Archaeology Data Service

Z39.50 Target Specification

System Requirements

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Requirements

This document is concerned with the functional requirements for target software and in part replaces section 3 of ArchSearch: Operational Requirements for ADS On-line Systems (available at http://ads.ahds.ac.uk/project/gateway_spec.html). A full implementation of the functionality described in the Target Specification is

necessary in order to ensure interoperability. Contractual agreements between target organisations and specific vendors should reference this specification. It is strongly recommended that any such agreement also references the relevant sections of ArchSearch: Operational Requirements for ADS On-line Systems in relation to procurement, performance and service requirements.

Targets will conform to the functional areas of the Bath profile (currently Release 1.1 - http://www.ukoln.ac.uk/interop-focus/bath/current/) and CIMI profile (Release 1.0H - http://www.cimi.org/documents/HarmonizedProfile/HarmonProfile1.htm) as detailed below.

Targets supplied in response to this Specification will respond correctly to queries submitted according to the specified areas of both the Bath Profile and the CIMI Profile. Target responses will not conflate the two Profiles, normally being expected to return either a Bath Profile or a CIMI Profile response, dependent upon the Profile specified in the originating Client request.

Bath Profile

A minimum requirement will be full compliance with Functional Area C for cross-domain search and retrieval at level 1. The possibility to upgrade to level 2 when this is defined is recommended.

Library-based targets should also consider conforming to Functional Area A at level 1 for basic bibliographic search, retrieval and scan. This will assist interoperability with other library-based Z servers.

The Bath profile will be used to define core functionality and the structure for cross-domain searching for the Dublin Core (DC) element set.

CIMI profile

Targets complying to this specification will support searches based upon the CIMI Core at conformance level 1 of the harmonised profile. Additionally, searches will be supported against the following six access points, defined as non-mandatory in the CIMI Profile. Targets will therefore need to support functions of the CIMI-1 Attribute Set; specifically Use Attributes 2046, 2047, 2048, 2049, 3003, 3004, 3005 (see below), and 2051-2065.

i. **Who** (use attribute 2046) = DC_Creator , DC_OtherContributer and DC_Publisher, i.e. organisations or individuals connected with a resource including creators, authors, publishers, archival bodies, distributors, etc. CIMI description: *'A search using this attribute supports a general inquiry about people, groups of people and institutions. These may have created, owned, stored, been depicted in or had any number of other relationships*

with the work(s) in question. It can also be data that infers a person, culture or institution, for instance stylePeriod. The data can refer to imaginary beings'.

Attribute type	Values	Attribute name
Use	2046	who
Relation	3	equal
Position	3	any position in field
Structure	2	word
Truncation	1	right truncation
Completeness	1	incomplete subfield

ii. **What** (use attribute 2047) = DC_Subject; i.e. subject terms used to categorise a resource or object, for example, stone, silver, coin, sword, excavation, survey, text, image, etc. CIMI description: *'A search using this attribute supports a general inquiry about the work itself. Data that discuss or describe the object, such as its content, place in history or physical nature, is appropriate material for this query'*.

Attribute type	Value	Attribute name
Use	2047	what
Relation	3	equal
Position	3	any position in field
Structure	2	word
Truncation	1	right truncation
Completeness	1	incomplete subfield

iii. **When** (use attribute 2048) = sub elements of DC_Coverage such as archaeological period or year, for example, Roman, Iron Age, 1066, 1949, etc. CIMI description: *'A search using this attribute supports a general inquiry about time. Any data that place the work in a time period (such as year, era, season, hour or geologic period) is appropriate for this query'*. Use of this attribute will be restricted in use to period terms for the time being.

Attribute type	Value	Attribute name
Use	2048	when

Relation	3	equal
Position	3	any position in field
Structure	2	word
Truncation	1	right truncation
Completeness	1	incomplete subfield

iv. **Where** (use attribute 2049) = sub elements of DC_Coverage such as site or place name, parish, unitary authority or district and county, for example, Canterbury, York, Kent, Covent Garden, etc. CIMI description: *'A search using this attribute supports a general inquiry about location. This can include place names associated with the work, part of its provenance, or places depicted in it. Locations can be either named or generic, real or imaginary. They can be very specific, as location information might be, or very general'*.

