



**CARLI**

**E-RESOURCES LINKING TROUBLESHOOTING PART II:  
OPENURL AND CTO**

Alma/Primo VE Open Office Hours

April 13, 2023

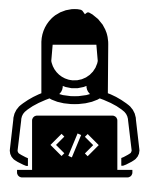
# **The Link \_Still\_ Doesn't Work: E-Resources Linking Troubleshooting Part II: OpenURL and CTO**

- **Denise Green, CARLI**
- **For I-Share Alma/PrimoVE Librarians working with e-resources' linking.**
- **Questions & Comments at the end of presentation.**



## Learning Goals

- **Build on [Dec. 8, 2022 presentation “The Link Didn’t Work...”](#)**
- **Become Familiar with OpenURL**
  - What is OpenURL?
  - How to interpret OpenURL
  - Steps in the Alma/Primo VE Link resolver process
    - Diagrams
    - What’s Alma CTO?
    - How to display and decipher CTO



Implications of Gender Consciousness for Students in Information Technology.

By: HERRING, SUSANC.; MARKEN, JAMESA. *Women's Studies*. Apr/May2008, Vol. 37 Issue 3, p229-256.

- Library e-resource
- Google Scholar
- Vendor's interface

If Off Campus- Authentication/Proxying



Alma builds an OpenURL/Context Object, etc.

**Link Resolver-** Alma as seen via Primo VE

On to publisher, repository or vendor interface

Full Text: html/pdf/  
streaming media, etc.



Review of First “Troubleshooting Linking Problems” December 2022 Office Hours

## 1. Always Start with a Do Over-



- **Re-create the search** and **Try another web browser** than what the patron used.

## 2. Authentication issues: On Campus/Off Campus

- the off-campus patron is getting "Access denied" or "You must authenticate..." type messages.

## 3. E-Collection or E-title activation problems:

- Correct e-resource activated?
- Need a Customer ID/Code/Subscriber number, etc.?
- Dates of coverage or Open Access status wrong in active resource?

## 4. Is The Citation accurate? Metadata issues.

- The journal/periodical/ebook is different. Or has different versions/editions? Ex. “New York Times”
- Could numbers have been flipped or typed incorrectly?
- Is important information missing like date or ISSN/ISBN?
- Is the article very new? Or in “members only” section?
- Does genre not match bibliographic info?



- So how do you investigate cases of poor linking due to bibliographic citation inaccuracy, too brief or skimpy citations or other metadata issues?
- These are cases where the generated OpenURL is not working as expected and hence, is helpful to examine the OpenURL and related CTO in detail.
- First, we'll explore how Alma processes a citation into an OpenURL for the link resolver Primo VE "View Online" menu.



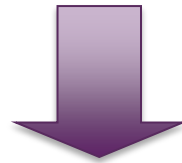
Your patron finds a citation like this example:

Kader M, Hossain MA, Reddy V, Perera NKP, Rashid M. *Effects of short-term breathing exercises on respiratory recovery in patients with COVID-19: a quasi-experimental study*. BMC sports science, medicine & rehabilitation. 2022; vol.14(issue 1): pp. 60-70.  
doi:10.1186/s13102-022-00451-z

- Next the Alma link resolver builds an OpenURL building on citation/metadata elements like ISSN/ISBN, DOI, PMID, periodical title, author, date, volume, pages, etc.



Kader M, Hossain MA, Reddy V, Perera NKP, Rashid M. *Effects of short-term breathing exercises on respiratory recovery in patients with COVID-19: a quasi-experimental study*. BMC sports science, medicine & rehabilitation. 2022; vol.14(issue 1): pp. 60-70. doi:10.1186/s13102-022-00451-z



**OpenURL**

[http://i-share-uic.primo.exlibrisgroup.com/view/uresolver/01CARLI\\_UIC/openurl?rft\\_val\\_fmt=info:ofi/fmt:kev:mtx:journal&rft.epage=60&rft.volume=14&rft.pub=BioMed Central Ltd&rft.place=England&rft\\_id=info:&rfr\\_id=info:sid/primo.exlibrisgroup.com-gale\\_doaj\\_&resource\\_typedoi/10.1186/s13102-022-00451-z&rft\\_id=info:pmid/35382885e=articles&rft.jtitle=BMC sports science, medicine & rehabilitation&rft.genre=article&rft.issue=1&rft.pages=60&rft\\_galeid=A699551545&vid=01CARLI\\_UIC:CARLI\\_UIC&rft.date=2022-04-05&rft\\_pqid=2652020974&rft.spage=60&rft.au=Kader, Manzur&rft\\_dat=<gale\\_doaj\\_>A699551545</gale\\_doaj\\_>&rft.atitle=Effects of short-term breathing exercises on respiratory recovery in patients with COVID-19: a quasi-experimental study&rft.issn=2052-1847&rft.eissn=2052-1847 \]](http://i-share-uic.primo.exlibrisgroup.com/view/uresolver/01CARLI_UIC/openurl?rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.epage=60&rft.volume=14&rft.pub=BioMed Central Ltd&rft.place=England&rft_id=info:&rfr_id=info:sid/primo.exlibrisgroup.com-gale_doaj_&resource_typedoi/10.1186/s13102-022-00451-z&rft_id=info:pmid/35382885e=articles&rft.jtitle=BMC sports science, medicine & rehabilitation&rft.genre=article&rft.issue=1&rft.pages=60&rft_galeid=A699551545&vid=01CARLI_UIC:CARLI_UIC&rft.date=2022-04-05&rft_pqid=2652020974&rft.spage=60&rft.au=Kader, Manzur&rft_dat=<gale_doaj_>A699551545</gale_doaj_>&rft.atitle=Effects of short-term breathing exercises on respiratory recovery in patients with COVID-19: a quasi-experimental study&rft.issn=2052-1847&rft.eissn=2052-1847 ])

