

bibliotek-o Identifiers Pattern

NOTE: the following represents the direction taken by the LD4L Labs and LD4P Ontology Group in the development of bibliotek-o and may not be fully formed. This pattern document was used internally to define a direction and is shared with the intention of contextualizing a pattern found within the ontology; terms specified below may not fully align to the ontology as published. Further, discussion of BIBFRAME 2.0 may be out-of-date.

2016 December

Open Questions for LC

No remaining open questions.

Requests for Modifications to BF2

Open Requests

No remaining open requests.

Resolved requests

Approved

LC has agreed to the following requests:

- Resource-to-identifier relationships
 - Define object property `bf:identifies` as inverse of `bf:identifiedBy`.
 - Eliminate `bf:barcode` and use `bf:identifiedBy` with a `bf:Barcode` object.
- Define the following new Identifier types with the definitions shown:
 - `bf:AudioTake`: Identifier assigned to the smallest identifiable unit of a recording session, e.g., a specific recording of an individual song.
 - `bf:Gtin14Number`: 14-digit number assigned to identify trade items at various packaging levels.
 - `bf:MusicAvDistributorIdentifier`: Identifier appearing on a resource assigned by a distributor to a specific audio recording, publication of notated music, other music-related resource, or video recording.
 - `bf:VideoGamePlatformIdentifier`: Identifier assigned to a video game platform, e.g., CUSA 54321 (a PlayStation 4 number).
- Modify the definitions of the following Identifier types as shown:

- bf:MusicPlate: Identifier assigned by a music publisher or printer to to the printing plates for the notated portion of a notated music publication, or an identifier that emulates the printing plate tradition in contemporary publications.
- bf:MusicPublisherNumber: Identifier assigned to a notated music publication other than an issue, matrix, or plate number.
- bf:MatrixNumber: Matrix identifier assigned to the master from which a specific sound recording was pressed.
- bf:IssueNumber: Identifier assigned by a publisher of an audio recording to identify the issue designation or serial identification.
- Name change:
 - Change bf:IssueNumber to bf:AudioIssueNumber.
 - Change bf:VideorecordingNumber to bf:VideoRecordingNumber.

Rejected

LC has not agreed to the following requests. LD4L will take the specified action.

- Identifier status
 - Define owl:NamedIndividuals (i.e., a controlled vocabulary) of type bf:Status within the id.loc.gov namespace.
 - Full set of individuals TBD, but should include:
 - current
 - deprecated
 - invalid
 - cancelled (02X \$z)
 - LC has declined to define these individuals in the id.loc.gov namespace. BIBLIOTEK-O will define these NamedIndividuals in its namespace. This allows for the use of other individuals with an rdf:value rather than one of the NamedIndividuals.
- Identifier source
 - Remove the specified range of bf:source (bf:Source) so that any resource may serve as its object. (Also requested in the [Titles recommendation](#)).
 - LD4L will define bib:hasSource and bib:isSourceOf, domain and range unspecified.
- Resource-to-identifier relationships
 - Eliminate bf:shelfMark and use bf:identifiedBy with a bf:ShelfMark (or subclass) object. (Request not yet made.)

Recommended for Review by Other Groups

The following identifiers are recommended for review by LD4P Ontology Extension groups.

- Performed Music Ontology Extension
 - bf:lsmn
 - bf:IssueNumber
 - bf:lswc
 - bf:MatrixNumber
 - bf:MusicPlate
 - bf:MusicPublisherNumber
- RareMat Ontology Extension
 - bf:Fingerprint
 - Canonical bibliographies
- MovingImage Extension
 - bf:VideorecordingNumber

The following identifiers are recommended for review by the Serials community:

- bf:Issn
- bf:IssnL
- bf:Sici

BF2 Identifier Model

See details in the [LC BF2 Identifiers Specification](#).

Diagram 1. Identifier in BF2 namespace

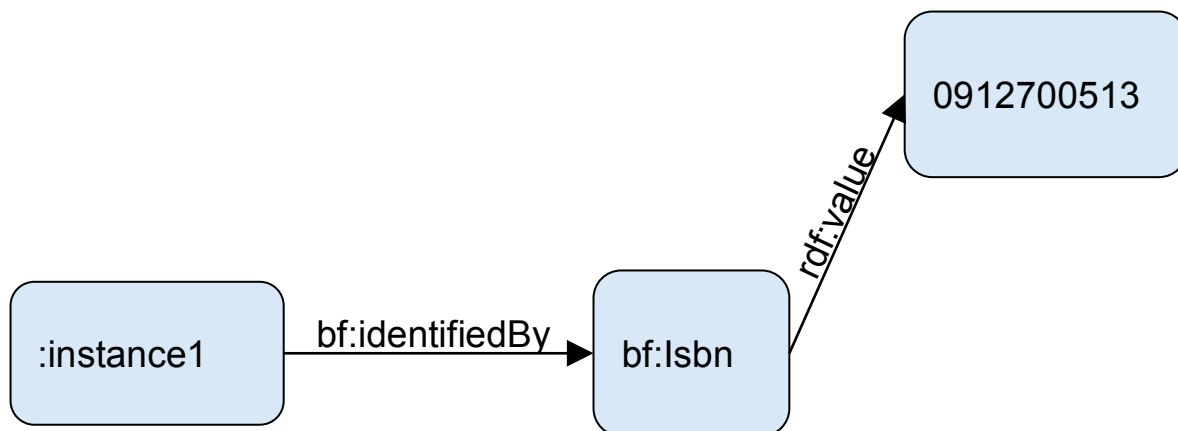
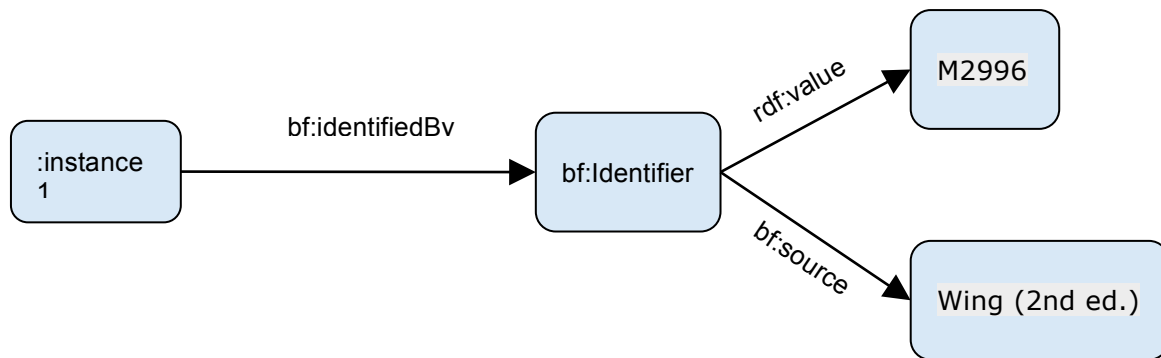


