


## Space Details

<b>Key:</b>	SESAT
<b>Name:</b>	Sesat
<b>Description:</b>	Project pages for Sesat - SEsam Search Application Toolkit
<b>Creator (Creation Date):</b>	kentv (Feb 26, 2007)
<b>Last Modifier (Mod. Date):</b>	mick (Nov 17, 2007)

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# Build your own federated search engine!

**Sesat** is an open sourced Search Middleware with federation capabilities and a built-in search portal framework. Sesat enables a single user query to be dispatched to multiple information sources. The result is analysed, weighted and presented to the user according to configurable business rules.

- Sesat is an acronym for "SEsam Search Application Toolkit" and is the core technology used to power <http://sesam.no> and <http://sesam.se>, which are scandinavian search, news and directory sites that utilise a large number of data sources including Yahoo!, PicSearch, Solr (Lucene), Youtube, and enterprise search systems from [FAST](#).
- Sesat makes it easy to build applications that look for information in many different places simultaneously. Sesat can connect to almost any kind of data source that can be accessed using Java - databases, search indexes, files, back office systems, web services, ESBs. Similar product examples are FAST Unity, WebFeat, DeepWeb Explorit, dbWIZ, and Raritan SIFT.
- Sesat takes care of all the complex tasks of communicating with multiple search indexes simultaneously, query- and result analysis, business rules application; leaving the developers to focus on other aspects of their application, such as presentation and usability
- Sesat is developed in an open environment and released under the Affero General Public License. We invite you to participate in this open development project. To learn more about getting involved, click [here](#).

## Showcases















Site	Screenshots	Description
<a href="http://sesam.no">sesam.no</a>		Is the portal that initiated the development of Sesat. The presentation layer is made by front end developers using the Velocity templating language. Each search on sesam.no results in several parallel searches in different data sources. When all search results have been collected, Sesat invokes the relevant templates and displays the result to the user. Sesam.no uses technology from Yahoo!, <a href="#">FAST</a> and PicSearch,. Sesam.no was launched november 2005.

[vg.sesam.no](http://vg.sesam.no)



VG is the largest newspaper in Norway, hosting Norway's most popular web services. By using Sesat, Sesam.no has created both a tv-guide and a news service for VG, all running on Sesam.no's platform, but with VG look-and-feel.

## News

Title	Author	Date Posted
 <a href="#">Lucene and Solr patches accepted</a>	<a href="#">Mck Semb Wever</a>	Jan 31, 2009
 <a href="#">Sesat 2.18 - "The acquisition of wealth is no longer the driving force in our lives."</a>	<a href="#">Mck Semb Wever</a>	Dec 03, 2008
 <a href="#">Sesat 2.18 - "The acquisition of wealth is no longer the driving force in our lives."</a>	<a href="#">Mck Semb Wever</a>	Nov 20, 2008
 <a href="#">federatedsearchblog.com - "New open source federated search middleware released"</a>	<a href="#">Mck Semb Wever</a>	Jul 09, 2008
 <a href="#">Sesat on Sourceforge</a>	<a href="#">Mck Semb Wever</a>	Apr 28, 2008
 <a href="#">Sesat on Freshmeat</a>	<a href="#">Mck Semb Wever</a>	Apr 28, 2008
 <a href="#">Sesat 2.17 - "Are we human because we gaze at the stars or do we gaze at the stars because we are human?"</a>	<a href="#">Mck Semb Wever</a>	Apr 22, 2008
 <a href="#">Sesat 2.17 - "Are we human because we gaze at the stars or do we gaze at the stars because we are human?"</a>	<a href="#">Mck Semb Wever</a>	Apr 08, 2008
 <a href="#">jaxmag.com - Search Middleware Portal Generally Available To Access Data Source</a>	<a href="#">Mck Semb Wever</a>	Apr 03, 2008
 <a href="#">Sesat, a federated search solution middleware, goes open source</a>	<a href="#">Mck Semb Wever</a>	Mar 31, 2008
 <a href="#">Cominvent - Norwegian search portal Sesam.no releases middleware as GPL</a>	<a href="#">Mck Semb Wever</a>	Mar 30, 2008
 <a href="#">DIGG - Build your own search engine with SESAT</a>	<a href="#">Mck Semb Wever</a>	Mar 30, 2008
 <a href="#">Sesambloggen - Sesam Search Application Toolkit (SESAT) available as Free Software</a>	<a href="#">Mck Semb Wever</a>	Mar 21, 2008
 <a href="#">Digi.no - Sesam deler ut kildekoden</a>	<a href="#">Mck Semb Wever</a>	Mar 21, 2008

## Apache

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This page last changed on Mar 06, 2009 by [sshafroi](#).