- **What's OpenURL?-** see <https://en.wikipedia.org/wiki/OpenURL>
- A standard of how to organize bibliographic citation data. How to map standard id numbers, author, titles, page, date, etc. into machine readable strings like:
- `http://i-share-uic.primo.exlibrisgroup.com/view/uresolver/01CARLI_UIC/openurl?rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.epage=60&rft.volume=14&rft.pub=BioMed Central Ltd&rft.place=England&rft_id=info:doi/10.1186/s13102-022-00451-z&rft_id=info:pmid/35382885&rfr_id=info:sid/primo.exlibrisgroup.com-gale_doaj_&resource_type=articles&rft.jtitle=BMC sports science, medicine & rehabilitation&rft.genre=article&rft.issue=1&rft.pages=60&rft_galeid=A699551545&vid=01CARLI_UIC:CARLI_UIC&rft.date=2022-04-05&rft_pqid=2652020974&rft.spage=60&rft.au=Kader, Manzur&rft_dat=<gale_doaj_>A699551545</gale_doaj_>&rft.atitle=Effects of short-term breathing exercises on respiratory recovery in patients with COVID-19: a quasi-experimental study&rft.issn=2052-1847&rft.eissn=2052-1847 ]`

From Wikipedia:**Format**

OpenURL consists of a base URL, which contains the address of the user's institutional link-server, followed by a query string, consisting of key-value pairs serializing a ContextObject. The OpenURL ContextObject and/or `rft_val_fmt` is most often bibliographic data, but as of version 1.0 OpenURL can also include information about the requester, the resource containing the hyperlink, the type of service required, and so forth. For example:

```
http://resolver.example.edu/cgi?ctx_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:book&rft.isbn=0836218310&rft.btitle=The+Far+Side+Gallery+3
```

is a version 0.1 OpenURL describing a book.[11] **`http://resolver.example.edu/cgi`** is the base URL of an example link-server.

`ctx_ver=Z39.88-2004` – specifying the OpenURL ContextObject version

`rft_val_fmt=info:ofi/fmt:kev:mtx:book` – specifying the metadata format for the referent (in this case, a book)

Then **key-value pairs**:

Fields from this format describing the referent object:

`rft.isbn=0836218310` – the ISBN identifying the book

`rft.btitle=The+Far+Side+Gallery+3` – the title of the book

Kader M, Hossain MA, Reddy V, Perera NKP, Rashid M. *Effects of short-term breathing exercises on respiratory recovery in patients with COVID-19: a quasi-experimental study*. BMC sports science, medicine & rehabilitation. 2022; vol.14(issue 1): pp. 60-70. doi:10.1186/s13102-022-00451-z

**http://i-share-**

**uic.primo.exlibrisgroup.com/view/uresolver/01CARLI\_UIC/**

**openurl?rft\_val\_fmt=info:ofi/fmt:kev:mtx:journal&rft.epage=60&rft.volum**  
**e=14&rft.pub=BioMed Central**

**Ltd&rft.place=England&rft\_id=info:doi/10.1186/s13102-022-00451-**

**z&rft\_id=info:pmid/35382885&rfr\_id=info:sid/primo.exlibrisgroup.com-**

**gale\_doaj\_&resource\_type=articles&rft.jtitle=BMC sports science,**  
**medicine &**

**rehabilitation&rft.genre=article&rft.issue=1&rft.pages=60&rft\_galeid=A69**

**9551545&vid=01CARLI\_UIC:CARLI\_UIC&rft.date=2022-04-**

**05&rft\_pqid=2652020974&rft.spage=60&rft.au=Kader,**

**Manzur&rft\_dat=<gale\_doaj\_>A699551545</gale\_doaj\_>&rft.atitle=Effect**  
**s of short-term breathing exercises on respiratory recovery in patients with**

