

# INVENIO

## OAI6 - Tutorial

Jérôme Caffaro  
Samuele Kaplun

# History

**1993** - CERN Preprint Server on the Web:  
institutional repository

**1996** - CERN Library Server (weblib): added  
books and periodicals

**2002** - CERN Document Server Software  
(CDSware): multimedia data and OAI-compliant

**2006** – changed name to CDS Invenio

**Today** - ...



## 1993 - CERN Preprint Server on the Web:

institutional repository

*"The Organization shall provide for collaboration among European States in nuclear research of a pure scientific and fundamental character (...). The Organization shall have no concern with work for military requirements and the results of its experimental and theoretical work shall be published or otherwise made generally available".*

CERN Convention, Article II.1, 1954





# History

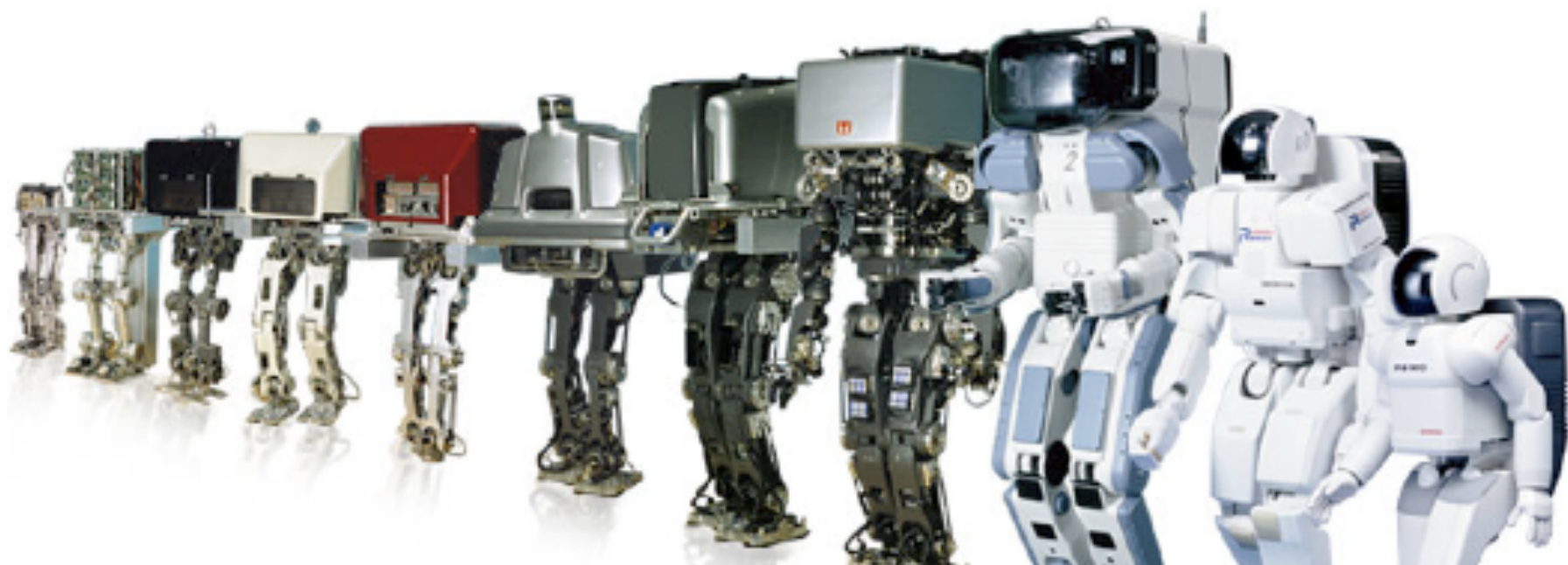
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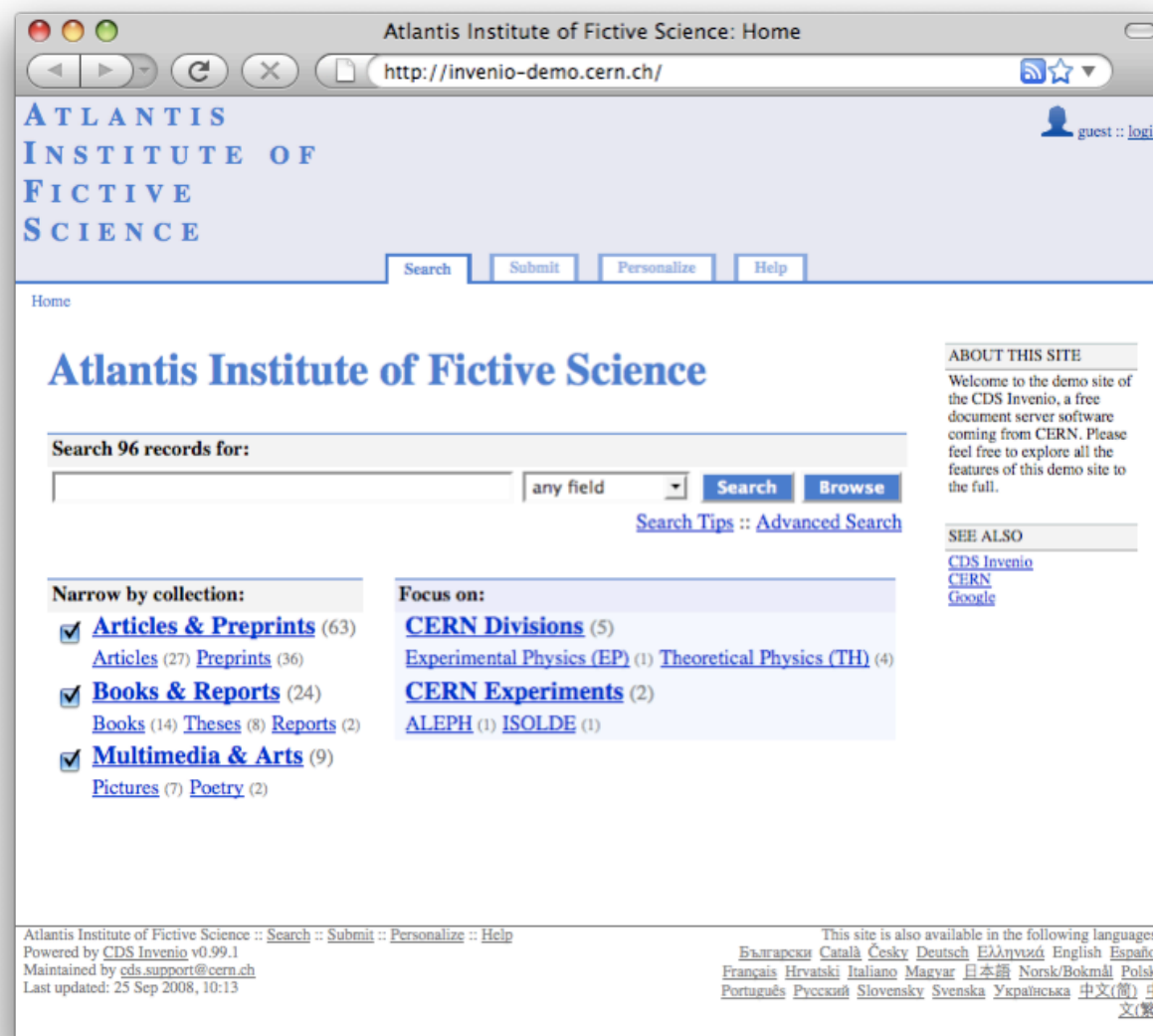
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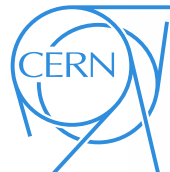
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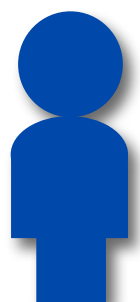


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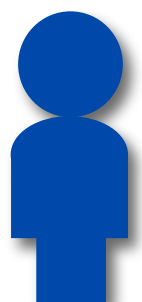


Samuele Kaplun & Jérôme Caffaro – CERN Document Server team  
CERN workshop on Innovations in Scholarly Communication [17<sup>th</sup> June 2009]





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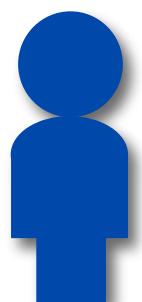
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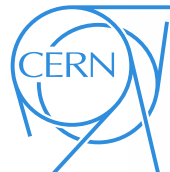
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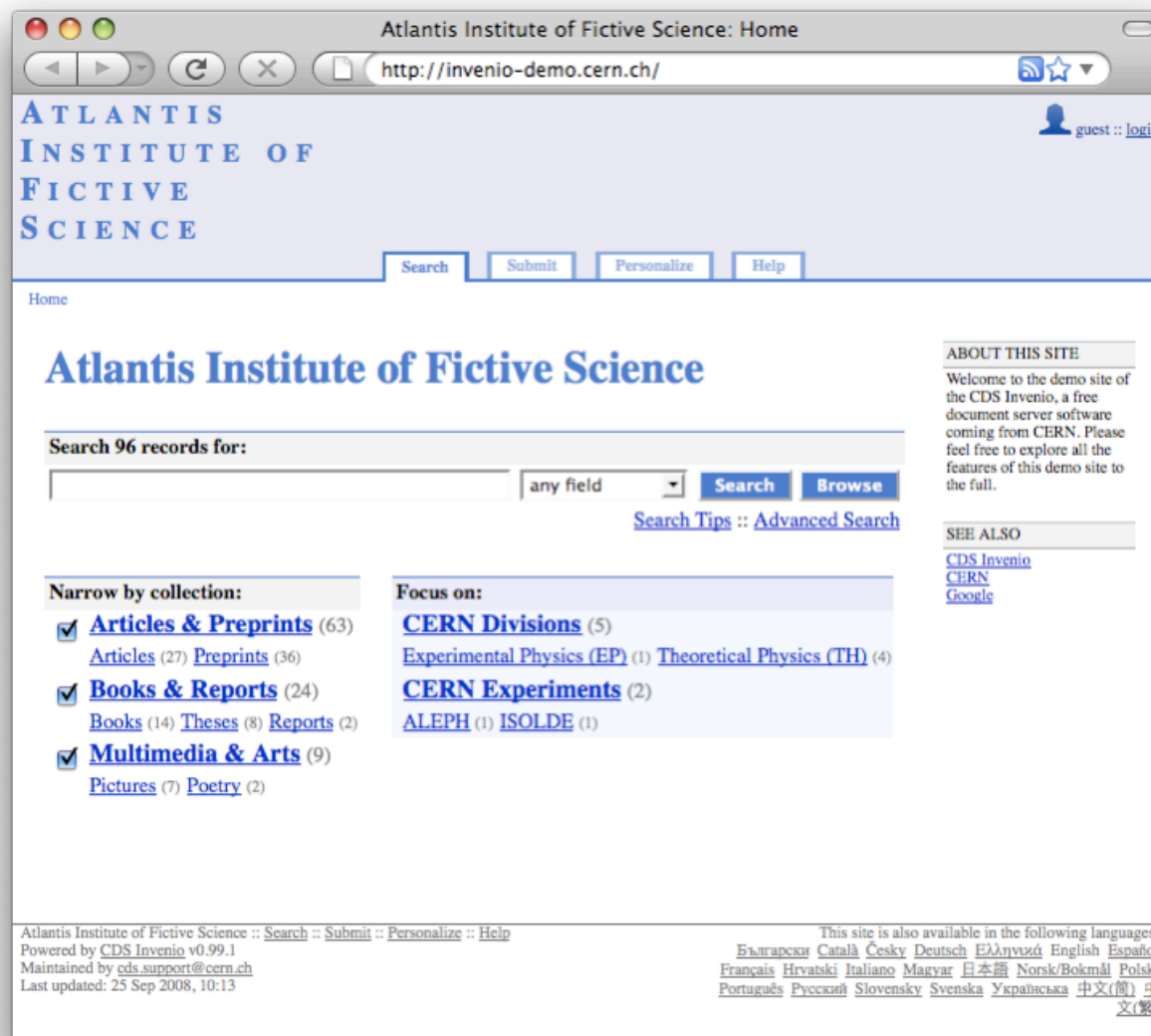
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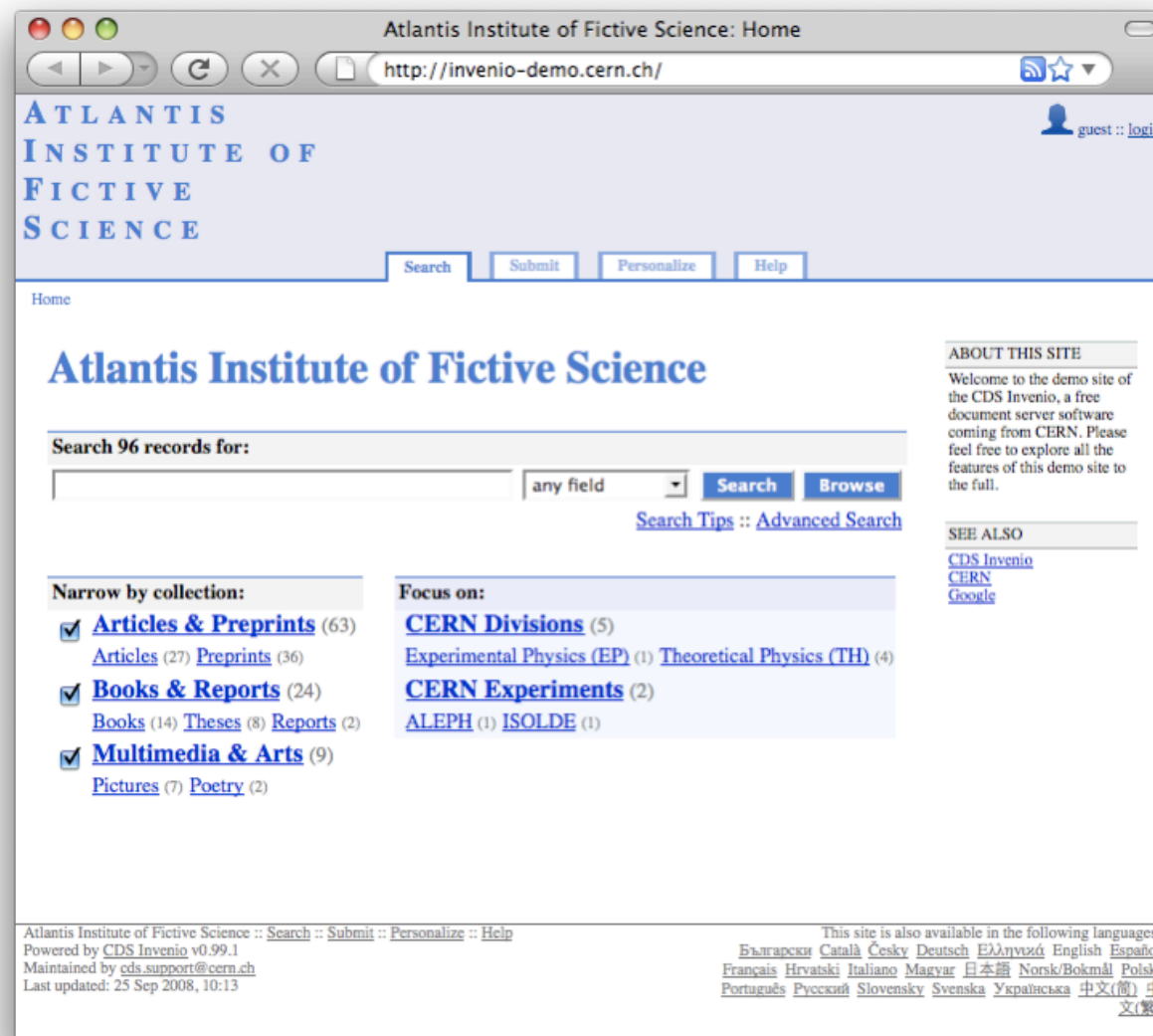
comment,  
review

subscribe

edit



Librarian



User





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'bookmark'



submit



search



comment,  
review



subscribe



export, check'



