### Linked Data In Libraries: BibFrame, Linked Data, and ILS III Systems

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#### What's Wrong with MARC

050 00 |a M250 |b .B

- 100 1\_ |a Böhner, Johann Ludwig, |d 1787-1860.
- 240 10 |a Fantasien, |m clarinet, piano, |n op. 68, |r C minor
- 245 00 |a Fantasie für Klarinette und Klavier, op. 68 = |b Fantasy for clarinet and piano, op. 68 / |c Johann Ludwig Böhner ; herausgegeben von Edgar Eichstädter.
- 260 \_ Ja Wien : Jb Universal Edition, Jc c1995.
- 300 \_ la 1 score (10 p.) + 1 part (3 p.) ; lc 31 cm.
- 490 1\_ |a The clarinettist's repertoire
- 500 \_\_ [a Edited from 1st ed. published: Hildburghausen : Kesselring, 1839.
- 546 \_ |a Pref. in German, English and French.
- 500 \_ |a ISMN: M-008-01743-8.
- 650 \_0 |a Clarinet and piano music |x Scores and parts.
- 700 1\_ | a Eichstädter, Edgar.
- 830\_0 |a Clarinetist's repertoire.
- 953 \_ | a TA28
- 991 \_\_ |b c-Music |h M250 |i .B |t Copy 1 |w MUSIC

# A History of BIBFRAME

May 2011 – Bibliographic Framework Initiative announced by LC

- October 2011 Bibliographic Framework Plan published
- Linked Data model to be used
- November 2012 BIBFRAME Draft Model & Primer published
- \* Bibframe 2.0 becomes available Spring 2016

# BIBFRAME Model & Vocabulary

http://bibframe.org

#### BibFram Core Classes – from 1.0 to 2.0





#### BibFrame 2.0 Core relationship

#### Agent

Agents are people, organizations, jurisdictions, etc., associated with a Work or Instance through roles such as author, editor, artist, photographer, composer, illustrator, etc.

- Subject A Work might be "about" one or more concepts. Such a concept is said to be a "subject" of the Work. Concepts that may be subjects include topics, places, temporal expressions, events, works, instances, items, agents, etc.
- **Event** Occurrences, the recording of which may be the content of a Work.

#### BibFrame 2.0 - Work

xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">

- <bf:Work

rdf:about="C:\Users\wchen\AppData\Local\Temp\kfwo1vgv.vl0marc93a8ac90fe4c4fa1b2e3d8c05a9ef368.tmpebr10023383#Work">

+ <bf:adminMetadata>

<rdf:type rdf:resource="http://id.loc.gov/ontologies/bibframe/Text"/>

+ <bf:colorContent>

+ <bf:language>

+ <bf:genreForm>

+ <bf:classification>

+ <bf:classification>

+ <bf:contribution>

<rdfs:label>The theory of composites</rdfs:label>

+ <bf:title>

+ <bf:genreForm>

+ <bf:subject>

+ <bf:subject>

+ <bf:subject>

+ <bf:genreForm>

+ <bf:contribution>

+ <bf:hasSeries>

<bf:seriesEnumeration>6</bf:seriesEnumeration>

<br/>bf:hasInstance

rdf:resource="C:\Users\wchen\AppData\Local\Temp\kfwo1vgv.vl0marc93a8ac90fe4c4fa1b2e3d8c05a9ef368.tmpebr10023383#] </bf:Work>

+ < bf:Instance

rdf:about="C:\Users\wchen\AppData\Local\Temp\kfwo1vgv.vl0marc93a8ac90fe4c4fa1b2e3d8c05a9ef368.tmpebr10023383#Instance"> </rdf:RDF>

^

#### BibFrame 2.0 - Instance

#### >DLINSCALCE

rdf:about="C:\Users\wchen\AppData\Local\Temp\kfwo1vgv.vl0marc93a8ac90fe4c4fa1b2e3d8c05a9ef368.tmpebr1002338

