*State Library of Iowa*

*Z39.50 Symposium*

# Z39.50 Technical Issues

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# Z39.50
# Brief Historical Overview

## (early)

## 1984: NISO Z39.50 ballot failed

## *1984: ISO SR introduced*

## 1987-8: Z39.50 re-balloted
## ANSI Z39.50-1988

## *1991: ISO SR Approved*

# Z39.50
# Brief Historical Overview
## (more recently)

**1990: ZIG**

**1990: Maintenance Agency**

**1992: ANSI Z39.50-1992**

***1992-4: SR amended***

**1995: ANSI Z39.50-1995**

**1996?: ISO 23950**

# SR (1991)

**Init**

**Search**

**Present**

**Delete**

# Z39.50-1992

**Init**

**Search**

**Present**

**Delete**

**Access Control**

**Resource Control**

**(Proximity)**

| Z39.50-1995 | Z39.50-1992 |
| --- | --- |
| Init | Init |
| Search | Search |
| Present | Present |
| **Segment** | |
| Delete | Delete |
| Access Control | Access Control |
| ResourceControl | Resource Control |
| **Sort** | |
| **Scan** | |
| **Explain** | |
| **Extended Services** | |
| **Close** | |

# Additional Miscellaneous Features of 1995

- **Attribute Set Enhancements**
- **Extensive Retrieval Tools**
  - **schemas**
  - **dynamic element specification**
  - **variant specifications**
- **Extensibility mechanisms**
- Multiple Present Ranges
- Concurrent Operations

# Z39.50
# Versions

| Published version | Protocol version |
|---|---|
| ANSI/NISO Z39.50-1988 | |
| ANSI/NISO Z39.50-1992 | 2 |
| ANSI/NISO Z39.50-1995 | 2 + 3 |
| ISO SR (1991) | 1 |
| ISO SR + amendments | 1 + 2 |
| ISO 23950 | 2 + 3 |

# Z39.50 Operations

**Origin** **Target**

## Initialization Operation

**Init request . . . . . >**
**< . . . . . Init response**

## Search Operation

**Search request . . . . . >**
**< . . . . . Search response**

## Present Operation

**Present request . . . . . >**
**< . . . . . Present response**

# Z39.50
# Operation Types

**Initialize**

**Search**

**Present**

**Scan**

**Sort**

***(and others)***

# Scan Example

**Scan request . . . . . >**

**"Scan the title index for the Music database; begin scan with ' mozart chamber music', as the fifth term; return ten terms "**

**< . . . . . Scan response**

**mozart & beethoven**
**mozart & prague**
**mozart & salieri**
**mozart & the archbooby**
**---> mozart chamber music**
**mozart im hurenhaus**
**mozart in new york**
**mozart speaks**
**(-->) mozart symphonies**
**mozart und hayden in London**

# Search

# Search request . . . . . >

**"Search the music database for records with 'mozart symphonies' in the title."**

# < . . . . . Search response

**"27 records found."**

# Present

## Present request . . . . . >

"Present the first three records; in MARC format, Brief records."

## < . . . . . Present response

1. Mozart, Wolfgang Amadeus, 1756-1791. Symphonies.
Saint-foix, Georges de, 1874-1954
**The Symphonies of Mozart, 1968**
LC Call Number ML410.M9S172 1968 68-55994

2. Mozart, Wolfgang Amadeus, 1756-1791. Symphonies.
Dickinson, A.E.F. (Alan Edgar Frederick)
**A study of Mozart's last three symphonies / 1978**
LC Call Number MT138.M8D4 73-181142

3. Mozart, Wolfgang Amadeus, 1756-1791. Symphonies.
Dearling, Robert, 1933-
**The Music of Wolfgang Amadeus Mozart, the Symphonies / 1982**
LC Call Number MT130.M8D33 1982 78-68625

# Present

**Present request . . . . . >**

**"Present the second record; in MARC format, Full record."**

**< . . . . . Present response**

| | | |
|---|---|---|
| | 001 | 73-181142 MN r952 |
| | 050 | MT130.M8D4 |
| | 082 | 785.1/1/0924 |
| | 100 | Dickinson, A.E.F. (Alan Edgar Frederick) |
| | 245 | A study of Mozart's last three Symphonies / by A.E.F. Dickinson. |
| | 260 | St. Clair Shores, Mich.: Scholarly Press, 1978. |
| | 300 | 58 p. : music ; 22 cm. |
| | 440 | The Music Pilgrim |
| | 500 | Reprint of the 1927 ed. published by Oxford University Press, london. |
| ---> | 600 | Mozart, Wolfgang Amadeus, 1765-1791. Symphonies. |
| | 040 | ..... |

# Scan Again

## Scan request . . . . . >

**"Scan Subjects (personal name); begin scan with 'Mozart, Wolfgang Amadeus, 1765-1791. Symphonies' as the fifth term; return ten terms"**

## < . . . . . Scan response

**Mozart, Wolfgang Amadeus, 1756-1791. Quintets**
**Mozart, Wolfgang Amadeus, 1756-1791. Requiem**
**Mozart, Wolfgang Amadeus, 1756-1791. Serenade**
**Mozart, Wolfgang Amadeus, 1756-1791. Sonatas**
**----> Mozart, Wolfgang Amadeus, 1756-1791. Symphonies**
**Mozart, Wolfgang Amadeus, 1756-1791. Variations**
**Mozart, Wolfgang Amadeus, 1756-1791. Vocal Music**
**Mozart, Wolfgang Amadeus, 1756-1791. Works --**
**Mozart, Wolfgang Amadeus, 1756-1791. Works, chamber**
**Mozart, Wolfgang Amadeus, 1756-1791. Zaide**

