Solr for newbies

http://brown.edu/go/solr

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BROWN code{4}lib

Useful Links

Workshop links

http://brown.edu/go/solr

http://github.com/hectorcorrea/solr-for-newbies

Code4Lib code of conduct

http://2019.code4lib.org/conduct/

Workshop Outline

1. Introduction
(concepts, quick tour, installation)

2. Schema
(fields, field types, query/ index analyzers)

3. Searching
(query parsers, search params, facets, highlighting)

4. Miscellaneous
(directories, configuration, synonyms, spellcheck)

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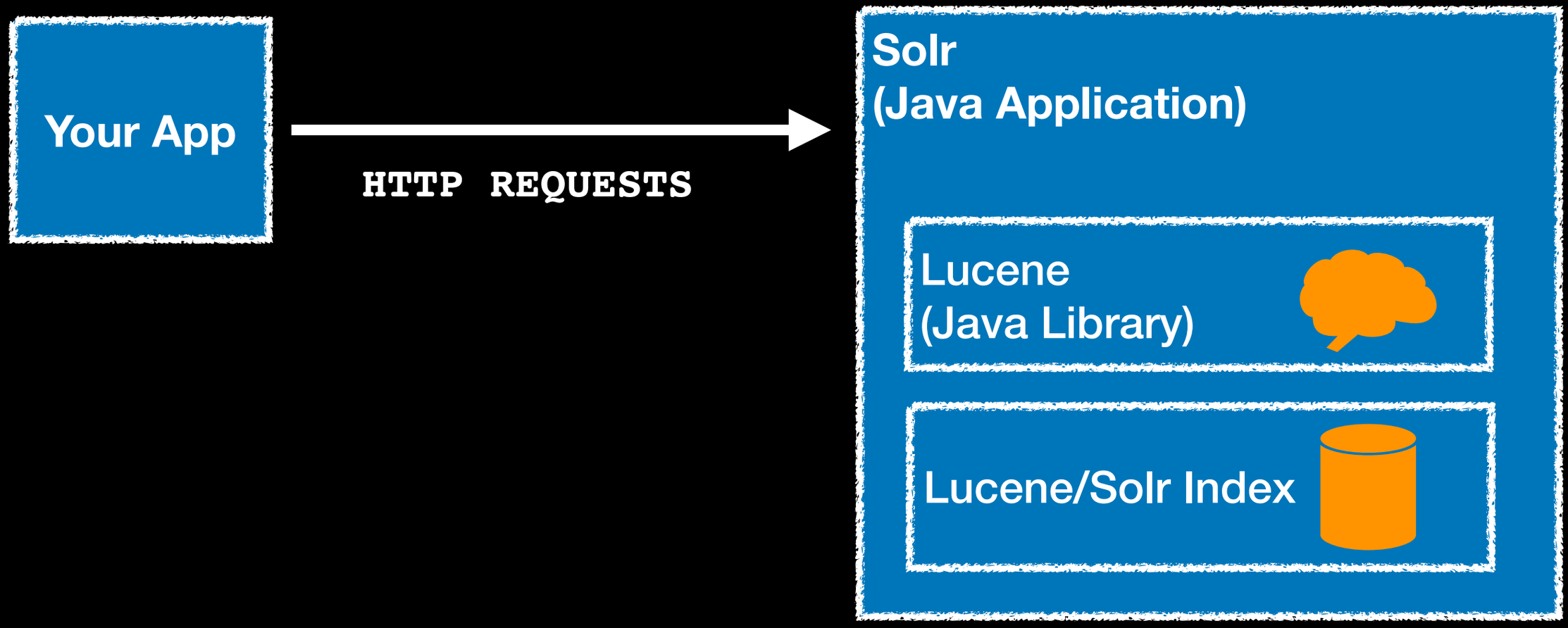
What is Solr

“Solr is the popular, blazing-fast,
open source enterprise **search platform**
built on Apache Lucene.”
- Solr’s Home Page

“Solr is a scalable, ready-to-deploy
enterprise **search engine** that’s optimized
to search large volumes of text-centric data
and return results sorted by relevance.”
- Solr in Action [p. 4]