- + <bf:issuance>
  - <rdf:type rdf:resource="http://id.loc.gov/ontologies/bibframe/Electronic"/>
- + <bf:media>
- + <bf:carrier>
- + <bf:provisionActivity>
- <bf:illustrativeContent>
  - + <bf:Illustration rdf:about="http://id.loc.gov/vocabulary/millus/ill">
  - </bf:illustrativeContent>
- + <bf:carrier>
- + <bf:supplementaryContent>
  - <rdf:type rdf:resource="http://id.loc.gov/ontologies/bibframe/Electronic"/>
- + <bf:identifiedBy>
- + <bf:identifiedBy>
- + <bf:identifiedBy>
  - <rdfs:label>The theory of composites</rdfs:label>
- + <bf:title>
  - <bf:responsibilityStatement>Graeme W. Milton</bf:responsibilityStatement>
- + <bf:genreForm>
- + <bf:provisionActivity>
  - <bf:provisionActivityStatement>Cambridge ; New York : Cambridge University Press, 2002./bf:provisionActivityStatement>
- + <bf:extent>
- + <bf:note>
  - <bf:seriesStatement>Cambridge monographs on applied and computational mathematics</bf:seriesStatement>
- <bf:seriesEnumeration>6</bf:seriesEnumeration>
- + <bf:note>
  - <br/>bf:instanceOf

rdf:resource="C:\Users\wchen\AppData\Local\Temp\kfwo1vgv.vl0marc93a8ac90fe4c4fa1b2e3d8c05a9ef368.tmpeb + <bf:hasItem>

- + <bf:hasItem>
- + < DI IndSitem

#### </bf:Instance>

df:RDF>

#### http://bibframe.org/vocab/identifier.html

Property	Label / Description	Used With
<u>ansi</u>	ANSI number / Number or code that uniquely identifies an entity.	Instance
<u>coden</u>	CODEN / Number or code that uniquely identifies an entity.	Instance
dissertationIdentifier	Dissertation identifier / Number or code that uniquely identifies an entity.	Work
<u>doi</u>	DOI / Number or code that uniquely identifies an entity.	Instance
<u>ean</u>	EAN / Number or code that uniquely identifies an entity.	Instance
fingerprint	Fingerprint identifier / Number or code that uniquely identifies an entity.	Instance
hdl	Handle / Number or code that uniquely identifies an entity.	Instance
isan	ISAN / Number or code that uniquely identifies an entity.	Work
isbn	ISBN / Number or code that uniquely identifies an entity.	Instance
ismn	ISMN / Number or code that uniquely identifies an entity.	Instance
iso	ISO number / Number or code that uniquely identifies an entity.	Instance
issn	ISSN / Number or code that uniquely identifies an entity.	Instance
issnL	ISSN-L / Number or code that uniquely identifies an entity.	Work

#### BibFrame2.0 - Resource

- <rdf:RDF xml:base="http://id.loc.gov/ontologies/bibframe/">
  - <owl:Class rdf:about="http://id.loc.gov/ontologies/bibframe/Text"> <rdfs:label>Text</rdfs:label>
    - <rdfs:subClassOf rdf:resource="http://id.loc.gov/ontologies/bibframe/Work"/>
    - -<skos:definition>

Resource intended to be perceived visually and understood through the use of language in written or spoken form. </skos:definition>

<dcterms:modified>2016-04-21 (New)</dcterms:modified>

</owl:Class>

#### </rdf:RDF>

#### Bibframe 2.0 - Agent

- <rdf:RDF xml:base="http://id.loc.gov/ontologies/bibframe/">

- <owl:Class rdf:about="http://id.loc.gov/ontologies/bibframe/Agent"> <rdfs:label>Agent</rdfs:label>
  - <rdfs:subClassOf rdf:resource="http://xmlns.com/foaf/0.1/Agent"/>
  - <skos:definition>

Entity having a role in a resource, such as a person or organization. </skos:definition>

<dcterms:modified>2016-04-21 (New)</dcterms:modified>

<dcterms:modified>2016-05-13 (New subclass)</dcterms:modified>

</owl:Class>

</rdf:RDF>

#### Make Your Own BIBFRAME Examples

- \* BIBFRAME Compare http://bibframe.org/tools/compare/
- \* Enter an LC system number (e.g. 10342843).
- \* Click Run Comparison
- \* Figure out what's going on.
- \* Print out and color in.