# eight Z39.50 Operation Types

# Init

**Search**

**Present**

**Scan**

# Sort

# Delete

# Resource-report

# Extended-services

# The Essense of a Search

## Search request . . . . . >

**Database(s) to search**

**name to give to new result set**

## Query

## < . . . . . Search response

**How may records were identified by the query**

# Z39.50 Query Types

*private:*

**Type-0 query**

## *required for conformance:*

# Type-1 query

*Also included:*

**Type-2 query**

**Type-100 query**

**Type-101 query**

*Plus some Under development*:

**Type-102 query**

***Ranked List Query***

**Type-103 query**

***SQL***

## Type-1: "Reverse Polish Notation" (RPN) query.

# examples:

# 1. Query : A

***Records in database for which A is true***

# 2. Query : A B C AND OR

***Records in database for which both B and C are true, or A is true***

# 3. Query : A B AND C OR

***Records in database for which both A and B are true, or C is true***

# 4. Query : (Result set R) AND A

***Records in result set R for which A is true***

# Bib-1 Attributes

| | | | |
|---|---|---|---|
| **Use** | **1** | **Structure** | **4** |
| **Relation** | **2** | **Truncation** | **5** |
| **Position** | **3** | **Completeness** | **6** |

| **Use** | **Value** | **Use** | **Value** |
|---|---|---|---|
| **Personal name** | **1** | **Name and title** | **57** |
| **Corporate name** | **2** | **Name geographic** | **58** |
| **Conference name** | **3** | **Place publication** | **59** |
| **Title** | **4** | **Abstract** | **62** |
| **Title series** | **5** | **Note** | **63** |
| **Title uniform** | **6** | **Name** | **1002** |
| **ISBN** | **7** | **Author** | **1003** |
| **Subject heading** | **21** | **Editor** | **1020** |
| **Date of publication** | **31** | **Music-key** | **1025** |

| **Relation** | **Value** | **Relation** | **Value** |
|---|---|---|---|
| **less than** | **1** | **greater than** | **5** |
| **equal** | **3** | **not equal** | **6** |

| **Structure** | **Value** | **Structure** | **Value** |
|---|---|---|---|
| **phrase** | **1** | **date** | **5** |
| **year** | **4** | **string** | **108** |

# Bib-1 Use Attributes

| | | | |
|---|---|---|---|
| Personal name | 1 | PA subject | 26 |
| Corporate name | 2 | LC subject heading | 27 |
| Conference name | 3 | RVM subject heading | 28 |
| Title | 4 | Local subject index | 29 |
| Title series | 5 | Date | 30 |
| Title uniform | 6 | Date of publication | 31 |
| ISBN | 7 | Date of acquisition | 32 |
| ISSN | 8 | Title key | 33 |
| LC card number | 9 | Title collective | 34 |
| BNB card no. | 10 | Title parallel | 35 |
| BGF number | 11 | Title cover | 36 |
| Local number | 12 | Title added title page | 37 |
| Dewey classification | 13 | Title caption | 38 |
| UDC classification | 14 | Title running | 39 |
| Bliss classification | 15 | Title spine | 40 |
| LC call number | 16 | Title other variant | 41 |
| NLM call number | 17 | Title former | 42 |
| NAL call number | 18 | Title abbreviated | 43 |
| MOS call number | 19 | Title expanded | 44 |
| Local classification | 20 | Subject precis | 45 |
| Subject heading | 21 | Subject rswk | 46 |
| Subject Rameau | 22 | Subject subdivision | 47 |
| BDI index subject | 23 | No. nat'l biblio. | 48 |
| INSPEC subject | 24 | No. legal deposit | 49 |
| MESH subject | 25 | No. govt pub. | 50 |

| | |
|---|---|
| **No. music publisher** | **51** |
| **Number db** | **52** |
| **Number local call** | **53** |
| **Code-- language** | **54** |
| **Code-- geogr. area** | **55** |
| **Code--institution** | **56** |
| **Name and title** | **57** |
| **Name geographic** | **58** |
| **Place publication** | **59** |
| **CODEN** | **60** |
| **Microform gen.** | **61** |
| **Abstract** | **62** |
| **Note** | **63** |
| **Author-title** | **1000** |
| **Record type** | **1001** |
| **Name** | **1002** |
| **Author** | **1003** |
| **Author-name -- personal** | **1004** |
| **Author-name -- corporate** | **1005** |
| **Author-name -- conference** | **1006** |
| **Identifier** | **1007** |
| **Subject -- LC children's** | **1008** |
| **Subject name -- personal** | **1009** |
| **Body of text** | **1010** |
| **Date/time added** | **1011** |
| **Date/time modified** | **1012** |
| **Authority/ format id** | **1013** |
| **Any** | **1016** |
| **Server-choice** | **1017** |
| **Publisher** | **1018** |
| **Record-source** | **1019** |
| **Editor** | **1020** |
| **Bib-level** | **1021** |
| **Geographic-class** | **1022** |
| **Indexed-by** | **1023** |
| **Map-scale** | **1024** |
| **Music-key** | **1025** |
| **Related-periodical** | **1026** |
| **Report-number** | **1027** |
| **Stock-number** | **1028** |
| **Thematic-number** | **1030** |
| **Material-type** | **1031** |
| **Doc-id** | **1032** |
| **Host-item** | **1033** |
| **Content-type** | **1034** |
| **Anywhere** | **1035** |
| **Author-Title-Subject** | **1036** |

