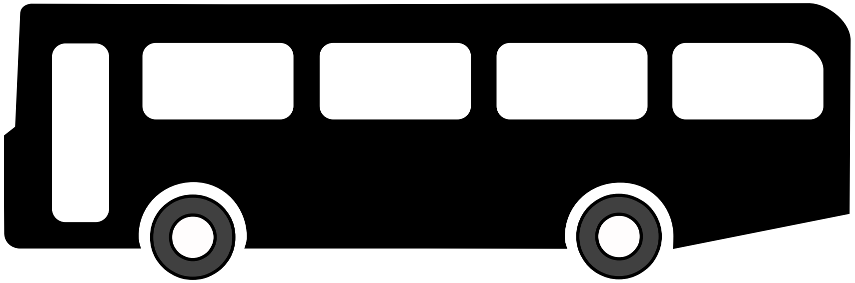
The Use Of Message-Driven Workflows On The Service Bus Pattern for Indexing Fedora Repositories



Open Repositories 2011

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Online Library Environment
the University of Virginia
Library

Motivations

Indexing is Curation

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Indexing metadata is metadata

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Keep indexing together with indexed material

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Indexing metadata is metadata

Keep indexing together with indexed material

Put indexing into the hands of curators

Indexing can be Continuous

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There is nothing natural about batch indexing

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There is nothing natural about batch indexing

Asynchronous workflows *can* have better scaling characteristics

Use the same configurations for data and workflow

Use the same configuration

Reduce maintenance

Use the same configuration

Reduce maintenance

Only works if repository-idiomatic tools are the right tools

Step 1: Make indexing asynchronous

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Done.

Thanks, Gert!

Step 1: Make indexing asynchronous

Use JMS event streams

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Add Web service connectivity

Step 2: Bring index configuration into the repository

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Simple beginnings: only XML metadata

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Create objects to represent configuration

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Simple beginnings: only XML metadata

Create objects to represent configuration

- Content models (types)
- Disseminations (behaviors)
- Use behaviors to hide state *only as desired*

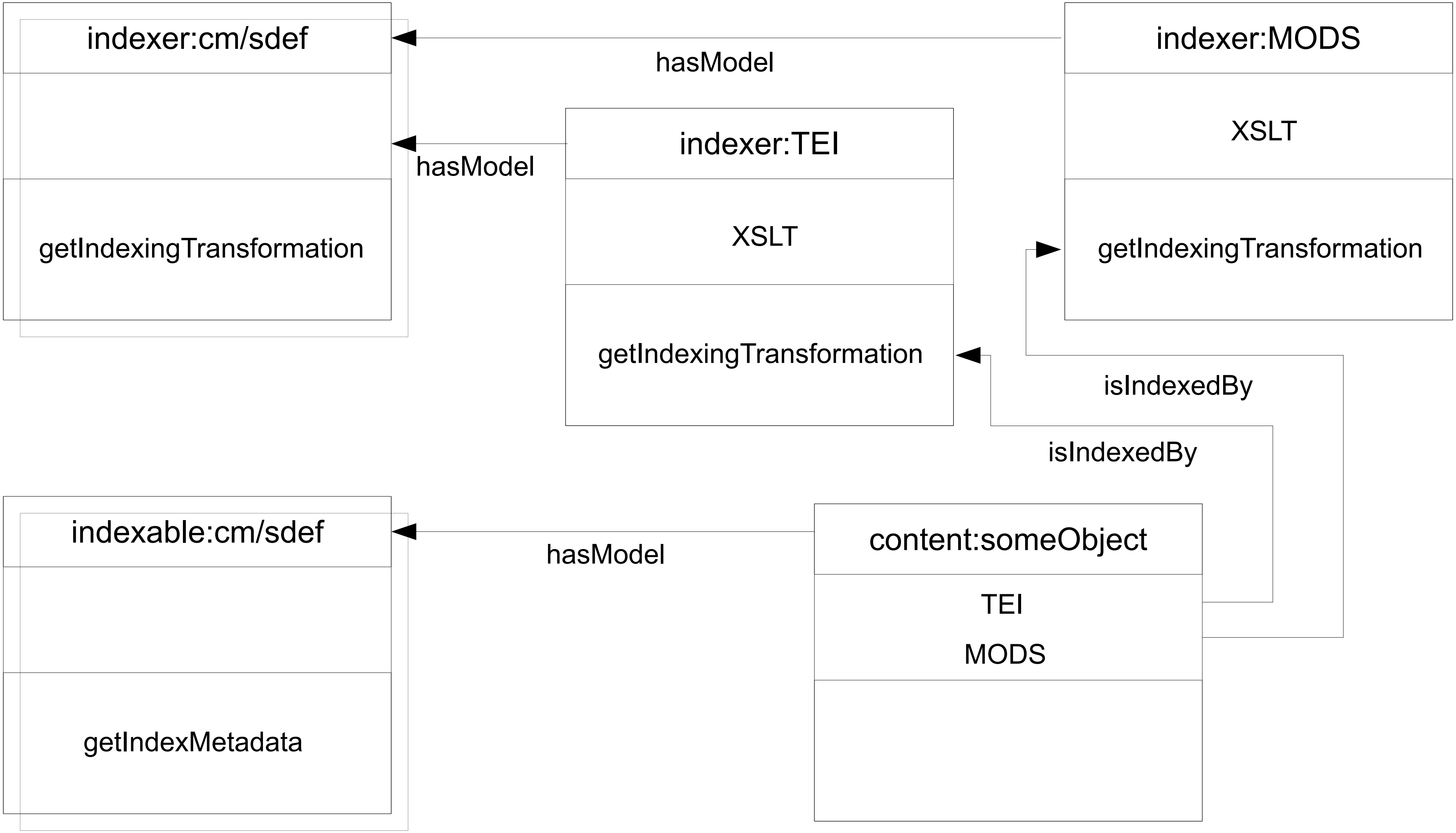
Step 2: Bring index configuration into the repository