#### LC system number -sample

\* 18269172 (001)
\* 5305165 张爱玲名作欣赏
\* 5303107 到底是上海人
\* 14011413 牡丹还魂
\* 13223520 Taibei ren = Taipei people

#### What is Linked Data

"Linked Data describes a method of publishing structured data, so that it can be interlinked and become more useful. It builds upon standard web technologies, such as HTTP and URIs - but rather than using them to serve web pages for human readers, it extends them to share information in a way that can be read automatically by computers."

http://www.webopedia.com/TERM/L/Linked\_Data.html

#### URI vs. URL vs. URN?



- \* URI : Uniform (Universal) Resource Identifier
- Represents a person, an event, a place, a thing, etc.
- \* **UR**L : Uniform (Universal Resource Locator)
- \* A document about that person, or place, or thing, etc.
- \* URN (uniform resource name) is a subset of URIs that include a name within a given space, but no location

#### URI vs. URL vs. URN

#### **URI (Uniform Resource Indentifier)**



#### Relationships are key -Unlock library data



Library data can be transformed and can interact with the web

- \* Data can easily be searchable
- Integrate outside data into what the Libraries already have
- Reuse library data to create their own applications



#### Using the web to connect data



#### Using the web to connect data

http://id.loc.gov/authorities/names/no00060883



http://id.loc.gov/authorities/subjects/sh85044098

http://id.loc.gov/authorities/names/n80022631

### Using the web to connect data



#### Tim Berners-Lee's Four Rules

- 1. Use URIs as names for things
- 2. Use HTTP URIs so that people can look up those names
- When someone looks up a URI, provide useful information, using the standards
- 4. Include links to other URIs, so they can discover more things

#### **RDF**:

#### **Resource Description Framework**

- The main standard of linked data
- RDF is a data model that expresses connections in the form of "triples"
- Model, not schema (expressing RDF often done in XML)

### The RDF Triple



# How will catalogers' jobs change?

- In Sierra, preparation for identifiers
  - Reviewed behavior of \$0 in Automatic Authorities
  - Automatic Authorities should update headings even if a \$0 exists in the string

```
TYPE : UPDATE
ENTRY : amoore stevie 1951
BIB WOM : b1555426
NEW FORM : b700 1 |aMoore, Steven,|d1951-|eeditor|Ohttp://id.loc.gov/authorities/names/n81044023
OLD FORM : b700 1 |aMoore, Stevie,|d1951-|eeditor|Ohttp://id.loc.gov/authorities/names/n81044023
AWTH 4XX : b400 1 |aMoore, Stevie,|d1951-
AUTH NUM : a1184439
```

# How will catalogers' jobs change?

• Fix to Automatic Authorities in Sierra 2.4 - A \$w in a 4XX field in the authority record will not prevent updates to the bibliographic record

	TYPE	:	UPDATE
	ENTRY	:	dvioloncello with orchestra arranged
	BIB NUM	÷	b1043329
	NEW FORM	÷	d650 0 aCello with orchestra, Arranged.
(	OLD FORM	:	d650 0 aVioloncello with orchestra, Arranged.
1	AUTH 4XX	;	e450  wnne  aVioloncello with orchestra, Arranged
	AUTH NUM	:	a1087860
	******	**	****
	TYPE	÷	UPDATE
	ENTRY	÷	dvioloncello with orchestra arranged
	BIB NUM	:	b1259562
	NEW FORM	:	d650 0 aCello with orchestra, Arranged.
	OLD FORM	:	d650 0 aVioloncello with orchestra, Arranged.
	AUTH 4XX	÷	e450  wnne  aVioloncello with orchestra, Arranged
	AUTH NUM	÷	a1087860
	******	**	*****

# How will catalogers' jobs change?

- Fix to Automatic Authorities in Sierra 3.0
  - The existence of \$6 and \$8 fields in the bibliographic record will not stop updates

TYPE : UPDATE			
ENTRY : dchu yuan dynasty 1260 1368 hi	story and criticism		
BIB NUM : 51937700			
XEW FORM : d650 0 81.1 aQu (Chinese literature)	yYuan Dynasty,1260-1368 xHistory and criticism.		
QLD FORM : d650 0 81.1 aCh{u02BB}{u00FC} yYuan D	ynasty,1260-1368 xHistory and criticism.		
AUTH 4XX : e450  wnne aCh{u02BB}{u00FC}			
AUTH NUM : a1465608			
***************************************			
TYPE : UPDATE			
ENTRY : dchu yuan dynasty 1260 1368 hi	story and criticism		
BIB NUM : b1948097			
NEW FORM : d650 0 6880-06 aQu (Chinese literatur	e)   yruan Dynasty, 1260-1368   xHistory and criticism.		
OLD FORM : d650 0 6880-06 aCh{u02BB}{u00FC} yYua	n Dynasty, 1260-1368   xHistory and criticism.		
AUTH 4XX : e450  wnne aCh{u02BB}{u00FC}			
AUTH NUM : a1465608			





