches. Level 0 searches are likely to be available in existing implementations.

Level 1 inherits all Level 0 searches and defines additional searches to provide for more precision in search and retrieval. Implementors are encouraged to provide Level 1 searches.

Level 2 inherits all Level 0 and 1 searches and defines additional searches to provide access to more precise bibliographic data such as key titles for serials.

Each search defined in Level 0, Level 1 and Level 2 includes a description of expected behavior, and a prescription for the attribute combination Z-clients are required to send and Z-servers are required to support.

### **3.1.2. Browsing Indexes**

Librarians and library users often use a browse function on a local system to identify appropriate search terms to use in a query. Browse-based searching can assist users in improving their selection of search terms for the query. This is a useful feature, often used in conjunction with known-item searching. Such browse-based searching can be seen as an alternative searching strategy for some search requirements listed in 3.1.1. Browsing indexes is a requirement for Z39.50 implementations and can be achieved through the Z39.50 SCAN service, and this requirement is addressed in Level 1.

### **3.1.3. Basic Bibliographic Retrieval**

This profile addresses retrieval of bibliographic records from library catalogues. Retrieval of bibliographic records given the existence of national MARC formats presents interoperability challenges. Z-servers must support the retrieval of brief and/or full forms of bibliographic records in an internationally accepted MARC format. Depending on business needs Z-servers may also support plain text format to achieve interoperability. The profile assumes that regional, national, state, local or project companion profiles to this international profile

may specify additional requirements such as a preferred MARC format when retrieving records from MARC databases within a specific region, country, state, locality, or project.

### **3.2. Bibliographic Holdings Retrieval and Search**

Identifying which collections contain certain information resources is a key factor in creating an infrastructure for resource sharing among libraries. Librarians require holdings information for resource sharing, and library users need holdings information for knowing where to go to use or borrow a resource. The holdings information should provide sufficient identification and description of an item to give the user adequate information to make a decision about requesting or retrieving the item.

Retrieval of bibliographic holdings information requires the use of the XML record syntax at Conformance Level 1 and above, and requires support for the ZIG Abstract Holdings Schema as specified in Functional Area B. Specifications for searching holdings are not included in release 2.0 of this profile.

### **3.3. Cross-Domain Search and Retrieval**

Librarians and library users desire integrated access to distributed resources, often in conjunction with resource discovery where searches are across many types of information resources. There is a requirement for effective cross-domain searching of diverse resources including library catalogues, government information, museum systems, and archives. A user may wish to send a single search to one or more of these resources.

For example, a user within a library might desire to search the local catalogue plus one or more museum systems and an archive to find information related to a specific artist. A library Z-client configured for cross-domain searching could send out queries to Z39.50 accessible museum and archive systems configured to support cross-domain searching. Similarly, a museum curator could use a museum Z-client configured to support cross-domain searching to search the local museum system, one or more other museum systems, one or more library catalogues, and government resources that are Z39.50 accessible and configured to support cross-domain searching.

Interoperability in the retrieval of such resources requires standard record syntaxes. This requirement can be accommodated through the Z39.50 Simple Unstructured Text Record Syntax (SUTRS) and the eXtensible Markup Language (XML).

This profile assumes that basic cross-domain searching behavior for resource discovery is similar to searching behavior defined for basic bibliographic searching. Therefore, the basic bibliographic searches defined in Level 0 are required for cross-domain Level 0 searches. Cross-domain Level 1 searching has some overlap with the basic bibliographic Level 1 searches but has fewer requirements for precision searches and requires support for unanchored phrase searching.

### **3.4. Authority Record Search and Retrieval**

This profile addresses the searching of records in library authority files. Library users may perform a variety of searches and this profile identifies the functional requirements for the following types of searches:

- A **name** search will look for matches in indexes derived from data elements containing names used as access points or references.
- A **title** search will look for matches in indexes derived from data elements containing a title of a work, a uniform title, or a series title.
- A **subject** search will look for matches in indexes derived from data elements containing subjects (e.g., topical subject, geographical subject, title as subject, and names as subject) and their references.
- An **any** search will search commonly used access points defined by the server. For each level of searching that specifies name, title and subject searches, an "any" search should look for matches in at least the indexes related to those access points.

Level 1 defines a core set of authority file searches. Additional searches have been defined at Level 2, which inherits all Level 1 requirements.

For retrieval, a Z-client must be able to receive records in the MARC21 or SUTRS record syntaxes. Z-servers must be able to deliver a record in MARC21. Additionally, both clients and servers are encouraged to support UNIMARC.

## 4. Z39.50 Specifications

This section summarizes the general Z39.50 specifications to address the functional requirements identified in Section 3.

### 4.1. Protocol Version

The profile requires Version 2 or Version 3 of Z39.50-1995, depending on Functional Area and Conformance Level. All implementations are encouraged to use Version 3, but in the near term, conformance to certain specifications prescribed by this profile is available to Version 2 implementations. Version 3 allows support for multiple attribute sets in a query. This multiple attribute set support is required by some national profiles that extend Bath for domestic requirements.

### 4.2. Z39.50 Objects

The profile uses a number of Z39.50 registered objects. The following table summarizes **all** Z39.50 objects referenced in the four Functional Areas.

Object	OID
bib-1 attribute set	1.2.840.10003.3.1
bib-1 diagnostic set	1.2.840.10003.4.1
holdings schema	1.2.840.10003.13.7.4
UNIMARC record syntax	1.2.840.10003.5.1
MARC21 record syntax	1.2.840.10003.5.10
Simple unstructured records syntax (SUTRS)	1.2.840.10003.5.101
XML record syntax	1.2.840.10003.5.109.10

Support for these registered objects by Z-clients and Z-servers is specified in *Section 5, Conformance*. For information on Z39.50 registered objects, see the Z39.50 Maintenance Agency's *Z39.50 Registry of Object Identifiers* (see also *Z39.50 Maintenance Agency*).

### 4.3. Z39.50 Services

The profile specifies the use of the following Z39.50 services:

- Init
- Search
- Present
- SCAN

See *Section 5, Conformance*, for specific requirements related to these Z39.50 services.

No additional services are required for conformance to this profile. Z-clients and Z-servers optionally may use other Z39.50 services.

Standard Z39.50 Init Service negotiation procedures control the use of all services.

#### 4.3.1. Init

Z-clients conforming to this profile may use the IDAuthentication parameters to transmit authentication information (e.g., userid and password). Z-servers conforming to this profile may or may not require authentication. The profile specifies no other security requirements. Z-clients may need to know in advance the authentication policy of a given server, and be prepared to provide values for userid and password.

Character Set Negotiation is required for Z-clients and Z-servers for particular Conformance Levels; see *Section 5, Conformance*.

#### 4.3.2. Search: Query Type and Attribute Sets

The profile requires Z-clients and Z-servers to use Z39.50 Type 1 queries (i.e., general purpose Boolean query structures).

The Result-set-name parameter is required for Z-servers, and Z-servers must be able to retain at least two named results sets for the duration of a session. Exceptional server situations may override the "two named results sets" requirement.

To accommodate the searching requirements for the four Functional Areas, the profile requires Z-clients and Z-servers to use the following attribute set:

Object	OID
bib-1 attribute set	1.2.840.10003.3.1

Conformant Z-clients and Z-servers will support Attribute types and values according to *Section 5, Conformance*. "Support" in this context means:

- Z-clients must transmit the attribute combination in a Type 1 Query for each defined search.
- Z-clients must accept the corresponding relevant responses (which may be a diagnostic record) from Z-servers including specified record syntaxes
- Z-servers must recognize the attribute set's OID
- Z-servers must recognize the attribute set's attribute types and value(s) listed for a conformance level
- Z-servers must accept for each defined search the associated attribute combination if they are relevant in the context of the corresponding databases
- Z-servers must process each defined search using the attribute combination sent by the Z-client and produce a valid result set (which could contain 0 hits)
- Z-servers must return the corresponding relevant responses (which may be a diagnostic message) to the Z-client including specified record syntaxes.

This means that all implementations conforming to this profile must have search capabilities for attribute types and values listed in each Functional Area and Conformance Level for which conformance is claimed (see *Section 5, Conformance*). Z-clients and Z-servers may also use attribute types and values from other public or private attribute sets in addition to those required by this profile.

Complex keyword searches can be expressed using Boolean operators to connect one or more operands where the operands are constructed using the searches defined in these specifications. Some servers, however, may only accept a limited number of search terms combined with Boolean operators. In such cases the z-server should return the appropriate diagnostic; see Section 4.4 Diagnostic Messages.

The bib-1 Attribute Set plays a primary role in this profile for both basic bibliographic searching and for cross-domain searching. Semantics for most of the bib-1 attributes specified for support in this profile can be found in *Attribute Set bib-1 (Z39.50-1995): Semantics (September 1995)*. Not all current bib-1 attribute values, however, are defined in that document. However, the complete bib-1 Attribute Set is available at <http://lcweb.loc.gov/z3950/agency/defns/bib1.html>.

The following table summarizes the bib-1 Attribute Set types and values referenced in the Functional Areas A, C and D:

Attribute Type	Attribute Values	Attribute Names
Use (1)	1 2 3 4 6 8 12 21 31 33 54 58 63 1002 1003 1007 1016 1031 1044 1075 1079	personal name corporate name conference name title uniform title ISSN local control number subject heading date of publication title key code-language geographic name note name author identifier-standard any material-type possessing institution genre/form subject topical subject
Relation (2)	1 2 3 4 5 104	less than less than or equal equal greater than or equal greater than within
Position (3)	1 3	first in field any position in field
Structure (4)	1 2 4	phrase word year
Truncation (5)	1 100	right truncation do not truncate
Completeness (6)	1 3	incomplete subfield complete field

### 4.3.3. Retrieval: Record Syntaxes

For interoperability, Z-clients and Z-servers must support common record syntaxes. Support of a record syntax means that for every record in a result set, the Z-server can deliver the record in a required record syntax. Exceptional server situations may override this required syntax requirement (e.g., database temporarily not available). Local policies may also restrict access to records in one or more specific record syntaxes to authorized users. In such cases, the server should return a diagnostic; see Section 4.4. Diagnostic Messages.

Z-clients and Z-servers have different responsibilities in their support for record syntaxes. Z-clients will support all syntaxes required in a Functional Area and at a given Conformance Level, while Z-servers will normally support only those syntaxes required for their business.