Simple beginnings: only XML metadata

Create objects to represent configuration

Keep indexing machinery outside repository

Object relationships



Step 2½: The machinery of indexing

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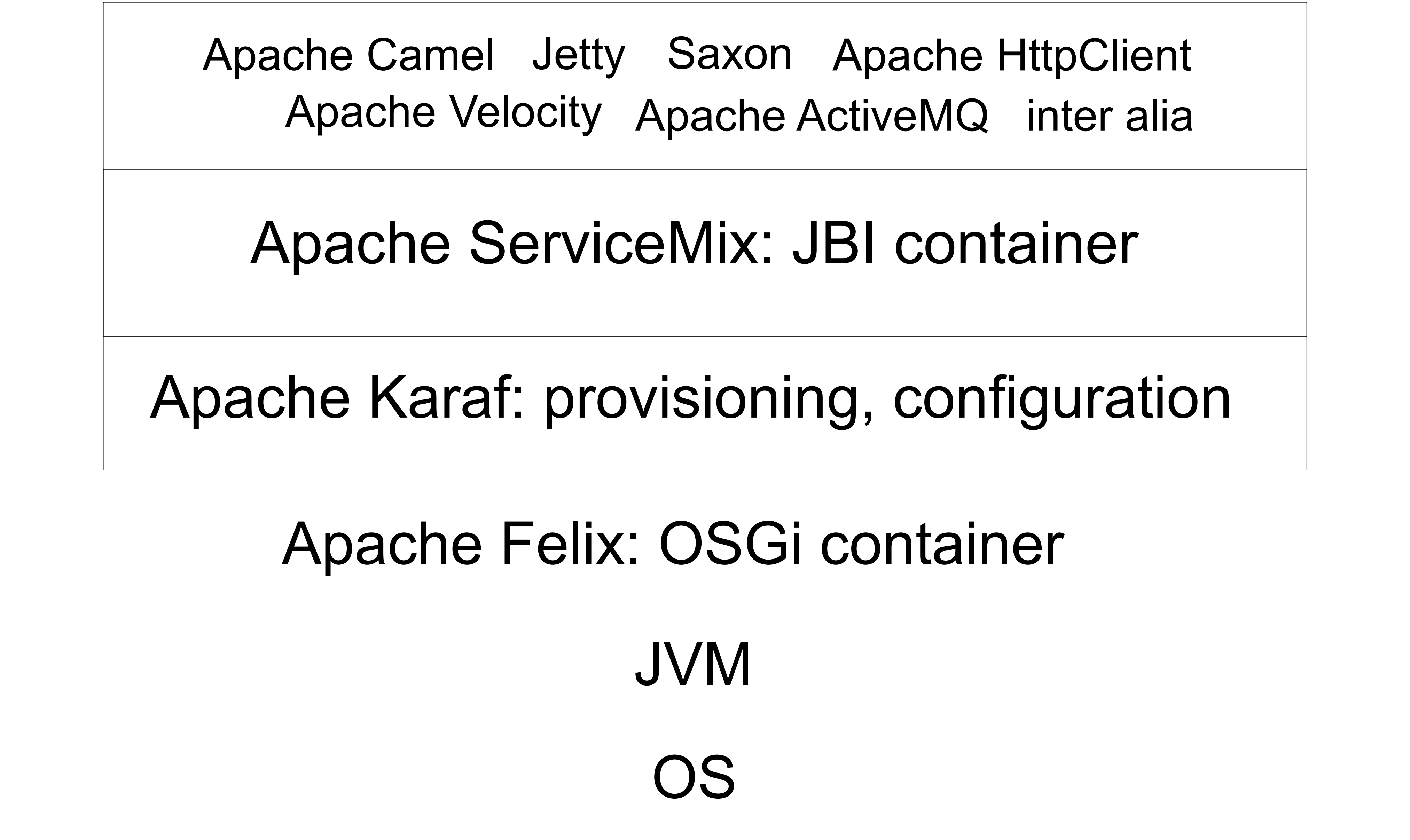


Apache Camel Jetty Saxon Apache HttpClient Apache Velocity Apache ActiveMQ inter alia