# Back to the Present

# Present request . . . . . >

**Result set**

**range**

# syntax

# composition

**Example: Retrieve records 1-10 from result set R; retrieve 'brief' records, in USMARC format**

# Syntax

## Object Identifier 1.2.840.10003.5.x

## Marc Record Formats:

| | |
|---|---|
| Unimarc | 1 |
| Intermarc | 2 |
| CCF | 3 |
| USmarc | 10 |
| UKmarc | 11 |
| Normarc | 12 |
| Librismarc | 13 |
| Danmarc | 14 |
| Finmarc | 15 |
| MAB | 16 |
| Canmarc | 17 |
| SBN | 18 |
| Picamarc | 19 |
| Ausmarc | 20 |
| Ibermarc | 21 |

# OPAC Record Syntax

# 102

**MARC record**

**+**

**1 or more holdings**

**and/or**

**holdings + circ records**

# Record Syntaxes

## Content Specific

- **Marc** **1-23**
- **OPAC** **102**

## Facility Specific

- **Explain** **100**
- **Extended Services** **106**

## Generic

- **SUTRS *(unstructured)*** **101**
- **GRS-1 *(structured)*** **105**

## And Now:

- **HTML** **108**

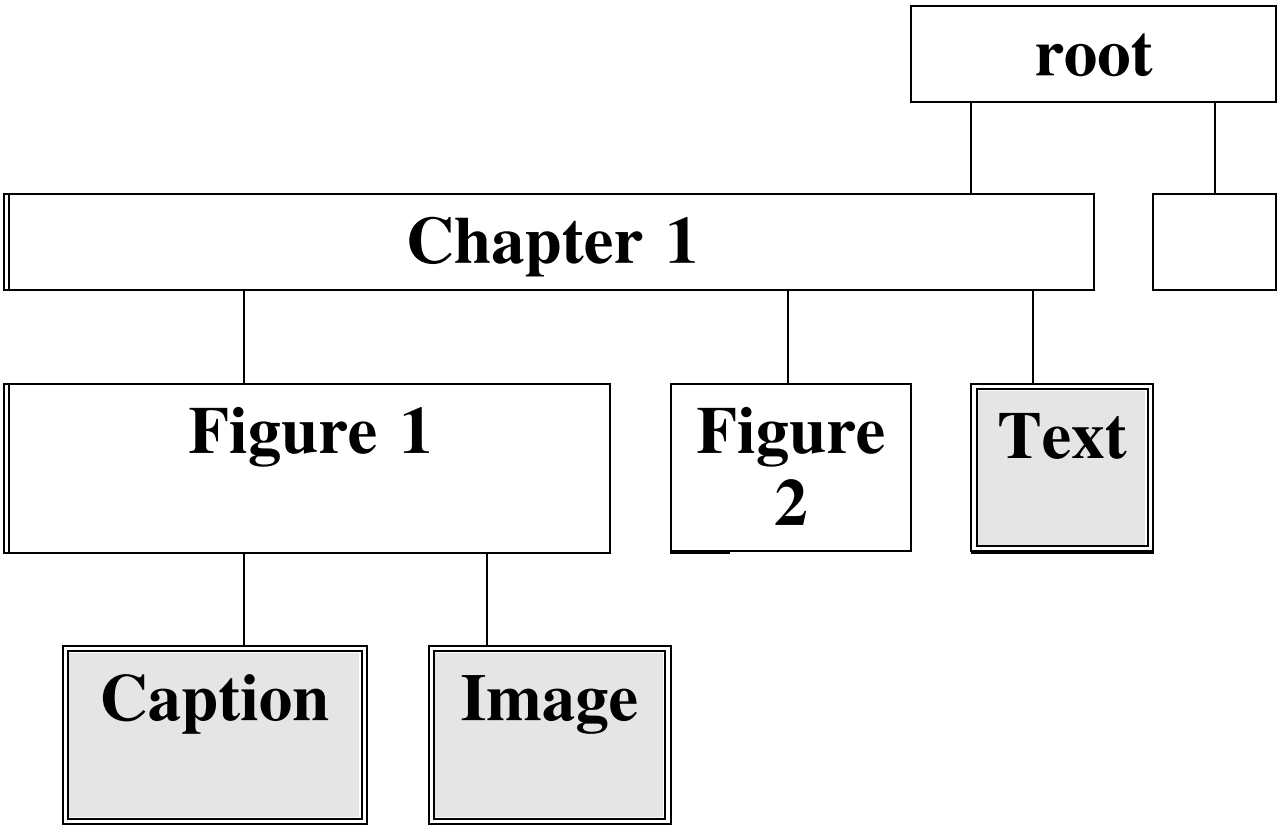
# Syntax and Element Sets

| MARC | OPAC |
|---|---|
| Bibliographic | Circulation |
| | Holdings |
| | Bibliographic |

# Element Sets

| MARC | OPAC |
|---|---|
| Full | Full |
| Brief | Circ |
| Brief-1 | holdings |
| | circ+holdings |
| | bib+circ |