Attribute type	Value	Attribute name
Use	2049	where
Relation	3	equal
Position	3	any position in field
Structure	2	word
Truncation	1	right truncation
Completeness	1	incomplete subfield

v. **Area** involves three CIMI use attributes; spatialReferencingSystem, x-coordinateInReferencingSystem and y- coordinateInReferencingSystem which are repeatable attributes. Used repeatedly these attributes can be used to define a geographic search area such as a rectangle when used in conjunction with the relation attributes >= and <=. Traditionally a rectangular geographic area is defined by its southwest or bottom left and northeast or top right corners. If these equate to coordinates x1, y1 and x2, y2 a simple algorithm for selection will be

>= x1
<= x2
>= y1
<= y2

The use attributes are

SpatialReferencingSystem (use attribute 3003) = sub element of

DC_Coverage which indicates the spatial referencing system in which coordinate data is expressed, for example, the Ordnance Survey (OS) (http://www.ordsvy.gov.uk/products/natgrid/) and Ordnance Survey Ireland (OSI) (http://www.osni.gov.uk/catalog/grid.htm) national grid referencing schemes or Longitude and Latitude (http://www.geosys.com/cgi-bin/genobject/mapskills_latlong/tig5e6). CIMI description: *'A string indicating the spatial referencing system in which search terms for x-coordinate and y-coordinate are expressed'*.

Attribute type	Value	Attribute name
Use	3003	spatialReferencingSystem
Relation	3	equal
Position	1	first in field
Structure	2	word
Truncation	100	do not truncate
Completeness	3	complete field

vi.

x-coordinateInReferencingSystem (use attribute 3004) = sub element of DC_Coverage which with y-coordinateInReferencingSystem (use attribute 3005) can be used to indicate a numerically represented point within a spatial referencing system defined in SpatialReferencingSystem (use attribute 3003). CIMI description: *'Along with #3005, a pair of numbers indicating a point in the nominated spatial referencing system; or a pair of ranges indicating an area'*.

Attribute type	Value	Attribute name
Use	3004	x-coordinateInReferencingSystem
Relation	4	greater or equal
Position	1	first in field
Structure	109	numeric
Truncation	100	do not truncate
Completeness	3	complete field

vii.

Attribute type	Value	Attribute name
Use	3004	x-coordinateInReferencingSystem
Relation	2	less or equal
Position	1	first in field
Structure	109	numeric
Truncation	100	do not truncate
Completeness	3	complete field

viii.

y-coordinateInReferencingSystem (use attribute 3005) - see x-coordinateInReferencingSystem (use attribute 3004)

Attribute type	Value	Attribute name
Use	3005	y-coordinateInReferencingSystem
Relation	4	greater or equal
Position	1	first in field
Structure	109	numeric
Truncation	100	do not truncate
Completeness	3	complete field

ix.

Attribute type	Value	Attribute name
Use	3005	y-coordinateInReferencingSystem
Relation	2	less or equal
Position	1	first in field
Structure	109	numeric
Truncation	100	do not truncate
Completeness	3	complete field

x.

Clearly it is necessary for a target to have spatially referenced data for this search to be effective and for this data to be available in a numeric format. Problematically coordinate information is often stored in a non-numeric form with which users are more comfortable. For example, the Ordnance Survey national grid reference for Eynsham Abbey is presented in the form SP 43304 09106 where the 'SP' represents a 100 km block within the grid system whose southwest corner is 400km east and 200km north of the zero point of the grid. Thus the numeric equivalent of the OS reference would be 443304 209106. Targets will need to hold spatial references in a numeric form in addition to any other format. Effectively there will be three extra fields in the table containing coordinate data; numeric easting, numeric northing and grid system. Any conversion must be undertaken by organisations holding the dataset or if preferred as a costed part of target implementation. Conversion is straightforward for OS and OSI grid references if the elements of these are held in separate fields in the host database. A lookup table of numeric equivalents for 100km blocks and sample scripts that used this to convert the ADS data can be supplied on request.

User input at the client end (portal or gateway) will necessarily be in a user friendly format such as SP 43304 09106 which will be passed to Z servers (targets) in this form. To accommodate this in the attributes spatialReferencingSystem, x-coordinateInReferencingSystem and y-coordinateInReferencingSystem the letter codes or map tiles will be concatenated to the spatial referencing system at the portal. For the above example spatialReferencingSystem would contain "OSGB SP" while x and y would contain 43304 and 09106 respectively. This will work for many referencing systems including OSGB and OSI but will not be necessary for longitude and latitude. The concatenation will need to be undone at the server end and the grid references converted to numeric equivalents for use in querying the target database. UKC will develop the algorithms for conversions and queries and supply to other developers. Mechanisms will also be developed by UKC for handling queries encompassing mixed coordinate systems, for example, when a query using longitude and latitude covers part of Britain and datasets that are using OSGB.

Z server implementation

Developers implementing targets should liaise to ensure concordance.

Current developers are the Computing Laboratory of the University of Kent at Canterbury (UKC) and System Simulation Ltd (SSL). Contact details are

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