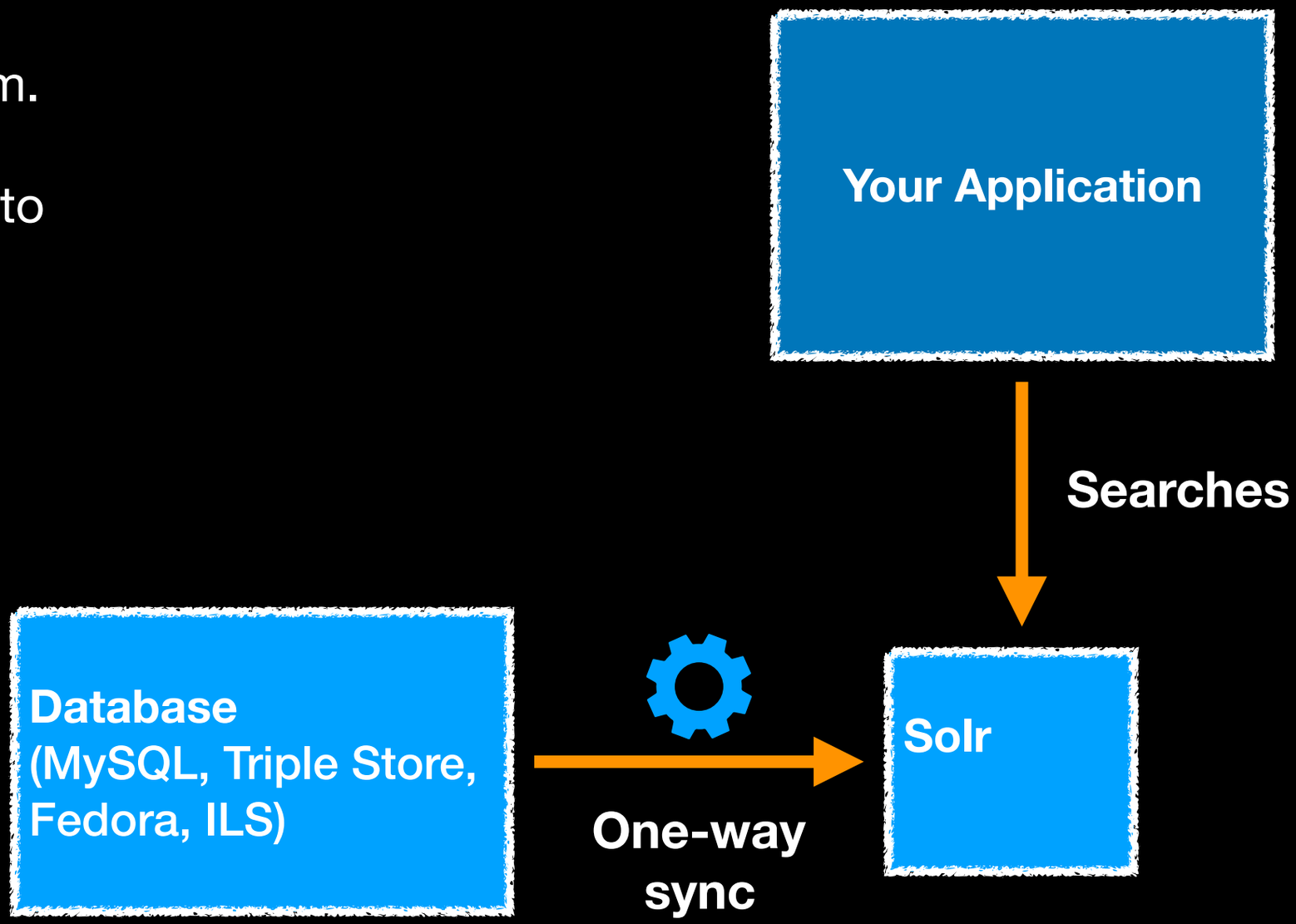
Your App, Solr, and Lucene



Typical Architectures I

Your application searches via Solr, but the data is maintained in another system.