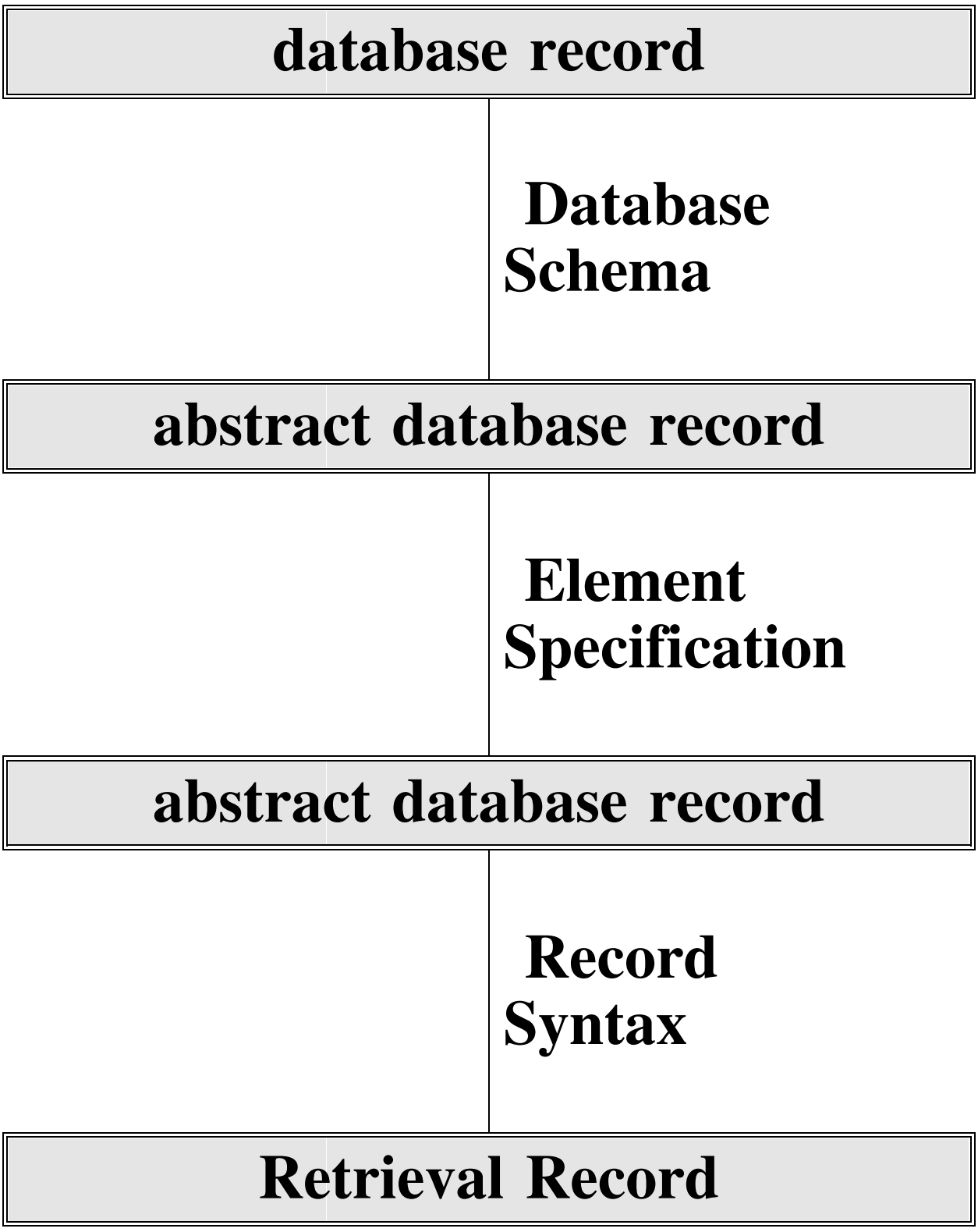
# Version 3 Dynamic Element Specification




**Chapter 1, figure 1, caption: ascii**

**Chapter 1, figure 1, image: tiff**

**Chapter 1, text: postScript**


database record
Database Schema
abstract database record
Element Specification
abstract database record
Record Syntax
Retrieval Record

# Access and Resource Control

**Origin** **Target**

**Search request . . . . . >**

**< . . . . . *Access Control Request***

***Access Control response* . . . . . >**

**< . . . . . Search response**

**Origin** **Target**

**Search request . . . . . >**

**< . . . . . *Resource Control Request***

***Resource Control response* . . . . >**

**< . . . . . Search response**

**Origin** **Target**

**Search request . . . . . >**

**< . . . . . Resource Control Request**

***"Search will probably:***

- ***take at least an hour, or***
- ***cost at least $100, or***
- ***result in more than 10,000 records***

***Want to continue?"***

**Resource Control response . . . >**

***"Sure"***

**< . . . . . Search response**

# Trigger-resource Control

**Origin** **Target**

Search request . . . . . >

**Trigger-resource-control-request . . . . . >**

**< . . . . . Resource Control Request**

**Resource Control response . . . . . >**

< . . . . . Search response

| Facility | Service(s) | Operation |
|---|---|---|
| Initialization | Init | Init |
| Search | Search | Search |
| Retrieval | Present<br>Segment | Present |
| Delete | Delete | Delete |
| Sort | Sort | Sort |
| Browse | Scan | Scan |
| Access Control | Access Control | |
| Resource control | Resource Control<br>Trigger-Resource control<br>Resource report | Resource Report |
| Extended Services | Extended Services | Extended Services |
| Explain | | |
| Termination | Close | |