For bibliographic and authority retrieval (Functional Areas A and D), the MARC21 and SUTRS record syntaxes are required depending on Conformance Level; however, it is

strongly recommended that UNIMARC also be supported for international interoperability. Regional, national, state, local, or project companion profiles may specify other Z39.50 registered MARC record syntaxes in addition to those required by this profile. In the case where a user requests a particular record syntax and the Z-server only provides records in a different syntax, the Z-server should return the appropriate diagnostic; see Section 4.4. Diagnostic Messages.

Interoperability requires use of standard character sets. If a character set is not negotiated the server should assume that the character set is ISO Latin-1. Character set negotiation is required depending on Conformance Level. See Section 5, Conformance for specific requirements.

For retrieval of bibliographic holdings information (Functional Area B), XML and the Z39.50 Holdings Schema are required. Three sub-schemas have been defined for the ESNs described in Functional Area B. These sub-schemas are available at the Z39.50 Maintenance Agency web site.

For retrieval of information resources in the context of resource discovery and cross-domain searching (Functional Area C), SUTRS and XML are the required record syntaxes. Appendix B contains an XML Document Type Definition (DTD) for Dublin Core Simple metadata records. This DTD is required when using the XML Record Syntax in Functional Area C.

See Section 5, Conformance for specific requirements regarding record syntaxes for the different Functional Areas and Conformance Levels. Z-clients and Z-servers may support other registered Z39.50 record syntaxes in addition to those required by this profile.

#### **4.4. Diagnostic Messages**

The profile requires that Z-servers return appropriate diagnostic messages from Diagnostic Set bib-1. To assist implementors in sending the appropriate diagnostic for an error condition, a listing of bib-1 Diagnostics to use for specific error conditions is located at the Maintenance Agency site as a Related Specification/Contribution (<http://lcweb.loc.gov/z3950/agency/contributions/1.html>). In addition, Z-clients are encouraged to display usable and meaningful diagnostic messages to users. To assist implementors, the list also includes suggested wording for diagnostic messages meant to be read by a user.

## 5. Conformance

Z-clients and Z-servers may claim conformance to one or more Functional Areas at specific Conformance Levels and be in compliance with this profile. Requirements and specifications for each Functional Area are compatible. While Functional Areas differ in their focal concern, it is likely that conformance to certain Functional Areas may imply conformance to other Functional Areas (i.e., to support a particular Functional Area may require conformance to one or more other Functional Areas).

This section identifies required Z39.50 specifications for Z-clients and Z-servers to claim conformance for each of the Functional Areas at a particular Conformance Level. This release specifies conformance for:

- **Functional Area A** for Bibliographic Search & Retrieval, with primary focus on library catalogues
  - Level 0 Basic Bibliographic Search & Retrieval
  - Level 1 Bibliographic Search & Retrieval
  - Level 2 Bibliographic Search & Retrieval
- **Functional Area B** for Bibliographic Holdings Retrieval & Search
  - Level 0 Bibliographic Holdings Retrieval
  - Level 1 Bibliographic Holdings Retrieval
- **Functional Area C** for Cross-Domain Search & Retrieval
  - Level 0 Basic Cross-Domain Search & Retrieval
  - Level 1 Basic Cross-Domain Search & Retrieval.
- **Functional Area D** for Authority Record Search & Retrieval
  - Level 1 Authority Record Search & Retrieval
  - Level 2 Authority Record Search & Retrieval

The goals, objectives, and detailed specification of this profile preclude Z-clients and Z-servers from "default" behavior. Z-clients are required to form queries using all attribute types and values listed for specific searches. Z-servers are required to execute the search specified in the query and are not to do a more general or a more specific search than the one specified in the query (e.g., Z-servers will not execute a Name search if the query specifies an Author search and vice versa).

Bath compliant servers will occasionally receive search queries from non-conformant clients that may not specify all 6 attributes. Where it is feasible to interpret the intent of the search, the server should not fail the query but rather perform the search using the most appropriate values for the missing attributes. The values should comply with the values defined in the profile for the type of search being performed.

### 5.A. Functional Area A: Bibliographic Search and Retrieval

Functional Area A addresses the requirements of basic search and retrieval among and between electronic resource descriptions with specific focus on bibliographic and related databases of library catalogues. Three Conformance Levels for bibliographic search and retrieval are specified.

Functional Area A uses the following Z39.50 Objects:

Object	OID	Z-client	Z-server
bib-1 attribute set	1.2.840.10003.3.1	X	X
bib-1 diagnostic set	1.2.840.10003.4.1	X	X
UNIMARC record syntax	1.2.840.10003.5.1	*	*
MARC21 record syntax	1.2.840.10003.5.10	X	X
SUTRS	1.2.840.10003.5.101	X	**

\* Z-clients and Z-servers are not required to support UNIMARC, but it is strongly recommended.

\*\* Z-servers may return records in SUTRS format (instead of MARC21) for business or copyright reasons.

Record Syntax "support" means that the Z-server can deliver any record in a result set formatted in a required record syntax, and a Z-client can receive and process for display or other uses any record formatted in a required record syntax. Exceptional server situations may override this required syntax requirement (e.g., database temporarily not available). Local policies may also restrict access to records in one or more specific record syntaxes to authorized users. In such cases, the server should return the appropriate diagnostic. Servers that provide records in selected record syntaxes for specific authorized users should use bib-1 Diagnostic #1070: "User not authorized to receive this record in requested syntax."

Default behavior by Z-clients or Z-servers is precluded by this profile. The profile requires that Z-clients formulate queries using all the specified attribute types and values (below), and requires Z-servers to process all of the attribute types (i.e., do not ignore any attribute types or values in the query). Z-servers that do not support specific attribute types and values must return a diagnostic message. See <http://lcweb.loc.gov/z3950/agency/contributions/1.html> for the appropriate diagnostic to return for specific error conditions. Z-clients and Z-servers may support additional searches that use bib-1 attribute type values not specified in this profile. In those cases, Z-clients should specify in a query all values for all 6 attribute types and Z-servers should be prepared to respond to such a query (no defaults).

A keyword search in this profile is defined as a search that matches the specified character string (i.e., the search term) against a word(s) in the record as characterized by the use attribute value. A word may be a single alphanumeric character or a string of characters bounded by spaces or characters treated as spaces by the server. Keyword searches are formulated according to the *ZIG Clarification #54, Z39.50 Keyword Searching of Bibliographic Systems* see <http://lcweb.loc.gov/z3950/agency/clarify/keyword.html>. However, where the Clarification leaves some attribute values unspecified, this profile specifies values for all attribute types. Where a keyword search contains multiple words, each word is a separate term with associated bib-1 attributes to form an operand within the query. Searches with multiple operands are combined with a Boolean operator. Operands can be formulated using searches defined for the levels of conformance (e.g., in Level 0 an operand to express a Title Keyword Search combined with an operand to express a Subject Keyword Search). Servers which support a limited number of operands return an appropriate diagnostic.

This profile does not specify data elements or indexes to be mapped to the required bib-1 use attributes. It recognizes that indexing practices may vary based on local needs. However, it assumes that in library catalogue implementations:

- An author search will look for matches in an index(es) derived from data elements containing names used as main entry, added entry, or series author
- A title search will look for matches in an index(es) derived from data elements containing the general title and alternative titles such as series title, uniform title, and variant titles; statement of responsibility is not generally considered part of a title search
- A subject search will look for matches in an index(es) derived from data elements containing subjects (e.g., topical subject, geographical subject, title as subject, and names as subject) with no expectation that the search term is from an authoritative subject heading list
- An "any" search will search commonly used access points defined by the server; for each level of searching that specifies author, title and subject searches, an "any" search should look for matches in the indexes related to those access points.

Since servers are required to support a minimum number of well-defined searches for each conformance level, they should be able to process a query that combines operands that express searches across different indexes (i.e., cross-index searching).

The Bath Profile uses the bib-1 Attribute Set when specifying searches; however, information retrieval systems work with indexes and access points. Throughout this section, where the terms field and/or subfield are used in Attribute Names (e.g., Incomplete Subfield), the term should be interpreted to mean access point.

### **5.A.0. Functional Area A: Level 0 Basic Bibliographic Search and Retrieval**

Conformance with Level 0 Searching enables a basic level of author, title, subject, and general keyword (any) searching. Author, title, subject, and general keyword searches are all based on a keyword approach to assist in high recall. It reflects and replaces the functionality supported by the ATS-1 Profile. (The Z39.50 Maintenance Agency has designated the ATS-1 Profile with the status "Not Currently Maintained".)

Z39.50 Version 2 is required; Z39.50 Version 3 is recommended and required for national profiles that extend Bath and need to use multiple attribute sets in a query.

Level 0 Searching requires that clients recognize the ISO Latin-1 character set. In addition, clients should be prepared to negotiate UNICODE. If a character set is not negotiated, a server should assume that the characters in the search term are Latin-1.

Level 0 Retrieval requires:

- Z-clients to support MARC21 **and** SUTRS.
- Z-servers to support MARC 21.

Level 0 Searching requires the following bib-1 Attributes Types and Values:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4, 21, 1003, 1016	title, subject heading, author, any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

Combinations of these Attributes Types and Values express the semantics of four Level 0 Searches detailed below:

- Author Search -- Keyword
- Title Search -- Keyword
- Subject Search -- Keyword
- Any Search -- Keyword

#### 5.A.0.1. Author Search -- Keyword

*Uses:* Searches for complete word in fields that contain the name of a person or entity responsible for a resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

#### 5.A.0.2. Title Search -- Keyword

*Uses:* Searches for complete word in a title of a resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.A.0.3. Subject Search -- Keyword**

*Uses:* Searches for complete word in subject fields in a record.

Attribute Type	Attribute Values	Attribute Name
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.A.0.4. Any Search -- Keyword**

*Uses:* Searches for complete word in fields that are commonly used as access points (as defined by the server). Any searches comprising more than one keyword are interpreted in such a way that the terms may exist in the same or different attributes.

Example: a search on "Dickens AND Twist" might conceivably find "Dickens" in the Author Use Attribute (1003) and "Twist" in the Title Use Attribute (4).

Attribute Type	Attribute Values	Attribute Name
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.A.1. Functional Area A: Level 1 Bibliographic Search and Retrieval**

Level 1 inherits all Level 0 search and retrieval requirements. Conformance with Level 1 Search enables basic and more precise Author, Title, and Subject searching as well as Standard Number and Date of Publication. Level 1 enhances keyword searching by providing truncation of words. To assist in understanding server behavior and results when using the Truncation and Completeness Attribute values, see Appendix A, Examples of Using Truncation and Completion.

