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U.S. Federal Institute of Museum and Library Services  
National Leadership Grant

**Realizing the Vision of Networked Access to  
Library Resources**

*An Applied Research and Demonstration Project to  
Establish and Operate a Z39.50 Interoperability Testbed*

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**Z-Interop Interoperability Testing  
Policies and Procedures**

***Phase 1 Testing***

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# Z-Interop Testbed Interoperability Testing Policies and Procedures

## 1. Introduction

This document provides an overview and the details of policies and procedures of the Z39.50 Interoperability Testbed Project (referred to as Z-Interop). Specifically, the document lays out the responsibilities and obligations of the Z-Interop testbed and the organizations that participate in interoperability testing. For purposes of this document, **Z-Interop staff** refers to all members of the Z39.50 Interoperability Testbed Project. **Z-Interop participant** refers to an individual or organization who tests its Z39.50 client or Z39.50 server through the Z39.50 Interoperability Testbed.

## 2. Overview of the Testbed

Z-Interop is funded by a National Leadership Grant from the U.S. federal Institute of Museum and Library Services. The goal of the testbed is to improve semantic interoperability among Z39.50 implementations for library applications. Details about the project, its goal, and objectives can be found in other documents available on the project website: <<http://www.unt.edu/zinterop>>.

To summarize, the Z-Interop testbed consists of and uses the following components:

- **Z39.50 profiles:** Current initiatives have produced the *Bath Profile: An International Z39.50 Specification for Library Applications and Resource Discovery* and the *U.S. National Z39.50 Profile for Library Applications*. Z-Interop testing is based on the specifications in these profiles.
- **Test dataset:** OCLC has provided a weighted sample of approximately 400,000 MARC 21 records from its WorldCat database. The Z-Interop staff used various tools and procedures to “understand” the content of the records to determine records that should be returned in test searches.
- **Reference implementations:** SIRSI and Sea Change corporations have contributed products that serve as reference implementations. SIRSI’s Unicorn integrated library system serves as a reference implementation for the Z39.50 server and the information retrieval system (in the form of its online catalog). Sea Change’s Bookwhere 2000 product serves as a reference implementation for the Z39.50 client. The Z-Interop staff, SIRSI, and Sea Change configured the reference implementations according to the Z39.50 profiles.
- **Test searches and results:** For bibliographic database searches defined in the profiles, Z-Interop provides a set of test searches with search terms. Analysis of the test dataset identified records that meet the search criteria.
- **Benchmarks:** Benchmarks for Z-Interop testing are established by executing the test searches using the testbed reference implementations.
- **Policies and procedures:** Provides detailed instructions and systematic procedures, along with published policies, for the operation of the testbed and for Z-Interop participants who want to go through interoperability testing.

Although this document discusses these various components, its primary purpose is to detail the policies and procedures for the testing.

## 3. Resources Available from Z-Interop

The Z-Interop testbed has a set of resources that is used during interoperability testing. Z-Interop makes these resources available to serve the purposes of the testbed. Organizations (e.g., integrated library system vendors, Z39.50 developers, and individual libraries) participating in interoperability testing (i.e. Z-

Interop participants) can use these resources, and Z-Interop staff will work with the testbed participants in their use of these resources.

### 3.1 Reference Implementation of a Z39.50 Server

Z-Interop provides a reference implementation of a protocol machine in the form of a Z39.50 server (also known as a “target”). For interoperability testing, SIRSI Corporation provided Z-Interop with its Z39.50 server product. This server is configured to support the Bath Profile.

### 3.2 Reference Implementation of an Information Retrieval System

A Z39.50 server communicates with an information retrieval (IR) system or database system; typically in a library context, one of those IR or database systems provides access to records in the online catalog. For interoperability testing, SIRSI Corporation provided Z-Interop with its Unicorn integrated library system that includes an online catalog module. The online catalog has been configured to support searches defined in the Bath Profile. Indexing policies in the Unicorn system of the dataset of 400,000 MARC21 records were set up according to the indexing guidelines published on the Z-Interop website. See the Z-Interop document ***Indexing Guidelines for MARC 21 Records to Support Z39.50 Profile Searches***. See also the Z-Interop document ***ZDoctor Report of SIRSI Indexing Policies for Phase 1 Interoperability Testing***, which provides verification of the indexing policies.