edit



import,  
harvest



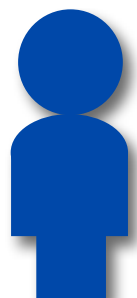
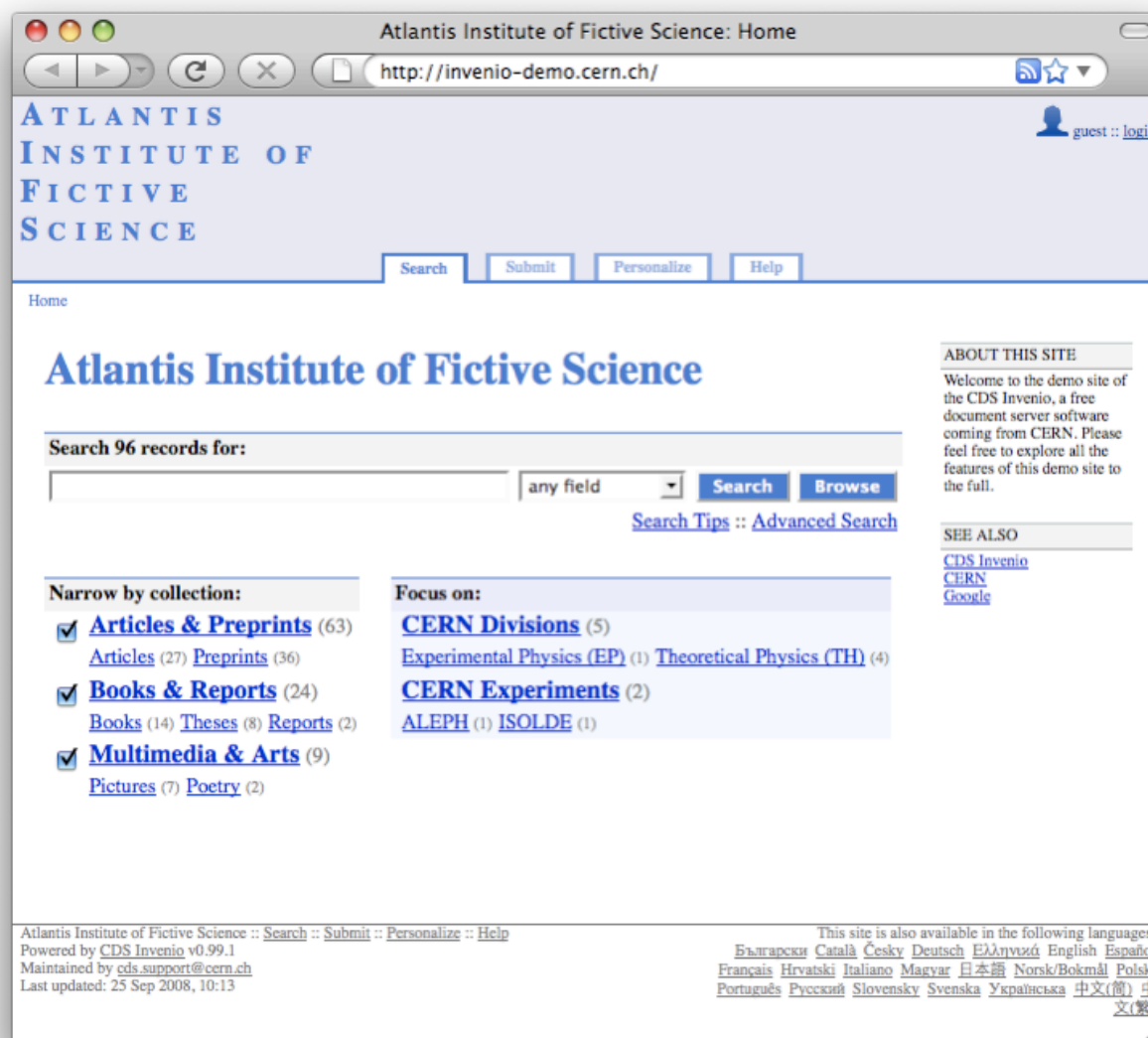
merge



convert

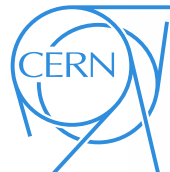


Librarian



User





# What is Invenio?

approve

share



'bookmark'



submit



search



comment,  
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subscribe



export, check'



edit



import,  
harvest



merge



convert



monitor



script



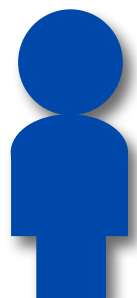
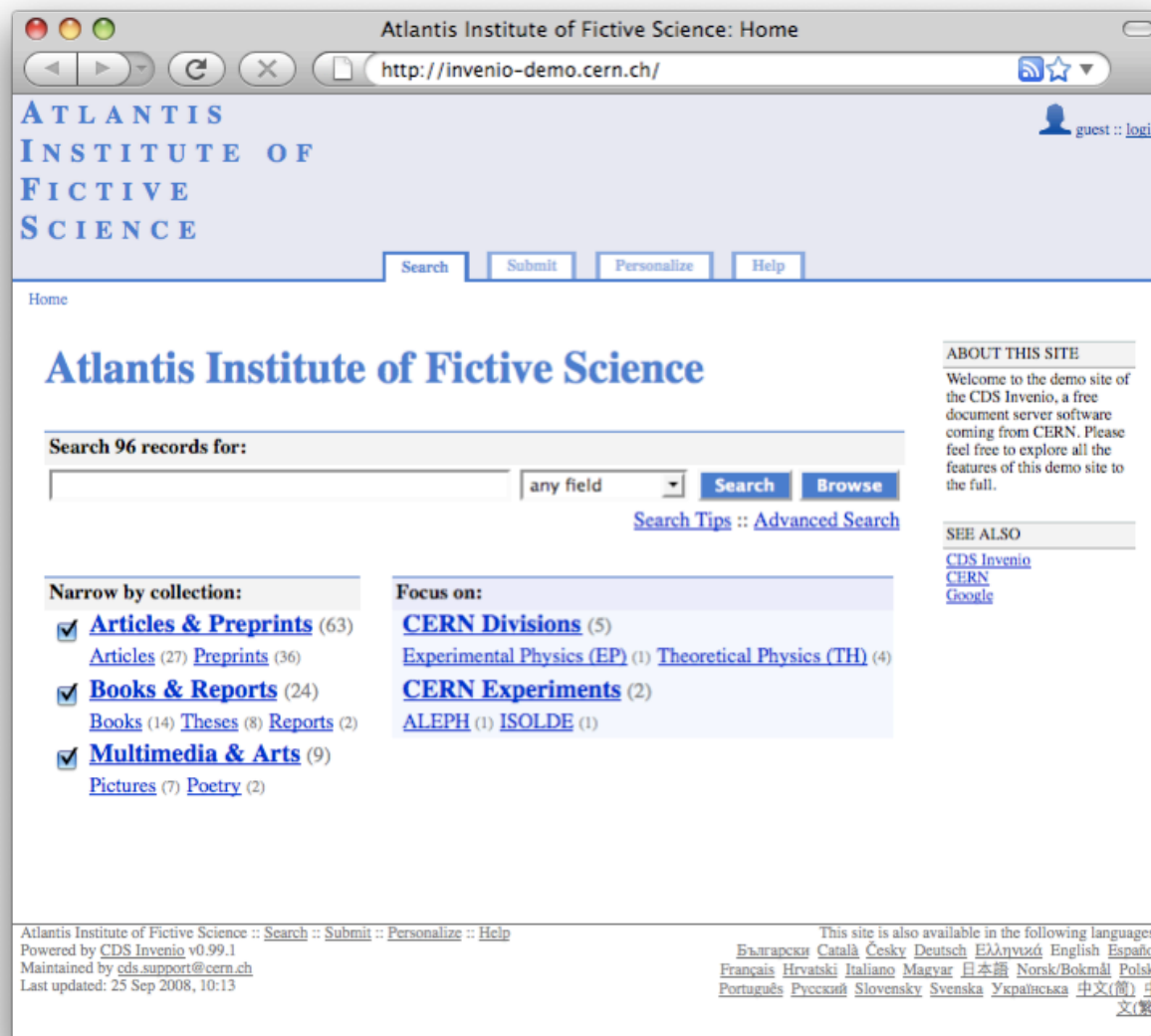
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Sources (Git):

<http://cdsware.cern.ch/repo/cds-invenio.git>



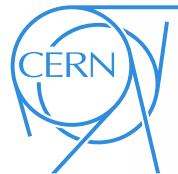
# Architecture

- OpenSource GPL project
- Python (and C and Lisp), MySQL and Apache
- Modularized architecture
- Based on open standards (MARCXML, MARC21, OAI-PMH, OpenURL...)
- Medium to big data repositories
- Flexible in every layer

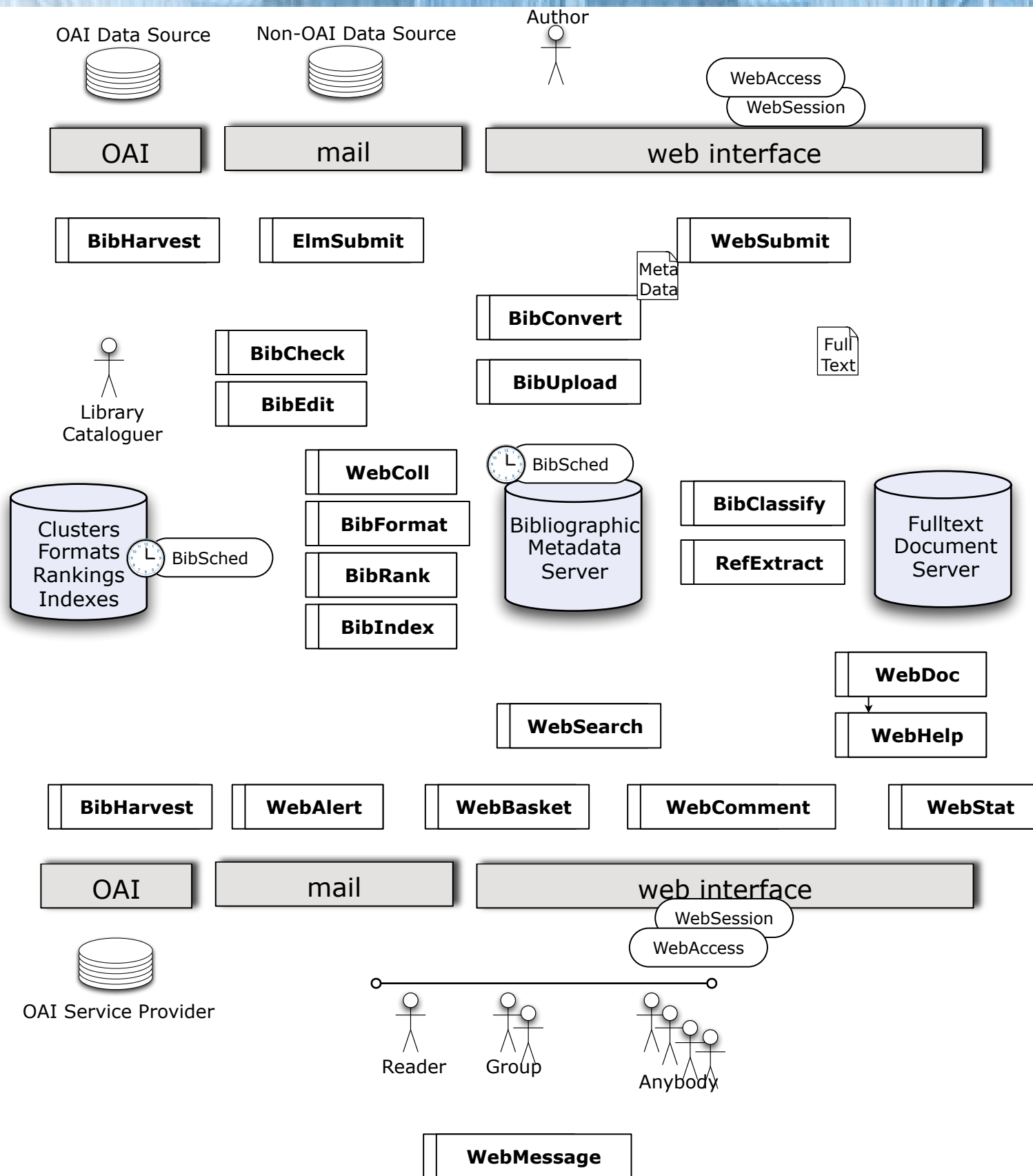


# How to install

- Unix/Linux
- Python
- Apache + mod\_python
- MySQL + MySQLdb
- Other smaller dependencies
- See: <http://cdsware.cern.ch/download/INSTALL>
- Contact [project-cdsware-users@cern.ch](mailto:project-cdsware-users@cern.ch) for help