**COVID-19: a quasi-experimental study&rft.issn=2052-**

**1847&rft.eissn=2052-1847 ]**

## Sections Highlighted:

### OpenURL (Alma)

[http://na01.alma.exlibrisgroup.com/view/uresolver/01CAL\\$ USM/openurl?ctx\\_enc=info:ofi/enc:UTF-8&ctx id=10 1&ctx tim=2016-03-02T12%3A42%3A43IST&ctx ver=Z39.88-2004&url ctx fmt=info:ofi/fmt:kev:mtx:ctx&url ver=Z39.88-2004&rfr id=info:sid/primo.exlibrisgroup.com-gale hrca&req id=&rft val fmt=info:ofi/fmt:kev:mtx:&rft.aucorp=&rft.date=19980930&rft.volume=117&rft.spage=A1&rft.issn=0458-3035&rft.pub=Los%20Angeles%20Times&rft.place=&rft.series=&rft.stitle=&rft.bici=&rft id=info:bibcode/&rft id=info:hdl/&rft id=info:lccn/&rft id=info:oclcnum/&rft id=info:pmid/&rft id=info:eric/\(\(addata/eric\)\)&rft dat=%3Cgale\\_hrca%3E21216876%3C/gale hrca%3E,language=eng,view=&svc dat=viewit&nv type=test&req.skin=csusm\\_uresolver](http://na01.alma.exlibrisgroup.com/view/uresolver/01CAL$ USM/openurl?ctx_enc=info:ofi/enc:UTF-8&ctx id=10 1&ctx tim=2016-03-02T12%3A42%3A43IST&ctx ver=Z39.88-2004&url ctx fmt=info:ofi/fmt:kev:mtx:ctx&url ver=Z39.88-2004&rfr id=info:sid/primo.exlibrisgroup.com-gale hrca&req id=&rft val fmt=info:ofi/fmt:kev:mtx:&rft.aucorp=&rft.date=19980930&rft.volume=117&rft.spage=A1&rft.issn=0458-3035&rft.pub=Los%20Angeles%20Times&rft.place=&rft.series=&rft.stitle=&rft.bici=&rft id=info:bibcode/&rft id=info:hdl/&rft id=info:lccn/&rft id=info:oclcnum/&rft id=info:pmid/&rft id=info:eric/((addata/eric))&rft dat=%3Cgale_hrca%3E21216876%3C/gale hrca%3E,language=eng,view=&svc dat=viewit&nv type=test&req.skin=csusm_uresolver)

Base URL

SID (source ID)