### 3.3 Reference Implementation of a Z39.50 Client

Z-Interop provides a reference implementation of a Z39.50 client (also known as an “origin”). For Phase 1 testing, Sea Change Corporation provided Z-Interop with its Bookwhere 2000 Z39.50 client product. This Z39.50 client is configured to support the Bath Profile. Z-Interop staff will use versions 3 and 4 of the Bookwhere Z39.50 client for testing.

### 3.4 Test Records

For Z-Interop participants that want to conduct interoperability testing of its Z39.50 server and information retrieval system (specifically, an online catalog implementation of an information retrieval system), Z-Interop makes available the test dataset of MARC 21 records. For Phase 1 testing, OCLC provided approximately 400,000 MARC 21 records from its WorldCat database. Z-Interop staff have analyzed and prepared the records to form a test dataset. These records have been loaded onto the online catalog reference implementation and indexed according to the MARC 21 indexing recommendations.

Documents related to the preparation of the test dataset are:

- ***Analysis Logic and Procedures for Creating a Test Dataset of MARC 21 Records for the Z39.50 Interoperability Testbed, Phase 1 Testing***
- ***Decomposing MARC 21 Records for Analysis***
- ***Data Normalization Procedures on Decomposed MARC 21 Records***
- ***SQL Data Analysis Procedures to Create Aggregate and Candidate Record Groups on a Sample of Decomposed MARC Records, Phase 1 Testing***

For Z-Interop participants wanting to test their Z39.50 server implementations, Z-Interop staff will provide to the participants a copy of the test dataset. To use the test dataset, Z-Interop participants must sign an appropriate use agreement prior to Z-Interop delivery of the test dataset (see Appendix B).

### 3.5 Test Searches

Z-Interop has a set of test searches and search terms for use in interoperability testing. The searches are those defined in the Bath and U.S. National Profiles, Functional Area A, Level 0:

- Title Search – Keyword (Bath/US Profile)
- Subject Search – Keyword (Bath/US Profile)
- Any Search – Keyword (Bath/US Profile)
- Author Search – Keyword (US Profile)

For Z-Interop participants wanting to test their Z39.50 client implementations, Z-Interop staff will provide the search terms. Z-Interop participants will use their Z39.50 clients will send the search terms for the prescribed searches. For Z-Interop participants testing Z39.50 clients, Z-Interop staff will check the incoming Z39.50 query to compare to the profile's prescribed attribute combination.

For Z-Interop participants wanting to test their Z39.50 server implementations, Z-Interop staff will issue the test searches from the client reference implementation to the Z-Interop participant's Z39.50 server. For Z-Interop participants testing Z39.50 servers, Z-Interop staff will issue the test searches and receive the results. Z-Interop staff will check the results to compare to the Z-Interop benchmarks for the specified search.

### 3.6 Analysis and Reports of Test Search Results

Upon completion of an interoperability testing session, Z-Interop staff will analyze the results and provide a written report to the Z-Interop participant. Analysis results will be provided online in a secured area of the Z-Interop website. Results will only be given to the Z-Interop participant. Individual Z-Interop participant's results will not be published publicly.

### 3.7 Purpose of Test Results

The goal of Z-Interop is to improve interoperability. Z-Interop test results do not imply any legal conformance or certification of individual products or implementations. Z-Interop participants should not claim conformance or certification to the Bath or US National Profiles based on Z-Interop test results.