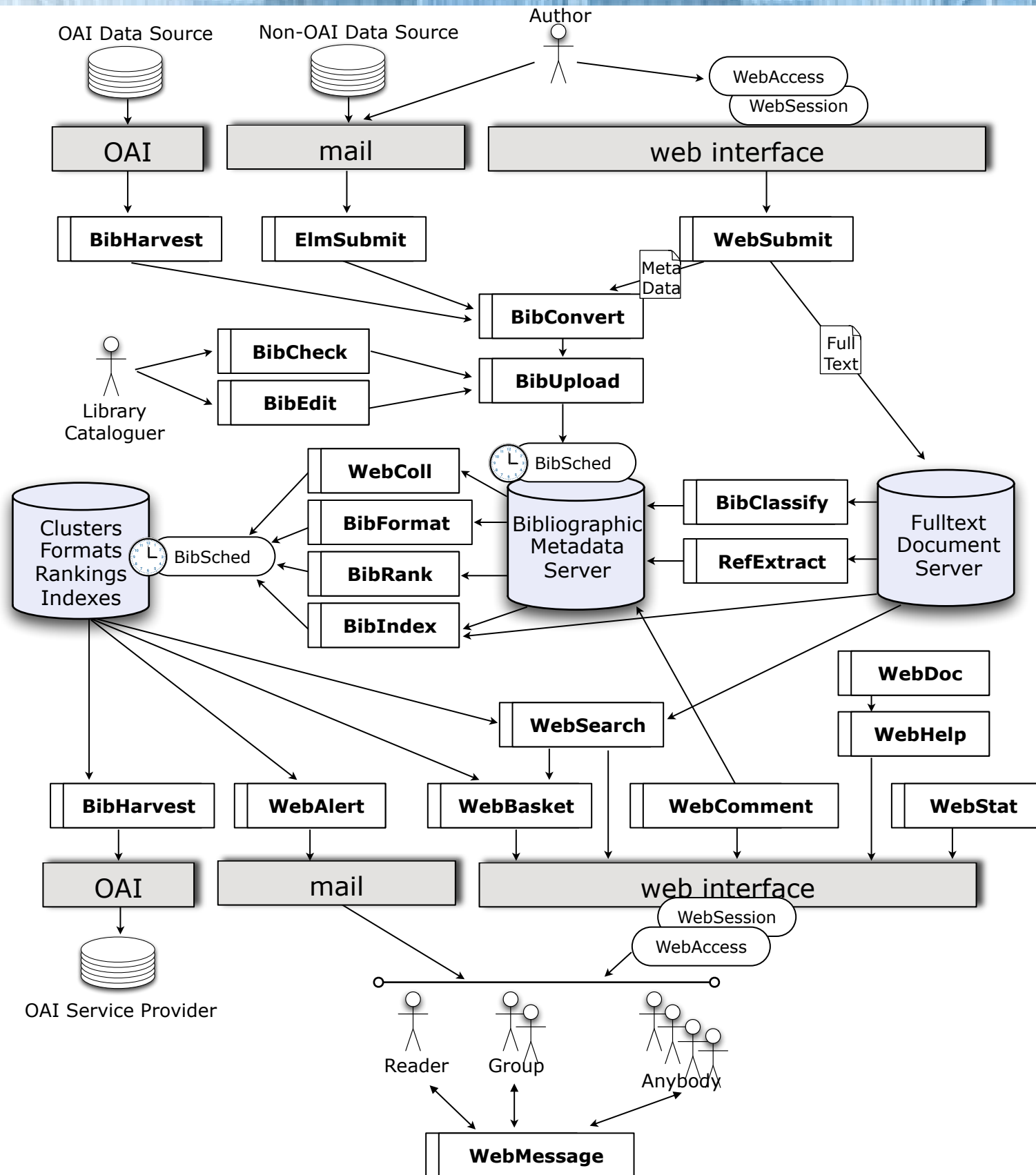


# Workflow

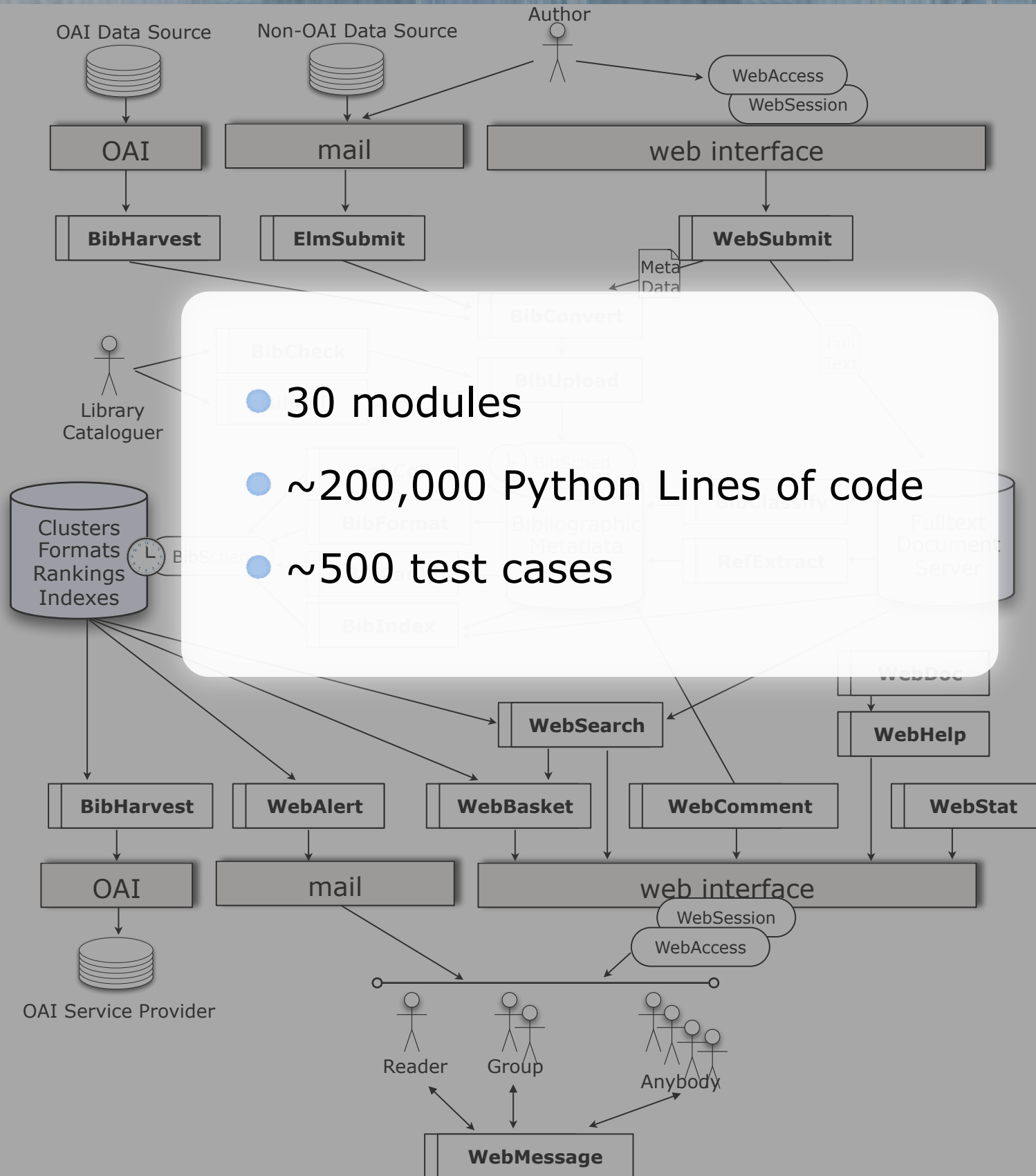




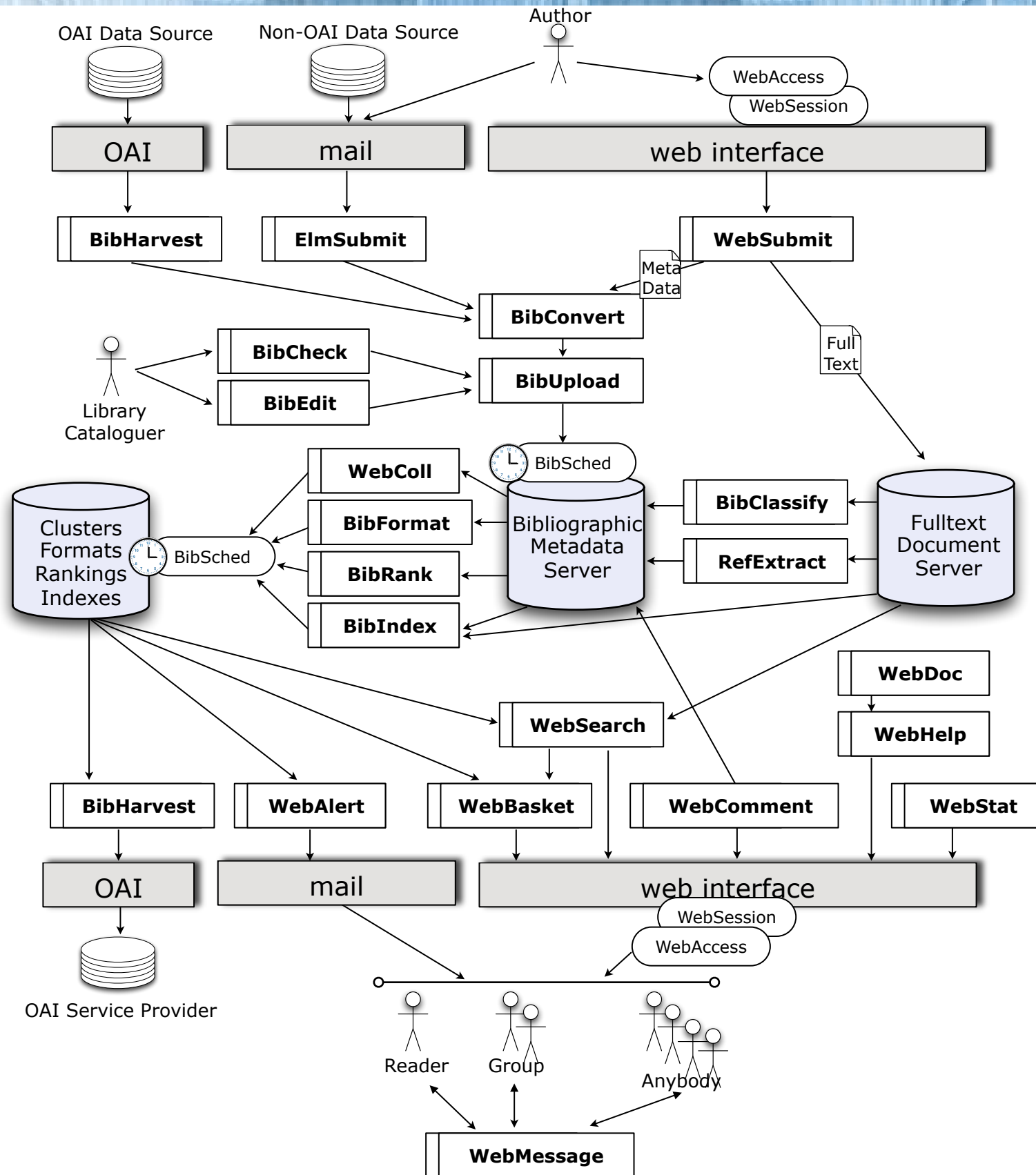
# Workflow



# Workflow

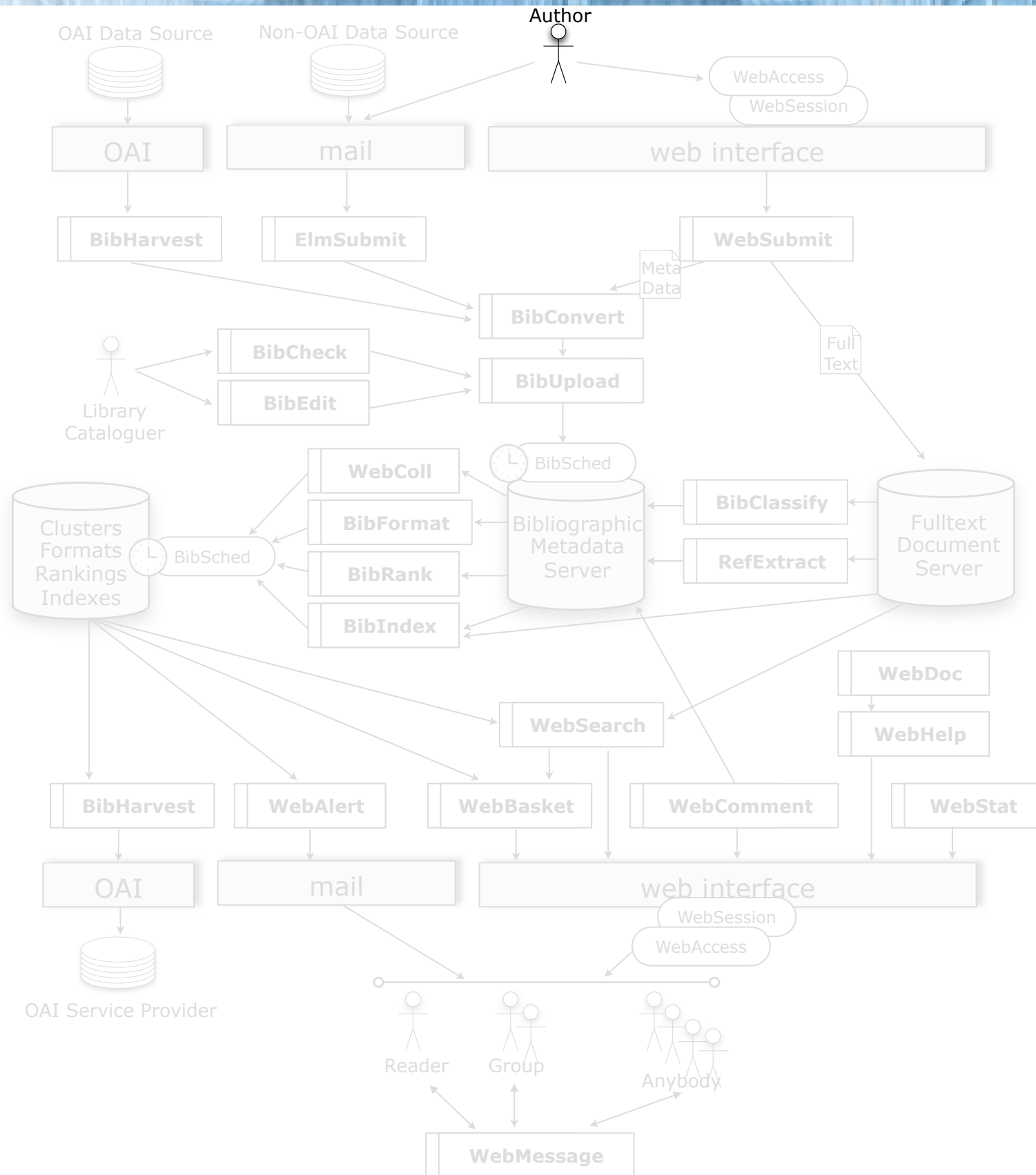


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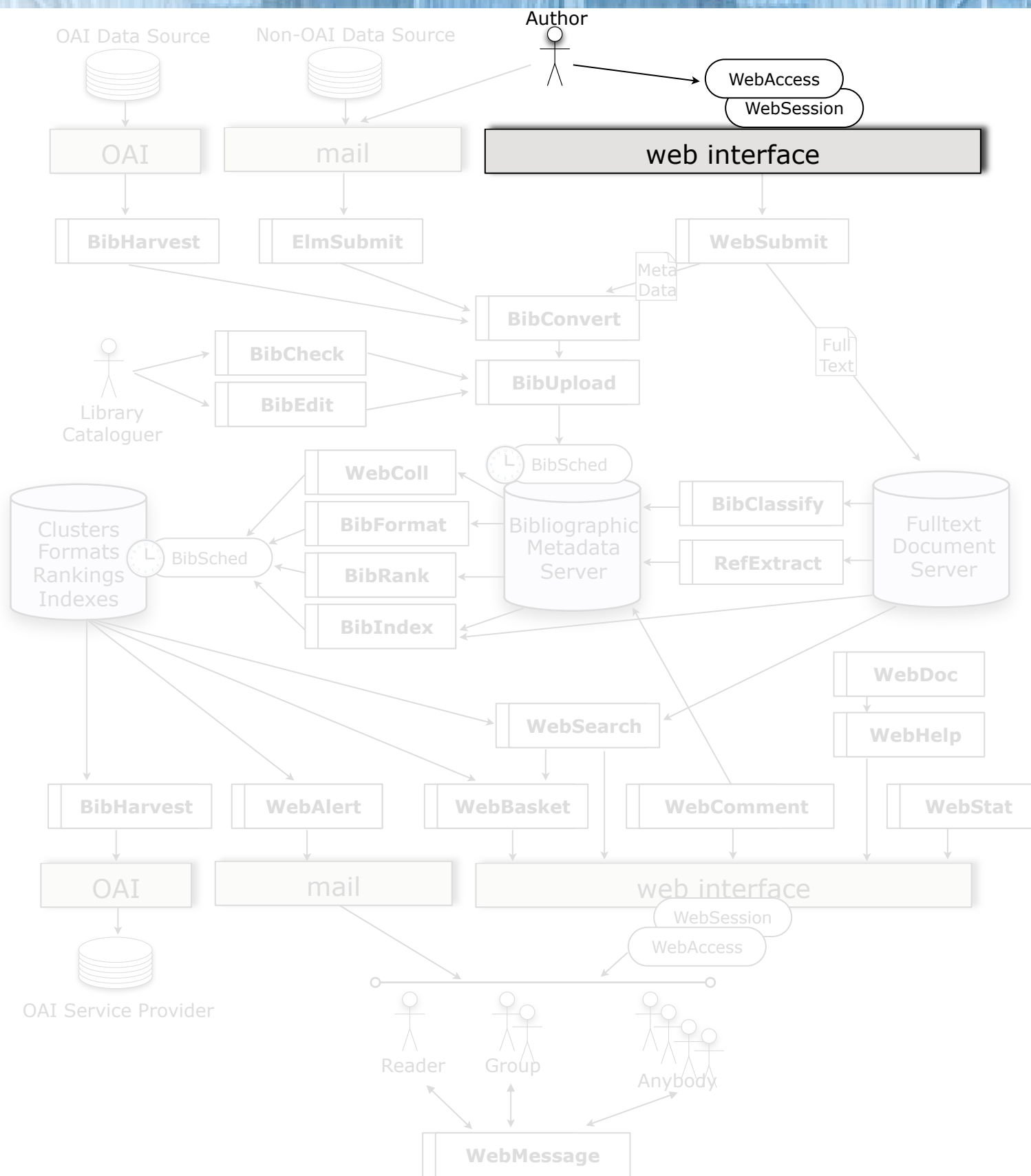