Citation  
Metadata

## URL With an Error Highlighted:

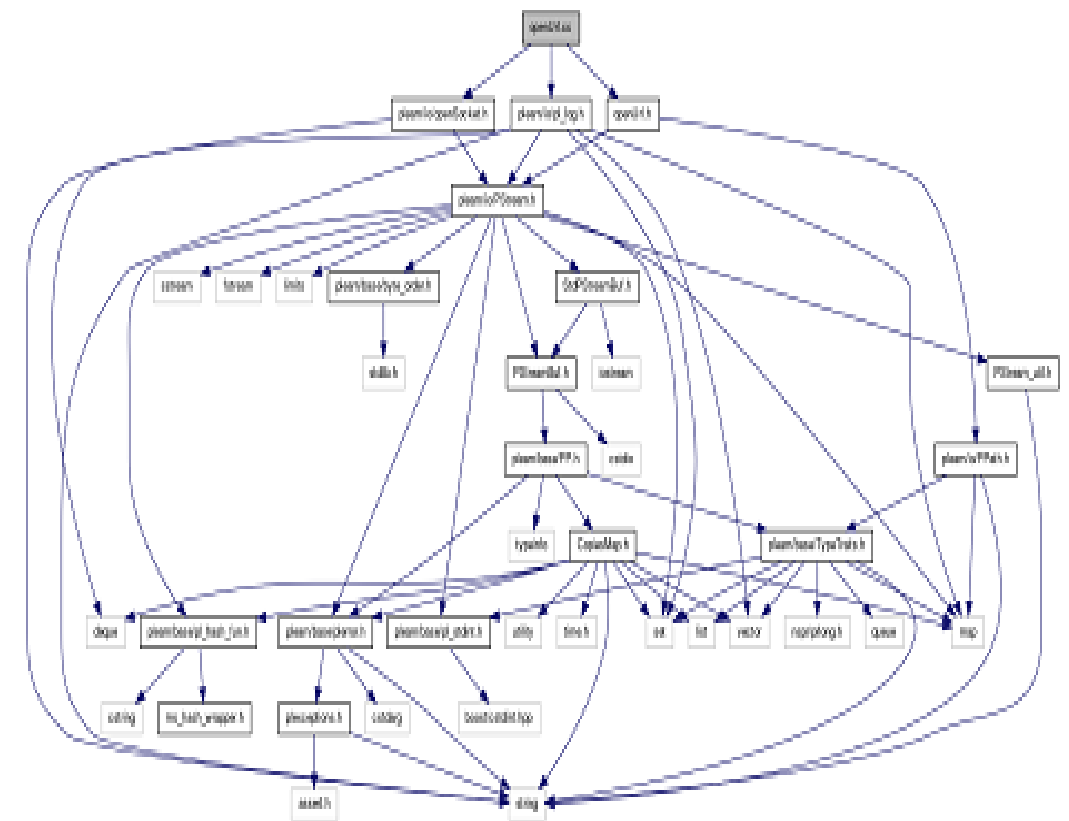
### openURL

[http://10.100.3.189:3410/vlad?ctx\\_ver=Z39.88-2004&ctx\\_enc=info:ofi/enc:UTF-8&ctx\\_tim=2016-04-11T09%3A36%3A10IST&url\\_ver=Z39.88-2004&url\\_ctx\\_fmt=info:ofi/fmt:kev:mtx:ctx&rft\\_id=info:sid/primo.exlibrisgroup.com:primo3-Article-gvrl\\_ref&rft\\_val\\_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article&rft.atitle=Erosion&rft.jtitle=&rft.btitle=&rft.aulast=&rft.auinit=&rft.auinit1=&rft.auinitm=&rft.ausuffix=&rft.au=&rft.aucorp=&rft.date=2010&rft.volume=&rft.issue=&rft.part=&rft.quarter=&rft.ssn=&rft.spage=375&rft.epage=376&rft.pages=375-376&rft.artnum=&rft.issn=&rft.eissn=&rft.isbn=978-1-4144-7620-9&rft.sici=&rft.coden=&rft\\_id=info:doi/&rft.object\\_id=&svc\\_val\\_fmt=info:ofi/fmt:kev:mtx:sch\\_svc&svc.fulltext=yes&rft\\_dat=%3Cgvrl\\_ref%3ECX2301300100%3C/gvrl\\_ref%3E%3Cgrp\\_id%3E-8429725385628909838%3C/grp\\_id%3E%3Ccoa%3E%3C/oa%3E&rft.eisbn=&rft\\_id=info:oai/&req.language=eng](http://10.100.3.189:3410/vlad?ctx_ver=Z39.88-2004&ctx_enc=info:ofi/enc:UTF-8&ctx_tim=2016-04-11T09%3A36%3A10IST&url_ver=Z39.88-2004&url_ctx_fmt=info:ofi/fmt:kev:mtx:ctx&rft_id=info:sid/primo.exlibrisgroup.com:primo3-Article-gvrl_ref&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=article&rft.atitle=Erosion&rft.jtitle=&rft.btitle=&rft.aulast=&rft.auinit=&rft.auinit1=&rft.auinitm=&rft.ausuffix=&rft.au=&rft.aucorp=&rft.date=2010&rft.volume=&rft.issue=&rft.part=&rft.quarter=&rft.ssn=&rft.spage=375&rft.epage=376&rft.pages=375-376&rft.artnum=&rft.issn=&rft.eissn=&rft.isbn=978-1-4144-7620-9&rft.sici=&rft.coden=&rft_id=info:doi/&rft.object_id=&svc_val_fmt=info:ofi/fmt:kev:mtx:sch_svc&svc.fulltext=yes&rft_dat=%3Cgvrl_ref%3ECX2301300100%3C/gvrl_ref%3E%3Cgrp_id%3E-8429725385628909838%3C/grp_id%3E%3Ccoa%3E%3C/oa%3E&rft.eisbn=&rft_id=info:oai/&req.language=eng)

## For more details see

- Introduction to OpenURL – see [NISO](#) for introduction or [DOI.org](#)
- OpenURL both a standard of how to organize bibliographic citation data and used to describe the URL output of that mapping.
- How to map standard id numbers, author, titles, page, date, etc. into machine readable strings like this sample OpenURL:
- <http://resolver.example.edu/cgi?genre=book&isbn=0836218310&title=The+Far+Side+Gallery+3>
- There are 4 general categories of OpenURL attributes that may be returned by Alma's Link Resolver:
  - Requester (prefix = .req)
  - ReferringEntity (prefix = rfe.)
  - Referent ( prefix = rft.)
  - ServiceType (prefix = svc.)Details at [Commonly Used OpenURL Attributes for the Alma URL Template](#)

- OpenURL construction quite complicated building on citation/metadata elements like ISSN/ISBN, title, author, date, pages, etc.
- Diagram from Plearn, openUrl.cc File Reference [https://www-labs.iro.umontreal.ca/~lisa/LibraryReference/html/d3/db7/openUrl\\_8cc.html](https://www-labs.iro.umontreal.ca/~lisa/LibraryReference/html/d3/db7/openUrl_8cc.html)