## 4. Z-Interop Responsibilities

To ensure proper functioning and utility of the interoperability testbed, the Z-Interop staff and the project have specific responsibilities and obligations. The following itemize the responsibilities of the Z-Interop testbed to support interoperability testing:

- **Provide all relevant documents:** Z-Interop will make available all documents that describe methodology, policies, and procedures relating to the interoperability testbed. See the Z-Interop website for the page **Z-Interop Testbed Documents – Phase 1**.
- **Public availability of reference implementation configuration:** To the extent allowable by the Z-Interop partners who have contributed software for the reference implementations, Z-Interop will provide configuration details and specifications for the reference implementations. Significant changes to the publicly available configuration will be announced to interoperability testing participants.

- **Availability of the reference implementation server and information retrieval system:** Z-Interop will provide access to the reference implementation Z39.50 server and associated online catalog on an ongoing basis for Phase 1 testing. The reference implementation should be available 7 days a week, 24 hours a day. In the event of needing to do maintenance on the reference implementation and making it unavailable, Z-Interop will alert participants in a timely manner (i.e., in advance of taking the reference implementations offline).
- **Availability of test dataset:** Z-Interop will provide a copy of the test dataset of MARC 21 records to organizations interested in interoperability testing after they have completed the online information summary form (see Appendix A) and signed the appropriate use agreement (Appendix B).
- **Conduct interoperability testing:** As Z-Interop participants are ready for testing, Z-Interop will send the specified test searches to participants that want to test Z39.50 server implementations, and will be ready to receive test searches from Z-Interop participants that want to test Z39.50 client implementations.
- **Prepare interoperability test results:** Z-Interop staff will prepare individual reports for each Z-Interop participant after testing is completed. Z-Interop staff will analyze testing results of Z39.50 queries from Z-Interop participants testing their client implementations and will analyze testing results from Z-Interop participants testing their server implementations.
- **Assist participants' understanding of the test results:** Z-Interop will provide analysis assistance to Z-Interop participants to understand the test results and make suggestions for possible changes to improve test results.
- **Confidentiality and use of interoperability testing results:** Individual Z-Interop participant's test results analysis and reports will not be shared other than with the individual Z-Interop participant. Z-Interop will provide test results and reports for individual Z-Interop participants on a secure website with access to the individual reports limited by access control through userid and password to a specific directory associated with the participant. Because of the nature of this publicly funded project, Z-Interop reserves the right to use interoperability test results in the aggregate for public dissemination and project reports. Z-Interop participants may choose to allow Z-Interop to associate test results with their names, and will sign a release agreement for the results.

## 5. Interoperability Testbed Participants' Responsibilities

To ensure all parties participating in the interoperability testbed are treated equally and to ensure proper documentation for the Z-Interop project, Z-Interop participants are required to fulfill a number of responsibilities. The following itemize the responsibilities of the Z-Interop participants:

- **Indicate interest in being a participant:** Send an email to the principal investigator, Dr. William E. Moen <wemoen@unt.edu> stating your interest in participating in the testbed.
- **Read the Z-Interop Policies and Procedures document:** Upon receipt of email indicating participant's interest, Z-Interop will point the participant to this document and other relevant documents for review. Participants should read this policies and procedures document to understand the roles and responsibilities of the testbed and participants.
- **Supply preliminary information requested by Z-Interop:** Upon receipt of email indicating participant's interest, Z-Interop will supply a URL to online data collection forms. Participants must complete all parts of the data collection forms and supply the requested information. The information requested is listed in Appendix A. You will be asked to indicate on the data collection forms that you have read and agree to these policies and procedures.

### 5.a. Z-Interop Participants Testing Z39.50 Client

Z-Interop participants who want to test a Z39.50 client implementation against the Z-Interop server reference implementation need to do the following:

- **Configure Z39.50 client to send the following Bath Profile and US National Profile searches:**
  - Title Search – Keyword
  - Subject Search – Keyword
  - Author Search – Keyword
  - Any Search – Keyword
- **Contact Z-Interop when ready to send searches:** After configuration is completed, contact Z-Interop to indicate Z-Interop participant's readiness to send searches. At that point, Z-Interop staff will provide the specific test searches.
- **Send the test searches:** Z-Interop participants will send the test searches in the order prescribed by Z-Interop instructions.
- **Indicate to Z-Interop the results of the test searches:** Z-Interop participants should indicate to Z-Interop the results received from the reference implementation, the number of records retrieved, and the adequacy of the Z-Interop participant's Z39.50 client application to display MARC 21 records.