Diagram 2. Identifier in external namespace



Diagram 3. Identifier with source



BF2 Resource-to-Identifier Relationships

bf:barcode (object property)

Label: Barcode

URI: <http://id.loc.gov/ontologies/bibframe/barcode>

Definition: Optical machine-readable representation of data relating to the item, to which it is attached.

Domain: bf:Item

Range: bf:Barcode (subclass of bf:Identifier)

bf:identifiedBy (object property)

Label: Identifier

URI: <http://id.loc.gov/ontologies/bibframe/identifiedBy>

Definition: Character string associated with a resource that serves to differentiate that resource from other resources, i.e., that uniquely identifies an entity.

Comment: Used with Unspecified

Domain: unspecified

Range: bf:Identifier

bf:shelfMark (object property)

Label: Shelf mark

URI: <http://id.loc.gov/ontologies/bibframe/shelfMark>

Definition: Piece identifier, such as a call or other type of number.

Domain: bf:Item

Range: bf:ShelfMark (subclass of bf:Identifier)

BF2 Identifier Class Hierarchy

bf:Identifier

Label: Identifier

URI: <http://id.loc.gov/ontologies/bibframe/Identifier>

Definition: "Token or name that is associated with a resource, such as a URI or an ISBN." .

Subclass of: rdfs:Resource

Subclasses of bf:Identifier

bf:Ansi

Label: ANSI number

URI: <http://id.loc.gov/ontologies/bibframe/Ansi>

Definition: American National Standards Institute identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [ a bf:Ansi ;
          rdf:value "ANSI_ID" ] .
```

bf:Barcode

Label: Barcode

URI: <http://id.loc.gov/ontologies/bibframe/Barcode>

Definition: Optical machine-readable representation of data relating to the item to which it is attached.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:hasItem :item1 ;

:item1 a bf:Item ;
      # LC has agreed to remove bf:barcode and use bf:identifiedBy instead.
      bf:barcode
        [ a bf:Barcode ;
          rdf:value "0 360029145 2" .
```

```
] .
```

bf:CODEN

Label: CODEN

URI: <http://id.loc.gov/ontologies/bibframe/CODEN>

Definition: "Identifier for scientific and technical periodical titles assigned by the International CODEN Section of Chemical Abstracts Service."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
    bf:identifiedBy
        [a    bf:CODEN ;
          rdf:value    "NATUAS"] .
```

bf:CopyrightNumber

Label: Copyright-legal deposit number

URI: <http://id.loc.gov/ontologies/bibframe/CopyrightNumber>

Definition: "Identifier assigned to a copyright registration or legal deposit."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
    bf:identifiedBy
        [a    bf:CopyrightNumber ;
          rdf:value    "PA0000217251"] .
```

bf:DissertationIdentifier

Label: Dissertation Identifier

URI: <http://id.loc.gov/ontologies/bibframe/DissertationIdentifier>

Definition: "Identifier assigned to a thesis or dissertation for identification purposes ."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Used with: bf:Dissertation

Last Updated: 2016-04-21 (New)

```
:work1 a bf:Work ;
    bf:dissertation _:dissertation1 ;
    owl:sameAs http://dx.doi.org/10.5860/lrts.60n3.140 .

_:dissertation1 a bf:Dissertation ;
    bf:identifiedBy
        [a bf:DissertationIdentifier ;
```

```
        rdf:value "dissID1"  
    ] .
```

bf:Doi

Label: DOI

URI: <http://id.loc.gov/ontologies/bibframe/Doi>

Definition: Digital Object Identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:work1 a bf:Work ;  
    bf:dissertation _:dissertation1 ;  
    owl:sameAs http://dx.doi.org/10.5860/lrts.60n3.140 .  
  
_:dissertation1 a bf:Dissertation ;  
    bf:identifiedBy  
        [a    bf:Doi ;  
         rdf:value "dissID1"] .
```

bf:Ean

Label: EAN

URI: <http://id.loc.gov/ontologies/bibframe/Ean>

Definition: "International Article Identifier."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;  
    bf:identifiedBy  
        [a    bf:Ean ;  
         rdf:value "4006381333931"] .
```

bf:Fingerprint

Label: Fingerprint identifier

URI: <http://id.loc.gov/ontologies/bibframe/Fingerprint>

Definition: "Identifier that is used to assist in the identification of antiquarian books by recording information comprising groups of characters taken from specified positions on specified pages of the book." .

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

bf:Hdl

Label: Handle

URI: <http://id.loc.gov/ontologies/bibframe/Hdl>

Definition: "Unique and persistent identifier for digital objects developed by the Corporation for National Research Initiatives." .