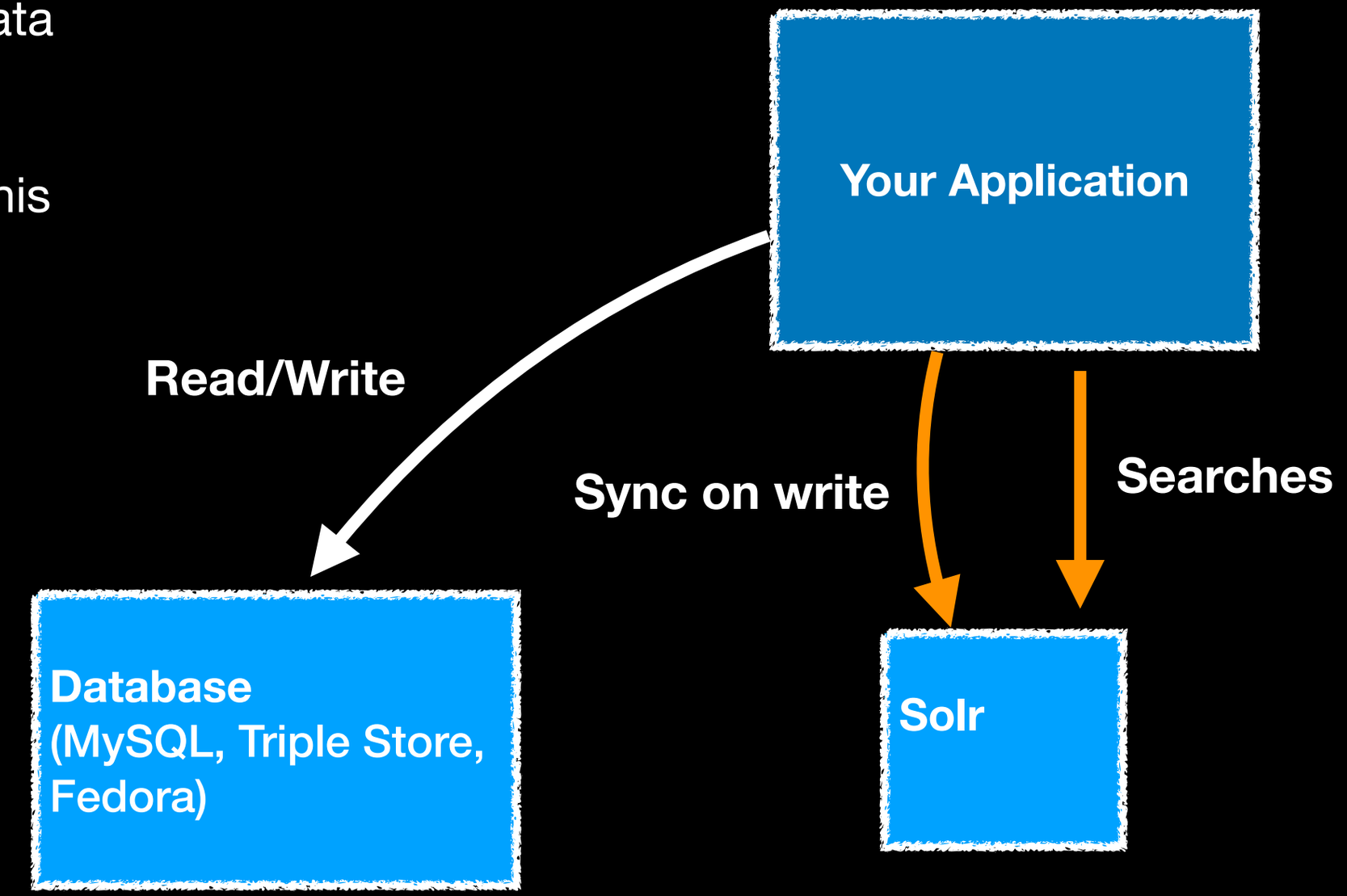
Blacklight applications tend to follow this pattern.



Typical Architectures II

Your application uses a database to maintain the data and Solr for searches.

VIVO and SamVera follow this pattern.



Document Model
(how Solr *stores* your data)

id	book_title	subjects
1	DC guide for dogs	animals, guides
2	DC tour guide	guides
3	cats and dogs	animals

Relational Model

Document Model

```
solr_doc: {
  id:"1",
  title:"DC guide for dogs",
  subjects: ["animals", guides"]
}
```

Solr Documents are flat
(i.e. there is no support nested objects)

```
your_data:
{
  id:”9041”,
  title:”Using Qualitative Inquiry to Promote…”,
  authors: [
    {uri:”http://somebody/51", name: “Loya, Karla”},
    {uri:”http://somebody/82", name: “Kimball, Ezekiel”}
  ],
  subjects: [“higher education”, “org theory”]
}
```

data in Solr is flatten

```
solr_doc: {
  id:”9041”,
  title:”Using Qualitative Inquiry to Promote…”,
  authors_uri: [”http://somebody/51”, ”http://somebody/82”],
  authors_name: [“Kimball, Ezekiel”, “Loya, Karla”],
  subjects: [“higher education”, “org theory”]
}
```