Z39.50 Version 3 is required.

Level 1 requires Z-clients and Z-servers to recognize Character Set and Language Negotiation.

Level 1 Retrieval requires:

- Z-clients to support MARC21 and SUTRS
- Z-servers to support MARC21.

Level 1 Searching requires the following bib-1 Attributes Types and Values:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4 21 31 1003 1007 1016	title subject heading date of publication author identifier-standard any
Relation (2)	1 2 3 4 5	less than less than or equal equal greater than or equal greater than
Position (3)	1 3	first in field any position in field
Structure (4)	1 2 4	phrase word year
Truncation (5)	1 100	right truncation do not truncate
Completeness (6)	1 3	incomplete subfield complete field

Combinations of these Attributes Types and Values express the semantics of fifteen Level 1 Searches detailed below:

- Author Search -- Keyword with Right Truncation
- Author Search -- Exact Match
- Author Search -- First Words in Field
- Author Search -- First Characters in Field
- Title Search -- Keyword with Right Truncation
- Title Search -- Exact Match
- Title Search -- First Words in Field
- Title Search -- First Characters in Field
- Subject Search -- Keyword with Right Truncation
- Subject Search -- Exact Match
- Subject Search -- First Words in Field
- Subject Search -- First Characters in Field
- Any Search -- Keyword with Right Truncation
- Standard Identifier Search
- Date of Publication Search

Level 1 requires the use of SCAN as detailed in *Section 5.A.1.SCAN, Functional Area A: Level 1 Use of SCAN*. Use of SCAN is a mechanism to browse indexes for authors, titles, subjects, and keywords when the searcher is not sure of how a term may be indexed in a database. A SCAN may be followed by a subsequent search once the appropriate term has been identified.

For the precision title searches described below, search results may show some variance because of the use of an initial article in a query. For example, if a client sends a title search that includes an initial article, the results may be variable depending, for example, on the

language of the work for which the title is being searched and/or the indexing practice of the target database.

Operands can be formulated using searches defined for different levels of conformance (e.g., in Level 1 an operand to express a Title Search -- Keyword with Right Truncation combined with an operand from level 0 to express a Subject Keyword Search). Each operand specifies all attribute values as prescribed for the defined searches.

#### 5.A.1.1. Author Search -- Keyword with Right Truncation

*Uses:* Searches for complete word beginning with the specified character string in fields that contain the name of a person or entity responsible for a resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

#### 5.A.1.2. Author Search -- Exact Match

*Uses:* Searches for the complete string as specified in fields that contain a name of a person or entity responsible for a resource. This search is needed to conduct a follow-up search when the user selects terms from an author index (e.g., from a SCAN).

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

#### 5.A.1.3. Author Search -- First Words in Field

*Use:* Searches for complete word(s) in the order specified in author fields. The field must begin with the specified character string. This search is useful when you know the surname and first name of an author but not necessarily a complete name.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.A.1.4. Author Search -- First Characters in Field**

*Use:* Searches for the specified character string in author fields. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all names beginning with a common stem or when a partial name is known (e.g., complete last name, first initial or other name).

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete field

**5.A.1.5. Title Search -- Keyword with Right Truncation**

*Uses:* Searches for complete word beginning with the specified character string in fields that contain a title of a resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.A.1.6. Title Search -- Exact Match**

*Uses:* Searches in fields that contain a title of a resource for an exact match on the complete string as specified. This search is useful for one or two word titles, often serials, where a less precise search may retrieve a very large result set. This search is also needed to conduct a follow-up search when the user selects terms from a full title index (e.g., from a SCAN).

*Note:* The exact match title search may result in zero results if the server indexes an entire field including the statement of responsibility (i.e., information about the person(s) or entities responsible for the intellectual creation of the resource).

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.A.1.7. Title Search -- First Words in Field**

*Uses:* Searches for complete word(s) in the order specified in fields that contain a title of a resource. The field must begin with the specified character string. This search is useful when the beginning words in a title are known to the user.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.A.1.8. Title Search -- First Characters in Field**

*Uses:* Searches for the specified character string in fields that contain a title of a resource. The field must begin with the specified character string. This search is useful when the beginning words in a title are known to the user but the user is not sure of the form or spelling of a particular word. For example, 'cat behav' will retrieve resources with titles beginning 'cat behavior' or 'cat behaviour'.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.A.1.9. Subject Search -- Keyword with Right Truncation**

*Uses:* Searches for complete word beginning with the specified character string in subject fields of a record.

Attribute Type	Attribute Values	Attribute Name
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.A.1.10. Subject Search -- Exact Match**

*Uses:* Searches in subject fields for the complete string as specified. This search is useful for limiting searches to a precise subject, especially where fields contain sub-headings. This search is needed to conduct a follow-up search when the user selects terms from a subject heading index (e.g., from a SCAN).

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.A.1.11. Subject Search -- First Words in Field**

*Uses:* Searches for complete word(s) in the order specified in subject fields. The field must begin with the specified character string. This search is useful when the searcher knows the main subject heading but not sub-headings.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.A.1.12. Subject Search -- First Characters in Field**

*Uses:* Searches for the specified character string in subject fields. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all headings beginning with a common stem. For example, 'catalog' will retrieve resources on 'cataloging', 'catalog cards', 'catalog use', etc.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

### 5.A.1.13. Any Search -- Keyword with Right Truncation

*Uses:* Searches for complete word beginning with the specified character string in fields that are commonly used as access points (as defined by the server). Any searches comprising more than one keyword are interpreted in such a way that the terms may exist in the same or different attributes.

Example: a search on "Dick AND Twi" might conceivably find "Dickens" in the Author Use Attribute (1003) and "Twist" in the Title Use Attribute (4).

Attribute Type	Attribute Values	Attribute Name
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

### 5.A.1.14. Standard Identifier Search

*Uses:* Searches standard identifiers such as ISBN, ISSN, Music Standard numbers, CODEN, Superintendent of Documents Item Number, etc., but does not identify a specific standard number scheme.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1007	identifier-standard
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

### 5.A.1.15. Date of Publication Search

*Uses:* Searches for the year in which a resource is published.

The Date of Publication Use attribute must be used as a search limiter in conjunction with another operand (i.e., used to limit a search using other Use attribute values). Z-servers may reject a query that only includes the Date of Publication Use attribute.

Attribute Type	Attribute Value	Attribute Name
Use (1)	31	date of publication
Relation (2)	1, 2, 3, 4, 5	less than, less than or equal, equal, greater than or equal, greater than
Position (3)	1	first in field
Structure (4)	4	year
Truncation (5)	100	do not truncate
Completeness(6)	1	incomplete subfield

### 5.A.1.SCAN. Functional Area A: Level 1 Use of SCAN

The Z39.50 SCAN Service is an effective mechanism for identifying appropriate search terms to be submitted in a query to a single database or server. It is required at Functional Area A: Level 1 Bibliographic Search and Retrieval.

The following requirements apply for SCAN:

- Z-clients must support Term and DisplayTerm, and display DisplayTerm if sent. If DisplayTerm is not sent, Term must be displayed.
- Required values for parameter preferredPositionInResponse are 0 and 1. Stepsize is 0.

Three SCANS are defined:

- Author -- Exact Match
- Title -- Exact Match
- Subject -- Exact Match

Unlike the other searches specified in this Profile, it is not necessary to specify the Relation, Completeness and Truncation attributes of a SCAN.

Guidance in using terms found from a SCAN in a subsequent search can be found at the Maintenance Agency site as a Related Specification/Contribution (see <http://lcweb.loc.gov/z3950/agency/contributions/2.html>).

#### 5.A.1.SCAN.1. Author -- Exact Match

*Uses:* To browse an ordered list of author names.

The termlist for an Author Exact Match SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Position (3)	1	first in field
Structure (4)	1	phrase

#### 5.A.1.SCAN.2. Title -- Exact Match

*Uses:* To browse an ordered list of complete titles.

The termlist for a Title Exact Match SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Position (3)	1	first in field
Structure (4)	1	phrase

### 5.A.1.SCAN.3. Subject -- Exact Match

Uses: To browse an ordered list of complete subject terms and headings.

The termlist for a Subject Exact Match SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject
Position (3)	1	first in field
Structure (4)	1	phrase

### 5.A.2. Functional Area A: Level 2 Bibliographic Search and Retrieval

Level 2 inherits all Level 0 and 1 search and retrieval requirements. Conformance with Level 2 allows additional searches for periodical titles and possessing institution as well as additional limiting searches by format/type of material, language of the item and date ranges.

Level 2 searching requires the following bib-1 Attribute Types and Values:

Attribute Type	Attribute Value	Attribute Name
Use (1)	31	date of publication
	33	title key
	54	code-language
	1031	material-type
	1044	possessing institution
Relation (2)	3	equal
	104	within
Position (3)	1	first in field
	3	any
Structure (4)	1	phrase
	2	word
	4	year
Truncation (5)	1	right truncation
	100	do not truncate
Completeness (6)	1	incomplete subfield
	3	complete field

Combinations of these Attribute Types and Values express the semantics of nine Level 2 searches detailed below:

- Key Title Search -- Keyword
- Key Title Search -- Keyword with Right Truncation
- Key Title Search -- Exact Match
- Key Title Search -- First Word in Field
- Key Title Search -- First Characters in Field
- Format/Type of Material Search -- Keyword
- Format/Type of Material Search -- Phrase
- Language Search -- Keyword
- Date of Publication Range Search
- Possessing Institution Search

#### 5.A.2.1 Key Title Search -- Keyword

*Uses:* Searches for complete word in the key title of a periodical.

Attribute Type	Attribute Values	Attribute Names
Use (1)	33	Title key
Relation (2)	3	Equal
Position (3)	3	Any
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

#### 5.A.2.2 Key Title Search -- Keyword with Right Truncation

*Use:* Searches for complete word beginning with the specified character string in fields that contain a key-title of a periodical.

Attribute Type	Attribute Values	Attribute Names
Use (1)	33	Title key
Relation (2)	3	Equal
Position (3)	3	Any
Structure (4)	2	Word
Truncation (5)	1	Right truncation
Completeness (6)	1	Incomplete subfield

#### 5.A.2.3 Key Title Search -- Exact Match

*Use:* Searches in fields that contain a key title of a periodical for an exact match on the complete string as specified. This search is useful for one or two word titles where a less precise search may retrieve a very large result set.