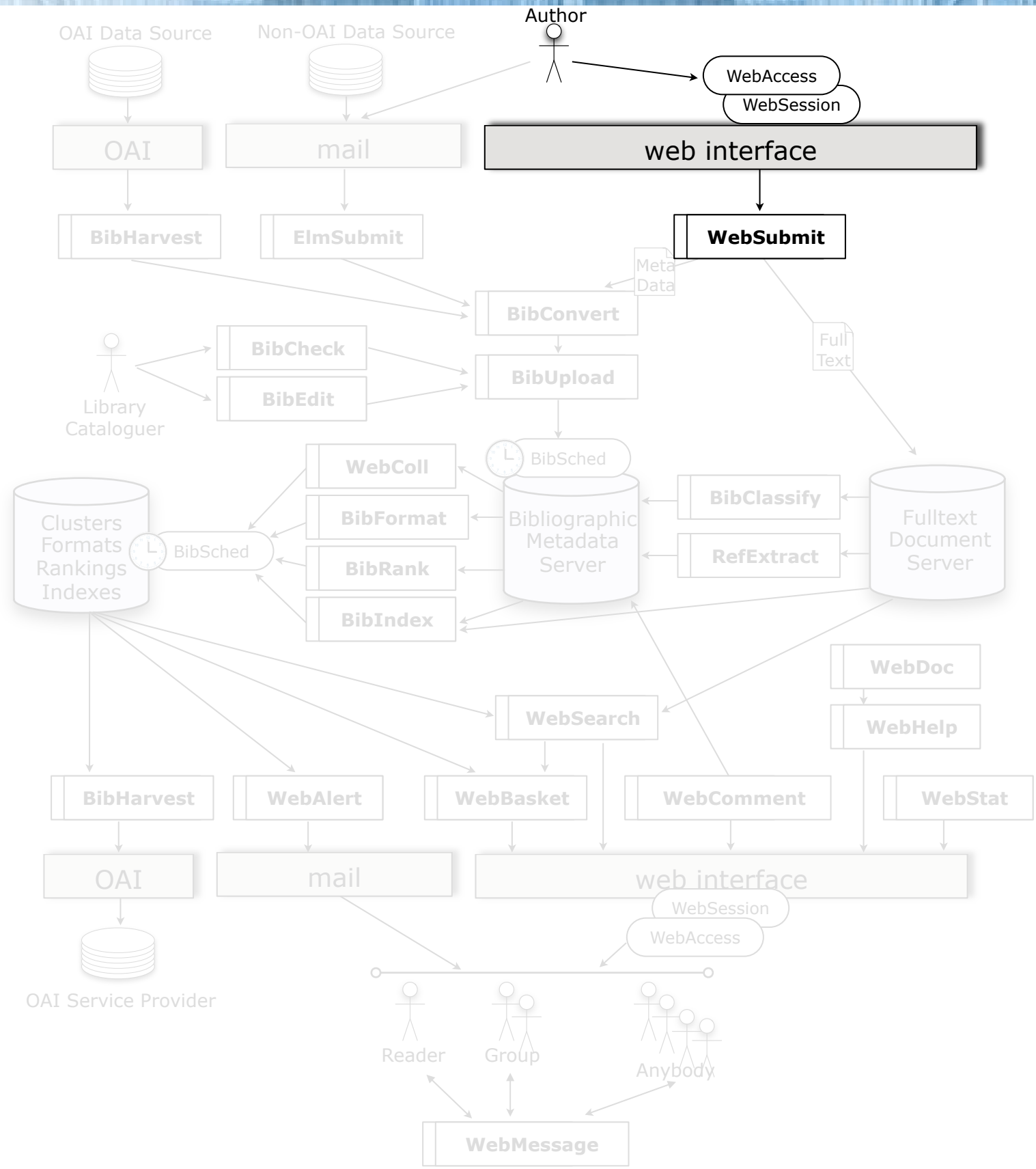
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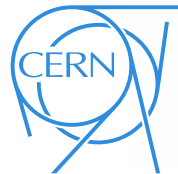
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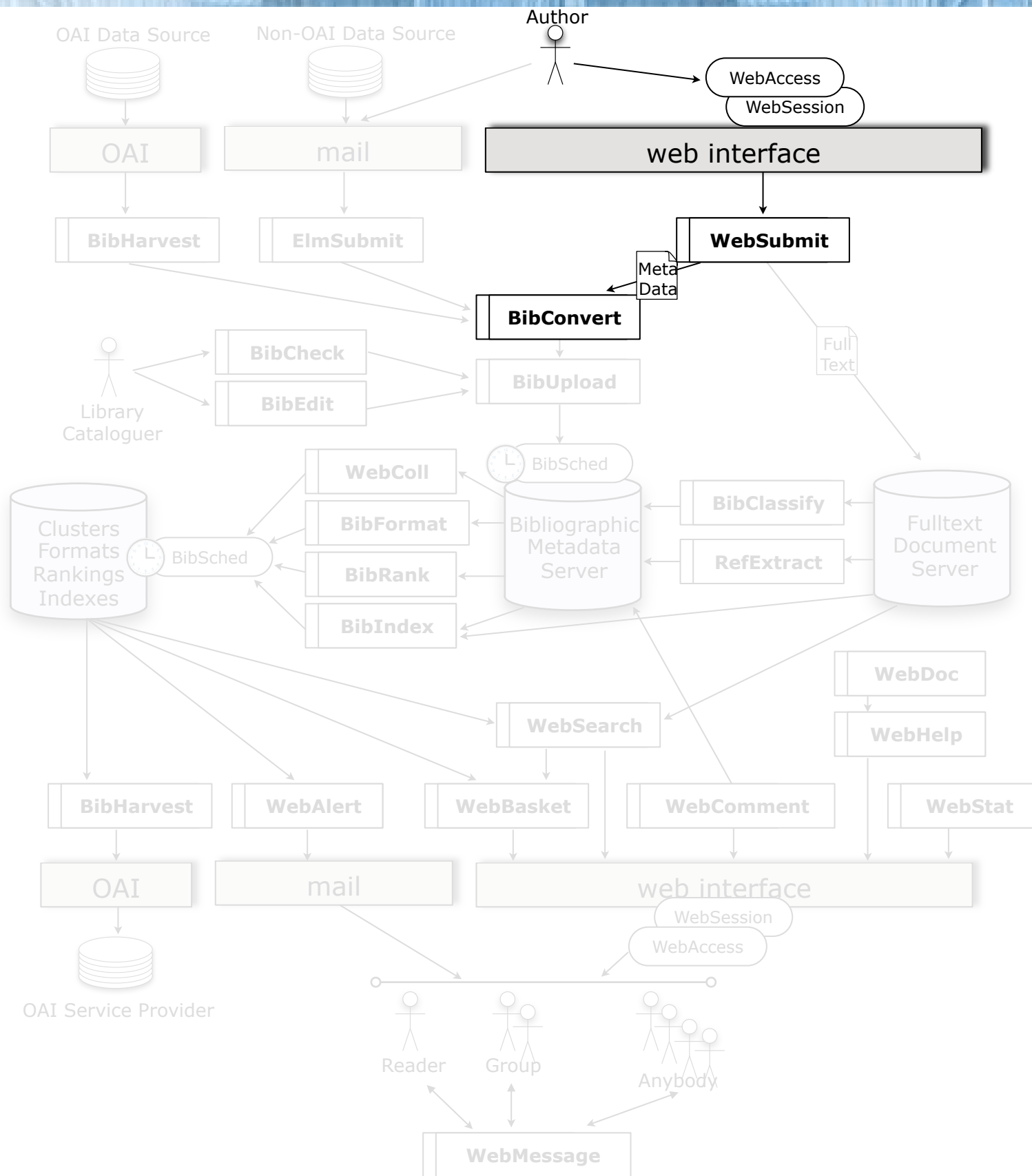
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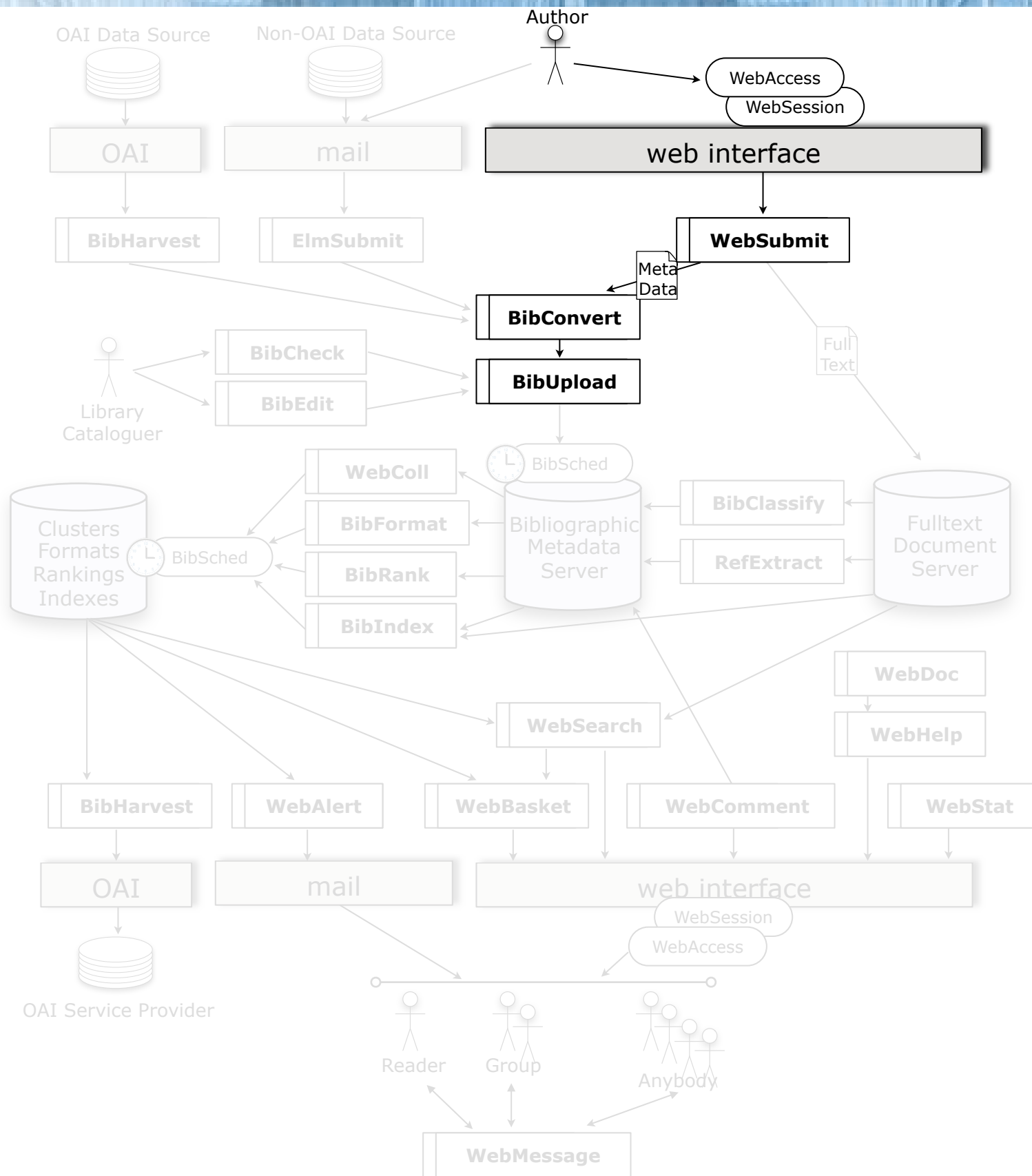




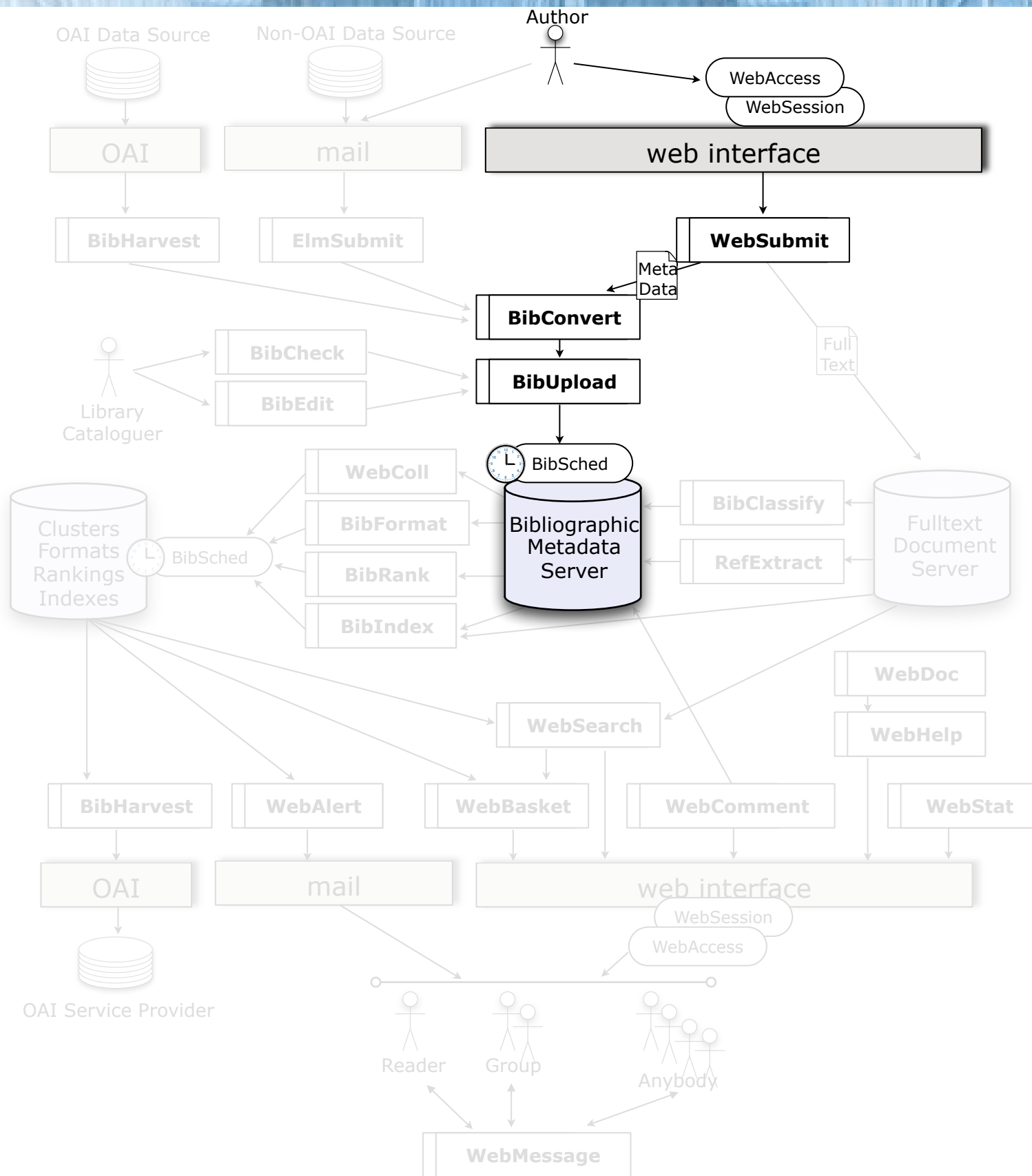
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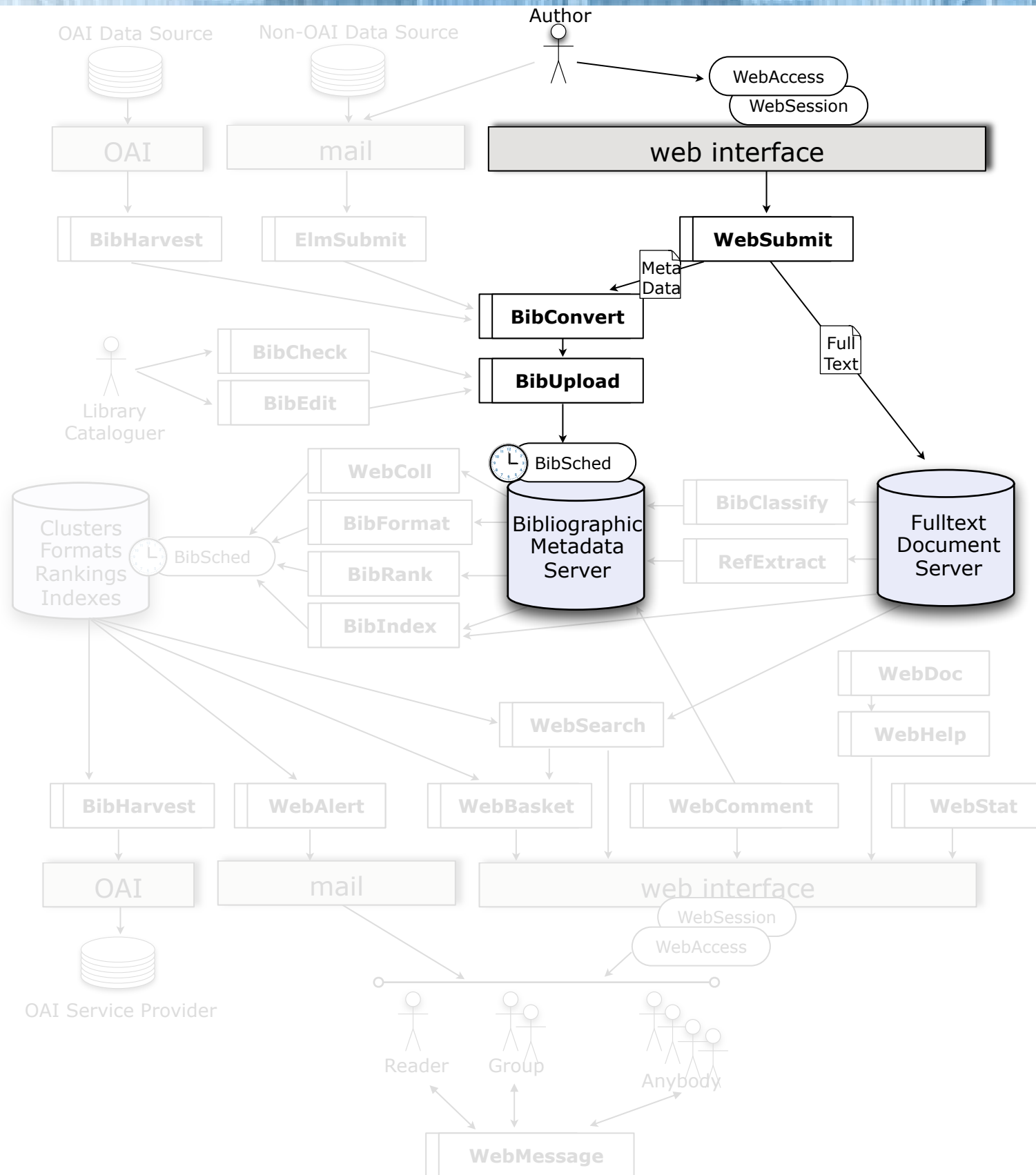