## 5.b. Z-Interop Participants Testing Z39.50 Server

Z-Interop participants who want to test a Z39.50 server implementation need to do the following:

- **Sign agreement for appropriate use of OCLC WorldCat MARC 21 test records:** Z-Interop has obligations to OCLC to ensure the appropriate use of the test dataset of MARC 21 records contributed by OCLC. Z-Interop participants must sign an appropriate use agreement that describes how they may use these MARC 21 records. Appendix B includes the agreement. A signed copy must be sent to the Principal Investigator (fax or mail). A copy of the agreement is available on the Z-Interop website to print out.
- **Load the MARC 21 test dataset:** When Z-Interop has received the signed agreement, the Z-Interop participant will be sent a file of the test dataset (approximately 400,000 MARC 21 records). Z-Interop participants will load these records on their systems and name the Z39.50 database **zinterop**.
- **Configure Z39.50 server to support the following Bath Profile and US National Profile searches:**
  - Title Search – Keyword
  - Subject Search – Keyword
  - Author Search – Keyword
  - Any Search – Keyword
- **Prepare the database to support test searches:** Z-Interop participants can choose how to index the MARC21 to support the test searches. Z-Interop has developed guidelines for indexing MARC 21 records to support profile-defined searches (see Z-Interop document **Indexing Guidelines to Support Z39.50 Searches**). These guidelines are available on the Z-Interop website. Z-Interop participants are not obligated to use these guidelines.
- **Contact Z-Interop when ready to receive searches:** After configuration and indexing are completed, the Z-Interop participant will contact Z-Interop to indicate readiness to accept test searches. The Z-Interop participant will provide the following information:
  - **Hostname for Z39.50 Server**
  - **IP Address for Z39.50 Server**
  - **Port Number for Z39.50 Server**
  - **Database Name** Note: Z-Interop participants should name the database "**zinterop**".
- When this information is received, Z-Interop staff will issue the test searches from the Z39.50 client reference implementation.

## **6. Interoperability Test Results**

As noted in Section 4, Z-Interop will maintain the confidentiality of test results. Individual Z-Interop participant's test results will be made available on a secure website. Z-Interop may use the test results in publications and reports, but only aggregate results will be used (i.e., no individual participant's name will be associated with specific test results).

Z-Interop participants may use their individual test results in any manner. If Z-Interop participants make their test results public (e.g., in marketing a product), any inquiries to Z-Interop about the accuracy of a Z-Interop participant's claim of interoperability test results will be responded to only after Z-Interop has consulted with the individual participant.

## Appendix A

### Information To Be Supplied by Participants

All Z-Interop participants must provide the Z39.50 Interoperability Testbed Project information through the online data collection forms at: <http://www.unt.edu/zinterop/zParticipants/>. The following indicates the information Z-Interop participants will need to provide.

#### Organization Information

Organization Name  
Homepage URL  
Mailing Address  
Type of Organization (Integrated Library System Vendor, Z39.50 Developer/Vendor, Library)

#### Your Information

Your Name  
Your Job Title/Position  
Your Email  
Your Telephone Number  
Your Fax Number

#### Information About Contact Person For Testing

Name  
Email Address  
Telephone Number  
Fax Number

#### Are You Interested In Testing

Z-server  
Z-client  
Both

#### Questions Related To Knowledge Of And Support For The Bath Profile

To what extent are you familiar with the Bath Profile: an international Z39.50 specification for library applications and resource discovery (Very Familiar, Somewhat Familiar, Not Familiar).

To what extent do you think your Z39.50 server is conformant with Bath Profile, Functional Area A, Level 0, at this time? (Fully Conformation, Somewhat Conformant, Not Conformant At This Point, None of the Above)

If you answered Somewhat Conformant in, please indicate the specifications to which your Z39.50 server does not conform

If you answered Not Conformant At This Point, please describe your plans to bring your Z39.50 server into conformance.