Apache ServiceMix: JBI container

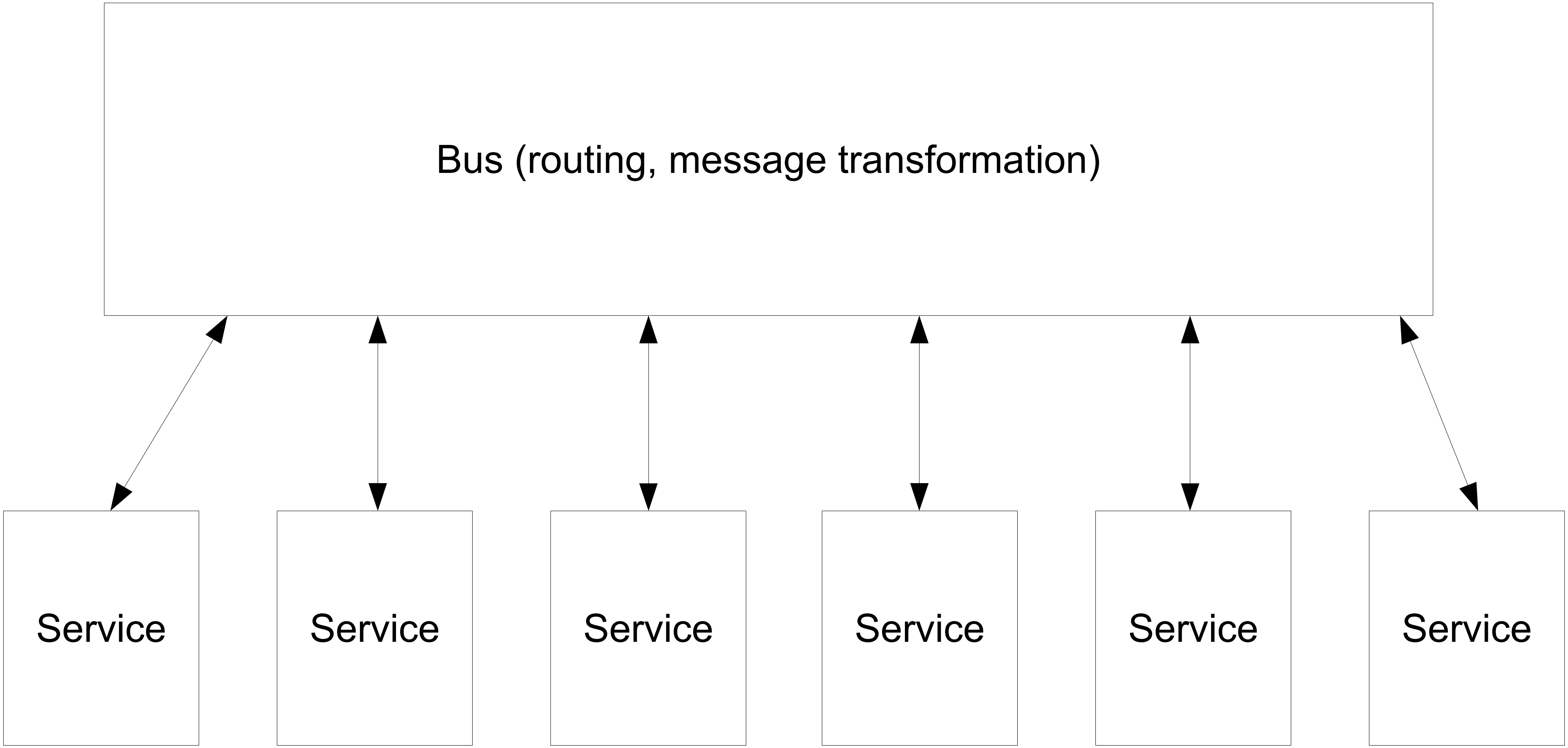
Apache Karaf: provisioning, configuration

Apache Felix: OSGi container

JVM

OS

Step 2½: The machinery of indexing


Bus (routing, message transformation)