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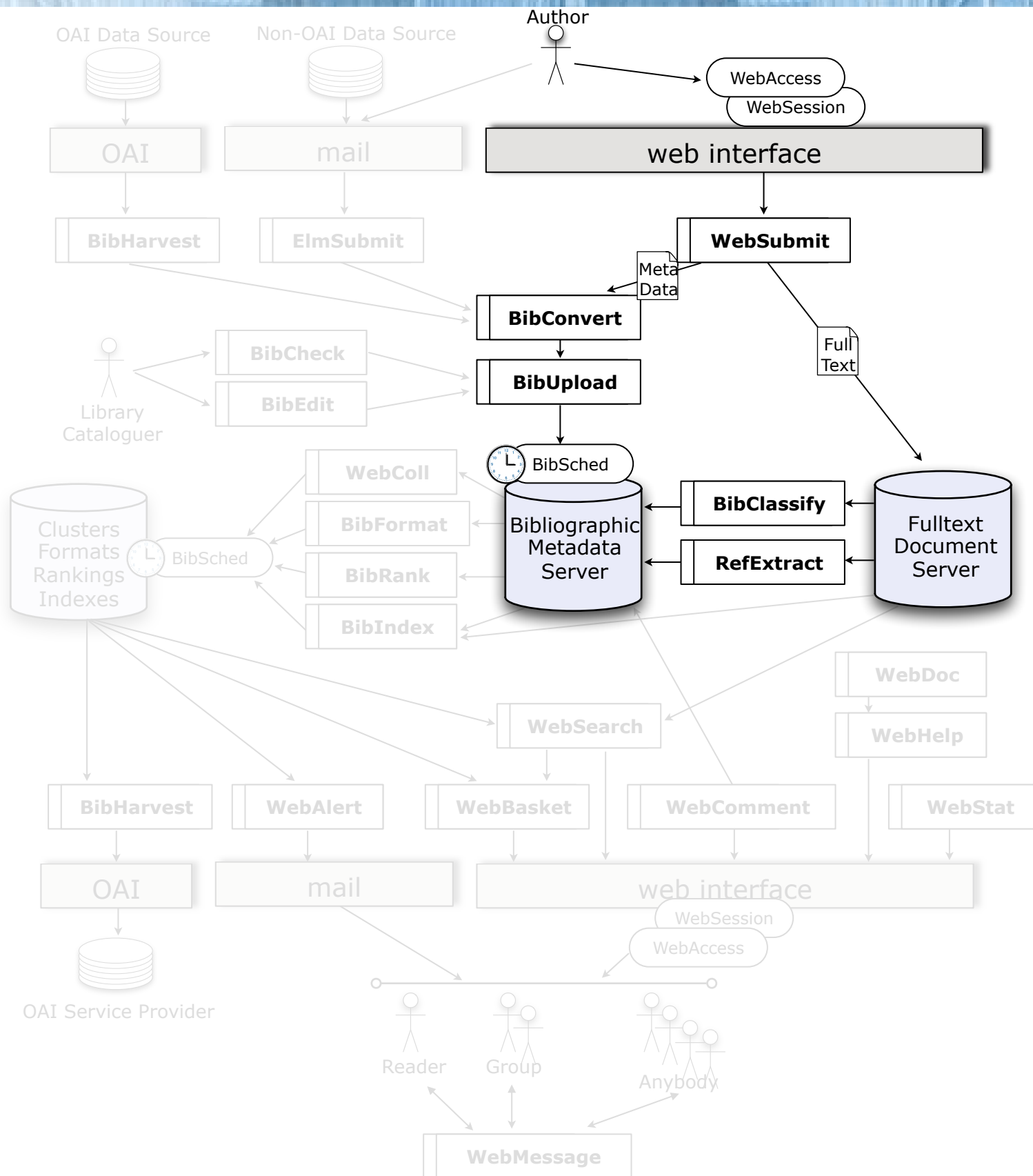


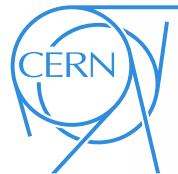


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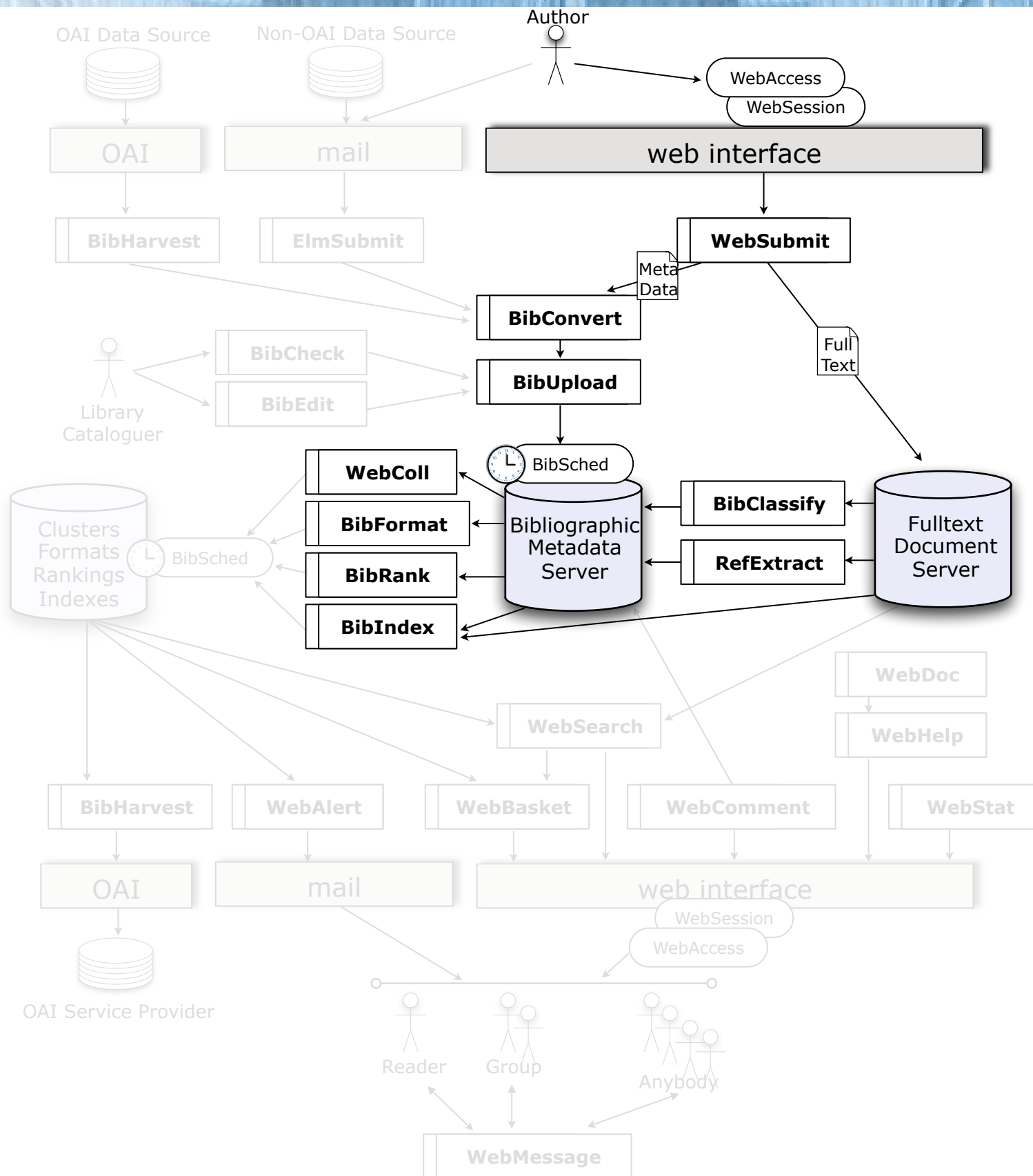


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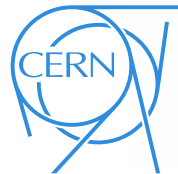




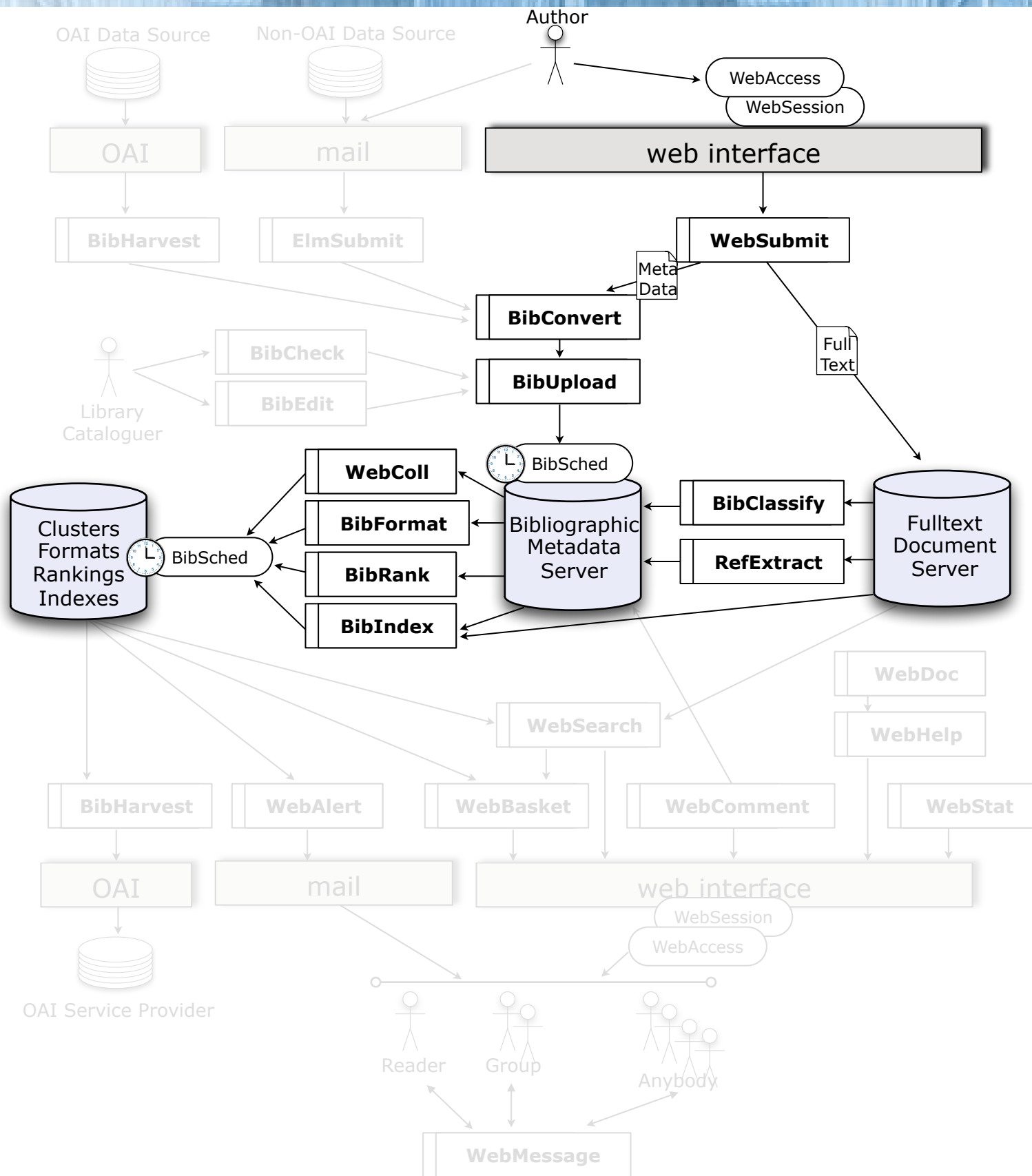
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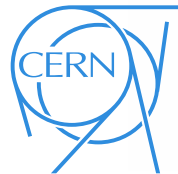