Attribute Type	Attribute Values	Attribute Names
Use (1)	33	Title key
Relation (2)	3	Equal
Position (3)	1	First
Structure (4)	1	Phrase
Truncation (5)	100	Do not truncate
Completeness (6)	3	Complete field

#### 5.A.2.4 Key Title Search -- First Words in Field

*Use:* Searches for complete word(s) in the order specified in fields that contain a key title of a periodical. The field must begin with the specified character string. This search is useful when only the beginning words are known to the user.

Attribute Type	Attribute Values	Attribute Names
Use (1)	33	Title key
Relation (2)	3	Equal
Position (3)	1	First
Structure (4)	1	Phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

#### 5.A.2.5 Key Title Search -- First Characters in Field

*Use:* Searches for the specified character string in fields that contain a key title of a periodical. The field must begin with the specified character string. This search is useful when the beginning words of a key title are known to the user but the user is not sure of the form or spelling of a particular word.

Attribute Type	Attribute Values	Attribute Names
Use (1)	33	Title key
Relation (2)	3	Equal
Position (3)	1	First
Structure (4)	1	Phrase
Truncation (5)	1	Right truncation
Completeness (6)	1	Incomplete subfield

#### 5.A.2.6 Format/Type of Material Search -- Keyword

*Use:* Searches for descriptions of the material type of an item (i.e., computer file, sound recording, cassette, etc.).

The Material-Type Use attribute must be used as a search delimiter in conjunction with another operand (i.e., used to limit a search using other Use Attribute values). Z-servers may reject a query that only includes the Material-Type Use Attribute.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1031	Material-type
Relation (2)	3	Equal
Position (3)	3	Any
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

#### 5.A.2.7 Format/Type of Material Search -- Phrase

*Use:* Searches for descriptions of the material type(s) of an item (i.e., computer file, sound recording, cassette, etc.).

The Material-Type Use attribute must be used as a search delimiter in conjunction with another operand (i.e., used to limit a search using other Use Attribute values). Z-servers may reject a query that only includes the Material-Type Use Attribute.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1031	Material-type
Relation (2)	3	Equal
Position (3)	1	First
Structure (4)	1	Phrase
Truncation (5)	100	Do Not Truncate
Completeness (6)	1	Incomplete subfield

#### 5.A.2.8 Language Search -- Keyword

*Use:* Searches for a code that indicates the language of the item. Code will be from the MARC21 Code list for languages.

The Language Use Attribute must be used as a search limiter in conjunction with another operand (i.e., used to limit a search using other Use Attribute values). Z-servers may reject a query that only includes the Language Use Attribute.

Attribute Type	Attribute Values	Attribute Names
Use (1)	54	Code-language
Relation (2)	3	Equal
Position (3)	3	Any
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.A.2.9 Date of Publication Range Search

*Use:* Searches for items published between two specified dates.

The Date of Publication Use Attribute must be used as a search limiter in conjunction with another operand (i.e., used to limit a search using other Use Attribute values). Z-servers may reject a query that only includes the Date of Publication Use Attribute.

This search must be based on the Z39.50 Implementors Agreement #1 for Linear Range Searching (see <http://lcweb.loc.gov/z3950/agency/agree/range.html>)

Attribute Type	Attribute Values	Attribute Names
Use (1)	31	Date of publication
Relation (2)	104	Within
Position (3)	3	Any
Structure (4)	4	Date
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.A.2.10. Possessing Institution Search

*Use:* Searches for a code (library symbol or other code) or name that identifies the institution that possesses the item.

The Possessing-institution attribute must be used as a search limiter in conjunction with an operand (i.e., used to limit a search using other Use Attribute values). Z-servers may reject a query that only includes the Possessing-institution Use Attribute.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1044	Possessing institution
Relation (2)	3	Equal
Position (3)	3	Any
Structure (4)	1	Phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

## 5.B. Functional Area B: Bibliographic Holdings Retrieval and Search

Functional Area B addresses the requirements for requesting and delivering bibliographic holdings information.

Functional Area B uses the following Z39.50 objects:

Object	OID	Z-client	Z-server
bib-1 diagnostic set	1.2.840.10003.4.1	X	X
holdings schema	1.2.840.10003.13.7.4	X	X
XML Record Syntax	1.2.840.10003.5.109.10	X	X

This version of Functional Area B does not define any requirements for searching of holdings information. Future versions of the Profile may, however, introduce such requirements.

### 5.B.0. Functional Area B: Level 0 Bibliographic Holdings Retrieval

For parallelism with other Functional Areas that define a Level 0 conformance, a Level 0 for exchanging bibliographic holdings information is provided for current implementations that do provide holdings information (e.g., embedded in bibliographic records). No other specifications are prescribed.

### 5.B.1. Functional Area B: Level 1 Bibliographic Holdings Retrieval

Level 1 conformance requires support of the Holdings Schema, XML, and Z39.50 Version 3. Holdings are retrieved by invoking a PresentRequest for one or more records in an existing result set and including the following parameters:

- Result set name
- Starting position in result set
- Number of records to return
- Preferred record syntax = XML (1.2.840.10003.5.109.10)
- One of the element set names specified below

Three Element Sets are defined for use at Level 1:

- B-1: BathHoldingsLocations Only: Locations Only
- B-2: BathHoldingsSummary Info: Locations, Summary Information, and Count if available
- C-2: BathHoldings CopyInfo: Summary Copy Level Holdings (i.e., summary holdings per copy).

These Element Set Names use data elements defined in the Z39.50 Abstract Holdings Schema. Many of the data elements in the Abstract Holdings Schema have been defined to be optional, and choices have been made as to which of them to include in the ESNs defined in this profile. Z-servers that do not support the requested Element Set Name must return diagnostic message #25 'Specified element set name not valid for specified database'.

Level 1 conformance requires that all Z-clients and Z-servers support ESN B-1 and either ESN B-2 or ESN C-2. Systems that present a bibliographic view of holdings should support ESN B-2 and systems that present a copy level view of holdings should support ESN C-2. To support maximum interoperability, systems are encouraged (but not required) to support both B-2 and C-2. Z-clients and Z-servers may also choose to provide additional views of holdings information beyond those defined here.

The tables below describing the element sets use the following conventions:

M = mandatory

MA = mandatory if applicable

O = optional

### 5.B.1.1. ESN B-1 Locations Only

This element set is appropriate for centralized union catalogues that only keep bibliographic level holdings and are only able to provide location information. The library symbol or code, taken from an authoritative list, is included in InstitutionOrSiteID and the human-readable name of the institution represented by the code is included in LocationName.

The XML schema definition for this ESN is

<http://lcweb.loc.gov/z3950/agency/defns/BathHoldingsLocationsOnly.xsd>

Element	ARS Tag	Type	M/O	Occurrence
holdingsStructure	0	Root	M	1
- biblItemInfo	1	Complex	M	1
- - targetItemId	3	Data	M	1
- holdingsStatements	4	Complex	M	1+
- - holdingsSiteLocation	6	Complex	M	1
- - - institutionOrSiteID1	27	Data	M	1
- - - locationName2	28	Data	O	0,1
- - - isilCode	29	Data	O	0,1

### 5.B.1.2. ESN B-2 Locations, Summary Information and Count if available

This element set is suitable for physical union catalogues and catalogues which only include summary bibliographic level holdings that describe the extent of the work, such as information for serials and other multi-part titles.

The XML schema definition for this ESN is

<http://lcweb.loc.gov/z3950/agency/defns/BathHoldingsSummaryInfo.xsd>

Element	ARS Tag	Type	M/O	Occurrence
holdingsStructure	0	Root	M	1
- biblItemInfo	1	Complex	M	1
- - targetItemId	3	Data	M	1
- holdingsStatements	4	Complex	M	1+
- - holdingsSiteLocation	6	Complex	M	1

- - - targetLocationId	26	Data	O	0,1
- - - institutionOrSiteId1	27	Data	M	1
- - - isilCode	29	Data	O	0,1
- - - streetAddress	30	Data	O	0+
- - - countryId	31	Data	O	0,1
- - - regionId	32	Data	O	0,1
- - - networkAddress	33	Data	O	0,1
- - - siteNotes	34	Data	O	0,1
- - - subLocation	35	Complex	O	0,1 (recursive)
- - - moreInfo	39	Data	O	0,1
- - dateOfReport	7	Data	O	0,1
- - publicationType	8	Data	O	0,1
- - unionCatShelfMark	9	Data	MA	0,1
- - localHoldings	10	Complex	M	1+
- - - bibView	11	Complex	M	1
- - - - targetBibPartId	40	Data	O	0,1
- - - - typeOfUnitDesignator	41	Data	MA	0,1
- - - - unitName	43	Data	MA	0,1
- - - - physicalFormDesignator	44	Data	O	0,1
- - - - bibPartLendingInfo	115	Data	O	0,1
- - - - - servicePolicy	109	Data	O	0,1
- - - - - serviceFee	110	Data	O	0,1
- - - - - copyrightFee	114	Data	O	0,1
- - - - - expectedDispatchDate	111	Data	O	0,1
- - - - - serviceNotes	112	Data	O	0,1
- - - - bibPartReproductionInfo	116	D	O	0,1
- - - - - servicePolicy	109	Data	M	0,1
- - - - - serviceFee	110	Data	O	0,1
- - - - - copyrightFee	114	Data	O	0,1
- - - - - expectedDispatchDate	111	Data	O	0,1
- - - - - serviceNotes	112	Data	O	0,1
- - - - numberOfChildBibParts	49	Data	MA	0,1
- - - - childEnumChronSummary	50	either structured or unstructured	MA	0,1
- - - - - childEnumChronSummary- structured	51	complex	O	0,1
- - - - - targetSequenceId	86	data	O	0,1
- - - - - primaryEnum	87	either starting enum and optional starting chron. ending	O	0,1

		enum and ending chron or unstructured summary enum		
----- startingEnum	89	complex	M	1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0+
----- startingChron	90	complex	O	0,1
----- chronLevel	96	data	O	0,1
----- chronCaption	97	data	O	0,1
----- specificChronology	98	data	M	1
----- childChronology	138	complex	O	0+
----- endingEnum	91	complex	O	0,1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0+
----- endingChron	92	complex	O	1
----- chronLevel	96	data	O	0,1
----- chronCaption	97	data	O	0,1
----- specificChronology	98	data	M	1
----- childChronology	138	complex	O	0+
----- unstructuredSummary-Enum	143	data	O	0,1
----- alternativeEnum	87	either starting enum and optional starting chron, ending enum and ending chron or unstructured summary enum	O	1
----- startingEnum	89	complex	M	1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	O	0,1
----- childEnumeration	137	complex	O	0+
----- startingChron	90	complex	O	1
----- chronLevel	96	data	O	0,1
----- chronCaption	97	data	O	0,1
----- specificChronology	98	data	M	1