Service

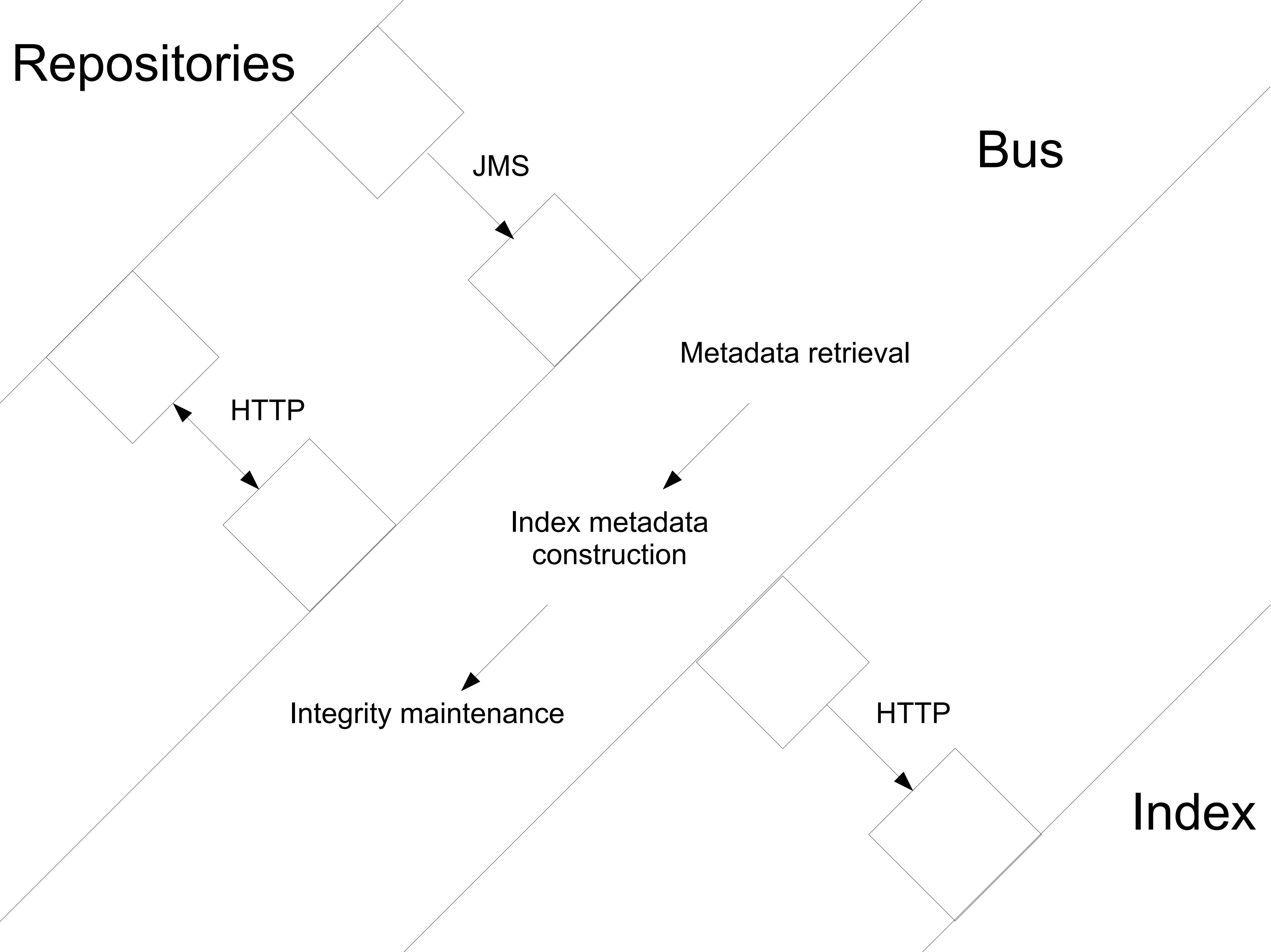
Service

Service

Service

Service

Service



Repositories

JMS

Bus

Metadata retrieval

HTTP

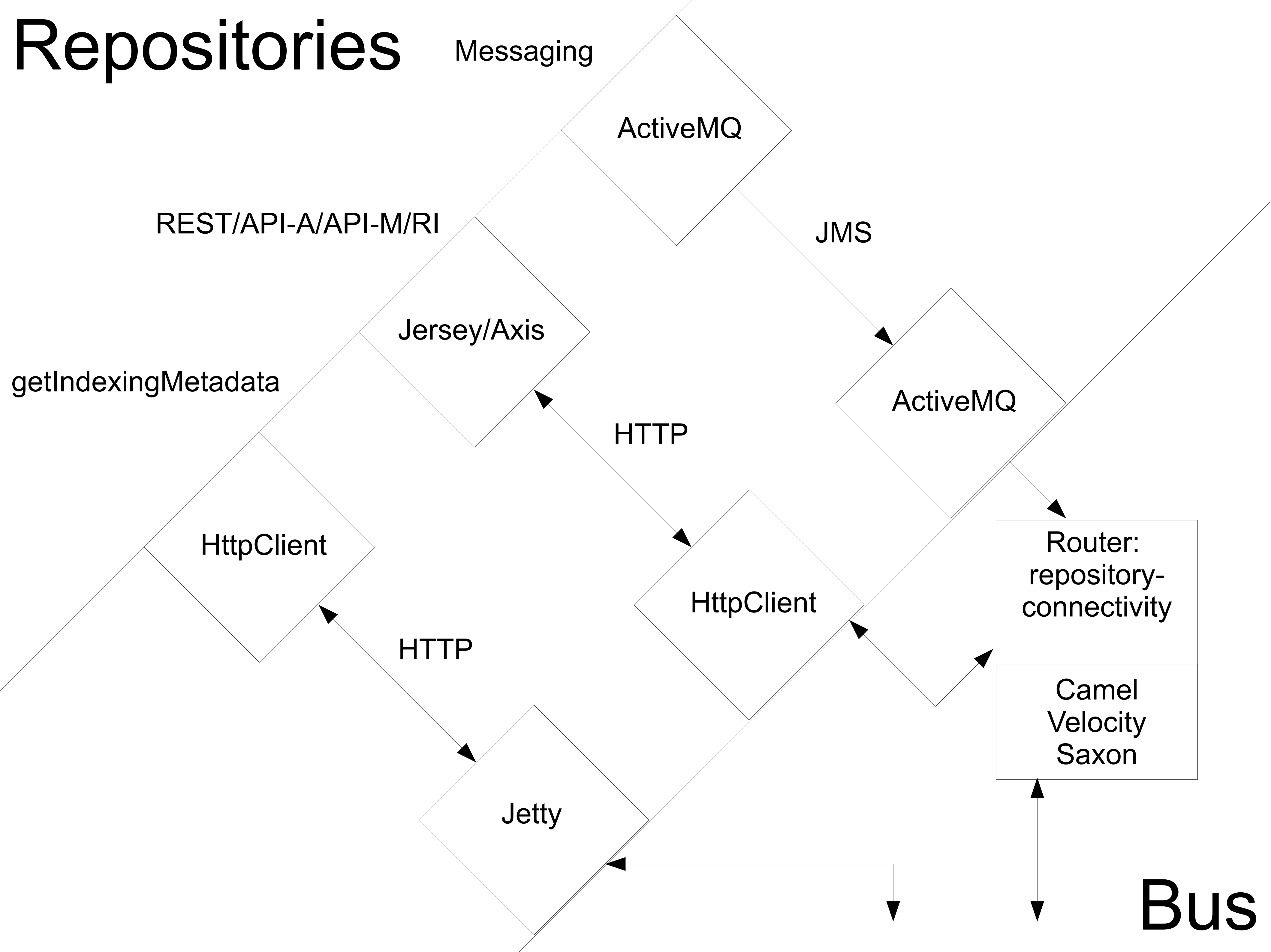
Index metadata construction

Integrity maintenance

HTTP

Index

Repositories



Messaging

ActiveMQ

REST/API-A/API-M/RI

Jersey/Axis

JMS

getIndexingMetadata