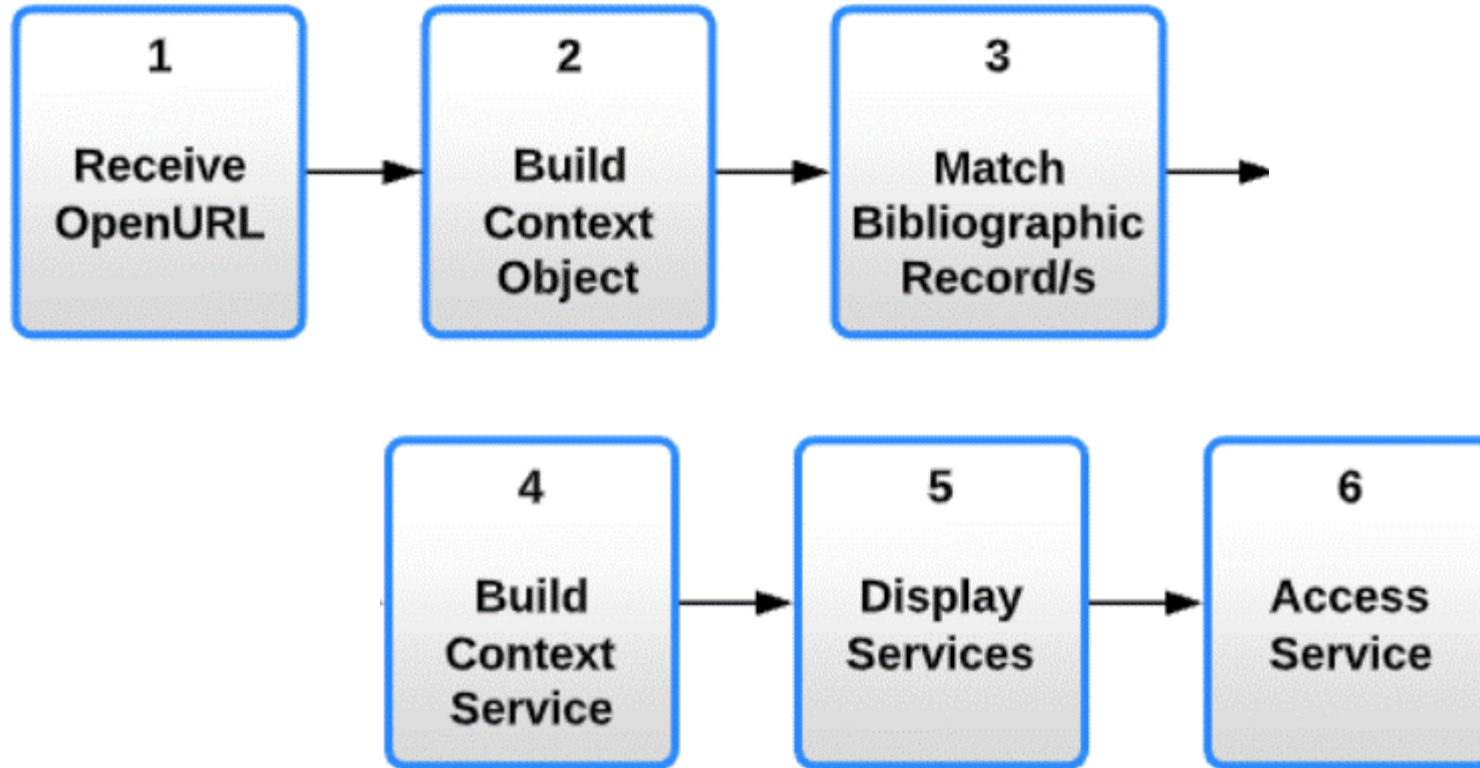




- **How does Alma/Primo VE use the OpenURL?**
- **Diagrams of Alma link resolver and presentation or display via Primo VE**
- **Introduction to Alma's Context Object (CTO)**
- **Getting OpenURL details via "CTO" XML—other the "under the hood" info.**



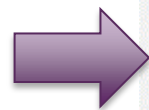
- Diagram from [“Alma Link Resolver Workflow”](#)




## Search Finds Results




nursing education history ✕ / Articles ▼ 

Select one to look at more.  
Click on “Available Online”





3  **BOOK**  
**A path to nursing excellence: the columbia experience**  
 Munding, Mary O'Neil  
 2013  
 “ ... and carefully constructed planning, led Advanced Practice Nursing to a new  
[Available Online >](#)

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4  **ARTICLE**  
**Historically-Informed Nursing: The Untapped Potential of History i  
 Education**  
 Grypma, Sonya  
 Quality Advancement in Nursing Education, 2017, Vol.3 (1)  
 PEER REVIEWED  OPEN ACCESS  
[Available Online >](#)

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5  **ARTICLE**  
**A Role for History in Inclusive Nursing Education**  
 Tobbell, Dominique  
 The Journal of nursing education, 2022, Vol.61 (8), p.469-475  
 “ ...; lesbian, gay, bisexual, transgender, queer or questioning (LGBTQ+) scholars demonstrate the role of history in inclusive nursing education. Results... ”  
 PEER REVIEWED  
[Available Online >](#)

## Alma Creates OpenURL For Selected Result

```
http://i-share-  
trt.primo.exlibrisgroup.com/view/uresolver/01CARLI_TR  
T/openurl?rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft  
t.volume=3&rft.pub=Canadian Association of Schools of  
Nursing&rft_id=info:doi/10.17483/2368-  
6669.1099&rft_id=info:sid/primo.exlibrisgroup.com-  
doaj_cross&resource_type=articles&rft.jtitle=Quality  
Advancement in Nursing  
Education&rft.genre=article&rft.issue=1&vid=01CARLI_T  
RT:CARLI_TRT&rft.date=2017-04-13&rft.au=Grypma,  
Sonya&rft_dat=<doaj_cross>oai_doaj_org_article_0cf9c7  
12dd52419ca039ca246eb1897c</doaj_cross>&rft.atitle=Hi  
storically-Informed Nursing: The Untapped Potential  
of History in Nursing Education&rft.issn=2368-  
6669&rft.eissn=2368-6669
```