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Hdl ;
          rdf:value http://hdl.handle.net/4263537/5041] ;
```

bf:Isan

Label: ISAN

URI: <http://id.loc.gov/ontologies/bibframe/Isan>

Definition: International Standard Audiovisual Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Isan ;
          rdf:value "0000-0000-3A8D-0000-Z-0000-0000-6"] .
```

bf:Isbn

Label: ISBN

URI: <http://id.loc.gov/ontologies/bibframe/Isbn>

Definition: International Standard Book Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Isbn ;
          rdf:value "0912700513" ] ;
        [a bf:Isbn ;
          rdf:value "0912700947"
        ] .
```

bf:Ismn

Label: ISMN

URI: <http://id.loc.gov/ontologies/bibframe/Ismn>

Definition: International Standard Music Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>


```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Ismn ;
          rdf:value "979-0-9016791-7-7"] .
```

bf:Iso

Label: ISO number

URI: <http://id.loc.gov/ontologies/bibframe/Iso>

Definition: International Organization for Standardization standard number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Iso ;
          rdf:value "23950:1998"] .
```

bf:Isrc

Label: ISRC

URI: <http://id.loc.gov/ontologies/bibframe/Isrc>

Definition: International Standard Recording Code.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Isrc ;
          rdf:value "US-S1Z-99-00001"] .
```

bf:Issn

Label: ISSN

URI: <http://id.loc.gov/ontologies/bibframe/Issn>

Definition: International Standard Serial Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Issn ;
          rdf:value "0028-0836"] .
```

bf:IssnL

Label: ISSN-L

URI: <http://id.loc.gov/ontologies/bibframe/IssnL>

Definition: International Standard Serial Number that links together various media versions of a continuing resource.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:IssnL ;
         rdf:value "ISSNLXXXXX"] .
```

bf:IssueNumber

Label: Audio issue number

URI: <http://id.loc.gov/ontologies/bibframe/IssueNumber>

Definition: Number used to identify the issue designation, or serial identification, assigned by a publisher to a sound recording.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:IssueNumber ;
         rdf:value "No. 1"] .
```

bf:Istc

Label: ISTC

URI: <http://id.loc.gov/ontologies/bibframe/Istc>

Definition: International Standard Text Code, a numbering system developed to enable the unique identification of textual works.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Istc ;
         rdf:value "A02-2009-000004BE-A"] .
```

bf:ISWC

Label: ISWC

URI: <http://id.loc.gov/ontologies/bibframe/ISWC>

Definition: International Standard Musical Work Code, a unique, persistent reference number for the identification of musical works.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Iswc ;
          rdf:value "T-000.000.001-0"] .
```

bf:Lccn

Label: LCCN

URI: <http://id.loc.gov/ontologies/bibframe/Lccn>

Definition: Library of Congress Control Number that identifies a resource description.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Lccn ;
          rdf:value "LCCN_Number"] .
```

bf:LcOverseasAcq

Label: LC acquisition program

URI: <http://id.loc.gov/ontologies/bibframe/LcOverseasAcq>

Definition: Identification number assigned by the Library of Congress to works acquired through one of its collaborative overseas acquisition programs.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:LcOverseasAcq ;
          rdf:value "I-E-2016315043"] .
```

bf:Local

Label: Local identifier

URI: <http://id.loc.gov/ontologies/bibframe/Local>

Definition: Identifier established locally and not a standard number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Local ;
          rdf:value "ab3167-c-20161005"] .
```

bf:MatrixNumber

Label: Audio matrix number

URI: <http://id.loc.gov/ontologies/bibframe/MatrixNumber>

Definition: Matrix number from the master from which a specific sound recording was pressed.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:MatrixNumber ;
         rdf:value "ABC123XYZ890"] .
```

bf:MusicPlate

Label: Music plate number

URI: <http://id.loc.gov/ontologies/bibframe/MusicPlate>

Definition: Number assigned by a music publisher to a specific music publication.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:MusicPlate ;
         rdf:value "028 32 EP 7958"] .
```

bf:MusicPublisherNumber

Label: Music publisher number

URI: <http://id.loc.gov/ontologies/bibframe/MusicPublisherNumber>

Definition: Number assigned to a notated music publication other than a matrix or plate number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:MusicPublisherNumber ;
         rdf:value "2012564395"] .
```

bf:Nbn

Label: NBD

URI: <http://id.loc.gov/ontologies/bibframe/Nbd>

Definition: National Bibliography Number that identifies a resource description.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Nbn ;
          rdf:value "urn:nbn:de:bvb:19-146642"] .
```

bf:PostalRegistration

Label: Postal registration number

URI: <http://id.loc.gov/ontologies/bibframe/PostalRegistration>

Definition: Number assigned to a publication for which the specified postal service permits the use of a special mailing class privilege.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:PostalRegistration ;
          rdf:value "003752" ;
          bf:source http://www.usps.com ] .
```

bf:PublisherNumber

Label: Other publisher number

URI: <http://id.loc.gov/ontologies/bibframe/PublisherNumber>

Definition: Number assigned by a publisher that is not one of the specific defined types.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:PublisherNumber ;
          rdf:value "440 073 033-9" ;
          bf:source http://www.deutschegrammophon.com ] .
```

bf:ReportNumber

Label: Technical report number

URI: <http://id.loc.gov/ontologies/bibframe/ReportNumber>

Definition: Identification number of a technical report that is not a Standard Technical Report Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:ReportNumber;
          rdf:value "Report Number XX" ] .
```

bf:ShelfMark

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

Definition: Piece/item identifier, such as a call or other type of number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Subclassed as:

<http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc>

<http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc>

<http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc>

<http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm>

```
:inst1 a bf:Instance ;
      bf:hasItem :item1 ;

:item1 a bf:Item ;
      bf:shelfMark [
        a bf:ShelfMark ;
        rdf:value "B48"
      ] .
```

bf:ShelfMarkDdc

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc>

Definition: Shelf mark based on Dewey Decimal Classification

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:ShelfMarkLcc

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc>

Definition: Shelf mark based on Library of Congress Classification

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:ShelfMarkNlm

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm>

Definition: Shelf mark based on Univerasl Decimal Classification

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:ShelfMarkUdc

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc>

Definition: Piece/item identifier, such as a call or other type of number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:Sici