ActiveMQ

HTTP

HttpClient

Router: repository-connectivity

Camel
Velocity
Saxon

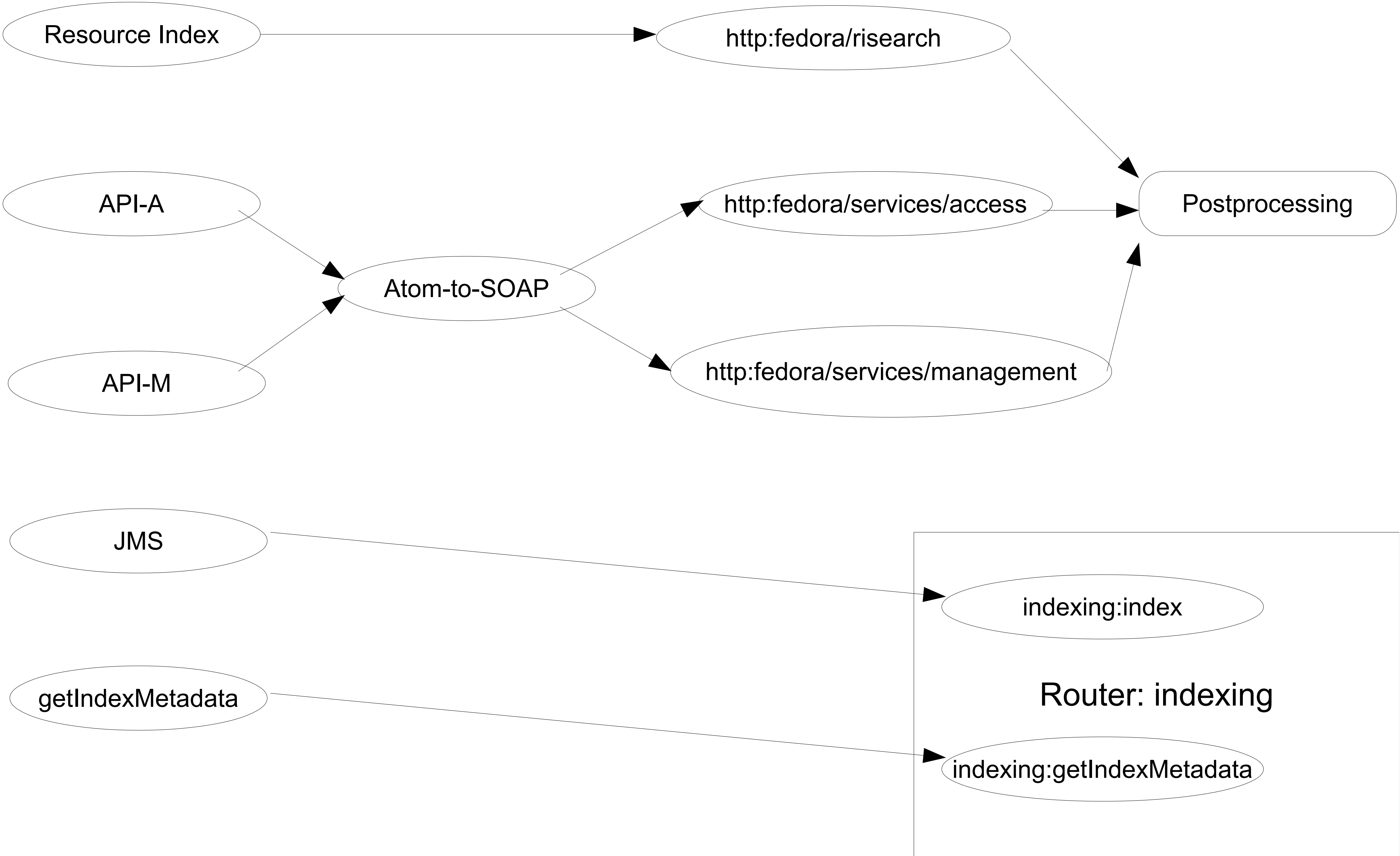
HttpClient

HTTP

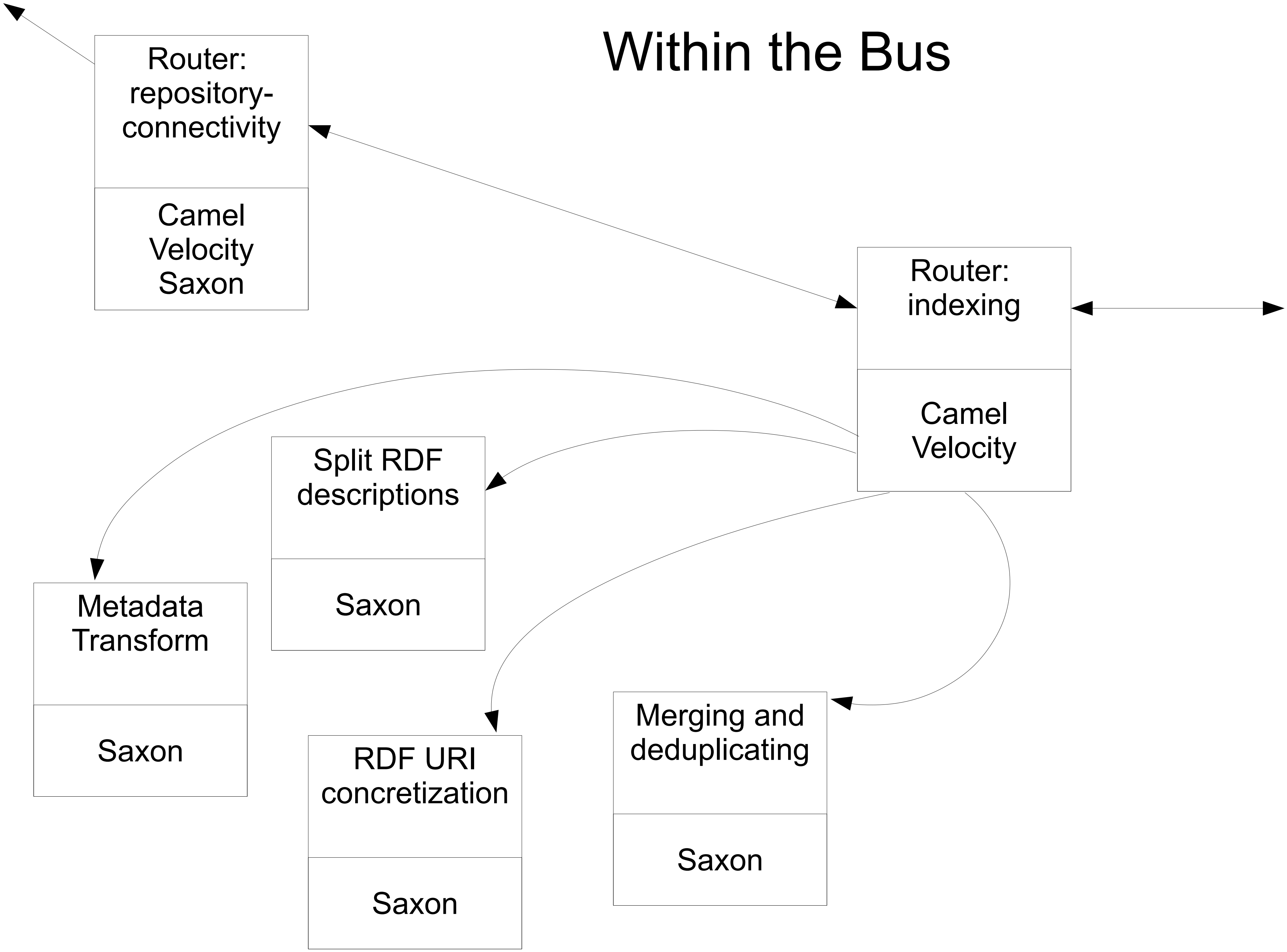
Jetty

Bus

Router: Repository Connectivity



Within the Bus



Router: repository-connectivity

Camel Velocity Saxon

Router: indexing

Camel Velocity

Split RDF descriptions