# Z39.50 Explain Facility

- **Uses Z39.50 Search and Present facilities**
- **Explain database**
- **exp-1 attribute set**
- **explain-1 record syntax**

**Example:**

***Search the Explain database for records where 'explainCategory' = 'databaseInfo'***

# Record Syntaxes

**Content Specific**

- **Marc** **1-23**
- **OPAC** **102**

# Facility Specific

- **Explain** **100**
- **Extended Services** **106**

**Generic**

- **SUTRS** ***(unstructured)*** **101**
- **GRS-1** ***(structured)*** **105**

**And Now:**

- **HTML** **108**

# Explain **Target-Info** Record

- **Server name**
- **Description**
- **Recent news**
- **"Welcome" message**
- **Icon**
- **Maximum size of a result set**
- **Timeout interval**
- **Contact information**
- **Restrictions**
- **Hours of operation**
- ***(and more)***

# Explain **Database-Info** Record

- **Database name**
- **Icon**
- **Description**
- **News**
- **Disclaimers**
- **Currently available for access?**
- **How many records**
- **Biggest record**
- **Hours of operation**
- **Best time to access**
- **Update interval**
- **Restrictions**
- **Cost information**
- **Attribute sets supported**
- **Record syntaxes supported**

- ***(and more)***

# Extended Services Facility

- **the Extended-services *service***
- **The extended *services***
- **The ES *database***

# The Extended Services *Service*

**Origin** **Target**

**Init request . . . . . >**
**< . . . . . Init response**

**Search request . . . . . >**
**< . . . . . Search response**

***Extended Service request . . . . . >***
***< . . . . . Extended Services response***

# Extended services

- **Save a result set**
- **Export**
- **Periodic Query**
- **Order an item**
- **Update a database**

# Maintenance Agency Web Page

## http://lcweb.loc.gov/z3950/agency

- **Z39.50-1995 Text**
- **Register of Implementors**
- **Objects and Definitions**
- **Implementor agreements**
- **ZIG Information**
- **Profiles**

***(and more)***

# Profiles

- **WAIS**
- **GILS**
- **ATS (Author-title-subject)**

# In Development

- **Collections**
- **CIMI (Musuems)**
- **Digital library**
- **CIP**
- **ZSTARTS**
- **Item Order/ILL**
- **Union Catalog**
- **Geo-spatial**

# Two proposed profiles for use of Z39.50 Extended Services

- **Z39.50 Cataloguing Profile**

  World 1 (joint project of National Libraries of Australia and New Zealand) will include a centralised national bibliographic database.

  Profiles Z39.50 for catalogue update transactions, using Z39.50 **Update Extended Service**.

- **Profile for the Use of Z39.50 Item Order Extended Service for Interlibrary Loan**

# *"Z39.50 Profile for Simple Distributed Search and Ranked Retrieval"*

# ZDSR

(formerly ZSTARTS  formerly Zlite)

## Features:

- **Documents.**
- **Document descriptors (metadata).**
- **Search by author, title, language, within body of text, url, date-last-modified.**
- **Relevance feedback.**
- **stem, phonetic, proximity searching.**
- **Result ranking.**

# ZDSR Document Metadata

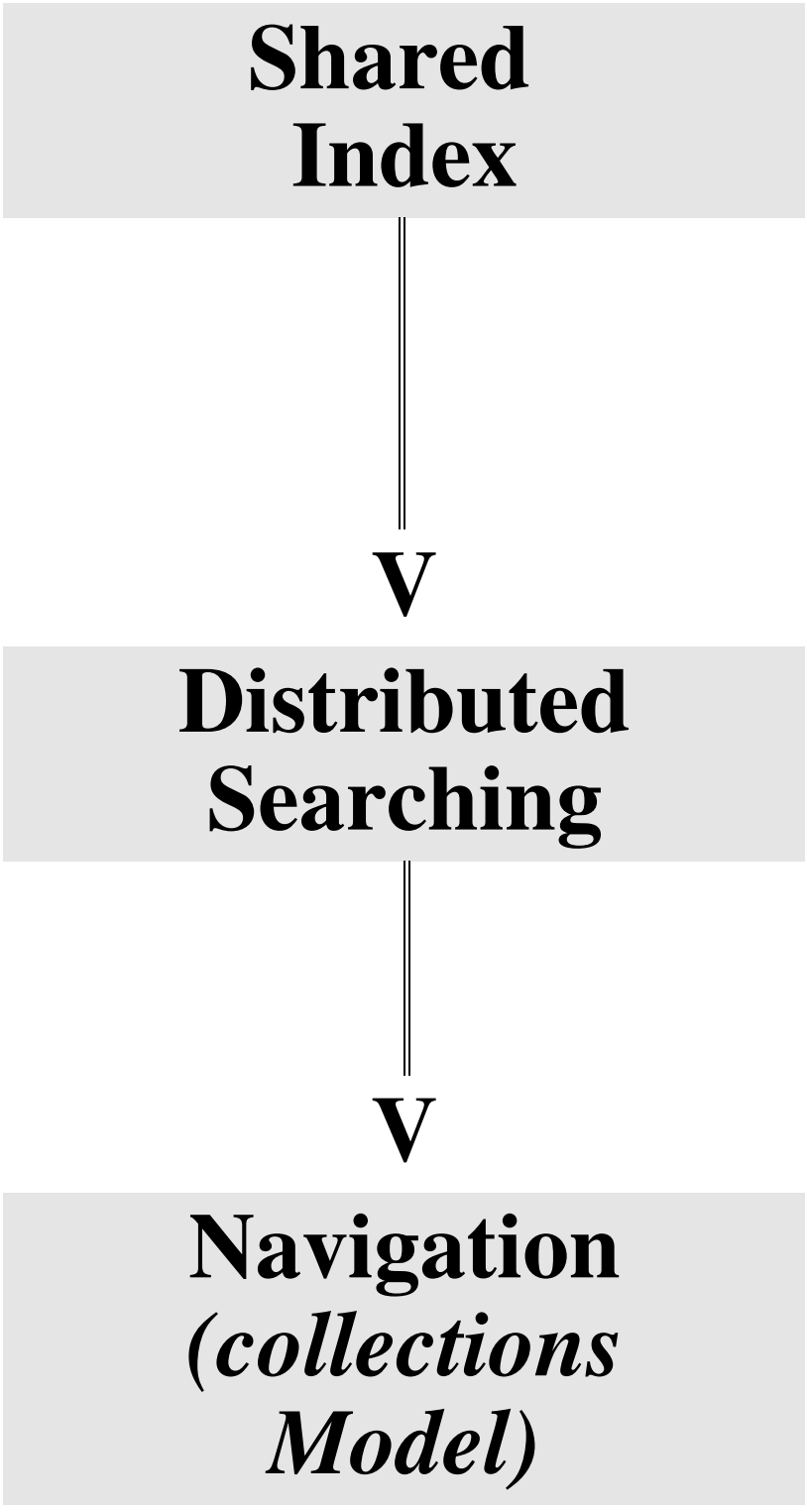
- **title**
- **abstract**
- **publication date**
- **creation date**
- **date last modified**
- **size**
- **score**
- **frequency and weight per term**
- **url**