----- childChronology	138	complex	O	0+
----- endingEnum	91	complex	O	1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0+
----- endingChron	92	Complex	O	1
----- chronLevel	96	Data	O	0,1
----- chronCaption	97	Data	O	0,1
----- specificChronology	98	Data	M	1
----- childChronology	138	Data	O	0,1
----- childEnumChronSummary-unstructured	52	Data	O	0,1
---- childCompletenessDesig	93	Data	O	0,1
---- bibPartNotes	54	Data	O	0,1
-- noOfTopBibParts	13	Data	MA	0,1
-- noOfCopies	14	Data	MA	0,1
-- unionCatCompletenessDesignator	15	data	MA	0,1
-- unionCatAcqStatusDesignator	16	data	MA	0,1
-- unionCatRetentionDesignator	17	data	MA	0,1
-- unionCatReproductionNote	18	data	MA	0,1
-- unionCatLendingInfo	19	complex	MA	0,1
--- servicePolicy	109	Data	O	0,1
--- serviceFee	110	Data	O	0,1
--- copyrightFee	114	Data	O	0,1
--- expectedDispatchDate	111	Data	O	0,1
--- serviceNotes	112	Data	O	0,1
-- unionCatReproductionInfo	20	complex	MA	0,1
--- servicePolicy	109	Data	O	0,1
--- serviceFee	110	Data	O	0,1
--- copyrightFee	114	Data	O	0,1
--- expectedDispatchDate	111	Data	O	0,1
--- serviceNotes	112	Data	O	0,1
-- unionCatTermsUseRepro	21	data	MA	0,1
-- summaryReservationPolicy	22	complex	MA	0,1
--- servicePolicy	109	Data	O	0,1
--- serviceFee	110	Data	O	0,1
--- copyrightFee	114	Data	O	0,1
--- expectedDispatchDate	111	Data	O	0,1

- - - serviceNotes	112	Data	O	0,1
- - summaryReservationInfo	23	Complex	MA	0,1
- - - reservationQueueLength	108	Data	M	1
- - - reservationStatus	113	Data	O	0,1
- - remoteHoldings	24	data	O	0,1
- - holdingsNotes	25	data	O	0,1
- remoteHoldingsData	5	data	MA	0+

### 5.B.1.3 ESN C-2 Summary Copy Level Holdings

This element set is applicable in virtual union catalogues or individual databases which have holdings information available at the copy level

The XML schema definition for this ESN is  
<http://lcweb.loc.gov/Z3950/agency/defns/BathHoldingsCopyInfo.xsd>

Element	ARS Tag	Type	M/O	Occurrence
holdingsStructure	0	root	M	1
- biblItemInfo	1	complex	M	1
- - actualBiblItem	2	data	O	0,1
- - targetItemId	3	data	O	0,1
- holdingsStatements	4	complex	M	1+
- - holdingsSiteLocation	6	complex	M	1
- - - targetLocationId	26	data	O	0,1
- - - institutionOrSiteId <a href="#">1</a>	27	data	M	1
- - - locationName <a href="#">2</a>	28	data	O	0,1
- - - isilCode	29	data	O	0,1
- - - streetAddress	30	data	O	0,1
- - - countryId	31	data	O	0,1
- - - regionId	32	data	O	0,1
- - - networkAddress	33	data	O	0,1
- - - siteNotes	34	data	O	0,1
- - - sublocation	35	complex	O	0,1 (recursive)
- - - moreInfo	40	data	O	0,1
- - localHoldings	10	complex	M	1+
- - - copyView	12	complex	M	1
- - - - targetCopyId	58	data	O	0,
- - - - copyId	59	data	O	0,1
- - - - locator	60	data	O	0,1
- - - - copyDesignation	61	data	MA	0,1
- - - -	140	complex	MA	O,1

copyPhysicalFormDesignator				
----- formCode	142	data	M	1
---- copySummaryEnumeration	62	complex	MA	0,
----- primaryEnum	87	either starting enum and optional starting chron, ending enum and ending chron or unstructured summary enum	M	1
----- startingEnum	89	complex	O	1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0,1+
----- startingChron	90	complex	O	0
----- chronLevel	96	data	O	0
----- chronCaption	97	data	O	0
----- specificChronology	98	data	O	0
----- childChronology	138	complex	O	0+
----- endingEnum	91	complex	O	0,1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0+
----- endingChron	92	complex	O	0,1
----- chronLevel	96	data	O	0,1
----- chronCaption	97	data	O	0,1
----- specificChronology	98	data	M	1
----- childChronology	138	complex	O	0+
----- alternativeEnum	88	either starting enum and optional starting chron, ending enum and ending chron or unstructured summary enum	O	0,1
----- startingEnum	89	complex	M	1
----- enumLevel	93	data	O	0
----- enumCaption	94	data	O	0
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0+
----- startingChron	90	complex	O	0,1

----- chronLevel	96	data	O	0,1
----- chronCaption	97	data	O	0,1
----- specificChronology	98	data	M	1
----- childChronology	138	complex	M	0+
----- endingEnum	91	complex	O	0,1
----- enumLevel	93	data	O	0,1
----- enumCaption	94	data	O	0,1
----- specificEnumeration	95	data	M	1
----- childEnumeration	137	complex	O	0+
----- endingChron	92	complex	O	0,1
----- chronLevel	96	data	O	0,1
----- chronCaption	97	data	O	0,1
----- specificChronology	98	data	M	1
----- childChronology	138	complex	O	0+
---- unstructuredSummaryEnum	52	data	O	0,1
--- copyNumberOfPieces	63	Data	O	0,1
--- copyCompletenessDesignator	64	Data	O	0,1
--- copyAcquisStatusDesignator	65	Data	O	0,1
--- copyRetentionDesignator	66	Data	O	0,1
--- copyReproductionNote	67	Data	O	0,1
--- copyLendingInfo	68	Complex	O	0,1
---- servicePolicy	109	Data	O	0,1
---- serviceFee	110	Data	O	0,1
---- copyrightFee	114	Data	O	0,1
---- expectedDispatchDate	111	Data	O	0,1
---- serviceNotes	112	Data	O	0,1
--- copyReproductionInfo	69	Complex	O	0,1
---- servicePolicy	109	Data	O	0,1
---- serviceFee	110	Data	O	0,1
---- copyrightFee	114	Data	O	0,1
---- expectedDispatchDate	111	Data	O	0,1
---- serviceNotes	112	Data	O	0,1
--- copyTermsUseAndRepro	70	Data	O	0,1
--- copyReservationPolicy	71	Complex	O	0,1
---- servicePolicy	109	Data	O	0,1
---- serviceFee	110	Data	O	0,1
---- copyrightFee	114	Data	O	0,1
---- expectedDispatchDate	111	Data	O	0,1

- - - serviceNotes	112	Data	O	0,1
- - - copyReservationInfo	72	Complex	O	0,1
- - - - reservationQueueLength	108	Data	M	1
- - - - reservationStatus	113	Data	O	0,1
- - - dateOfReport	7	Data	O	0,1
- - - dateOfCreation	73	Data	O	0,1
- - - copyNotes	74	data	O	0,1
- - noOfCopies	14	data	O	0,1
- - remoteHoldings	24	data	O	0,1
- - holdingsNotes	25	data	O	0,1
- remoteHoldingsData	5	data	O	0+

1 InstitutionOrSiteId should be a code value from one of these standard code lists

2 locationName identifies the location within an institution at which the title is held. It should be in text form.

## 5.C. Functional Area C: Cross-Domain Search and Retrieval

Functional Area C addresses the requirements for effective cross-domain searching of networked resources including library catalogues, government information, museum systems, and archives. Three Conformance Levels are identified (0,1,2). Functional Area C exploits searches defined in *Section 5.A.0. Functional Area A: Level 0 Search and Retrieval* and *Section 5.A.1. Functional Area A: Level 1 Search and Retrieval* to enable early adoption of a cross-domain searching approach. Conformance Levels 0 and 1 requires the use of the bib-1 Attribute Set.

To address retrieval requirements in a cross-domain context, the profile requires SUTRS and XML for basic data interchange, The XML record syntax will be used with a Document Type Definition (DTD) for Dublin Core Simple. Retrieval records will be cast in the 15 basic Dublin Core metadata elements, marked up in XML using the DTD found in Appendix B, eXtensible Markup Language (XML) Document Type Definition for Dublin Core Simple.

The Dublin Core Element Set (<http://dublincore.org/documents/dces>) is widely recognized as a means of achieving semantic interoperability between resource descriptions from a variety of domains. Used in conjunction with Z39.50, the fifteen Dublin Core elements are currently represented as bib-1 Use attributes.

Functional Area C utilizes the following Z39.50 Objects:

Object	OID	Z-client	Z-server
bib-1 attribute set	1.2.840.10003.3.1	X	X
bib-1 diagnostic set	1.2.840.10003.4.1	X	X
SUTRS record syntax	1.2.840.10003.5.101	X	**
XML record syntax	1.2.840.10003.5.109.10	X	**

\*\* Z-servers will support one of either SUTRS or XML

Record Syntax "support" means that the Z-server can deliver any record in a result set formatted in a required record syntax and a Z-client can receive and process for display or other uses any record formatted in a required record syntax. Exceptional server situations may override this required syntax requirement (e.g., database temporarily not available). Local policies may also restrict access to records in one or more specific record syntaxes to authorized users. In such cases, the server should return the appropriate diagnostic. Servers that provide records in selected record syntaxes for specific authorized users should use bib-1 Diagnostic #1070: "User not authorized to receive this record in requested syntax."

This profile does not attempt to specify the data elements or indexes to be mapped to the required bib-1 Use attributes. It recognizes that indexing practices may vary based on local metadata sets and needs. However, implementors that have already mapped their local metadata sets (including MARC) to Dublin Core (DC) Simple elements should base their Use Attributes on the following equivalencies:

- A creator search will look for matches in the DC creator element
- A title search will look for matches in the DC title element
- A subject search will look for matches in the DC subject element
- An identifier search will look for matches in the DC identifier element
- A date of publication search will look for matches in the DC date element
- An "any" search will search commonly used access points defined by the server; since Level 0 and Level 1 specify searches for author, title, and subject, an "any" search should look for matches in the indexes related to those access points.