Saxon

Metadata Transform

Saxon

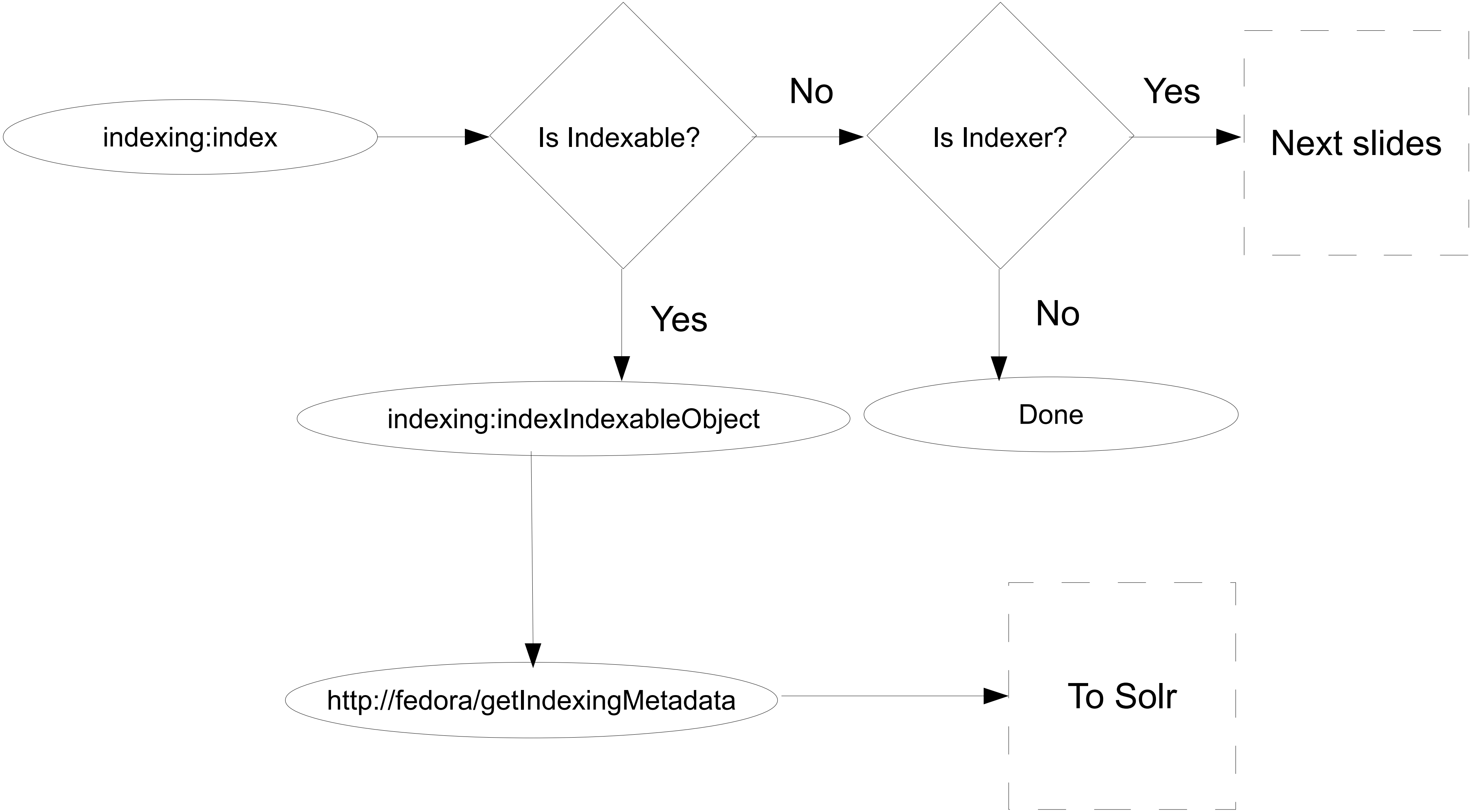
RDF URI concretization

Saxon

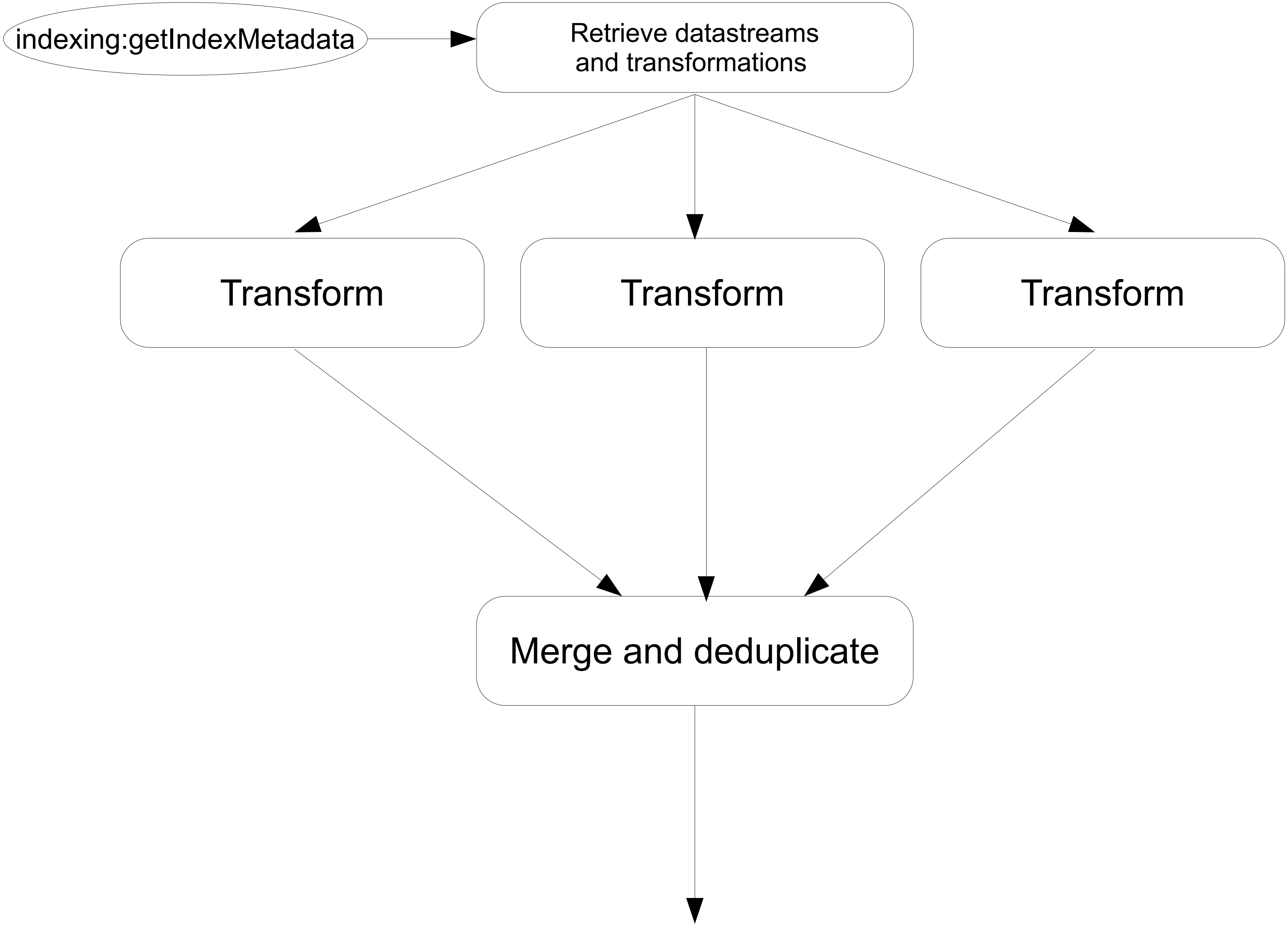
Merging and deduplicating

Saxon

Router: Indexing



Router: Indexing



indexing:getIndexMetadata

Retrieve datastreams and transformations

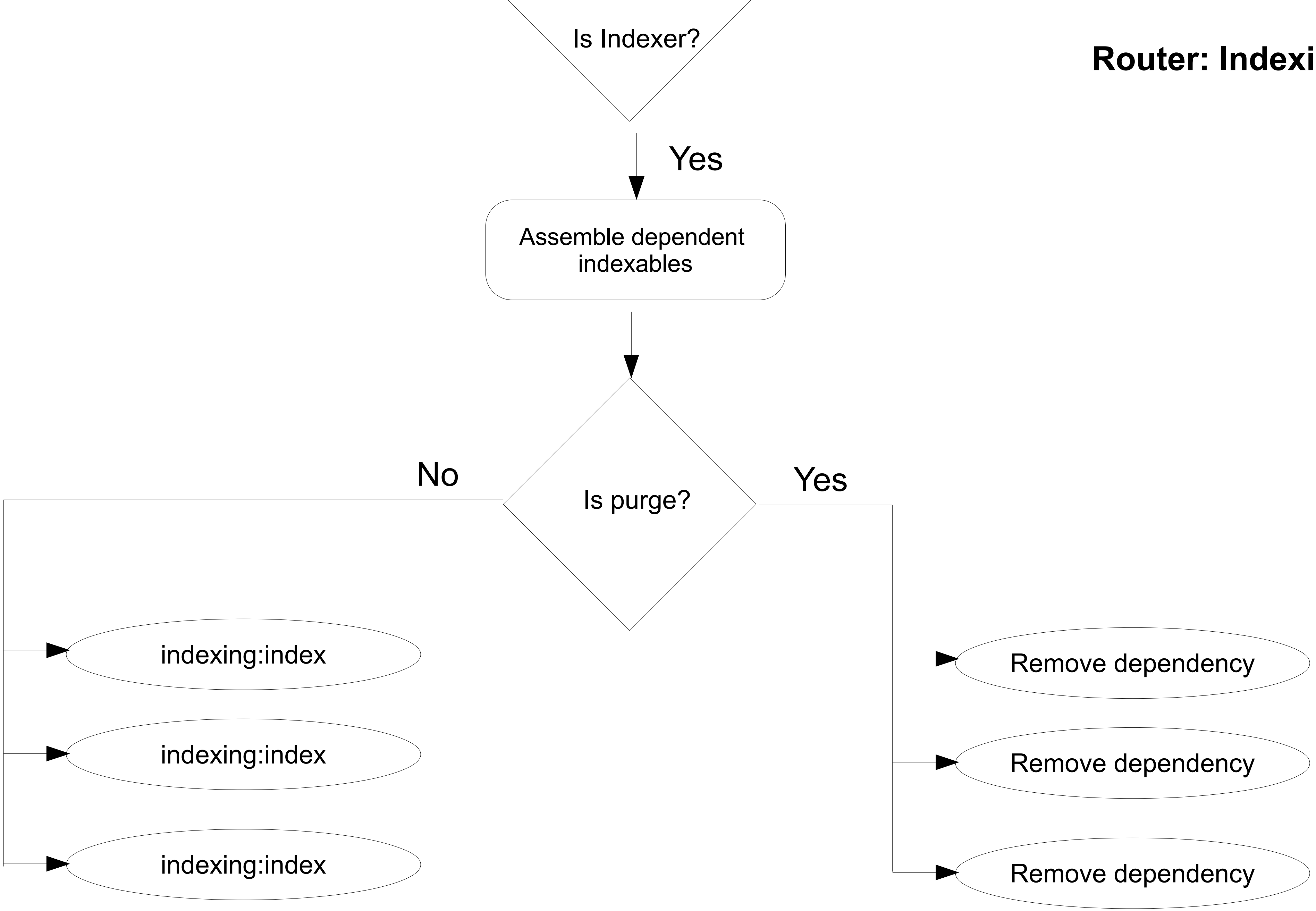
Transform