To what extent do you think your Z39.50 client is conformant with Bath Profile, Functional Area A, Level 0, at this time? (Fully Conformation, Somewhat Conformant, Not Conformant At This Point, None of the Above)

If you answered Somewhat Conformant, please indicate the specifications to which your Z39.50 client does not conform

If you answered Not Conformant At This Point, please describe your plans to bring your Z39.50 client into conformance.

To what extent are you familiar with the draft US National Z39.50 ProfileLibrary? (Very Familiar, Somewhat Familiar, Not Familiar)

What are the two most important reasons for conforming to Z39.50 profiles such as the Bath Profile or the U.S. National Profile?

Which specifications of the Bath Profile, Functional Area A, Level 0, were or will be most difficult to achieve conformance?

Attribute combinations required for specific searches: All searches are Keyword. You may choose more than one answer.

- Author Search
- Title Search
- Subject Search
- Any Search
- Not a problem

Record Syntaxes Required

- MARC 21
- SUTRS
- XML
- Not a problem

Specific searches because of limitations in current online catalog system (e.g., search functionality or indexing constraints) All searches are Keyword. You may choose more than one answer.

- Author Search
- Title Search
- Subject Search
- Any Search
- Not a problem

Named results sets

What are the three most important benefits a Z39.50 interoperability testbed offers your organization?

If interoperability testing results point to specific changes that need to be made in your Z39.50 client, Z39.50 server, or online catalog system configuration, will your organization make the necessary changes?

If you answered No, please explain.

Do you have the capability and resources to reconfigure your Z39.50 client, Z39.50 server, or indexing policies of your online catalogue to better conform to the Bath Profile, Functional Area A, Level 0 specification? Please explain.

#### For Participants Testing Z-Clients

- Name of Z-client product
- Version of Z-client product
- Operating system
- Protocol version
- Z39.50 services supported
- Attribute sets supported
- Record syntaxes supported
- Code base of client (e.g. YAZ, ICONE, other?)
- Is your Z-client a commercial product? (Yes, No)
- Is your Z-client available for public download? (Yes, Yes for evaluation, No)

#### For Participants Testing Z-Servers

- Name of Z-server product
- Version of Z-server product
- Operating system
- Protocol version

Z39.50 services supported

Attribute sets supported

Record syntaxes supported

Code base of server (e.g. YAZ, ICONE, other?)

Is your Z-server a commercial product? (Yes, No)

Is your Z-server available for public download? (Yes, Yes for evaluation, No)

Information Retrieval or Online Catalog System Details:

    Name of system product

    Version of system product

    Underlying database management system(s)

## **Appendix B Agreement for Appropriate Use of OCLC WorldCat MARC 21 Test Dataset**

Z-Interop participants who want to test their Z39.50 server implementations will be sent the test dataset of approximately 400,000 MARC 21 records from the OCLC WorldCat database. Before Z-Interop provides the test dataset, Z-Interop participants must sign and return to the Principal Investigator the following appropriate use agreement. Go to the Z-Interop website to print a copy of this agreement, sign, and return to Dr. William E. Moen at the address specified in the agreement.

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### **Agreement for the Appropriate Use of Test Dataset by Participants in the Z39.50 Interoperability Testbed**

This agreement prescribes the appropriate use of Test Dataset by participants in the University of North Texas Z39.50 Interoperability Testbed Project (Z-Interop). The Test Dataset comprises approximately 400,000 MARC 21 records from OCLC's WordCat database. Z-Interop has signed an agreement with OCLC for the use of these records, the use of which includes providing a copy of the test dataset to organizations who participate in the Z-Interop testbed for evaluating their Z39.50 server implementations. The agreement between OCLC and the University of North Texas includes the following:

“UNT may grant access to copies of WorldCat Records, or derivative works from or compilations including such Records to libraries and educational institutions for noncommercial, research purposes as described herein. Should UNT make WorldCat Records available to for-profit entities, UNT shall enter into a third party agreement similar to the form of OCLC's third party agreement hereto as Attachment A.”