To have tomcat and jboss to play together we need apache with rewrite and proxy enables.

First you need this modules in apache.

rewrite\_module

proxy\_module

proxy\_http\_module

On ubuntu you can enable this with:

```
sudo a2enmod proxy
sudo a2enmod proxy_http
sudo a2enmod rewrite
```

You need to allowoverride -> all

```
DocumentRoot /var/www/
<Directory />
Options FollowSymLinks
AllowOverride All
</Directory>
```

and under virtualHost, add

```
ProxyPreserveHost on
```

In your /var/www/ put .htaccess with this:

```
RewriteEngine On

RewriteRule ^useradmin/(.*)$ http://localhost.no:9090/useradmin/$1 [P]
RewriteRule ^(.*)$ http://localhost.no:8080/$1 [P,L]
```

This page last changed on Mar 30, 2008 by [mick](#).

# Accessing the source code repository

Access the source code repository for this project in one of following ways:

- Browse source code online at <http://sesat.no/svn> to view this project's directory structure and files.
- Check out source code with a Subversion client using the following command.

```
svn checkout http://sesat.no/svn/<project-name> <project-name>
```

If you are new to Subversion, you may want to visit the [Subversion Project website](#) and/or read [Version Control with Subversion](#).

## Downloading binaries

Binaries can be downloaded directed from our [maven2 repository](#).

## Community

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This page last changed on May 12, 2008 by [mick](#).



**work in progress**

<b>Coding</b>	
<a href="#">Getting Started</a>	Building Sesat-kernel from sources.
<a href="#">Building a skin</a>	Building your first Sesat skin (Sesat Frontend Container).
<b>Communication</b>	
<a href="#">Getting Help</a>	Questions and answers on our <a href="#">mailing lists</a> .
<a href="#">Guide Helping</a>	How to help out.
<a href="#">Team List</a>	Current developers.
<b>Roadmaps</b>	
<a href="#">Kernel Roadmap</a>	Where the Kernel is headed for...

This page last changed on May 06, 2008 by [mick](#).

# Overview of our [mailman](#) mailing lists

## Normal mailing lists

List	Description	Links
Commons-development	Commons Use + Development	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>
Kernel-development	Kernel Use + Development. <b>(start here if unsure)</b>	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>
Sesat-discuss	General discussions around the website, license, and other non-code stuff	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>

## Read only mailing lists

Project	Commit lists	Build lists	Issue lists
Commons	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>	todo
Kernel	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>	<a href="#">Browse</a> <a href="#">Subscribe</a> <a href="#">gmane archive</a>



This page last changed on Mar 23, 2008 by [mick](#).

# How to Contribute

1. Ask questions and give answers on our [mailing lists](#),
2. Check out and build the Kernel and Sesam.com skin,
3. Enter bugs and improvements into our issue tracker (pending to bring issue tracker live).

## Kernel Roadmap

This page last changed on Sep 26, 2008 by [mick](#).

In an attempt to formally define what the Sesat Kernel open source project is trying to achieve, and how we plan to achieve it, we've come up with the Kernel Roadmap.

Please bear in mind that as with any good open source project all decisions are consensus-based by the community. Today this community consists of [Schibsted Søk AS](#) and [Schibsted Søk AB](#).

Feel free to contribute to these priorities on [kernel-development@sesat.no](mailto:kernel-development@sesat.no)

[Upgrade Guides](#) exist between each version.