### 5.C.0. Functional Area C: Level 0 Cross-Domain Search and Retrieval

Level 0 Search enables basic cross-domain searching on Creator, Title, and Subject.

Version 2 is required, Version 3 is recommended.

Level 0 Retrieval requires:

- Z-clients to support SUTRS **and** XML
- Z-servers to support SUTRS **or** XML

Level 0 Searching requires support of the following bib-1 Attributes Types and Values:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4, 21, 1003, 1016	title, subject heading, author, any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

The Bath Profile uses the Bib-1 Attribute Set when specifying searches; however, information retrieval systems work with indexes and access points. Throughout this section, where the terms field and/or subfield are used in Attribute Names (e.g., Incomplete Subfield), the term should be interpreted to mean access point.

Combinations of these Attributes Types and Values express the semantics of four Level 0 Searches detailed below:

- Creator Search -- Keyword
- Title Search -- Keyword
- Subject Search -- Keyword
- Any Search -- Keyword.

These four searches use the same attribute combinations as the searches defined in *Section 5.A.0. Functional Area A: Level 0 Basic Search and Retrieval*, however, the names and uses of the searches reflect a more generic approach (i.e., not oriented to library data) and semantics related to the Dublin Core Element Set.

### 5.C.0.1. Creator Search -- Keyword

*Uses:* Searches for complete word in data elements that contain names of entities primarily responsible for making the content of the resource; examples of a Creator include a person, an organisation, or a service.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.C.0.2. Title Search -- Keyword

*Uses:* Searches for complete word in data elements that contain the name given to a resource; typically, a Title will be a name by which the resource is formally known.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.C.0.3. Subject Search -- Keyword

*Uses:* Searches for complete word in data elements that contain the topic of the content of the resource; typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.C.0.4. Any Search -- Keyword

*Uses:* Searches for complete word in data elements that are commonly used as access points (as defined by the server). Any searches comprising more than one keyword are interpreted in such a way that the terms may exist in the same or different attributes.

Example: a search on "Dickens AND Twist" might conceivably find "Dickens" in the Author Use Attribute (1003) and "Twist" in the Title Use Attribute (4).

Attribute Type	Attribute Values	Attribute Names
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

## 5.C.1. Functional Area C: Level 1 Cross-Domain Search and Retrieval

Level 1 inherits all Level 0 search and retrieval requirements. Level 1 enhances keyword searching by providing truncation of words and unanchored phrase searching.

Z39.50 Version 3 is required.

Level 1 Retrieval requires two record syntaxes: SUTRS and the Extensible Markup Language (XML) Record Syntax. For XML, the use of the Document Type Definition (DTD) for Dublin Core Simple (see Appendix B) is required. Retrieval records are structured in Dublin Core Metadata Elements and transferred in the XML Record Syntax using the ESN <http://www.nlc-bnc.ca/bath/tp-dc-dtd.htm>

Level 1 Searching requires support of the following bib-1 Attributes Types and Values:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4, 21, 31, 1003, 1007, 1016	title, subject heading, date of publication, author, identifier-standard, any
Relation (2)	1, 2, 3, 4, 5	less than, less than or equal, equal, greater than or equal, greater than
Position (3)	1, 3	first in field, any position in field
Structure (4)	1, 2	phrase, word
Truncation (5)	1, 100	right truncation, do not truncate
Completeness (6)	1	Incomplete subfield

Combinations of these Attributes Types and Values express the semantics of nine Level 1 Searches detailed below:

- Creator Search -- Keyword with Right Truncation
- Title Search -- Keyword with Right Truncation
- Title Search -- Unanchored Phrase
- Subject Search -- Keyword with Right Truncation
- Subject Search -- Unanchored Phrase
- Any Search -- Keyword with Right Truncation
- Any Search -- Unanchored Phrase
- Standard Identifier Search
- Date of Publication Search

#### 5.C.1.1. Creator Search -- Keyword with Right Truncation

*Uses:* Searches for complete word beginning with the specified character string in data elements that contain names of entities primarily responsible for making the content of the resource; examples of a Creator include a person, an organisation, or a service.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1003	author
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	1	right truncation
Completeness (6)	1	Incomplete subfield

**5.C.1.2. Title Search -- Keyword with Right Truncation**

*Uses:* Searches for complete word beginning with the specified character string in data elements that contain the name given to a resource; typically, a Title will be a name by which the resource is formally known.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	1	right truncation
Completeness (6)	1	Incomplete subfield

**5.C.1.3. Title Search -- Unanchored Phrase**

*Uses:* Searches for the specified phrase in data elements that contain the name given to a resource; typically, a Title will be a name by which the resource is formally known.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	1	phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

**5.C.1.4. Subject Search -- Keyword with Right Truncation**

*Uses:* Searches for complete word beginning with the specified character string in data elements that contain the topic of the content of the resource; typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	1	right truncation
Completeness (6)	1	Incomplete subfield

**5.C.1.5. Subject Search -- Unanchored Phrase**

*Uses:* Searches for the specified phrase in data elements that contain the topic of the content of the resource; typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource.

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	1	phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

**5.C.1.6. Any Search -- Keyword with Right Truncation**

*Uses:* Searches for complete word beginning with the specified character string in data elements that are commonly used as access points (as defined by the server).

Attribute Type	Attribute Values	Attribute Names
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	Word
Truncation (5)	1	right truncation
Completeness (6)	1	Incomplete subfield

**5.C.1.7. Any Search -- Unanchored Phrase**

*Uses:* Searches for the specified phrase in data elements that are commonly used as access points (as defined by the server).

Attribute Type	Attribute Values	Attribute Names
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	1	phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.C.1.8. Standard Identifier Search

*Uses:* Searches standard identifiers such as ISBN, ISSN, Music Standard numbers, CODEN, Superintendent of Documents Item Number, etc., but does not identify a specific standard number scheme. A standard number provides an unambiguous reference to the resource within a given context.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1007	identifier-standard
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

### 5.C.1.9. Date of Publication Search

*Uses:* Searches for the date (year) associated with an event in the life cycle of the resource. Typically, this date will be associated with the creation or availability of the resource.

The Date of Publication Use attribute must be used as a search limiter in conjunction with another operand (i.e., used to limit a search using other Use attribute values). Z-servers may reject a query that only includes the Date of Publication Use attribute.

Attribute Type	Attribute Values	Attribute Names
Use (1)	31	date of publication
Relation (2)	1, 2, 3, 4, 5	less than, less than or equal, equal, greater than or equal, greater than
Position (3)	1	first in field
Structure (4)	4	year
Truncation (5)	100	Do not truncate
Completeness (6)	1	Incomplete subfield

## 5.D. Functional Area D: Authority Record Search and Retrieval in Online Library Catalogues

Functional Area D specifies two levels of conformance for Z-clients and Z-servers. To claim conformance at a specific level means that the Z-client or Z-server supports all specifications listed for that conformance level.

All conformance levels of Functional Area D use the following Z39.50 objects:

Object	OID	Z-client	Z-server
bib-1 attribute set	1.2.840.10003.3.1	X	X
bib-1 diagnostic set	1.2.840.10003.4.1	X	X
MARC 21 record syntax	1.2.840.10003.5.10	X	X
SUTRS	1.2.840.10003.5.101	X	*
UNIMARC record syntax	1.2.840.10003.5.1	**	**

\*Z-servers may return records in SUTRS format (instead of MARC 21) for business or copyright reasons.

\*\*Z-clients and Z-servers are not required to support UNIMARC, but it is strongly recommended.

For retrieval, record syntax "support" means that the Z-server can deliver any record in a result set formatted in a required record syntax, and a Z-client can receive and process for display, or other uses, any record formatted in a required record syntax. For example, Functional Area D: Level 1 conformance requires that a Z-client must be able to receive any record in MARC 21 or in SUTRS, and a Z-server must be able to deliver any record in MARC21. In addition, Z-clients and Z-servers are strongly encouraged to also support the UNIMARC syntax for exchange of MARC data. Exceptional server situations may override this syntax requirement (e.g., database temporarily not available). Local policies may restrict access to records in one or more specific record syntaxes to authorized users. In such cases, the server should return the appropriate diagnostic. For servers that provide records in selected record syntaxes for specific authorized users, Bib-1 Diagnostic #1070: "User not authorized to receive this record in requested syntax" is available to indicate this condition. If there are business reasons why a server cannot deliver MARC 21 records, it should be possible for the records to be delivered in SUTRS.

An authority file is accessed by using a unique database name (i.e., different than the database name used for bibliographic records) in the Z39.50 search request. Record syntax object identifier extensions (e.g., 1.2.840.10003.5.10.2) are not utilized in this profile.

The profile requires that Z-clients formulate queries using all the attribute types and values specified in the searches listed below, and requires Z-servers to process all of the attribute types (i.e., servers cannot ignore any attribute types or values in the query). Z-servers that do not support specific attribute types and values must return a diagnostic message. Appropriate diagnostics for specific error conditions can be found at the Related Specification/Contributions section of the Maintenance Agency site <http://lcweb.loc.gov/z3950/agency/contributions/1.html>.

Z-clients and Z-servers may support additional searches that use attribute types and values not specified in this profile. Z-servers may receive queries that do not conform to the searches listed in this profile. The profile does not prescribe Z-server behavior for non-conformant searches.

This profile does not specify data elements or indexes to be mapped to the required bib-1 Use attributes. It recognizes that indexing practices may vary based on local needs. However, it assumes that in library catalogue implementations:

- A **name** search will look for matches in indexes derived from data elements containing names used as access points or references.
- A **title** search will look for matches in indexes derived from data elements containing a title of a work, a uniform title, or a series title.
- A **subject** search will look for matches in indexes derived from data elements containing subjects (e.g., topical subject, geographical subject, title as subject, and names as subject) and their references.
- An **any** search will search commonly used access points defined by the server. For each level of searching that specifies name, title and subject searches, an "any" search should look for matches in at least the indexes related to those access points.

In this section the term "references" encompasses data derived from see and see also references and optionally heading linking entry fields.