For-profit organizations wishing to participate in the Z-Interop testbed to test Z39.50 server implementations will receive a full copy of the test dataset to load on their systems upon receipt by Z-Interop of a signed copy of the following Third-Party Vendor Agreement.

## THIRD-PARTY VENDOR AGREEMENT

This agreement ("Agreement"), effective as of the date on which executed by both parties hereto, by and between the University of North Texas ("UNT") a not-for profit institution organized and existing under the laws of the State of Texas, and \_\_\_\_\_

\_\_\_\_\_ ,  
a corporation organized and existing under the laws of the State of \_\_\_\_\_, (hereafter referred to as "Vendor").

Whereas, Vendor has indicated its interest in testing its Z39.50 server implementation in the Z39.50 Interoperability Testbed Project ("Project"), and has read the Z39.50 Interoperability Testbed (Z-Interop) Policies and Procedures; and

Whereas UNT will make available to Vendor a copy of the Z-Interop Test Dataset of bibliographic records derived from the online database of such information maintained and owned by OCLC Online Computer Library Center, Incorporated (hereinafter "OCLC-Derived Records"); and

Whereas for UNT to make OCLC-Derived Records available to Vendor, it is necessary that Vendor provide assurances concerning its use of such records.

Now, therefore, in consideration of the premises and other valuable consideration, UNT and Vendor agree as follows:

1. During the term of this agreement, all present and future contracts between UNT and Vendor will be deemed amended to include the terms of this agreement as to all OCLC-Derived Records furnished hereunder.
2. Vendor will make no copies and no use of the OCLC-Derived Records except as necessary to prepare its systems for interoperability testing through the Z-Interop testbed.
3. Vendor acknowledges that delivery of the OCLC-Derived Records to Vendor does not represent a transfer of ownership or license of said records or any copies thereof, other than provided herein.
4. Vendor agrees that it will not transfer or otherwise make available OCLC-Derived Records or copies thereof or derivative works made therefrom to any third party, and will promptly return to UNT at the termination of this agreement all OCLC-Derived Records received in connection with the Project.
5. This Agreement is terminable by either party hereto at any time, with or without cause, by thirty (30) days prior written notices sent by prepaid registered or certified first-class mail, with return receipt requested, to:

Dr. William E. Moen  
The Z39.50 Interoperability Testbed Principal Investigator  
School of Library and Information Sciences  
ISB, Room 205  
205 Chestnut Street  
P.O. Box 311068  
Denton, Texas 76203-1068

and to OCLC Online Computer Library Center, Incorporated  
6565 Frantz Road  
Dublin, OH 43017  
Attention: General Counsel

Such addresses may be changed by UNT and by OCLC by written notice to Vendor sent by prepaid registered or certified first-class mail, with return receipt requested, to:

\_\_\_\_\_ (Vendor)

\_\_\_\_\_

\_\_\_\_\_

Attention: \_\_\_\_\_

All notices given in accordance with this Section 4 shall be deemed given on the date of proper deposit in the U.S. mail.

- 6. OCLC Online Computer Library Center, Incorporated is intended to be a third party beneficiary of this Agreement.
- 7. Vendor's obligations under this Agreement, as they affect any Contract which has become effective prior to the termination hereof, shall survive any such termination.
- 8. This Agreement is the final, complete and exclusive statement of agreement between UNT and Vendor with respect to the Project, and may not be terminated (other than provided in Section 4 above), amended or canceled except by a writing signed by both parties hereto and, as a condition precedent to the effectiveness thereof, with a copy thereof furnished by UNT to OCLC by the same means and at the same address as provided in Section 4 above. No waiver of any provisions of this Agreement or of any right hereunder shall be deemed a further waiver of such provision or right, or a waiver of any other provision or right hereunder.

In WITNESS WHEREOF, the parties have executed this Agreement as of the dates indicated below.

University of North Texas

Date: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

\_\_\_\_\_ (Vendor)

Date: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_