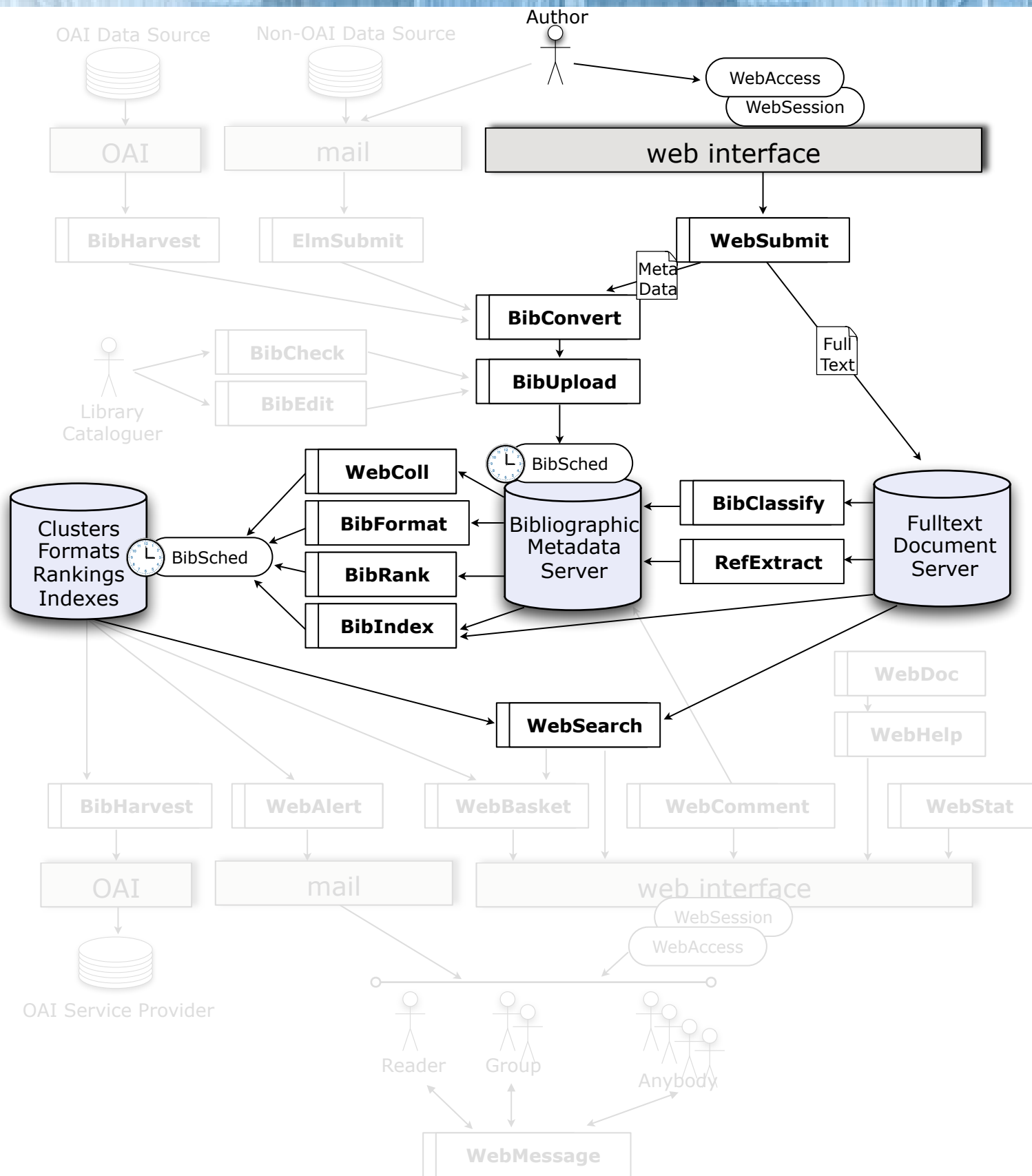


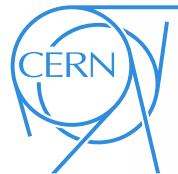
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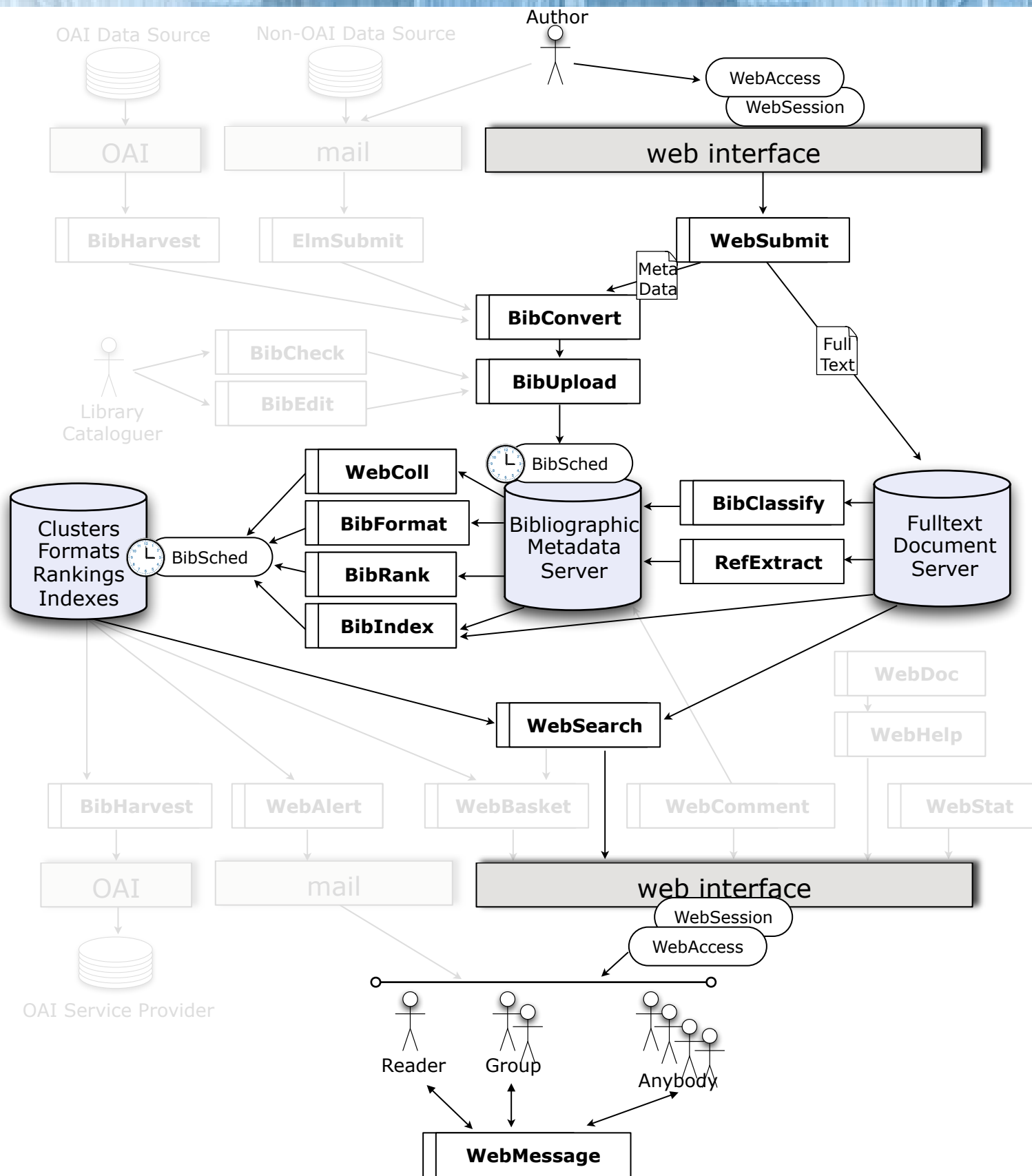


# Workflow





# Workflow





```
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ID      PROC [PRI]  USER      RUNTIME      SLEEP  STATUS  PROGRESS  
-----  
7       bibindex      admin     2008-07-04 19:53:16  5m     WAITING  
8       bibreformat   admin     2008-07-04 19:53:55  5m     WAITING  
13      oaiharvest    admin     2008-07-04 19:53:59  5m     WAITING  
11      oaiarchive    admin     2008-07-04 19:53:59  5m     WAITING  
9       webcoll       admin     2008-07-04 20:47:42  1h     WAITING  
10      invenio_gc    admin     2008-07-04 19:53:59  5m     WAITING  
-----  
Automatic Mode [A Manual] [1/2/3 Display] [P Purge] [l/L Log] [O Opts] [Q Quit]
```

```
id: 9  
priority: 0  
proc: webcoll  
user: admin  
runtime: 2008-07-04 20:47:42  
sleeptime: 1h  
status: WAITING  
progress:  
executable : /opt/cds-dev/bin/webcoll  
arguments : -slh -uadmin  
  
Press a key to continue...
```

## Background daemons

- Inputting
- Indexing
- Pre-caching
- Monitoring
- Tasks scheduling



# Integration & Customization





# Style Customization

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*Portal boxes*

*Collection tree*





# Style Customization

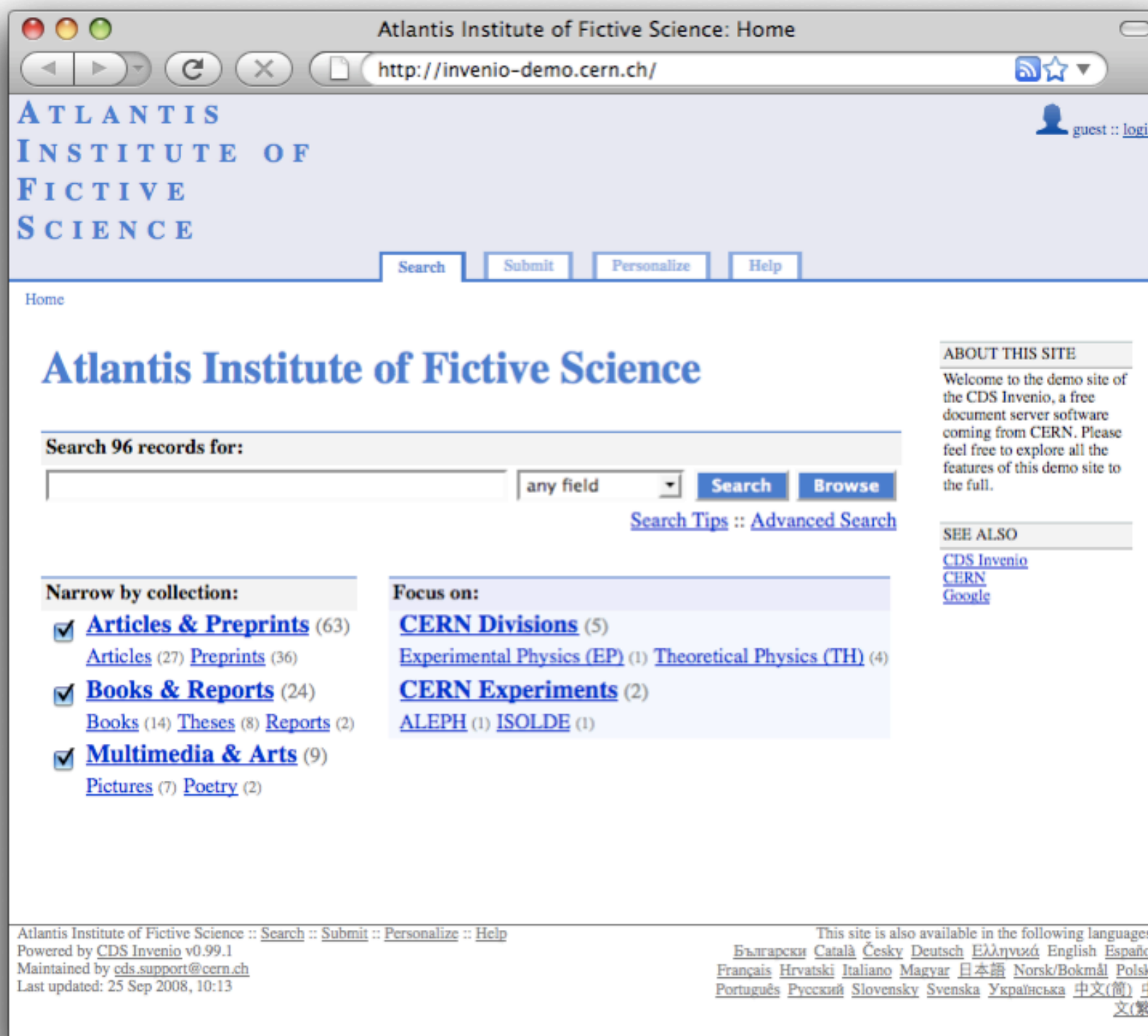
Each building block of the web interface



Portal boxes

Collection tree

- Templating system, with WebStyle



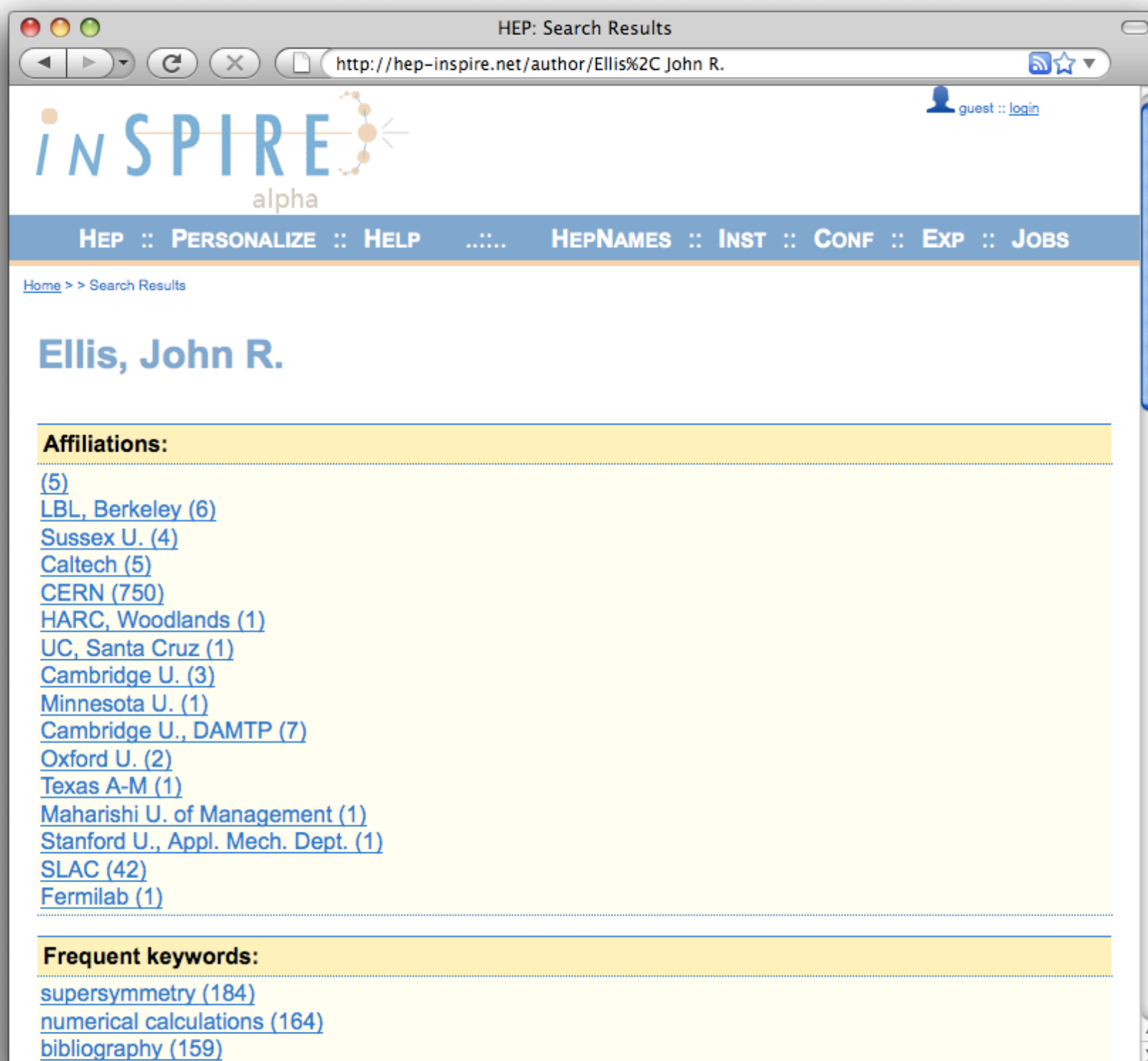
- Templating system, with WebStyle



The screenshot shows a web browser window displaying a record on the CERN Document Server. The browser's address bar shows the URL <http://cdsweb.cern.ch/record/1178304>. The page features a filmstrip navigation bar at the top, followed by the title "Exhibition 'Angels & Demons' : the science behind the story". Below the title is a video player showing a scene with Tom Hanks. To the right of the video player is a text description of the exhibition, including production details and keywords. Below the video player, there is a "Download Movie" section with options for Flash (High and Medium) and Windows Media (Medium and High). A "See also" section on the right lists related content with small video thumbnails. The page footer indicates "This page has been viewed by 354 users".

- Templating system, with WebStyle

# Style Customization



HEP: Search Results  
[http://hep-inspire.net/author/Ellis%2C John R.](http://hep-inspire.net/author/Ellis%2C%20John%20R.) guest :: [login](#)

**INSPIRE**  
alpha

HEP :: [PERSONALIZE](#) :: [HELP](#) ..... [HEPNAMES](#) :: [INST](#) :: [CONF](#) :: [EXP](#) :: [JOBS](#)

[Home](#) > > [Search Results](#)

## Ellis, John R.

**Affiliations:**

- [\(5\)](#)
- [LBL, Berkeley \(6\)](#)
- [Sussex U. \(4\)](#)
- [Caltech \(5\)](#)
- [CERN \(750\)](#)
- [HARC, Woodlands \(1\)](#)
- [UC, Santa Cruz \(1\)](#)
- [Cambridge U. \(3\)](#)
- [Minnesota U. \(1\)](#)
- [Cambridge U., DAMTP \(7\)](#)
- [Oxford U. \(2\)](#)
- [Texas A-M \(1\)](#)
- [Maharishi U. of Management \(1\)](#)
- [Stanford U., Appl. Mech. Dept. \(1\)](#)
- [SLAC \(42\)](#)
- [Fermilab \(1\)](#)