### 5.D.1. Functional Area D: Level 1 Authority Record Search and Retrieval

Level 1 defines search and retrieval requirements for Z39.50 clients and servers and includes name, title, and subject searches that enable robust heading searches across library catalogs.

Z39.50 Version 3 is recommended. Level 1 requires Z-clients and Z-servers to support SCAN.

Level 1 Search requires the ISO Latin-1 character set for encoding the query term.

Level 1 Retrieval requires:

- Z-clients to support MARC 21 and SUTRS. (UNIMARC support is also recommended).
- Z-servers to support MARC 21. (SUTRS may be returned instead of MARC 21 if there are business reasons why MARC 21 cannot be returned to all clients. UNIMARC support is also recommended).
- Z-clients and Z-servers to support the character set defined for use with the record syntax.

Level 1 searching requires the following bib-1 Attributes Types and Values:

Attribute type	Attribute values	Attribute names
Use (1)	4, 21, 1002	title, subject heading, name heading
Relation (2)	3	equal
Position (3)	1, 3	first in field, any position in field
Structure (4)	1, 2	phrase, word
Truncation (5)	1, 100	right truncation, do not truncate
Completeness (6)	1, 3	incomplete subfield, complete field

Combinations of these Attributes Types and Values express the semantics of the following fourteen Level 1 searches (more completely specified below):

**5.D.1.1. Name Search -- Keyword**

*Use:* Searches for complete word in headings (or references) for people, corporate bodies, conferences, and geographic names.

Attribute type	Attribute values	Attribute names
Use (1)	1002	Name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.1.2 Name Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain the name of a person or entity associated with a resource.

Attribute type	Attribute values	Attribute names
Use (1)	1002	Name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.1.3 Name Search -- Exact Match**

*Use:* Searches for the complete string as specified in fields that contain a name of a person or entity associated with a resource. This search is needed to conduct a follow-up search when the user selects terms from a name index (e.g., from a SCAN).

Attribute type	Attribute values	Attribute names
Use (1)	1002	Name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.1.4. Name Search -- First Characters in Field**

*Use:* Searches for the specified character string in fields that contain a name of a person or entity associated with a resource. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all names beginning with a common stem or when a partial complete name is known (e.g., complete last name, initial of first name).

Attribute type	Attribute values	Attribute names
Use (1)	1002	Name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.1.5. Title Search -- Keyword**

*Use:* Searches for complete word in a title of a work or uniform title.

Attribute type	Attribute values	Attribute names
Use (1)	4	Title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.1.6. Title Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain a title of a work or uniform title.

Attribute type	Attribute values	Attribute names
Use (1)	4	Title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

### 5.D.1.7. Title Search -- Exact Match

*Use:* Searches in fields that contain a title of a work or uniform title for an exact match on the complete string as specified. This search is useful for one or two word titles, often series, where a less precise search may retrieve a very large result set. This search is also needed to conduct a follow-up search when the user selects terms from a full title index (e.g., from a SCAN).

Attribute type	Attribute values	Attribute names
Use (1)	4	Title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

### 5.D.1.8. Title Search -- First Words in Field

*Use:* Searches for complete word(s) in the order specified in fields that contain a title of a work or a uniform title. The field must begin with the specified character string. This search is useful when the user knows the beginning words in a title.

Attribute type	Attribute values	Attribute names
Use (1)	4	Title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

### 5.D.1.9. Title Search -- First Characters in Field

*Use:* Searches for the specified character string in fields that contain a title of a work or uniform title. The field must begin with the specified character string. This search is useful when the beginning words in a title are known to the user but the user is not sure of the form or spelling of a particular word. For example, 'catalog' will retrieve resources with titles beginning 'cataloging' or 'cataloguing'.

Attribute type	Attribute values	Attribute names
Use (1)	4	Title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.1.10. Subject Search -- Keyword**

*Use:* Searches for complete word in a subject heading.

Attribute type	Attribute values	Attribute names
Use (1)	21	Subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.1.11. Subject Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in subject heading.

Attribute type	Attribute values	Attribute names
Use (1)	21	Subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.1.12. Subject Search -- Exact Match**

*Use:* Searches in subject fields for the complete string as specified. This search is useful for limiting searches to a precise subject, especially where fields contain sub-headings. This search is needed to conduct a follow-up search when the user selects terms from a subject heading index (e.g., from a SCAN).

Attribute type	Attribute values	Attribute names
Use (1)	21	Subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.1.13. Subject Search -- First Words in Field**

*Use:* Searches for complete word(s) in the order specified in subject headings. The field must begin with the specified character string. This search is useful when the searcher knows the main subject heading but not sub-headings.

Attribute type	Attribute values	Attribute names
Use (1)	21	Subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.1.14. Subject Search -- First Characters in Field**

*Use:* Searches for the specified character string in subject headings. The heading must begin with the specified character string. This search is useful when the searcher wants to retrieve all headings beginning with a common stem. For example, 'catalog' will retrieve resources on 'cataloging', 'catalog cards', 'catalogers', etc.

Attribute type	Attribute values	Attribute names
Use (1)	21	Subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.1.SCAN. Functional Area D: Level 1 Use of SCAN**

The Z39.50 SCAN Service is required at Functional Area D: Level 1 Search and Retrieval. The following requirements apply for SCAN:

- Z-clients must support Term and DisplayTerm, and display DisplayTerm if sent. If DisplayTerm is not sent, Term must be displayed.
- Required values for parameter preferredPositionInResponse are 0 and 1.
- Stepsize is 0.

Three SCANS are defined:

- Name -- Exact Match
- Title -- Exact Match
- Subject -- Exact Match

Unlike the other searches specified in this Profile, it is not necessary to specify the Relation, Completeness and Truncation attributes of a SCAN.

Guidance in using terms found from a SCAN in a subsequent search can be found at the Maintenance Agency site as a Related Specification/Contribution <http://lcweb.loc.gov/z3950/agency/contributions/2.html>

### 5.D.1.SCAN.1. Name -- Exact Match

*Uses:* To browse an ordered list of name headings.  
The termlist for a Name Exact Match SCAN is:

Attribute type	Attribute values	Attribute names
Use (1)	1002	name
Position (3)	1	first in field
Structure (4)	1	phrase

### 5.D.1.SCAN.2. Title -- Exact Match

*Uses:* To browse an ordered list of complete titles.  
The termlist for a Title Exact Match SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Position (3)	1	first in field
Structure (4)	1	phrase

### 5.D.1.SCAN.3. Subject -- Exact Match

*Uses:* To browse an ordered list of complete subject headings.  
The termlist for a Subject Exact Match SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject
Position (3)	1	first in field
Structure (4)	1	phrase

**5.D.2 Functional Area D: Level 2 Authority Record Search and Retrieval**

Level 2 inherits all search and retrieval requirements from Level 1. Level 2 also defines additional requirements. Level 2 defines a variety of more specialized searches.

Level 2 searching requires the following bib-1 Attributes Types and Values:

Attribute Type	Attribute Values	Attribute Names
Use (1)	1	personal name
	2	corporate name
	3	conference name
	4	title
	6	uniform title
	8	ISSN
	12	local control number
	21	subject
	58	geographic name
	63	note
	1002	name
	1016	any
	1075	genre/form subject heading
	1079	topical subject heading
Relation (2)	3	equal
Position (3)	1	first in field
	3	any position in field
Structure (4)	1	phrase
	2	word
Truncation (5)	1	right truncation
	100	do not truncate
Completeness (6)	1	incomplete subfield
	3	complete field

Combinations of these Attributes Types and Values express the semantics of the following 40 Level 2 searches (more completely specified below):

**5.D.2.1. Personal Name Search -- Keyword**

*Use:* Searches for complete word in fields that contain a personal name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1	personal name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.2. Personal Name Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain a personal name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1	personal name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.3. Personal Name Search -- Exact Match**

*Use:* Searches for the complete string as specified in fields that contain a personal name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1	personal name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.4. Personal Name Search -- First Characters in Field**

*Use:* Searches for the specified character string in fields that contain a personal name heading or reference. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all names beginning with a common stem or when a partial name is known (e.g., complete surname, partial first name).

Attribute Type	Attribute Values	Attribute Names
Use (1)	1	personal name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.5. Corporate Name Search -- Keyword**

*Use:* Searches for complete word in fields that contain a corporate name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	2	corporate name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.6. Corporate Name Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain a corporate name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	2	corporate name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.7. Corporate Name Search -- Exact Match**

*Use:* Searches for the complete string as specified in fields that contain a corporate name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	2	corporate name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.8. Corporate Name Search -- First Characters in Field**

*Use:* Searches for the specified character string in fields that contain a corporate name heading or reference. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all names beginning with a common stem.

Attribute Type	Attribute Values	Attribute Names
Use (1)	2	corporate name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.9. Conference Name Search -- Keyword**

*Use:* Searches for complete word in fields that contain a conference name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	3	conference name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.10. Conference Name Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain a conference name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	3	conference name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.11. Conference Name Search -- Exact Match**

*Use:* Searches for the complete string as specified in fields that contain a conference name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	3	conference name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.12. Conference Name Search -- First Characters in Field**

*Use:* Searches for the specified character string in fields that contain a conference name heading or reference. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all names beginning with a common stem.

Attribute Type	Attribute Values	Attribute Names
Use (1)	3	conference name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.13. Uniform Title Search -- Keyword**

*Use:* Searches for complete word in a uniform title heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	6	uniform title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.14. Uniform Title Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain a uniform title heading or reference.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	6	uniform title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.15. Uniform Title Search -- Exact Match**

*Use:* Searches in fields that contain a uniform title heading or reference for an exact match on the complete string as specified. This search is useful for one or two word titles where a less precise search may retrieve a very large result set.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	6	uniform title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.16. Uniform Title Search -- First Characters in Field**

*Use:* Searches for the specified character string in fields that contain a uniform title heading or reference. The field must begin with the specified character string. This search is useful when the user knows the beginning words of a key title but the user is not sure of the form or spelling of a particular word.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	6	uniform title
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.17. Uniform Title Search - First Words in Field**

*Use:* Searches for the specified character string in fields that contain a uniform title heading or reference. The field must begin with the specified words. This search is useful when the user knows the beginning words of a uniform title or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	6	uniform title
Relation (2)	3	equal
Position (3)	1	first position in field
Structure (4)	1	phrase
Truncation (5)	100	Do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.18. ISSN Search**

*Use:* Searches for a complete ISSN.