Put identifiers in your MARC records

#### Build Linked Records - - X The Linked Data Tool has been designed to loop through a set of MARC records and resolve access points in the 1xx, 6xx, and 7xx Process a Source File: ٦ Save File: Service Status C:\Users\sandyc\AppData\Roaming\marcedit\co a Rules File: Close ID Services AutoDetect Main/Added Entry OCLC VIAF LC (NACO) AutoDetect Subject ID Embed OCLC Work ID OCLC Number: 001 Process 3xx Fields Limit Resolution to:

Build Linked Records				
	The Linked Data Tool has been designed to loop through a set of MARC records and resolve access points in the 1xx, 6xx, and 7	o 'xx		
Source File:	Conference\Ambroselibrary4Title0208201	7.mrc 🛅	Process	
Save File:	C:\Users\sandyc\Documents\1 AZUSA\Fu	Jen C [ 🔄	Service Status	
Rules File:	C:\Users\sandyc\AppData\Roaming\marce	edit\co 🛅	Close	
Processing Record 3Please Wait.				
ID Services				
🕦 📝 AutoDete	ct Main/Added Entry	OCLC VIAF	LC (NACO) -	
🌖 📃 AutoDete	ct Subject ID	Embed OCLC	Work ID	
1 Process	3xx Fields	OCLC Numbe	er: 001	
📃 Limit Res	solution to:			

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<ul> <li> <ul> <li></li></ul></li></ul>		Before
=050 \4\$aHD4905 =082 04\$a658.31422 =100 1\\$aSchwartz, Barry,\$d1946-\$eauthor =245 10\$aWhy we work /\$cBarry Schwartz. =250 \\\$aFirst TED Books hardcover edition. =264 \1\$aNew York :\$bTED Books, Simon & Schuster,\$c[2015] =264 \4\$c©2015 =300 \\\$a96 pages ;\$c19 cm.		Name heading
=650 \0\$aWork\$xPhilosophy. =650 \0\$aWork\$xPsychological aspects. =650 \0\$aJob satisfaction. =650 \0\$aSelf-realization. =650 \0\$aHappiness.		Subject headings





BibFrame TestBed		
bf: BIBFRAME	The BibFrame2 Testbed is a simple to use utility designed to allow metadata specialists the ability to model their data using BibFrame Concepts.	Process
Source File:	C:\Users\sandyc\Documents\1 AZUSA\Fu Jen (	Close
Save File:	C:\Users\sandyc\Documents\1 AZUSA\Fu Jen (	
File Type:	MARC -	
BaseURI:	http://www.example.com	
Profile:	BibFrame2 -	
Translation Rules:	C:\Program Files\MarcEdit 6\xslt\bibframe2\ma	
Data Serialization:	RDFXML -	
Id Field:	001	

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xml version="1.0" encoding="UTF-8"? - <rdf:rdf "="" bibframe="" http:="" id.loc.gov="" ontologies="" xmlns:bflc="http:&lt;br&gt;xmlns:bf=" xmlns:madsrdf="http://www.loc.gov/mads/rdf/v1#" xmlns:rdfs="http://www.w&lt;br&gt;synta-ns#"> - <bf:work <br="" rdf:about="C:\Users\sandyc\AppData\Local\Temp\2qdqayog.ejin&lt;br&gt;- &lt;bf:dminMetadata&gt;&lt;br&gt;- &lt;bf:AdminMetadata&gt;&lt;br&gt;- &lt;bf:Status&gt;&lt;br&gt;- &lt;bf:status&gt;&lt;br&gt;- &lt;bf:status&gt;&lt;br&gt;- &lt;bf:code&gt;n&lt;/bf:code&gt;&lt;br&gt;&lt;/bf:status&gt;&lt;br&gt;- &lt;bflc:EncodingLevel&gt;&lt;br&gt;&lt; &lt;bflc:encodingLevel&gt;&lt;br&gt;&lt;bflc:encodin&lt;/th&gt;&lt;th&gt;://id.loc.gov/ontologies/bflc/">'3.org/2000/01/rdf-schema#" xmln marc64f96306241e494cbbe4aeeded</bf:work></rdf:rdf>	As:rdf="http://www.w3.org/1999/02/22-rdf- e8a29a8.tmpmfm00108212 #Work">	
</td <td>ema#dateTime"&gt;2014-06-16T13:0 hema#date"&gt;2008-07-16/bf:creati</td> <td>1:04</td>	ema#dateTime">2014-06-16T13:0 hema#date">2008-07-16/bf:creati	1:04
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