Inverted Index
(how Solr *indexes* your data)

id	title	subjects
1	DC guide for dogs	animals, guides
2	DC tour guide	guides
3	cats and dogs	animals

Traditional Index

id	title
3	cats and dogs
1	dc guide for dogs
2	dc tour guide

Inverted Index

key	ids
cats	3
dc	1, 2
dogs	1, 3
guide	1, 2
tour	2

Solr Admin - Quick Tour

Solr

- Dashboard
- Logging
- Core Admin
- Java Properties
- Thread Dump

bibdata

- Overview
- Analysis
- Dataimport
- Documents
- Files
- Ping
- Plugins / Stats
- Query
- Replication
- Schema
- Segments info

Request-Handler (qt)

/select

common

q

subjects:medicine

fq

sort

start, rows

0 10

fl

id,title,author,subjects

df

Raw Query Parameters

key1=val1&key2=val2

wt

------

indent off

debugQuery

dismax

edismax

hl

facet

spatial

spellcheck

Execute Query

http://localhost:8983/solr/bibdata/select?fl=id,title,author,subjects&q=subjects:medi


```
{
  "responseHeader":{
    "status":0,
    "QTime":1,
    "params":{
      "q":"subjects:medicine",
      "fl":"id,title,author,subjects",
      "_":"1518201320605"}},
  "response":{"numFound":76,"start":0,"docs":[
      {
        "id":"00012830",
        "title":["The complementary and alternative medicine information s
        "subjects":["Alternative medicine",
          "Alternative Medicine",
          "Alternative Medicine"]},
      {
        "id":"00003310",
        "author":["Allchin, William Henry,"],
        "title":["A manual of medicine,"],
        "subjects":["Medicine"]},
    {
        "id":"00003317",
        "author":["Black, John Janvier,"],
        "title":["Forty years in the medical profession, 1858-1898,"],
        "subjects":["Medicine"]},
    {
        "id":"00005043",
        "author":["Gould, George M."],
        "title":["The student's medical dictionary; including all the word
        "subjects":["Medicine"]},
    {
        "id":"00005150",
        "author":["Stedman, Thomas Lathrop,"],
        "title":["Twentieth century practice; an international encyclopedi
        "subjects":["Medicine"]},
    {
        "id":"00006523",
```

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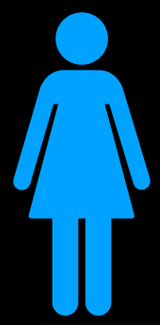
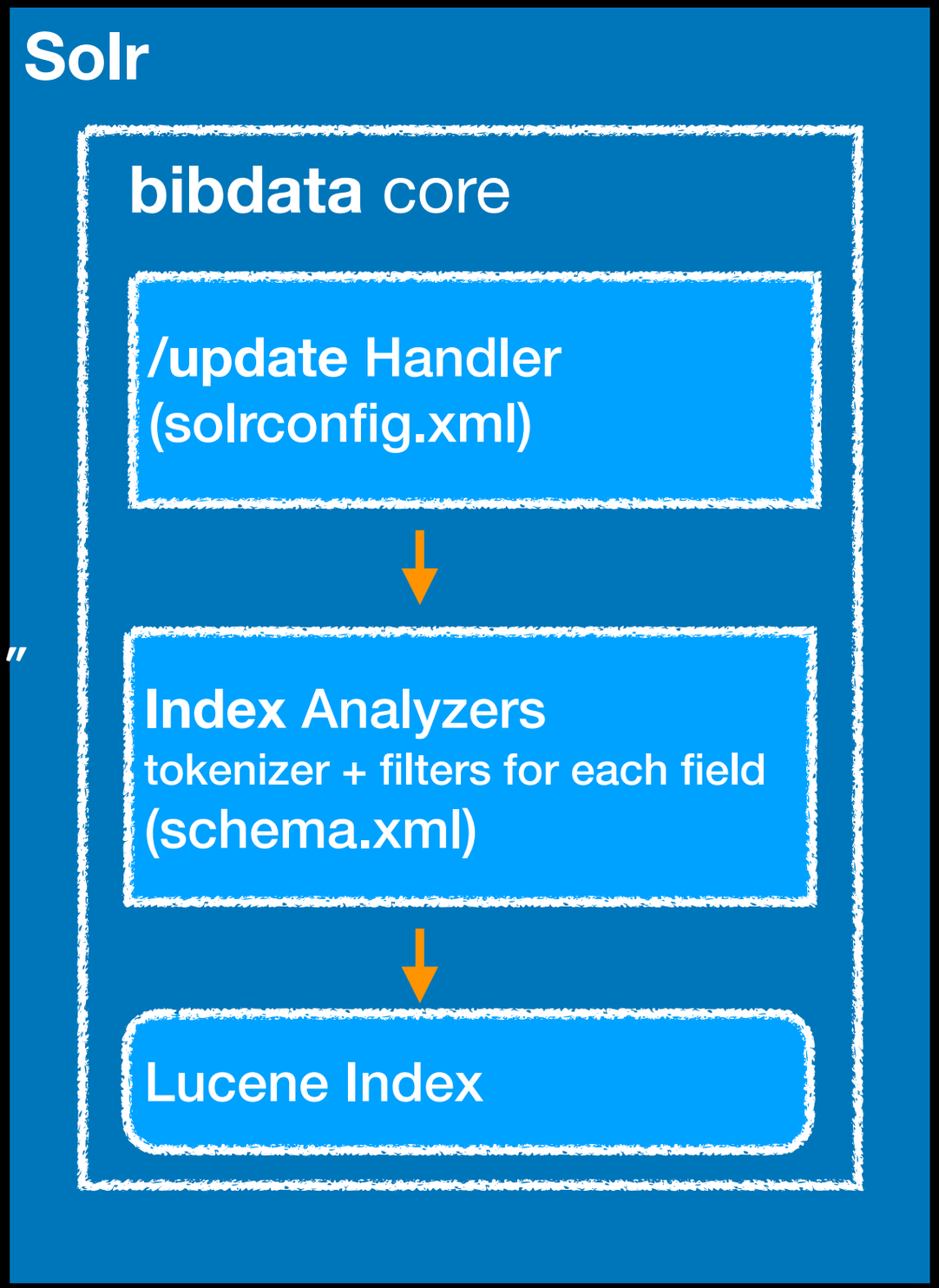
Adding a document to Solr