Attribute Type	Attribute Values	Attribute Names
Use (1)	8	ISSN
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.19. Remote System Record Number Search**

*Use:* Searches for a complete local system record number from a remote system.

Attribute Type	Attribute Values	Attribute Names
Use (1)	12	local control number
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.20. Geographic Name Search -- Keyword**

*Use:* Searches for complete word in fields that contain a geographic name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	58	geographic name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.21. Geographic Name Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain a geographic name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	58	geographic name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.22. Geographic Name Search -- Exact Match**

*Use:* Searches for the complete string as specified in fields that contain a geographic name heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	58	geographic name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.23. Geographic Name Search -- First Characters in Field**

*Use:* Searches for the specified character string in fields that contain a geographic name heading or reference. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all names beginning with a common stem.

Attribute Type	Attribute Values	Attribute Names
Use (1)	58	geographic name
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.24. Title Search -- Unanchored Phrase**

*Use:* Searches for the specified phrase anywhere in fields that contain a title of a work or uniform title or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.25. Subject Search -- Unanchored Phrase**

*Use:* Searches for the specified phrase anywhere in subject heading fields or references of a record.

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.26. Name Search -- Unanchored Phrase**

*Use:* Searches for the specified phrase anywhere in fields of a record that contain name headings or references.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	1002	name
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.27. Note Search -- Keyword**

*Uses:* Searches for complete word in notes fields of a record.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	63	note
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.28. Note Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in fields that contain notes.

<b>Attribute Type</b>	<b>Attribute Values</b>	<b>Attribute Names</b>
Use (1)	63	note
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.29. Any Search -- Keyword**

*Use:* Searches for complete word in headings fields or references. Any searches comprising more than one keyword are interpreted in such a way that the terms may exist in the same or in different fields. Example: a search on “Copland AND Rodeo” might conceivably find “Copland” in a name heading and “Rodeo” in a title heading.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.30. Any Search -- Keyword with Right Truncation**

*Use:* Searches for complete word in headings fields or references. Any searches comprising more than one keyword are interpreted in such a way that the terms may exist in the same or in different fields. Example: a search on “Copland AND Billy the Kid” might conceivably find “Copland” in a name heading and “Billy the Kid. Prairie night” in a title heading.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1016	any
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.31. Topical Subject Search -- Keyword**

*Use:* Searches for complete word in a topical subject heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1079	topical subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.32. Topical Subject Search -- Keyword with Right Truncation**

*Use:* Searches for a complete word beginning with the specified character string in a topical subject heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1079	topical subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.33. Topical Subject Search -- Exact Match**

*Use:* Searches in topical subject fields or references for the complete string as specified. This search is useful for limiting searches to a precise topical subject, especially where fields contain sub-headings.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1079	topical subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.34. Topical Subject Search -- First Words in Field**

*Use:* Searches for complete word(s) in the order specified in topical subject headings or references. The field must begin with the specified character string. This search is useful when the searcher knows the main topical subject heading but not sub-headings.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1079	topical subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.35. Topical Subject Search -- First Characters in Field**

*Use:* Searches for the specified character string in topical subject headings or references. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all headings beginning with a common stem. For example, 'catalog' will retrieve resources on 'cataloging', 'catalog cards', 'catalogers', etc.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1079	topical subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.36. Genre/form Subject Search --Keyword**

*Use:* Searches for complete word in a genre/form subject heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1075	genre/form subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.37. Genre/form Subject Search -- Keyword with Right Truncation**

*Use:* Searches for complete word beginning with the specified character string in genre/form subject heading or reference.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1075	genre/form subject heading
Relation (2)	3	equal
Position (3)	3	any position in field
Structure (4)	2	word
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.38. Genre/form Subject Search -- Exact Match**

*Use:* Searches in genre/form subject headings or references for the complete string as specified. This search is useful for limiting searches to a precise subject, especially where fields contain sub-headings.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1075	genre/form subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	3	complete field

**5.D.2.39. Genre/form Subject Search -- First Words in Field**

*Use:* Searches for complete word(s) in the order specified in genre/form subject headings or references. The field must begin with the specified character string. This search is useful when the searcher knows the main subject heading but not sub-headings.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1075	genre/form subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	100	do not truncate
Completeness (6)	1	incomplete subfield

**5.D.2.40. Genre/form Subject Search -- First Characters in Field**

*Use:* Searches for the specified character string in genre/form subject headings or references. The field must begin with the specified character string. This search is useful when the searcher wants to retrieve all headings beginning with a common stem.

Attribute Type	Attribute Values	Attribute Names
Use (1)	1075	genre/form subject heading
Relation (2)	3	equal
Position (3)	1	first in field
Structure (4)	1	phrase
Truncation (5)	1	right truncation
Completeness (6)	1	incomplete subfield

**5.D.2.SCAN. Functional Area D: Level 2 Use of SCAN**

Level 2 SCAN inherits Level 1 SCAN requirements. Three additional SCANS are defined:

- Name -- Keyword
- Title -- Keyword
- Subject -- Keyword

**5.D.2.SCAN.1.Name -- Keyword**

*Uses:* To browse an ordered list of words from name headings or references.  
The termlist for a Name Keyword SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	1002	name
Position (3)	3	any position in field
Structure (4)	2	word

**5.D.2.SCAN.2.Title -- Keyword**

*Uses:* To browse an ordered list of words from title fields or subfields.  
The termlist for a Title Keyword SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	4	title
Position (3)	3	any position in field
Structure (4)	2	word

**5.D.2.SCAN.3.Subject -- Keyword**

*Uses:* To browse an ordered list of words from subject headings or references.  
The termlist for a Subject Keyword SCAN is:

Attribute Type	Attribute Values	Attribute Names
Use (1)	21	subject
Position (3)	3	any position in field
Structure (4)	2	word

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## Appendix A: Examples of Using Truncation and Completion

### Examples of Using Truncation and Completion

[Note: This table may be extended to address all searches defined in this profile.]

The following table illustrates the expected retrieval behavior for various combinations of attributes. The behavior with regard to combinations of the truncation and completeness attributes has been especially troublesome in terms of predictable interoperability. The following table illustrates the expected behavior.

term = "dog"

USE	TRUNCATION	COMPLETENESS	FINDS
title	none	complete field	titles containing only the single word "dog". Would find "Dog"; would not find "Dogma" or "A dog and bone story".
title	none	incomplete field	titles containing the word "dog", but not titles containing words starting "dog...". Would find the previous and "A dog and bone story"; would not find "Dogma".
title	right	complete field	titles containing a single word beginning "dog...". Would find "Dog" and "Dogma"; would not find "A dog and bone story".
title	right	incomplete subfield	titles containing words starting "dog...". Would find the previous and "Dogma and the Christian church".

Additionally, the position attribute determines where in the matching database term the search term is required to be:

USE	POSITION	TRUNCATION	COMPLETENESS	FINDS
title	<irrelevant>	none	complete field	titles containing only the single word "dog". Would find "Dog"; would not find "Dogma"; would not find "Dog and cat".
title	first in field	none	incomplete subfield	titles beginning with the word "dog", but not titles beginning with words starting with "dog...". The title may contain additional words. Would find the previous and also "Dog and cat"; would not find "Dogma".
title	any position in field	none	incomplete subfield	titles containing the word "dog", but not titles containing words starting "dog...". The title may contain additional words. Would find the previous and also "Me and a cat named Dog", would not find "The truth about Katz and dogs".
title	<irrelevant>	right	complete field	titles containing only a single word beginning "dog...". Would find "Dog" and "Dogma"; would not find "Dogma and the Christian church".
title	first in field	right	incomplete subfield	titles beginning with a word starting "dog...". The title may contain additional words.

				Would find the previous and also "Dogma and the Christian church".
title	any position in field	right	incomplete subfield	titles containing words starting "dog..." anywhere in the field. Would find all of the previous and also "The truth about Katz and dogs".

The behavior with regard to other values of truncation can be easily extrapolated. Few servers support "left truncation" or "left and right truncation."

Note that bib-1 does not address behavior with respect to initial articles or stopwords. Whether or not the term "dog" with (truncation=do no truncate) completeness=complete field) finds "The dog" or "A dog" in addition to just "Dog" is a local implementation issue.

Retrieval behavior with regard to (position=first in subfield) and (completeness=complete subfield) is undefined.

## Appendix B: Extensible Markup Language (XML) Document Type Definition for Dublin Core Simple

The following is a Document Type Definition (DTD) for use in Cross-Domain Retrieval using the XML Record Syntax. This DTD does not address qualified Dublin Core elements.

This DTD was developed for use in the Consortium for the Computer Interchange of Museum Information (CIMI) project, the Dublin Core Testbed.

```
<?xml version="1.0" ?>
<!--<!DOCTYPE record-list [-->
<!-- Dublin Core Version 1.1 -->
<!-- Based on CIMI Guide to Best Practice 1999-08-12 -->
<!ELEMENT record-list (dc-record*)>
<!ELEMENT dc-record (title | creator | subject | description | publisher | contributor
| date | type | format | identifier | source | language | relation | coverage | rights)*>
<!ELEMENT title (#PCDATA) >
<!ELEMENT creator (#PCDATA) >
<!ELEMENT subject (#PCDATA) >
<!ELEMENT description (#PCDATA) >
<!ELEMENT publisher (#PCDATA) >
<!ELEMENT contributor (#PCDATA) >
<!ELEMENT date (#PCDATA) >
<!ELEMENT type (#PCDATA) >
<!ELEMENT format (#PCDATA) >
<!ELEMENT identifier (#PCDATA) >
<!ELEMENT source (#PCDATA) >
<!ELEMENT language (#PCDATA) >
<!ELEMENT relation (#PCDATA) >
<!ELEMENT coverage (#PCDATA) >
<!ELEMENT rights (#PCDATA) >
]>
```

As further explanation of how the DTD works, it specifies that there is a single tag, <record-list>, which is used to delimit the block of DC XML (<record-list>, once, at the start and </record-list> once, at the end). This tag contains 0 or more occurrences of the tag, <dc-record>, which defines a metadata block, or single description. Within this tag (from <dc-record> to </dc-record>), there are 0 or more occurrences of each of the 15 Dublin Core element tags.

This results in something like the following:

```
<record-list>
<dc-record>
<creator>some author</creator>
<creator>some author</creator>
<title>some title</title>
...
</dc-record>

<dc-record>
<creator>some other author</creator>
<title>some other title</title>
...
</dc-record>
</record-list>
```