Label: SICI

URI: <http://id.loc.gov/ontologies/bibframe/Sici>

Definition: Serial Item and Contribution Identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Sici ;
         rdf:value "0002-8231(199412)45:10<737:TIODIM>2.3.TX;2-M" ] .
```

bf:StockNumber

Label: Stock number

URI: <http://id.loc.gov/ontologies/bibframe/StockNumber>

Definition: Identification number used for stock purposes and assigned by agencies such as distributors, publishers, or vendors.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:StockNumber ;
         rdf:value "Stock Number 12345" ] .
```

bf:Strn

Label: STRN

URI: <http://id.loc.gov/ontologies/bibframe/Strn>

Definition: Standard Technical Report Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Strn ;
         rdf:value "MPC-386" ;
         bf:status "Canceled"
        ] .
```

bf:StudyNumber

Label: Study number

URI: <http://id.loc.gov/ontologies/bibframe/StudyNumber>

Definition: Identification number for a computer data file.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:StudyNumber ;
          rdf:value "CNRS 84115"
          bf:source http://www.cnrs.com
        ] .
```

bf:Upc

Label: UPC

URI: <http://id.loc.gov/ontologies/bibframe/Upc>

Definition: Universal Product Code.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Upc ;
          rdf:value "042100005264"] .
```

bf:Urn

Label: URN

URI: <http://id.loc.gov/ontologies/bibframe/Urn>

Definition: Uniform Resource Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Urn;
          rdf:value "urn:isbn:0451450523"] .
```

bf:VideorecordingNumber

Label: Videorecording number

URI: <http://id.loc.gov/ontologies/bibframe/VideorecordingNumber>

Definition: Number assigned by a publisher to a videorecording.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:VideorecordingNumber ;
          rdf:value "aVM5108"
        ] .
```

BF2 Identifier Source

bf:source (object property)

Label: Source

URI: <http://id.loc.gov/ontologies/bibframe/source>

Definition: Resource from which value or label came or was derived, such as the formal source/scheme from which a classification number is taken or derived, list from which an agent name is taken or derived, source within which an identifier is unique.

Comment: Used with Unspecified. The expected value is bf:Source.

Domain: unspecified

Range: unspecified

bf:Source

Label: Source

URI: <http://id.loc.gov/ontologies/bibframe/Source>

Definition: Resource from which value or label came or was derived.

BF2 Identifier Value

rdf:value (property)

Label: value

URI: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

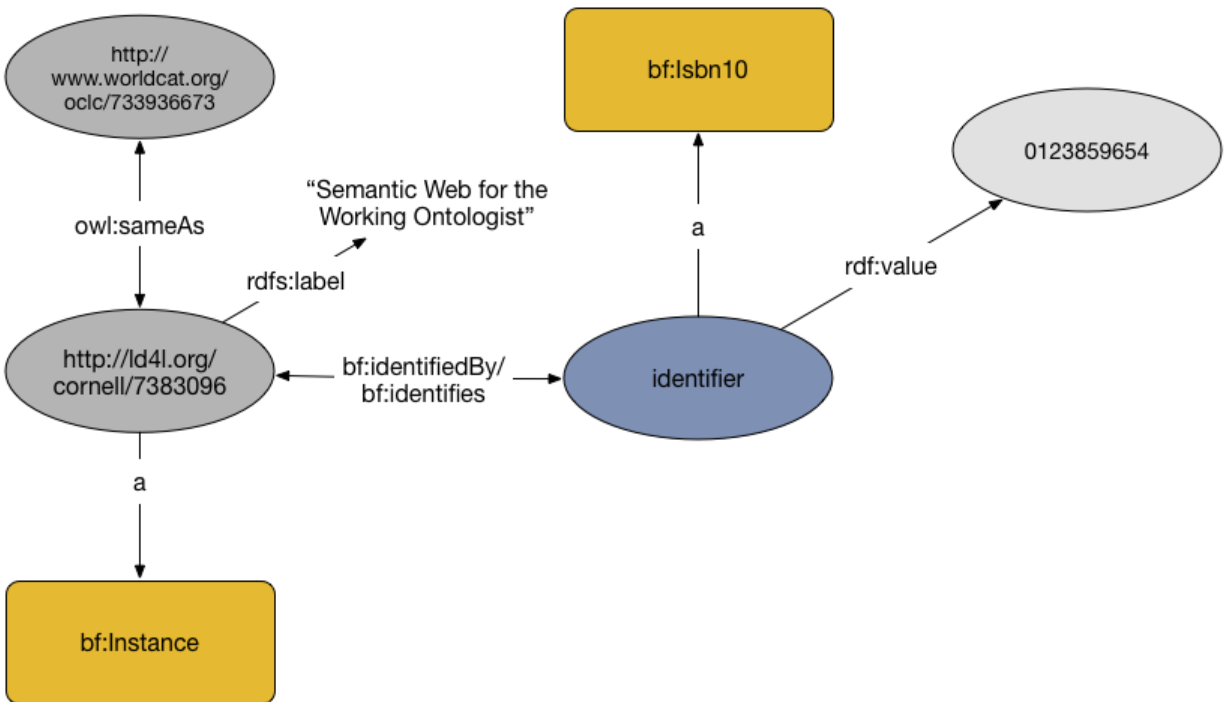
Definition: Idiomatic property used for structured values

bibliotek-o Identifier Model

NOTE: *The bibliotek-o is presented with the recommended BF2 terms, according to the [modifications requested above](#). Those terms that are not adopted by BF2 will be defined in the BIBLIOTEK-O namespace, with corresponding revisions made to this document.*

The following diagram provides an overview of the model. It does not differ from the BF2 representation of the same data, but is provided to illustrate the overall model and the use of owl:sameAs vs. bf:identifiedBy.

Diagram 4. Instance with Identifier and sameAs.



Identifiers and owl:sameAs

There is a relationship between `bf:identifiedBy` and `owl:sameAs` assertions. The following example shows the relationship of a Work to both a URI and non-URI identifier of the Work (from [Rob Sanderson's Analysis of BF1](#)). Because generally catalogs will require a local URI for `bf:Works` and other local resources in order to make local assertions, the local URI is not simply replaced with <http://dx.doi.org/10.1007/study-1345b>.