Version	Expected Features
<b>2.x</b>	<b><i>Sesat Kernel concepts still under development</i></b>
<b>2.17</b>	<ul style="list-style-type: none"><li>* <a href="#">SKER4290 Design and code with JSPs in skins</a></li><li>* <a href="#">SKER3654 Generalized enrichment handling</a></li><li>* <a href="#">SKER3733 New methods for offset</a></li><li>* <a href="#">SKER4302 Building Sesam.com tutorial</a></li></ul>
<b>2.18</b>	<ul style="list-style-type: none"><li>* <a href="#">SKER2146 modes.dtd generator</a></li><li>* <a href="#">SKER2149 Divide &amp; Conquer</a> AbstractSearchCommand to delegates</li><li>* <a href="#">SKER3540 Anonymous TokenPredicates &amp; Token Evaluator SPI</a></li><li>* <a href="#">SKER2273 SyndicationGenerator</a> to work for any tab</li><li>* <a href="#">SKER4949 Solr (Lucene) search command</a></li><li>* <a href="#">Yahoo "Contextual Web Search" search command</a></li></ul>
<b>3.0</b>	<b><i>Sesat Kernel original goals met, all Service Provider Interfaces defined.</i></b> <ul style="list-style-type: none"><li>* <a href="#">SKER1757</a> SESAT Kernel</li><li>* <a href="#">SKER4182</a> Sesat-ise and standardise decorators</li></ul>
<b>3.1</b>	<b><i>Second phase of goals from Sesat Kernel's original specification.</i></b> <ul style="list-style-type: none"><li>* <a href="#">SKER1793</a> XML API (SESAT API)</li><li>* <a href="#">SKER2163</a> SESAT Testing Environment</li><li>* <a href="#">SKER1609</a> Immutability and the flyweight pattern within the DataModel</li><li>* Swing integration and tutorial</li><li>* Seam integration and tutorial</li></ul>
<b>?</b>	<b><i>Ideas we'd like to see and think easily feasible.</i></b> <ul style="list-style-type: none"><li>* Google search command</li><li>* Sharepoint integration</li><li>* Compass integration??</li></ul>

## Team List

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This page last changed on Apr 17, 2008 by [mick](#).

Member	Profile page
<b>Active</b>	
Anders Berneby	
Anna Larsson	
Bernt Rostad	
Endre Midtgård Meckelborg	
Kristian Saebdal	
Håvard Frøiland	
Magne Thyrhaug	
Magnus Lambert	
Michael Semb Wever	<a href="http://wever.org/">http://wever.org/</a>
Thomas Kjærstad	
<b>Past</b>	
Anders Johan Jamtli	<a href="http://www.jamtli.no/">http://www.jamtli.no/</a>
Kent Vilhelmsen	
Magnus Eklund	
Ola Marius Hoff Sagli	

## External

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This page last changed on Jan 25, 2008 by [mick](#).

## External - FAST

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# Integration Platforms

There are several suitable integratino platform available. The following lists some of the more common. Note that a later version of FAST **will** include its own ETL-tool for easy feeds of documents into the index.

System	Homepage	Description	License
BODI	<a href="http://www.businessobjects.com">http:// www.businessobjects.com</a>	Business Objects Data Integrator	Commercial, expensive
Mule	<a href="http://mule.codehaus.org">http:// mule.codehaus.org</a>	Mule - ESB glue / ETL tool. Links: <ul style="list-style-type: none"><li>• <a href="http://www.itmanagersjournal.com/feature/22422">http:// www.itmanagersjournal.com/ feature/22422</a></li></ul>	Open Source
Apatar	<a href="http://www.apatar.com/">http:// www.apatar.com/</a>	Data integration software. Connectivity to Oracle, MS SQL, MySQL, Sybase, DB2, MS Access, PostreSQL, XML, InstantDB, Paradox, BorlandJDataStore, Csv, MS Excel, Qed, HSQL, Compiere ERP, Salesforce.Com, SugarCRM, Goldmine, any JDBC data sources and more.	Open Source

## Features

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## Kernel Feature list

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### Work In Progress

The SESAT Kernel, the core to the search front, and the generic.sesam skin (SFC) serves as a search engine's controlling and presentation framework.

It provides developers will the following features:

- A **modularised model-view-control architecture** specialised for a data fetch and present paradigm aka a search engine. Each layer forms a separate maven-2 built library project, fully extendable by defined Service Provider Interfaces (SPIs). Dependencies through each layer are supported with a Contextual Inversion of Control implementation. Default implementation of these SPIs exist within the generic.sesam skin (SFC), and reference implementations found in the genericno.sesam.no & genericse.sesam.se skins (SFCs).
- A **Search Command SPI**, also comprising of individual for SPIs Query Transformations, Search Executions, and Result Handling. Provides sequential and parallel thread execution for maximum performance.
- Default **Query Transformer implementations** for Age filtering, Exact field matching, Regular Expression transformations, Synonym transformations, Term prefixing, and Query-Matching Token (un)masking.
- Default **Result Handler implementations** for Age calculations, Modifier combining, Date formatting, Detect/Find File/Url formats, Mathematical & Scientific number operations, Phone number formatting, Spelling Suggestion formatting.
- Default **Search Command implementations** for Fast-4 Simple search, Fast-4 Advanced search, Fast-5 ESP search, generic XML search, Web Services search, Blending (FAST) search, Clustering (FAST) search, Correcting (FAST) search, Mathematical/Calculator search, Danish Mobile search, Overture PPC search, PicSearch search, Platefood PPC search, Sensis search, Stock market search, Yahoo IDP search, Yahoo Contextual Web Service search, Yahoo Media search, and Youtube search.
- Reference Search Command implementations for Blinkx Video search, Blocket search, Finn search, GeoData Map search, HittaMap search, Hitta search, HittaWeather search, Prisjakt search, Solr (Lucene), Storm Weather Blinkx Video search, Tasteline search, TV-guide (FAST) search, Whitepages (FAST) search, Yellowpages (FAST) search.
- **DataModel infrastructure** holding definitions and access to all data required through the process stack and in the presentation layer. The DataModel provides compile-time type safety to the data, an interface for presentation pluggable renderers, templating simplicity, client and developer security, scalability through immutability and re-use of objects, and ajax (remoting) interaction.
- The DataModel contains (**Data Access Objects**) nodes for http-requests, http-sessions, users and locations, skins (SFCs), Queries, Pages and verticals, and Searches (results, navigators, enrichments, advertisements, rss).
- The DataModel extends and supports the **JavaBean specification**, each node a bean with associated BeanInfos.
- **Query parser and tree** implementation. Based on javacc. Provides a superior approach over string manipulation from the user's inputted query through the query transformations and into the search commands. The resulting Query tree is manipulated through the remainder of the process stack with visitor patterns. Each node (token or operator) permits storage of meta-data and becomes immutable providing better than linear scalability.
- **Query parser supports tokens** for words, numbers, phone numbers, urls, email addresses, and phrases.
- **Query parser supports operators** of and, or, xor, and default hidden operator.
- Default **visitor pattern implementations** for counting nodes, finding nodes, finding positions within the tree, finding forests of like nodes, finding parents, searching meta-data, name and location separation and extraction.
- Default **Query tree alternations** for Fullname detection, and Tree rotations.
- **Presentation framework** for quick and flexible visual designs for various formats (html, xml, rss, vcard, etc). Organisation and inheritance/overload for configuration (properties & XML), CSS, javascript, and image resources. Templating (layout and decoration) system providing ajax support, search-engine specific macros and directives, link and click encodings and statistics, publishing system (static html or xml URLs inclusion) integration, and http protocol independence. The presentation layer renders off the java beans provided by the datamodel simplifying the templates and securing through isolation the view from the control and model layers.
- **Apache Velocity** is fully supported as "templates" in the presentation framework.



- **JavaServer Pages** are fully supported as "templates" in the presentation framework.
- An **http protocol layer** handling and encapsulating sessions, encodings (including broken clients), pretty URL variants and URL rewriting (like apache's mod\_rewrite), user login persistence, parameter encryption, and resource caching.
- Custom **HttpClient library**, providing basic Quality-of-Service and statistics of outbound connections. Backgrounds and buffers outbound connections to avoid thread starvation or locking, and protect against misbehaving indexes.

## Product Description

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# Product Description

## Definitions of Terms

Term	Definition
<b>SESAT SFC - Search Frontend Container</b>	This is where all User Applications using SESAT are run.
<b>SESAT SFC User Application (UA)</b>	A user-provided search application/portal with a unique vhost
<b>SESAT SFC Domain</b>	Root domain for vhost applications. Example: «sesam.no» is a root domain, whereas «sports.sesam.no» is a unique vhost belonging to a SFC User Application.
<b>Magical Words</b>	Special trigger keywords that invokes special ranking or index selection rules. Example: «weather singapore» may trigger a weather vertical to be displayed, or indicate that the weather search result should be displayed first in the result set.

### Product components

- The SESAT Core application
- The SESAT Search Frontend Container (SFC)
- The SESAT Admin framework
- The SESAT API

These components are described in the following sections.