# Z39.50 Metadata

- **Search access points**
- **Retrieval elements**
- **Transient metadata**
  ***(e.g. score)***
- **Variant information**
  ***(e.g. size, format)***
- **User dependent**
  ***(e.g. terms/conditions)***
- **Server/database level metadata**
- **Collection level metadata**

# Dublin Core
## Meta Data Elements

- **Title**
- **Subject**
- **Author**
- **Publisher**
- **Other Agent *(editor, ....)***
- **Date *(in present form)***
- **Object Type**
- **Genre *(home page, novel, ...)***
- **Form**
- **Identifier *(url ...)***
- **Source *(from which derived)***
- **Language**
- **Relationship *(to other objects)***
- **Coverage *(spatial/temporal)***


Shared
Index
V
Distributed
Searching
V
Navigation
(collections
Model)

# A **Collection** is a:

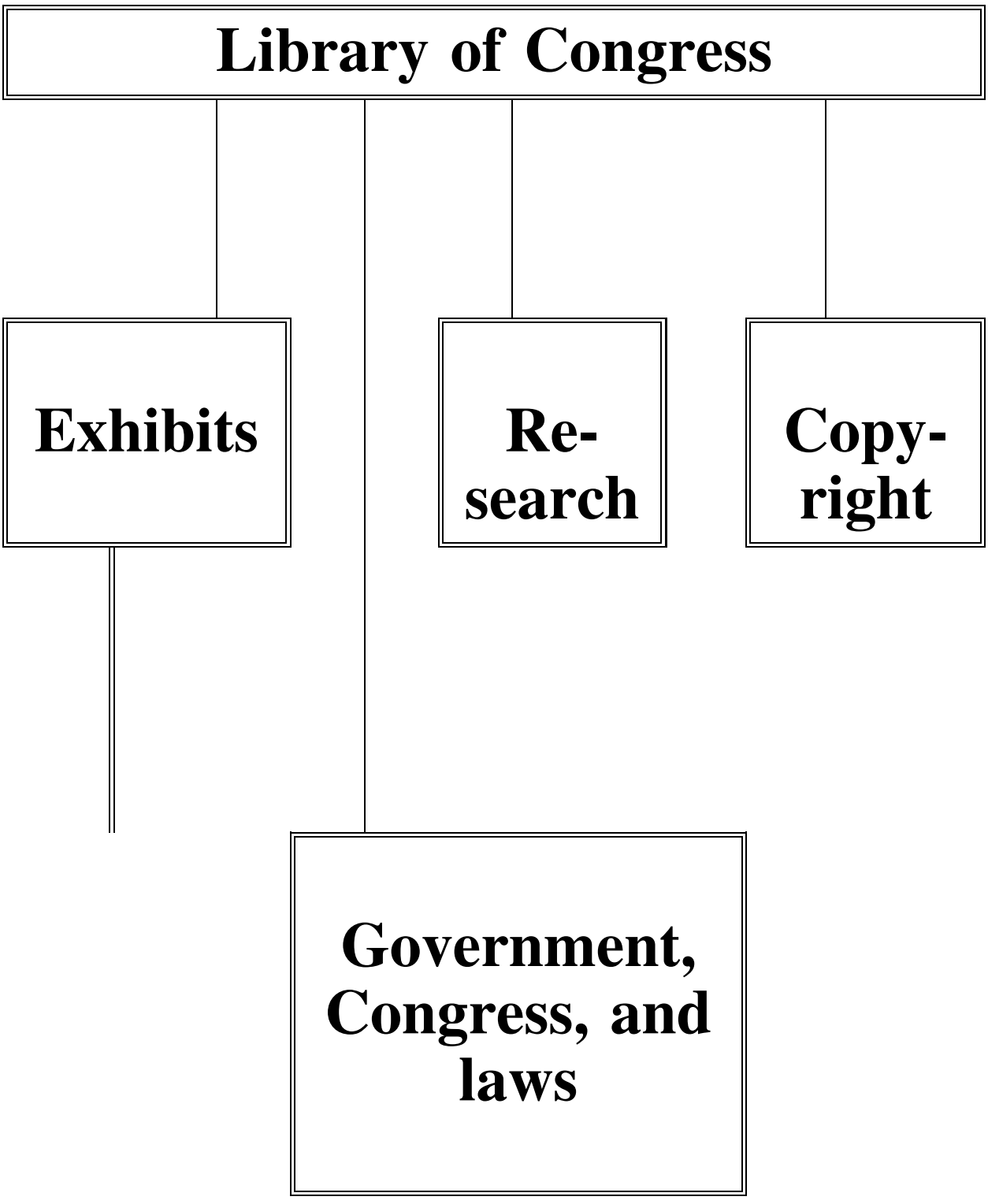
## *group of related objects and collections*.