```
:work1 a bf:Work ;
  bf:identifiedBy [
    a bf:Doi ;
    rdf:value "1345b" ] ;
  owl:sameAs <http://dx.doi.org/10.1007/study-1345b> .
```

bibliotek-o Resource-to-Identifier Relationships

bf:identifiedBy (object property)

Label: Identifier

URI: <http://id.loc.gov/ontologies/bibframe/identifiedBy>

Definition: Character string associated with a resource that serves to differentiate that resource from other resources, i.e., that uniquely identifies an entity.

Comment: Used with Unspecified

Domain: unspecified

Range: bf:Identifier

Inverse: <http://id.loc.gov/ontologies/bibframe/identifies>

bf:identifies (object property)

Label: identifies

URI: <http://id.loc.gov/ontologies/bibframe/identifies>

Definition: Resource that this character string serves to differentiate that resource from other resources, i.e., that uniquely identifies an entity.

Domain: bf:Identifier

Range: unspecified

Inverse: <http://id.loc.gov/ontologies/bibframe/identifiedBy>

bibliotek-o Identifier Class Hierarchy

bf:Identifier

Label: Identifier

URI: <http://id.loc.gov/ontologies/bibframe/Identifier>

Definition: Token or name that is associated with a resource, such as a URI or an ISBN.

Comment: Used with Unspecified

Subclasses of bf:Identifier

The vast majority of these are the same as BF2. They are included here to clarify points of departure in bibliotek-o, including the RDF samples. **Differences are highlighted in yellow.**

bf:Ansi

Label: ANSI number

URI: <http://id.loc.gov/ontologies/bibframe/Ansi>

Definition: American National Standards Institute identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a    bf:Ansi ;
         rdf:value "ANSI_ID"] .
```

bf:Barcode

Label: Barcode

URI: <http://id.loc.gov/ontologies/bibframe/Barcode>

Definition: Optical machine-readable representation of data relating to the item to which it is attached.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:hasItem :item1 ;

:item1 a bf:Item ;
      # LC has agreed to remove bf:barcode and use bf:identifiedBy instead.
      bf:barcode
        [ a bf:Barcode ;
          rdf:value "0 360029145 2" .
        ] .
```

bf:Coden

Label: CODEN

URI: <http://id.loc.gov/ontologies/bibframe/Coden>

Definition: "Identifier for scientific and technical periodical titles assigned by the International CODEN Section of Chemical Abstracts Service."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a    bf:Coden ;
         rdf:value "NATUAS"] .
```

bf:CopyrightNumber

Label: Copyright-legal deposit number

URI: <http://id.loc.gov/ontologies/bibframe/CopyrightNumber>

Definition: "Identifier assigned to a copyright registration or legal deposit."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:CopyrightNumber ;
      rdf:value "PA0000217251"] .
```

bf:DissertationIdentifier

Label: Dissertation Identifier

URI: <http://id.loc.gov/ontologies/bibframe/DissertationIdentifier>

Definition: "Identifier assigned to a thesis or dissertation for identification purposes ."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Used with: bf:Dissertation

Using BF2 model for now; will revisit as part of [Degrees recommendation](#) (not yet ready for review).

```
:work1 a bf:Work ;
  bf:dissertation _:dissertation1 ;
  owl:sameAs http://dx.doi.org/10.5860/lrts.60n3.140 .

_:dissertation1 a bf:Dissertation ;
  bf:identifiedBy
    [a bf:DissertationIdentifier ;
      rdf:value "dissID1"
    ] .
```

bf:Doi

Label: DOI

URI: <http://id.loc.gov/ontologies/bibframe/Doi>

Definition: Digital Object Identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Using BF2 model for now; will revisit as part of [Degrees recommendation](#) (not yet ready for review).

```
:work1 a bf:Work ;
  bf:dissertation _:dissertation1 ;
  owl:sameAs http://dx.doi.org/10.5860/lrts.60n3.140 .

_:dissertation1 a bf:Dissertation ;
  bf:identifiedBy
    [a bf:Doi ;
      rdf:value "dissID1"] .
```

bf:Ean

Label: EAN

URI: <http://id.loc.gov/ontologies/bibframe/Ean>

Definition: "International Article Identifier."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a    bf:Ean ;
         rdf:value    "4006381333931"] .
```

bf:Fingerprint

Label: Fingerprint identifier

URI: <http://id.loc.gov/ontologies/bibframe/Fingerprint>

Definition: "Identifier that is used to assist in the identification of antiquarian books by recording information comprising groups of characters taken from specified positions on specified pages of the book."

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to RareMat Ontology Extension group.

bf:Hdl

Label: Handle

URI: <http://id.loc.gov/ontologies/bibframe/Hdl>

Definition: "Unique and persistent identifier for digital objects developed by the Corporation for National Research Initiatives." .

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Last Updated: 2016-04-21 (New)

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a    bf:Hdl ;
         rdf:value    http://hdl.handle.net/4263537/5041] .
```

bf:Isan

Label: ISAN

URI: <http://id.loc.gov/ontologies/bibframe/Isan>

Definition: International Standard Audiovisual Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
```

```
[a bf:Isbn ;
rdf:value "0000-0000-3A8D-0000-Z-0000-0000-6" ] .
```

bf:Isbn

Label: ISBN

URI: <http://id.loc.gov/ontologies/bibframe/Isbn>

Definition: International Standard Book Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
    bf:identifiedBy
        [a bf:Isbn ;
rdf:value "0912700513" ] ;

        [a bf:Isbn ;
rdf:value "0912700947" ] .
```

bf:Ismn

Label: ISMN

URI: <http://id.loc.gov/ontologies/bibframe/Ismn>

Definition: International Standard Music Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to Performed Music Ontology Extension group.