HTTP POST
http://localhost/solr/**bibdata**/**update**

```
{
  id:"1",
  title:"history of medicine",
  subject: "medicine",
  abstract_txt: "this book is about..."
}
```



Adding a document to Solr

Solr's Schema

```
<field name="id" type="string" multiValued="false" />
<field name="title" type="text_general" />
<field name="subject" type="string" multiValued="true" />

<dynamicField name="*_txt" type="text_general" />
```

+ Your data

```
{
  id:"1",
  title:"history of medicine",
  subject: "medicine",
  abstract_txt: "this book is about..."
}
```

Gives

id and subject will be handled as a string
title and abstract_txt will be handled as text_general

Adding a document to Solr

Id and Subject will be handled as a string

```
$ curl localhost:8983/solr/bibdata/schema/fieldtypes/string

“fieldType”:{
    "name":"string",
    "class":"solr.StrField",
    "sortMissingLast":true,
    “docValues”:true
}
```

Adding a document to Solr

Title and abstract_txt will be handled as a text_general

```
$ curl localhost:8983/solr/bibdata/schema/fieldtypes/text_general

“fieldType":{
    "name":"text_general",
    "class":"solr.TextField",
    "positionIncrementGap":"100",
    “multiValued":true,
    "indexAnalyzer":{
      "tokenizer":{"class":"solr.StandardTokenizerFactory"},
      “filters":[
        {“class":"solr.StopFilterFactory"},
        {"class":"solr.LowerCaseFilterFactory"}]},
    "queryAnalyzer":{
      "tokenizer":{"class":"solr.StandardTokenizerFactory"},
      “filters”:[
        {“class”:"solr.StopFilterFactory"},
        {"class":"solr.SynonymGraphFilterFactory"},
        {“class":"solr.LowerCaseFilterFactory"}]}}
}
```

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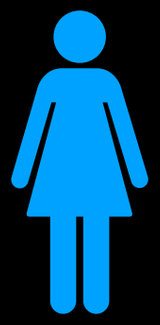
Searching for documents in Solr



HTTP GET
http://localhost/solr/**bibdata**/**select**
?q=subject:medicine

Solr

bibdata core

/select Handler
(solrconfig.xml)

Query Parser - eDisMax

Query Analyzers
tokenizer + filters for each field
(schema.xml)

Lucene Index

Documents
Facets
Highlighting
...

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Thanks and good luck

Stay in touch

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