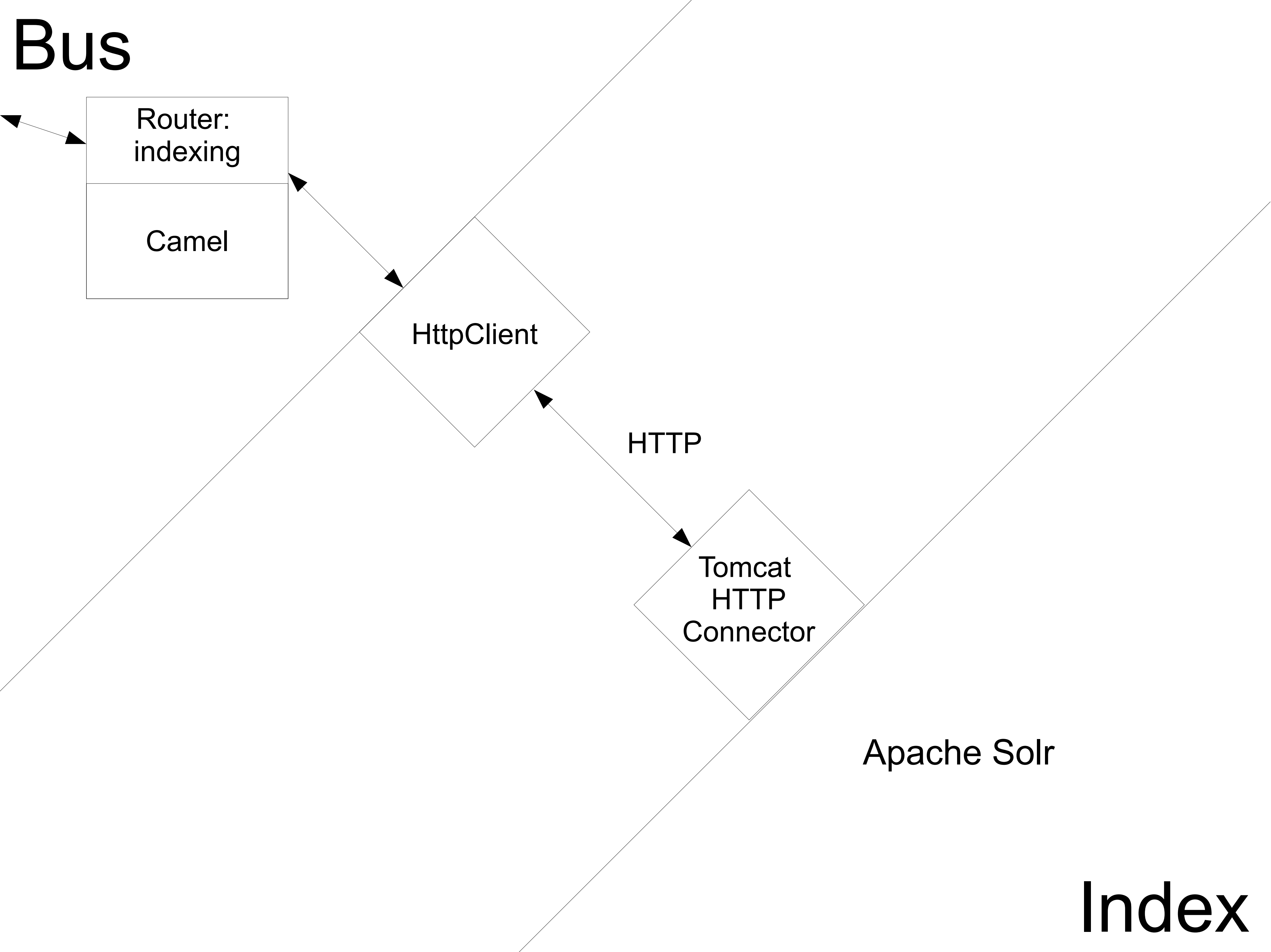
Transform

Transform

Merge and deduplicate

Router: Indexing





Bus

Router: indexing

Camel

HttpClient

HTTP

Tomcat HTTP Connector

Apache Solr

Index

Step 3: The future

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Indexing multiobject records (ECM Views)

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Indexing non-XML metadata

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Indexing multiobject records (ECM Views)

Indexing non-XML metadata

Indexing RDF to external (non-RI) triplestores

Step 3: The future

- Source code available soon
- Virtual instance test drive available now
  - http://mbusdev.lib.virginia.edu/or2011/demo.ova.gz