```
:inst1 a bf:Instance ;
    bf:identifiedBy
        [a bf:Ismn ;
rdf:value "979-0-9016791-7-7" ] .
```

bf:Iso

Label: ISO number

URI: <http://id.loc.gov/ontologies/bibframe/Iso>

Definition: International Organization for Standardization standard number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
    bf:identifiedBy
        [a bf:Iso ;
rdf:value "23950:1998" ] .
```

bf:isrc

Label: ISRC

URI: <http://id.loc.gov/ontologies/bibframe/isrc>

Definition: International Standard Recording Code.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Isrc ;
          rdf:value "US-S1Z-99-00001"] .
```

bf:issn

Label: ISSN

URI: <http://id.loc.gov/ontologies/bibframe/issn>

Definition: International Standard Serial Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to *Serials and Other Multipart Works Recommendation.*

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Issn ;
          rdf:value "0028-0836"] .
```

bf:issnL

Label: ISSN-L

URI: <http://id.loc.gov/ontologies/bibframe/issnL>

Definition: International Standard Serial Number that links together various media versions of a continuing resource.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to *Serials and Other Multipart Works Recommendation.*

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:IssnL ;
          rdf:value "ISSNLXXXXX"] .
```

bf:issueNumber

Label: Audio issue number

URI: <http://id.loc.gov/ontologies/bibframe/issueNumber>

Definition: Number used to identify the issue designation, or serial identification, assigned by a publisher to a sound recording.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:IssueNumber ;
         rdf:value "No. 1"] .
```

bf:Istc

Label: ISTC

URI: <http://id.loc.gov/ontologies/bibframe/Istc>

Definition: International Standard Text Code, a numbering system developed to enable the unique identification of textual works.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Istc ;
         rdf:value "A02-2009-000004BE-A"] .
```

bf:Iswc

Label: ISWC

URI: <http://id.loc.gov/ontologies/bibframe/Iswc>

Definition: International Standard Musical Work Code, a unique, persistent reference number for the identification of musical works.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to Performed Music Ontology Extension group.

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Iswc ;
         rdf:value "T-000.000.001-0"] .
```

bf:Lccn

Label: LCCN

URI: <http://id.loc.gov/ontologies/bibframe/Lccn>

Definition: Library of Congress Control Number that identifies a resource description.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Lccn ;
          rdf:value "LCCN_Number"] .
```

bf:LcOverseasAcq

Label: LC acquisition program

URI: <http://id.loc.gov/ontologies/bibframe/LcOverseasAcq>

Definition: Identification number assigned by the Library of Congress to works acquired through one of its collaborative overseas acquisition programs.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:LcOverseasAcq ;
          rdf:value "I-E-2016315043"] .
```

bf:Local

Label: Local identifier

URI: <http://id.loc.gov/ontologies/bibframe/Local>

Definition: Identifier established locally and not a standard number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Local ;
          rdf:value "ab3167-c-20161005"] .
```

bf:MatrixNumber

Label: Audio matrix number

URI: <http://id.loc.gov/ontologies/bibframe/MatrixNumber>

Definition: Matrix number from the master from which a specific sound recording was pressed.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to Performed Music Ontology Extension group.

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:MatrixNumber ;
          rdf:value "ABC123XYZ890"] .
```

bf:MusicPlate

Label: Music plate number

URI: <http://id.loc.gov/ontologies/bibframe/MusicPlate>

Definition: Number assigned by a music publisher to a specific music publication.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to Performed Music Ontology Extension group.

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:MusicPlate ;
         rdf:value "028 32 EP 7958"] .
```

bf:MusicPublisherNumber

Label: Music publisher number

URI: <http://id.loc.gov/ontologies/bibframe/MusicPublisherNumber>

Definition: Number assigned to a notated music publication other than a matrix or plate number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to Performed Music Ontology Extension group.

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:MusicPublisherNumber ;
         rdf:value "2012564395"] .
```

bf:Nbn

Label: NBD

URI: <http://id.loc.gov/ontologies/bibframe/Nbd>

Definition: National Bibliography Number that identifies a resource description.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Nbn ;
         rdf:value "urn:nbn:de:bvb:19-146642"] .
```

bib:OclclIdentifier

Label: A number assigned to a bibliographic MARC record from OCLC

URI: <http://bibliotek-o.org/ontology/OclclIdentifier>

Definition: OCLC Worldcat identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

bf:PostalRegistration

Label: Postal registration number

URI: <http://id.loc.gov/ontologies/bibframe/PostalRegistration>

Definition: Number assigned to a publication for which the specified postal service permits the use of a special mailing class privilege.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:PostalRegistration ;
         rdf:value "003752" ;
         bf:source http://www.usps.com ] .
```

bf:PublisherNumber

Label: Other publisher number

URI: <http://id.loc.gov/ontologies/bibframe/PublisherNumber>

Definition: Number assigned by a publisher that is not one of the specific defined types.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:PublisherNumber ;
         rdf:value "440 073 033-9" ;
         bf:source http://www.deutschegrammophon.com ] .
```

bf:ReportNumber

Label: Technical report number

URI: <http://id.loc.gov/ontologies/bibframe/ReportNumber>

Definition: Identification number of a technical report that is not a Standard Technical Report Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:ReportNumber;
         rdf:value "Report Number XX"] .
```

bf:ShelfMark

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

Definition: Piece/item identifier, such as a call or other type of number.