## Creates CTO, Match Bib Records, Build Context Services & Display Services for Selected Result



ARTICLE  
**Historically-Informed Nursing: The Untapped Potential of History in Nursing Education**  
Grypma, Sonya  
Quality Advancement in Nursing Education, 2017, Vol.3 (1)  
PEER REVIEWED OPEN ACCESS  
[Available Online >](#)

View Online

Full text availability

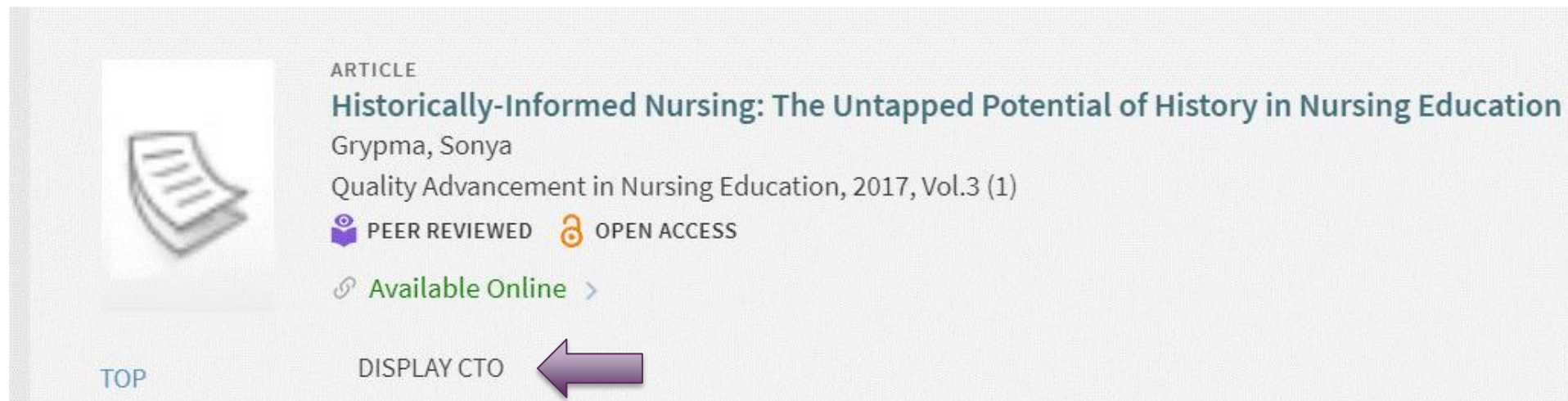
[DOAJ Directory of Open Access Journals \(Free resource, activated by CARLI\)](#)  
Available from 2014.

- **Introduction to Alma Context Object (CTO) –**
  - (not OpenURL same named component.)
- **What is Context Object?** – All the OpenURL bibliographic metadata parsed and organized for Alma to read the information (plus any augmentations from Alma\*\*.)
- Alma uses CTO to look for any matching full text resources (or GES) with priority searching for:
  - Numeric Identifiers: EISSN,ISSN, EISBN, ISBN, LCCN, CODEN, OCLC number.
  - Within numeric identifiers prioritize EISSN/ISSN for article/journal/issue genres.
  - Other genres or blank in genre field give a higher priority to EISBN/ISBN.
- **[Definition from this Alma Documentation.](#)**
- \*\* More on augmentations later in presentation.

## Take the permalink and add “ &displayCTO=true” to end

**Ex.** i-share-trt.primo.exlibrisgroup.com/permalink/  
01CARLI\_TRT/1eflh7h/cdi\_doaj\_primary\_oai\_doaj\_org\_article\_0cf9c712dd52419ca039c  
a246eb1897c&displayCTO=true

- Click on “Display CTO” in result



The screenshot shows a search result for an article. On the left is a document icon. To its right, the text reads: "ARTICLE", "Historically-Informed Nursing: The Untapped Potential of History in Nursing Education", "Grypma, Sonya", and "Quality Advancement in Nursing Education, 2017, Vol.3 (1)". Below this are two icons: a purple book icon labeled "PEER REVIEWED" and an orange padlock icon labeled "OPEN ACCESS". A green link with a chain icon and the text "Available Online >" is also present. At the bottom left is a "TOP" link. At the bottom center is a "DISPLAY CTO" link with a purple arrow pointing to it from the right.