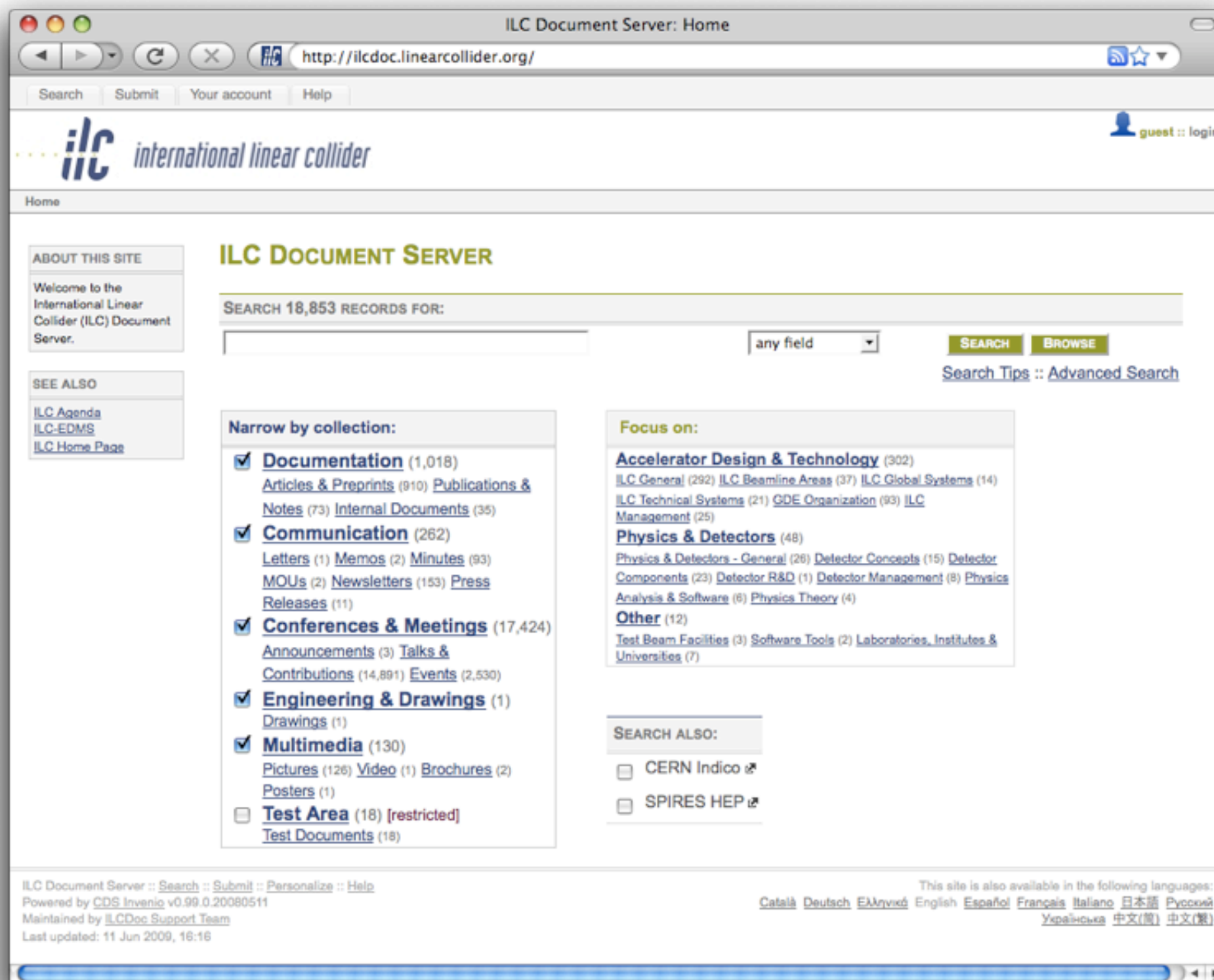
**Frequent keywords:**

- [supersymmetry \(184\)](#)
- [numerical calculations \(164\)](#)
- [bibliography \(159\)](#)