Subclass of: bf:Identifier

Subclassed as:

<http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc>

<http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc>

<http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc>

<http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm>

```
:inst1 a bf:Instance ;
      bf:hasItem :item1 ;

:item1 a bf:Item ;
      bf:identifiedBy [
        a bf:ShelfMark ;
        rdf:value "B48"
      ] .
```

See [proposal to model shelf marks as locations](#) as an area for future research.

bf:ShelfMarkDdc

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkDdc>

Definition: Shelf mark based on Dewey Decimal Classification

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:ShelfMarkLcc

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkLcc>

Definition: Shelf mark based on Library of Congress Classification

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:ShelfMarkNlm

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkNlm>

Definition: Shelf mark based on Univerasl Decimal Classification

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:ShelfMarkUdc

Label: Shelf location

URI: <http://id.loc.gov/ontologies/bibframe/ShelfMarkUdc>

Definition: Piece/item identifier, such as a call or other type of number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/ShelfMark>

bf:Sici

Label: SICI

URI: <http://id.loc.gov/ontologies/bibframe/Sici>

Definition: Serial Item and Contribution Identifier.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to [Serials and Other Multipart Works Recommendation](#).

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:Sici ;
         rdf:value "0002-8231(199412)45:10<737:TIODIM>2.3.TX;2-M"] .
```

bf:StockNumber

Label: Stock number

URI: <http://id.loc.gov/ontologies/bibframe/StockNumber>

Definition: Identification number used for stock purposes and assigned by agencies such as distributors, publishers, or vendors.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
      bf:identifiedBy
        [a bf:StockNumber ;
         rdf:value "Stock Number 12345"] .
```

bf:Strn

Label: STRN

URI: <http://id.loc.gov/ontologies/bibframe/Strn>

Definition: Standard Technical Report Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Strn ;
      rdf:value "MPC-386" ;
      bf:status :canceled .
    ] .
```

bf:StudyNumber

Label: Study number

URI: <http://id.loc.gov/ontologies/bibframe/StudyNumber>

Definition: Identification number for a computer data file.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:StudyNumber ;
      rdf:value "CNRS 84115"
      bf:source http://www.cnrs.com
    ] .
```

bf:Upc

Label: UPC

URI: <http://id.loc.gov/ontologies/bibframe/Upc>

Definition: Universal Product Code.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:Upc ;
      rdf:value "042100005264"] .
```

bf:Urn

Label: URN

URI: <http://id.loc.gov/ontologies/bibframe/Urn>

Definition: Uniform Resource Number.

Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

```
:inst1 a bf:Instance ;
```

```
bf:identifiedBy
  [a bf:Urn;
   rdf:value "urn:isbn:0451450523"] .
```

bf:VideorecordingNumber

Label: Videorecording number

URI: <http://id.loc.gov/ontologies/bibframe/VideorecordingNumber>

Definition: Number assigned by a publisher to a videorecording.

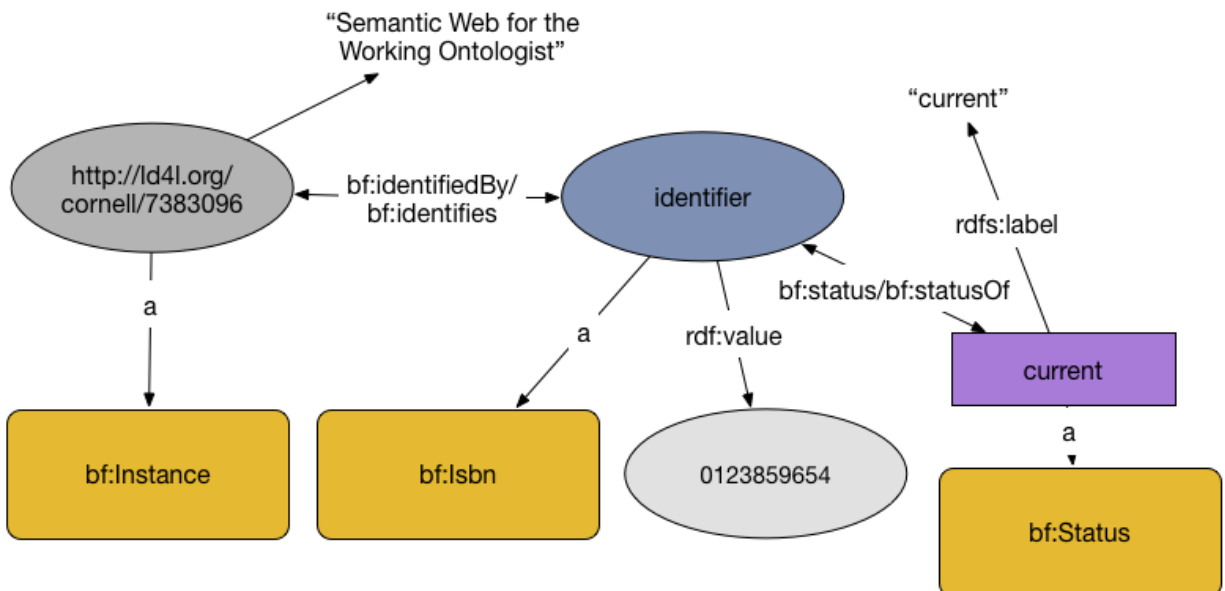
Subclass of: <http://id.loc.gov/ontologies/bibframe/Identifier>

Referred to Moving Image Ontology Extension group.