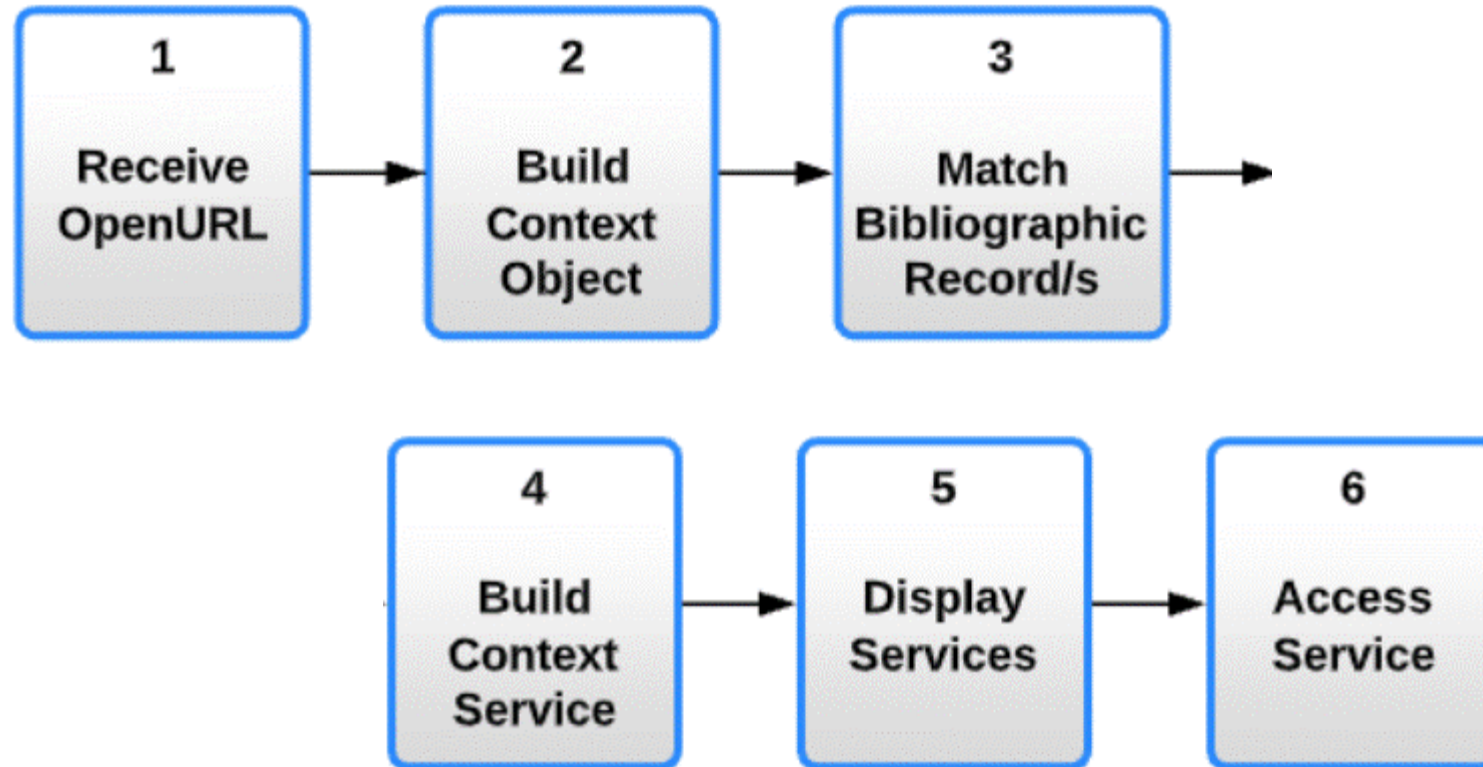
## How interpret CTO? How use in troubleshooting linking problems?

- Compare CTO details with an accurate citation for the article or Ebook. Any typos or mistakes in dates, volumes, ISSNs, ISBNs, etc.
- Check source (sid) of the citation in CTO to help check on availability & accuracy.
- CTO is in XML (Extensible Markup Language.)
- CTO can change over time. Is a snapshot of the available OpenURL info at the time of generation.
- Note some Alma documentation and web pages call CTO “Debug URL” or source of XML to help “debug” OpenURLs.