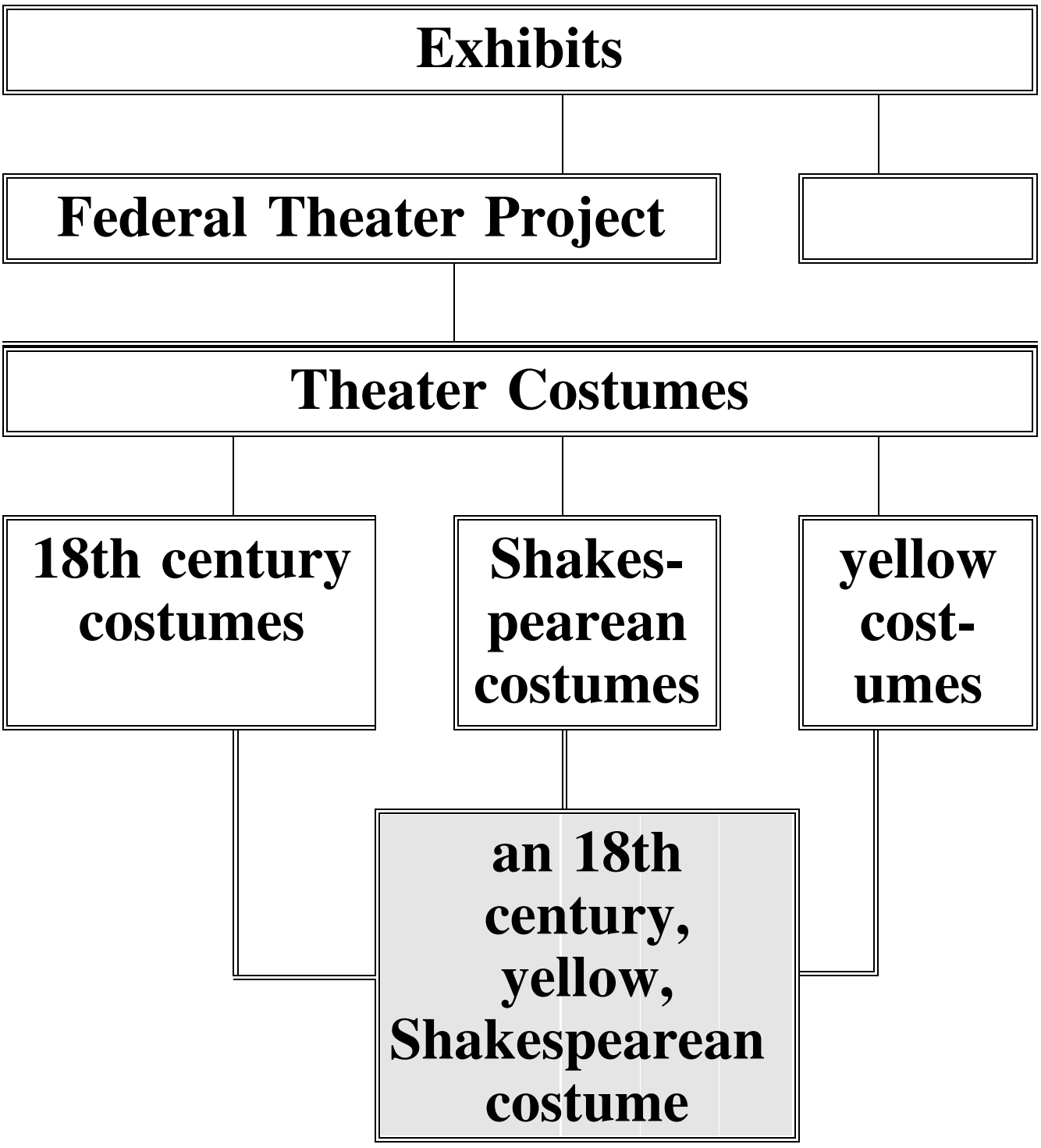
- **Organized thematically (e.g. by subject, creator, historical period),**
- **with diverse objects;**
- **with associated description(s);**
- **hierarchical;**
- **distributed.**

# Navigation

**Support for navigation generally Requires:**

- **Semantic interoperability**
  - **search semantics**
  - **meta-structures**
- **Intellectual resources**
  - **aggregation**
  - **organization**
  - **description**
- **Cataloging Resources**