```
:inst1 a bf:Instance ;
  bf:identifiedBy
    [a bf:VideorecordingNumber ;
     rdf:value "aVM5108"
    ] .
```

bibliotek-o Identifier Status

Diagram 5. Identifier status



bf:status (object property)

Label: status

URI: <http://id.loc.gov/ontologies/bibframe/status>

Definition: The status of a resource

Domain: unspecified

Range: bf:Status

bibliotek-o Status Named Individuals

Namespace TBD.

cancelled

Label: cancelled

Type: owl:NamedIndividual, bf:Status

current

Label: current

Type: owl:NamedIndividual, bf:Status

deprecated

Label: deprecated

Type: owl:NamedIndividual, bf:Status

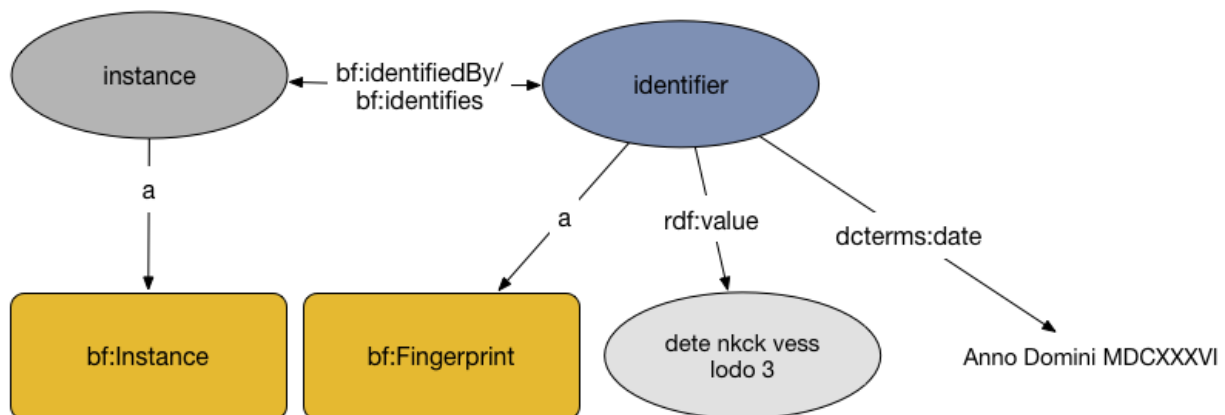
invalid

Label: invalid

Type: owl:NamedIndividual, bf:Status

bibliotek-o Identifier Date

Diagram 6. Identifier Date



dcterms:date (property)

Label: Date

URI: <http://purl.org/dc/terms/date>

Definition: A point or period of time associated with an event in the lifecycle of the resource.

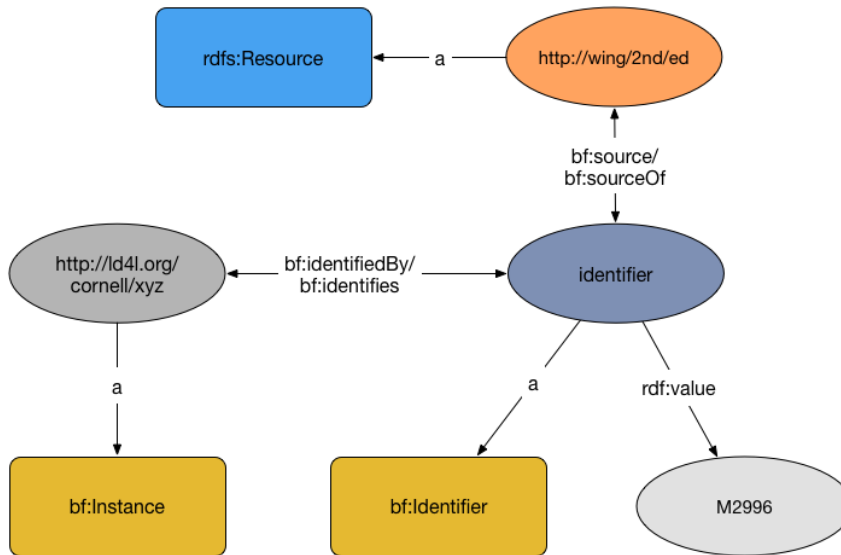
Comment: Date may be used to express temporal information at any level of granularity.

Recommended best practice is to use an encoding scheme, such as the W3CDTF profile of ISO 8601.

Range: rdfs:Literal

bibliotek-o Identifier Source

Diagram 7. Identifier source



bf:source (object property)

Label: Source

URI: <http://id.loc.gov/ontologies/bibframe/source>

Definition: Resource from which value or label came or was derived, such as the formal source/scheme from which a classification number is taken or derived, list from which an agent name is taken or derived, source within which an identifier is unique.

Domain: unspecified

Range: unspecified

Inverse: <http://id.loc.gov/ontologies/bibframe/sourceOf>

The object of bf:source is expected to be a URI for the assigner of the identifier.

bf:sourceOf (object property)

Label: is source of

URI: <http://id.loc.gov/ontologies/bibframe/sourceOf>

Definition: This resource is the source of the object.

Domain: unspecified

Range: unspecified

Inverse: <http://id.loc.gov/ontologies/bibframe/source>

The subject of bf:source is expected to be a URI for the assigner of the identifier.

bibliotek-o Identifier Value

rdf:value (property)

Label: value

URI: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>

Definition: Idiomatic property used for structured values

Domain: rdfs:Resource

Range: rdfs:Resource

Open Questions and Areas for Future Work

- What to do when stable identifiers become URIs?
 - ISBNs, ESTC numbers, etc.
- What to do with canonical bibliographies whose identifiers are essential to rare book cataloging? (510s)
 - Referred to RareMat extension group
- Attach DissertationIdentifier to Work rather than the Dissertation object.
- Modeling shelf marks as locations has been discussed but not finalized as a recommendation.
 - bibliotek-o has adopted the following model for locations:
 - Replaces bf:Place with prov:Location.
 - Defines subclasses of prov:Location:
 - bib:GeographicLocation
 - bib:PhysicalLocation
 - bib:ElectronicLocation
 - Defines predicates bib:atLocation (range prov:Location) and inverse bib:locationOf (domain prov:Location).
 - Future integration of shelf marks into this model would involve making the ShelfMark class a subclass of prov:Location, and using bib:locationOf rather than bf:identifiedBy to link the resource to the ShelfMark. This would be recommended for BF, but if not adopted then BIBLIOTEK-O would define bib:ShelfMark as subclass of prov:Location. Current subclasses of ShelfMark would remain.