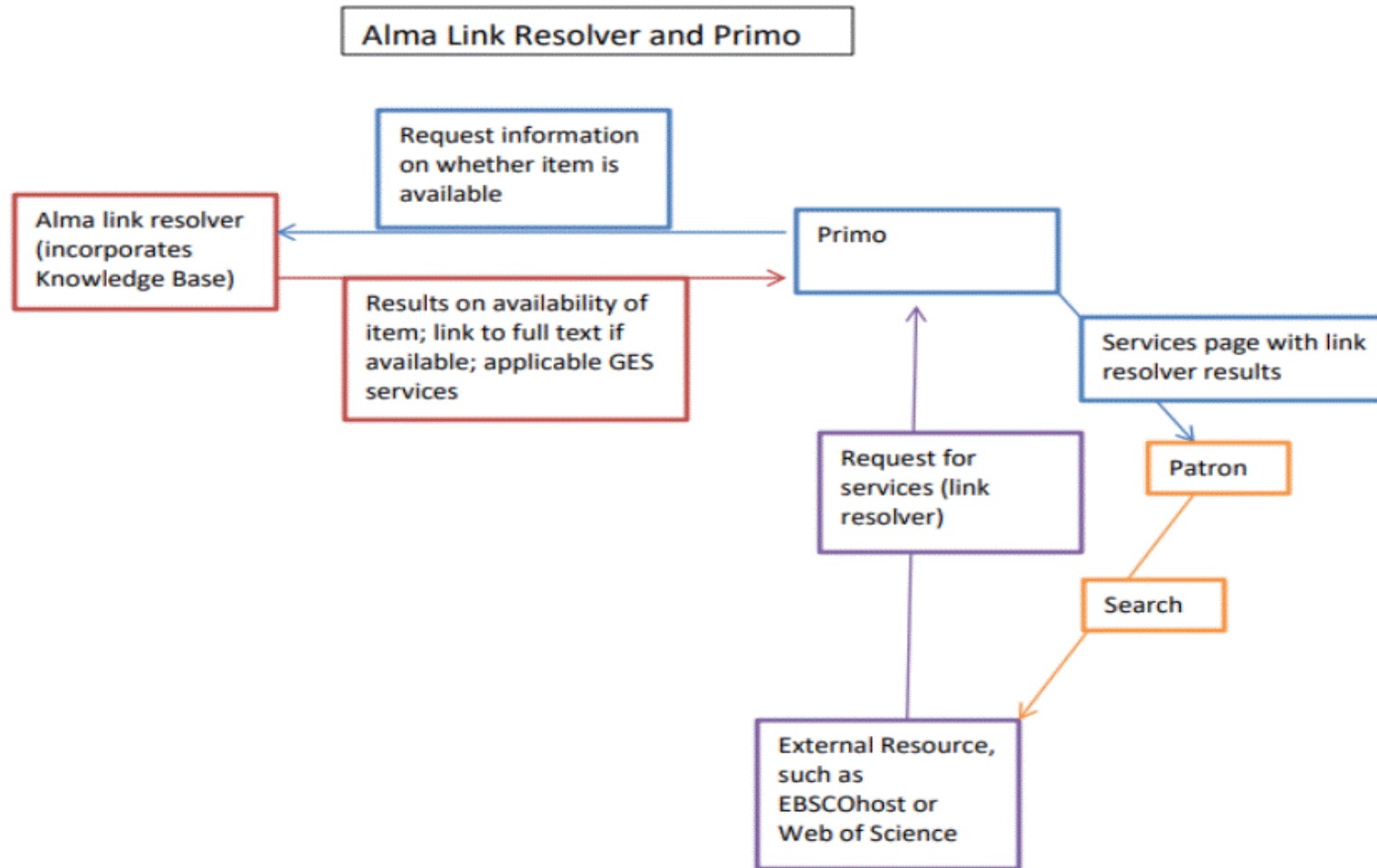
- Diagram from [“Alma Link Resolver Workflow”](#)



- We didn't cover Alma "Link in Record" method for linking to full text via Primo VE.

## Diagram II of link resolving

# Alma Link Resolver and Primo



- **Can we make citations work better with CTO generation?**
  - **Yes!**
- Good place to start is enrich or augment citations used by the Alma Link Resolver via activating your Institution Zone's **“Augmentations.”**
- **see [Improving Alma/PrimoVE linking with CrossRef DOI and PubMed ID](#)**
- Alma link resolver will overwrite or augment the referring source's citation elements with metadata from CrossRef or PubMed if the OpenURL has a DOI or PMID. This helps ensure that we use the most accurate and up-to-date metadata to connect users with full text.

## Resources for Further Learning


- [Dec. 2022 Office Hours on troubleshooting linking](#)
- CARLI Web Page on troubleshooting-  
<https://www.carli.illinois.edu/products-services/i-share/electronic-res-man/primove-broken-links>
- [Alma Link Resolver workflow-](#) from Ex Libris Alma

## Diagrams and Info from these Presentations

- [Linking with Alma April 2021 Video Presentation](#) -focus on CDI.
- [What's Wrong With This Link? Troubleshooting Common Linking Issues \(2019\)](#) - reviews OpenURL and CTO among other factors.
- [Where Does THAT Come From? How Primo Uses and Displays Data from Alma \(2018\)](#)

- **How did we do on these learning goals ?**
- **Become Familiar with OpenURL definitions.**
  - **How to interpret OpenURL**
  - **Steps in the Alma/Primo VE Link resolver process**
    - **Diagrams**
    - **What's CTO?**
    - **How to display via “&displayCTO=true” and decipher CTO**
- **Time for your Questions and Comments?**
- **Denise Green, [dgree1@uillinois.edu](mailto:dgree1@uillinois.edu)**



A close-up photograph of a black butterfly with white spots on its wings, perched on a purple flower. The butterfly's wings are spread, showing a pattern of white spots along the edges. The background is a soft, out-of-focus light blue.

Next Office  
Hours May 11  
Quarterly  
Release  
Review