Library of Congress
Exhibits
Re-
search
Copy-
right
Government,
Congress, and
laws


Exhibits
Federal Theater Project
Theater Costumes
18th century costumes
Shakes-pearean costumes
yellow cost-umes
an 18th century, yellow, Shakespearean costume

# *Collection*
# Descriptive Record

**Brief text Description**

**Associated Description**

**Related Collections**

**Enumerated Members**

**An object or a collection may have one or more Associated Descriptions:**

- **Finding Aid**
- **EAD**
- **Cataloging Record**
- **Exhibition catalog**
- **GILS Record**
- **Web Page**

# *Collection*
# Descriptive Record

## Brief text Description

## Associated Descriptions

- brief description
- type
- size
- format
- pointer

## Related Collections

## Enumerated Members

# Related Collections: Relationships

- **Parent (or Superior)**
- **Child (or Subordinate)**
- **Sibling**
- **"might be of interest"**

# *Collection*
# Descriptive Record

## Brief text Description

## Associated Descriptions

## Related Collections

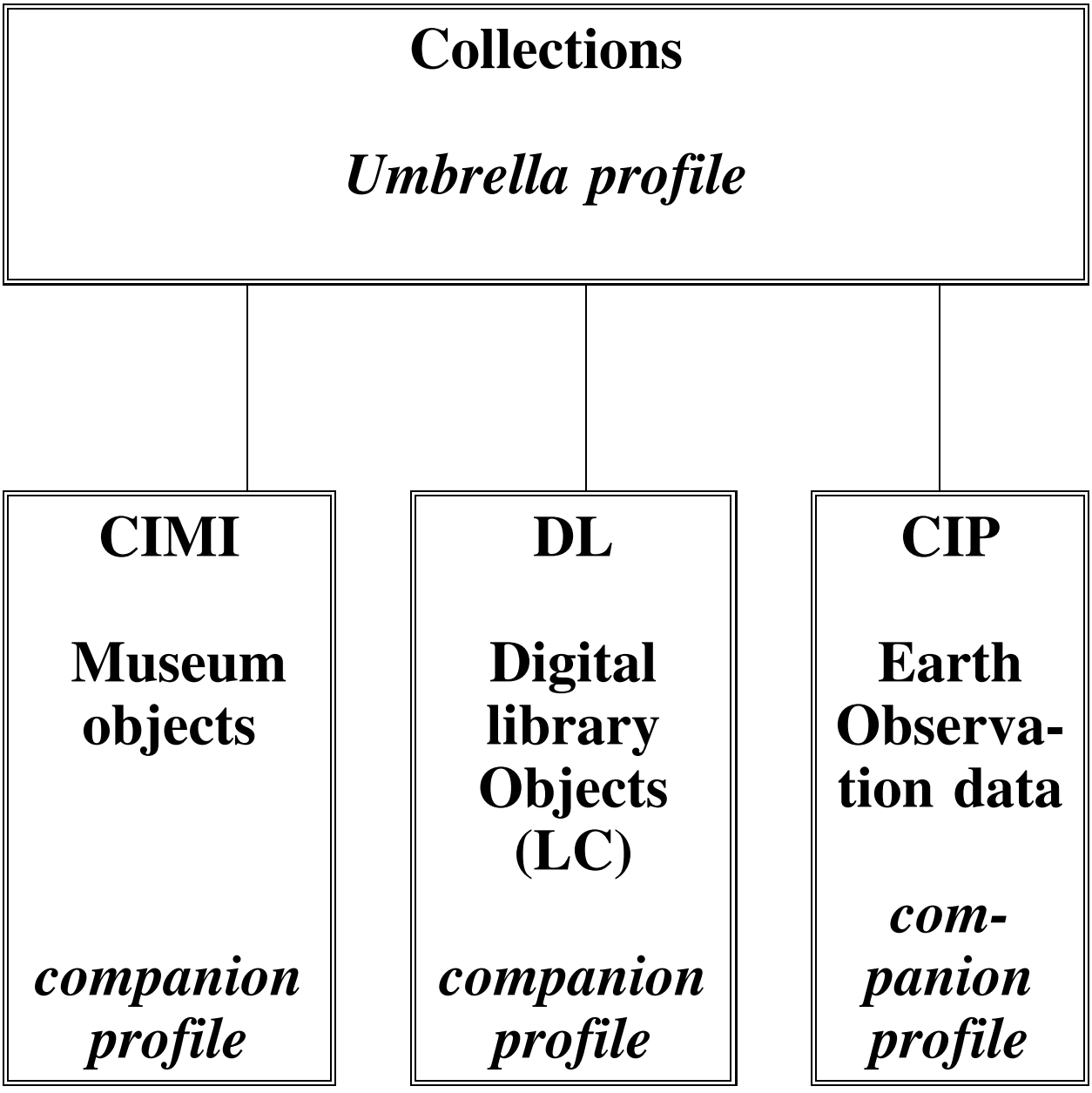
- relationship
- pointer to collection descriptive record

## Enumerated Members

# Enumerated Members

| First Object |
| --- |
| ***Brief description*** |
| ***pointer*** |

| Second Object |
| --- |
| ***Brief description*** |
| ***pointer*** |

| Third Object |
| --- |
| ***Brief description*** |
| ***pointer*** |

# Collections Suite of Z39.50 Profiles