- Templating system, with WebStyle

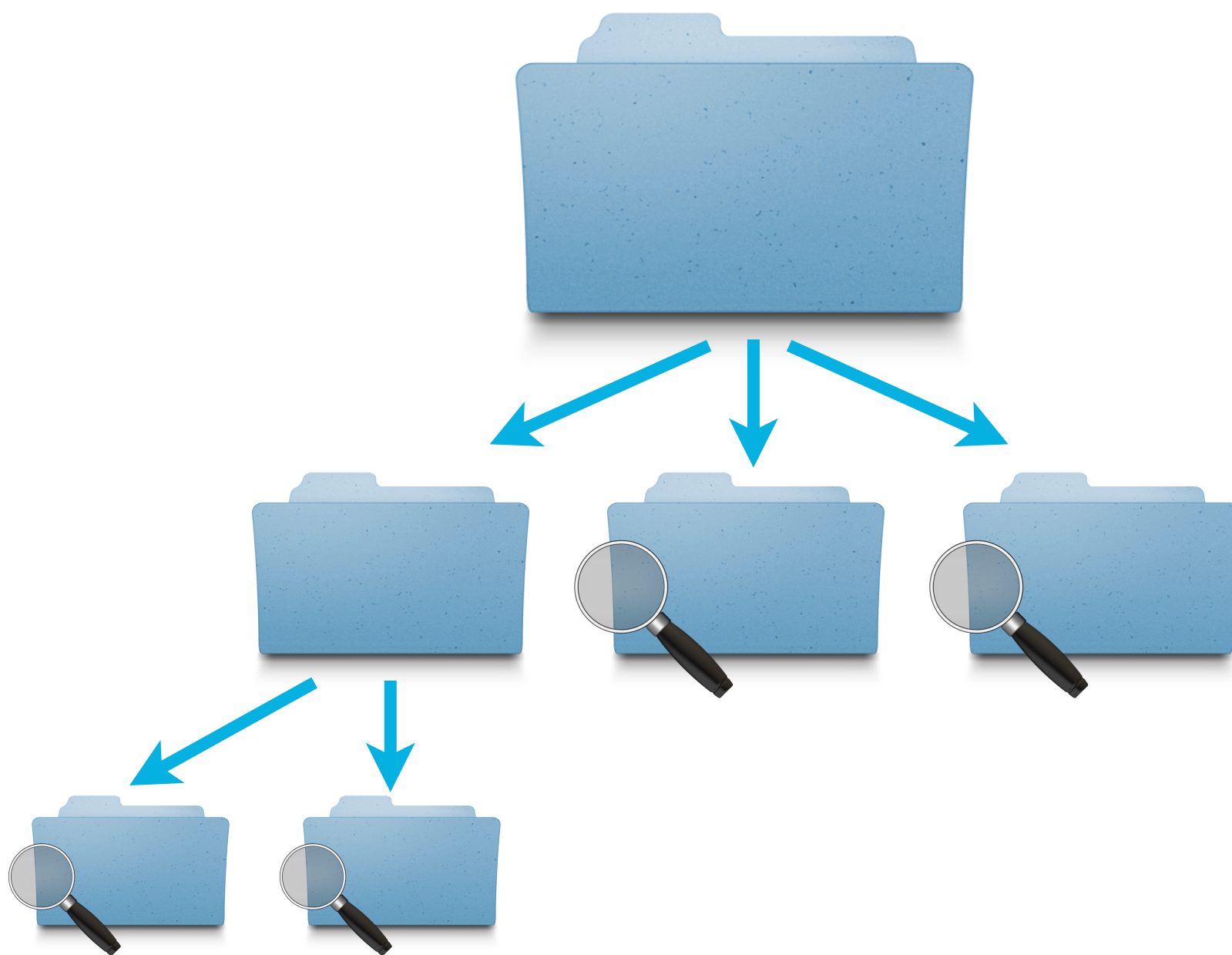


# Style Customization



- Templating system, with WebStyle

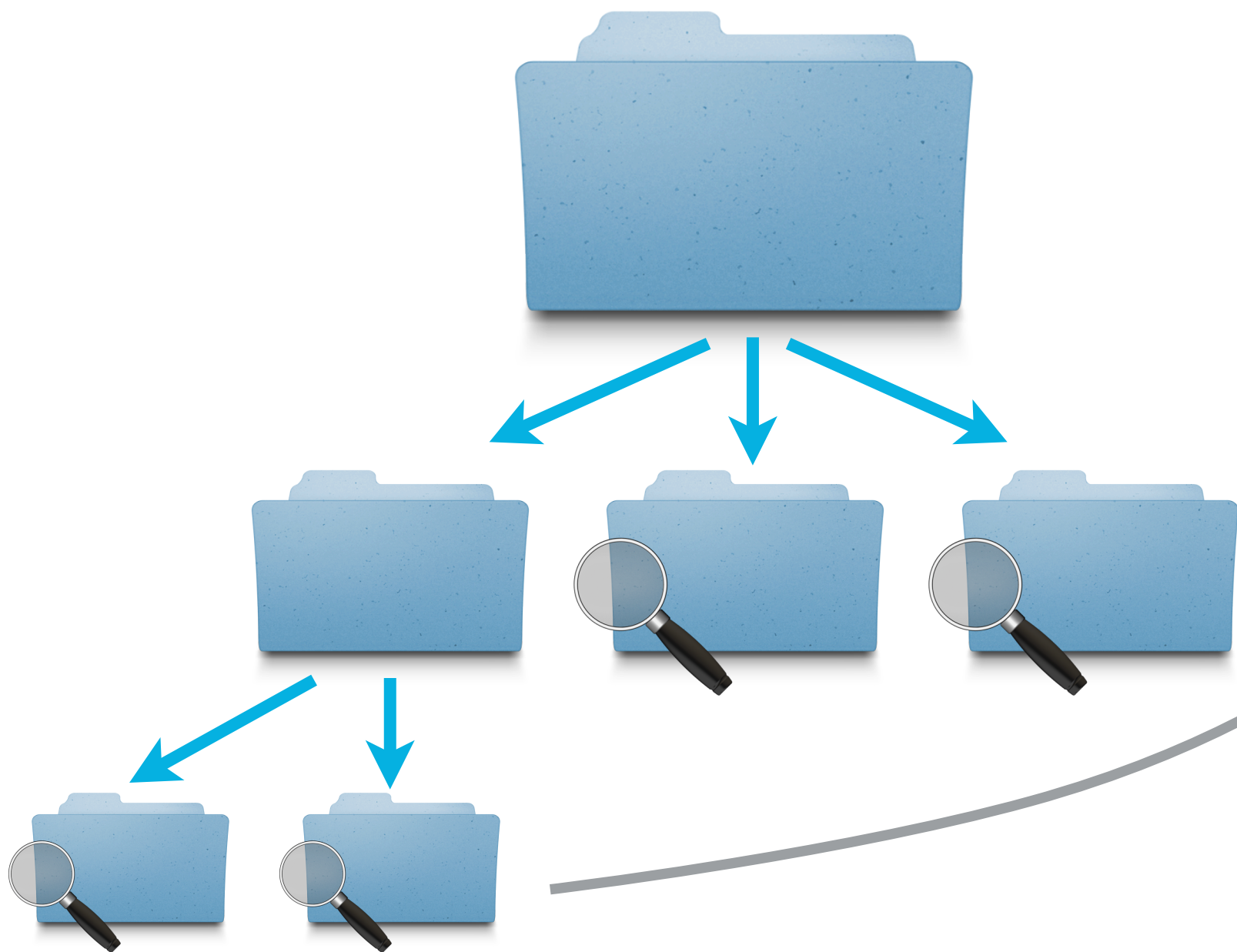
# Collection Tree



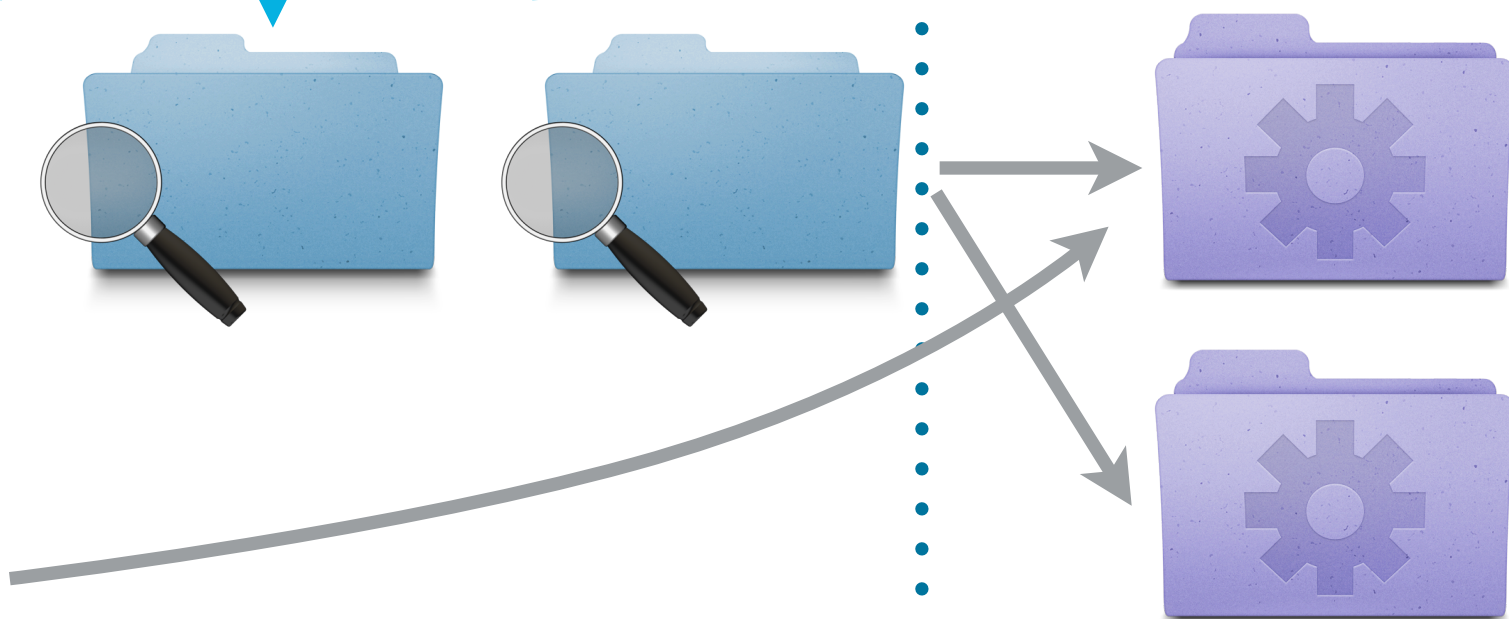


# Collection Tree

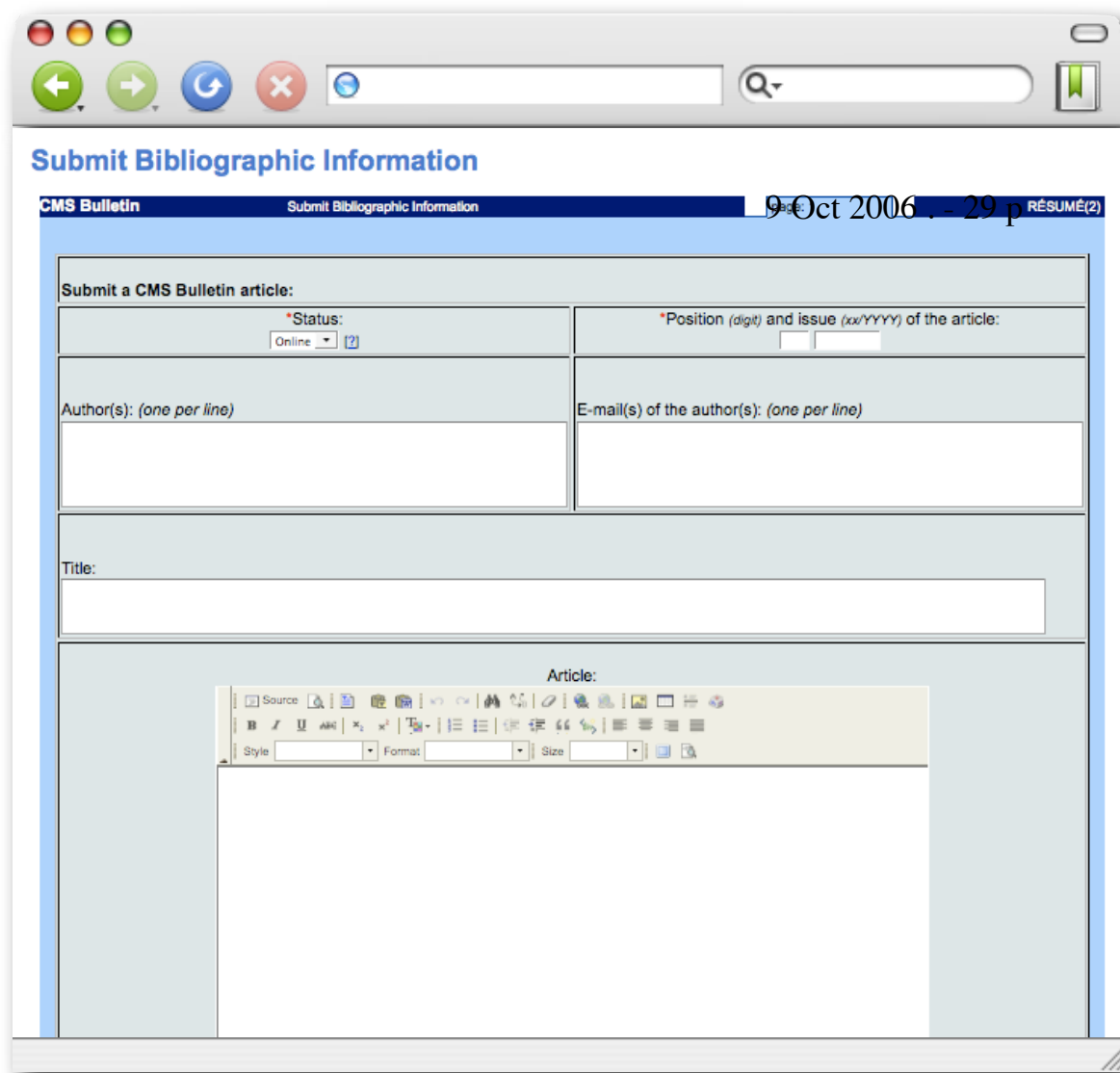
Regular collections  
*("narrow by")*



Virtual collections  
*("focus on")*



# Submissions

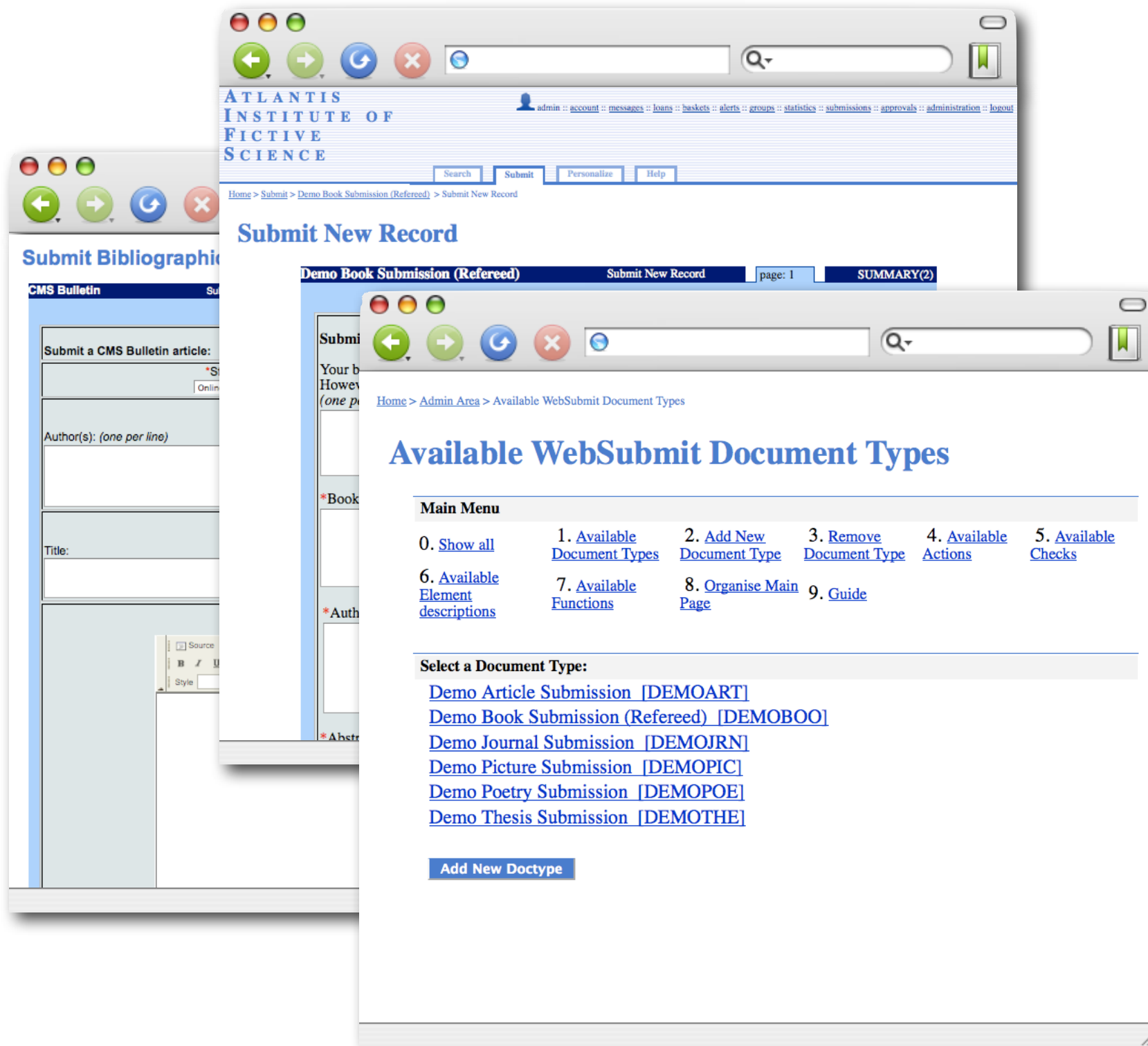


The screenshot shows a web browser window with the title 'Submit Bibliographic Information'. The browser's address bar shows '9 Oct 2006, 29 p RÉSUMÉ(2)'. The form is titled 'Submit a CMS Bulletin article:' and contains several input fields:

- \*Status: Online [?]
- \*Position (digit) and issue (xx/YYYY) of the article: [ ] [ ]
- Author(s): (one per line) [ ]
- E-mail(s) of the author(s): (one per line) [ ]
- Title: [ ]
- Article: [Rich text editor with toolbar]

- Customizable web forms
- Customizable workflow (approval process, sending emails, conversion, stamping, OCR, etc)
- Metadata & File revisions preserved

# Submissions



- Customizable web forms
- Customizable workflow (approval process, sending emails, conversion, stamping, OCR, etc)
- Metadata & File revisions preserved





- HTML-like
- XSL



The image shows a browser window displaying a search result on the CERN Document Server. The search results list three entries from 2006-08-24. The first entry is highlighted with a red dashed box and contains the following text: "Evaluation of measurement of the critical current density of a superconducting cable (1998) 513-517". Below the title is the author information "Jean-Luc; Ri" and a link to "Detailed record".

The second entry is "Magnetic field of a superconducting cable (1998) 1251-1254" by "T; Cloez, H 2".

The third entry is "Supercritical helium cooling of a superconducting cable (1994) 591-597" by "Duchateau, Jean-Luc; Bonnard, Alain; Rousset, Bernard".

The main window shows the article "LHCb: Monitoring the DIRAC Distribution System" by Nandakumar, R.; Seco Miguelez, M.; Santinelli, R. The abstract is partially visible: "Abstract to any (current intended for mining consists wait to and age activity An imp the infr of these".

The XML metadata for the article is displayed in a separate window:

```
--<articles>
--<article>
--<front>
--<journal-meta>
  <journal-title>Mod. Phys. Lett. A</journal-title>
  <abbrev-journal-title>Mod. Phys. Lett. A</abbrev-journal-title>
  <issn/>
</journal-meta>
--<article-meta>
--<title-group>
  --<article-title>
    Non-Abelian Flat Directions in a Minimal Superstring Standard Mod
  </article-title>
</title-group>
--<contrib-group>
  --<contrib contrib-type="author">
    --<name>
      <surname>Clever</surname>
      <given-names>G B</given-names>
    </name>
  </contrib>
  --<contrib contrib-type="author">
    --<name>
      <surname>Faraggi</surname>
      <given-names>A E</given-names>
    </name>
  </contrib>
  --<contrib contrib-type="author">
```

- HTML-like
- XSL

# Authentication

To support an external authentication method (e.g. to interact with an institutional Human Resources Database, implementing):

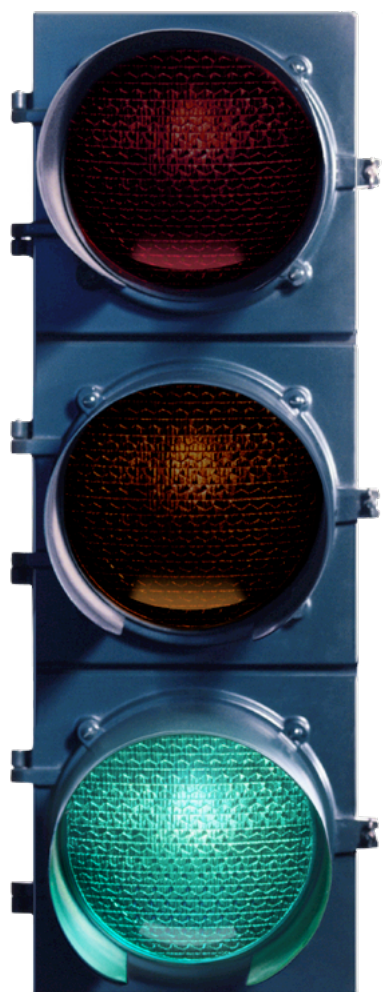
- user/password checking
- External group/ mailing list membership importing
- External user details (e.g. phone number, affiliation...)



## Authentication methods:

- «Internal»
- Shibboleth
- LDAP
- ... (write your plugin)

# Access Control



- RBAC (Role Based Access Control)  
<http://invenio-demo.cern.ch/help/admin/webaccess-admin-guide>
- FireRole (Firewall Like Role Definition)  
<http://invenio-demo.cern.ch/help/admin/webaccess-admin-guide#6>



# Access Control



- RBAC (Role Based Access Control)

<http://invenio-demo.cern.ch/help/admin/webaccess-admin-guide>

- FireRole (Firewall Like Role Definition)

<http://invenio-demo.cern.ch/help/admin/webaccess-admin-guide#6>

```
allow email /*cern.ch/,/*slac.stanford.edu/  
deny group badguys  
allow remote_ip "123.0.0.0/24"  
deny all
```



# Tools (Cataloguing)



CERN Document Server: BibEdit

http://cdsweb.cern.ch/record/edit/?ln=en#state=edit&recid=1183466

Home > Admin Area > BibEdit

## BibEdit: Record #1183466 [\(view history\)](#)

1183466 Rec ID

Search

Submit Cancel

View

Fields

Ready

[Help](#)

<input type="checkbox"/> 001			1183466	
<input type="checkbox"/> 003			SzGeCERN	
<input type="checkbox"/> 005			20090611172916.0	
<input type="checkbox"/> 041__		<input type="checkbox"/> \$\$a	eng	<input type="checkbox"/>
<input type="checkbox"/> 100__	↓	<input type="checkbox"/> \$\$a	Valishev, A	<input type="checkbox"/>
	↑	<input type="checkbox"/> \$\$u	Fermilab	<input type="checkbox"/>
<input type="checkbox"/> 245__		<input type="checkbox"/> \$\$a	Simulation of Beam-Beam Effects and Tevatron Experience	<input type="checkbox"/>
<input type="checkbox"/> 260__		<input type="checkbox"/> \$\$c	2008	<input type="checkbox"/>
<input type="checkbox"/> 595__		<input type="checkbox"/> \$\$a	SIS EPAC2008	<input type="checkbox"/>
<input type="checkbox"/> 65017	↓	<input type="checkbox"/> \$\$2	SzGeCERN	<input type="checkbox"/>
	↑	<input type="checkbox"/> \$\$a	Accelerators and Storage Rings	<input type="checkbox"/>
<input type="checkbox"/> 690C_		<input type="checkbox"/> \$\$a	ARTICLE	<input type="checkbox"/>
<input type="checkbox"/> 710__		<input type="checkbox"/> \$\$g	for the Tevatron Group	<input type="checkbox"/>
<input type="checkbox"/> 8564_	↓	<input type="checkbox"/> \$\$u	http://accelconf.web.cern.ch/AccelConf/e08/papers/thym01.pdf	<input type="checkbox"/>
	↑	<input type="checkbox"/> \$\$y	Published version from JACoW	<input type="checkbox"/>
<input type="checkbox"/> 916__	↓	<input type="checkbox"/> \$\$s	n	<input type="checkbox"/>
	↑	<input type="checkbox"/> \$\$w	200924	<input type="checkbox"/>
<input type="checkbox"/> 960__		<input type="checkbox"/> \$\$a	13	<input type="checkbox"/>
<input type="checkbox"/> 961__	↓	<input type="checkbox"/> \$\$c	20090611	<input type="checkbox"/>
	↑ ↓	<input type="checkbox"/> \$\$h	1729	<input type="checkbox"/>
	↑ ↓	<input type="checkbox"/> \$\$l	CER01	<input type="checkbox"/>
	↑	<input type="checkbox"/> \$\$x	20090611	<input type="checkbox"/>
<input type="checkbox"/> 962__	↓	<input type="checkbox"/> \$\$b	002705838	<input type="checkbox"/>
	↑ ↓	<input type="checkbox"/> \$\$k	THYM01	<input type="checkbox"/>
	↑	<input type="checkbox"/> \$\$n	genoa20080623	<input type="checkbox"/>
<input type="checkbox"/> 963__		<input type="checkbox"/> \$\$a	PUBLIC	<input type="checkbox"/>
<input type="checkbox"/> 970__		<input type="checkbox"/> \$\$a	002826547CER	<input type="checkbox"/>
<input type="checkbox"/> 980__		<input type="checkbox"/> \$\$a	ARTICLE	<input type="checkbox"/>

# Record enrichment

- BibMerge to merge records
- BibCheck batch record checker and corrector
- RefExtract to extract reference lists from PDFs
- BibClassify to extract keywords (RDF taxonomy)

baryon: asymmetry effect: nonperturbative  
energy: density field theory: scalar fluctuation  
fundamental constant: fine structure gravitation inflation  
inflaton: decay inflaton: oscillation  
magnetic moment **mass** potential: scalar  
**preheating** resonance: effect rotation  
supersymmetry: flat direction temperature: reheating



# Looking for help?



e.g. <http://invenio-demo.cern.ch/help/admin/>

Admin Module	Admin Description	Admin Interface	Admin Guide
<b>BibIndex Admin</b>	Enables you to configure "word files", i.e. to define which bibliographic fields are indexed into which word indexes. The word indexes are then used by the search interface. For example, you can define that the logical author index is constructed from physical 100 \$a and 700 \$a bibliographic tags, you can force reindexing of the fulltext index, etc.	<a href="#">Manage indexes</a> <a href="#">Manage logical fields</a>	<a href="#">BibIndex Admin Guide</a>
<b>BibRank Admin</b>	Enables you to configure various ranking methods to be used by the search engine. You can rebalance existing ranking sets, create new ranking methods, etc.	<a href="#">BibRank Admin Interface</a>	<a href="#">BibRank Admin Guide</a>
<b>BibClassify Admin</b>	Enables you to automatically classify documents according to keyword taxonomies and thesauri.	command-line configuration	<a href="#">BibClassify Admin Guide</a>
<b>BibFormat Admin</b>	Enables you to specify how the bibliographic data is presented to the end user in the search interface. You can decide that titles should be presented in bold font, that for each author an automatic link to author's home page should be created according to some receipt, etc.	<a href="#">BibFormat Admin Interface</a>	<a href="#">BibFormat Admin Guide</a>
<b>WebSearch Admin</b>	Enables you to configure the search interface for various metadata collections. You can define new collections and organize them in the tree, you can define various portalboxes that would appear on the screen, you can define search options and search fields to present, etc.	<a href="#">WebSearch Admin Interface</a>	<a href="#">WebSearch Admin Guide</a>
<b>WebStat Admin</b>	Enables you to configure the usage statistics reporting system.	command-line configuration	<a href="#">WebStat Admin Guide</a>



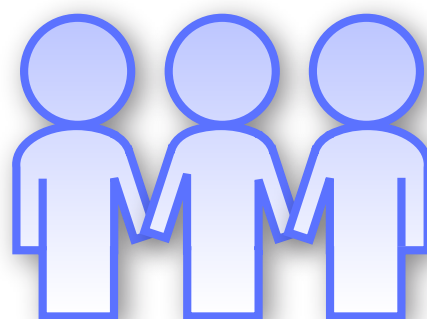
# References...

- CDS Invenio homepage: <http://cdsware.cern.ch/invenio/>
- CERN Document Server: <http://cdsweb.cern.ch/>
- CDS Invenio Demo installation: <http://invenio-demo.cern.ch/>
- Administrating CDS Invenio: <http://invenio-demo.cern.ch/help/admin/>
- Hacking CDS Invenio: <http://invenio-demo.cern.ch/help/hacking/>
- CDS Invenio Wiki: <http://twiki.cern.ch/twiki/bin/view/CDS/Invenio>





Librarian & Admin tools



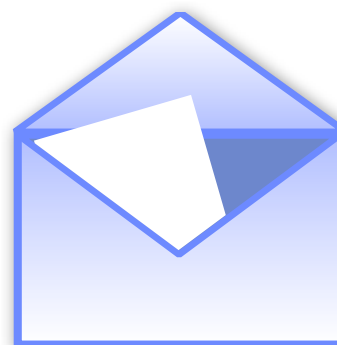
Collaborative tools



Multi-language



Fast search + Browse



+



Alerts (emails, RSS)



Commenting + reviewing



Multiple files formats support

OAI-PMH MARCXML  
OpenURL  
XSLT EndNote  
BibTeX RefWork

Standards support

Web journals,  
OCR,  
and more...



# Thank You!



**Jérôme Caffaro & Samuele Kaplun** – CERN Document Server team  
*CERN workshop on Innovations in Scholarly Communication [17<sup>th</sup> June 2009]*