### SESAT Core

SESAT Core runs as a web application within a Tomcat Web Server. All access to the search portal is handled by this application.

All access is through a recommended maximum number of vhosts (50), each of which specify which SFC user application is accessed.

A rules engine provides functionality to handle a wide variety of ranking models, ranking dependencies, magical words and analysis rules.

For a full feature list of what SESAT Core provides see <http://sesat.no/Kernel+Feature+list>

### SESAT SFC (Search Frontend Container)

Deployed in the same directory and on the same Tomcat Web Server as the SESAT Core, all SFC User Applications are web archives utilising the services of the SESAT Core. SFC User Applications belong to a domain hierarchy, with configuration inheritance applied by default.

To define a User Application in the SFC, the following must be provided:

Element	Description
vhost-name	<p>(for example, «vertical.mydomain.com», «mydomain.com»</p> <p>«modes.xml» configuration file, which specify: available modes, where a «mode» is defined as a portal tab or vertical. For example, «vg.sesam.no» may have two modes, one for «search within vg.no content only», and one for «search whole of norwegian internet».</p> <p>All modes within a User Application (vhost) have a unique name, that is later referred to from views.xml.</p> <p>A mode define which indexes should be used for a given tab or vertical. For example, the «search within vg.no content only» may also perform commandoes to get information from a PPC-system, from a yellow pages directory and from a stock market information index.</p>
views.xml	<p>configuration file, which specify:</p> <ul style="list-style-type: none"> <li>• For a given view or tab, which «mode» is used</li> <li>• For a given view or tab, which enrichments applied (enrichment access methods are usually listed in the modes.xml configuration) and how they should be applied/weighed. For example, for a financial newspaper, enrichments may be yellow pages, stock information and news. These enrichments are then ranked according to rules in the views.xml configuration.</li> <li>• Any ad-commands that should be applied to the search result</li> </ul>
Images and templates	<p>Optionally, the User Application can provide own images and templates. If these are not provided, the parent templates are used. For example, «vg.sesam.no» will by default inherit all images and templates from «vg.no», unless the application has defined its own.</p>

## SFC Directory Layout

From a *developers* perspective, the SFC are layed out in the following manner:

```

root-directory: domain.com/
sitesearch.domain.com/
LICENSE.txt
logs
pom.xml
war/
src/
conf
css
images
javascript
templates/
defaultSearch.vm
VM_site_library.vm
enrichments/

```

fragments/  
navigators/  
pages/

From a *deployers* perspective, the SFC is layed out in the following manner:

webapp/  
/ROOT.war (<-- this is sesat)  
/generic.sesam.war (<-- this is sesat)  
/sitesearch.domain.com.war  
/sitesearch2.domain.com.war

## SESAT Admin

SESAT Admin consists of portlets and applications running on JBoss Portals (server), which is a standards-compliant (JSR-168) portal. As of version 1.0 of SESAT, the following appliacions are available:

- User Administration Portlet (require usage of OpenLDAP). The administrator can define users, groups and roles, and ensure that access to other administrative systems or the search portal are prohibited and controlled.
- Statistics Portlet, providing simple statistics of queries and traffic.
- FAST Lists Editor (version 1.0 of SESAT). FAST Lists are lookup-tables within the FAST engine that are used when analysing search queries.
- Rules Engine Portlet (version 1.2 of SESAT)
- Personalisation Manager (version 1.2 of SESAT)

## SESAT API

SESAT provide two APIs for communication with the SESAT Core.

The APIs are available as

- WS - Web Service.
- XML - XML feed API

Access control etc. is controlled through access control lists (ACLs).



### Note

Link to more documentation about the API. This could also be documented in Continuum.

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# Product Description - Business Managers & Business Developers

**With Sesat, your IT department can quickly merge content from a huge variety of different data sources, in line with your business requirements.**

## Executive Summary

**Sesat is a federating search portal middleware, enabling developers to easy collect information from a variety of different sources and data stores, and present them in a configurable, intelligent and flexible way to the user.**

**Sesat** includes a set of applications working together to provide a feature-rich search middleware. **Sesat**glues together information from underlying indexes and data sources, applies the relevant business logic, and passes the resulting collection of information on to the presentation layer. The toolkit has excellent support for all recent versions of the FAST search engine, as well as many other data sources. The APIs provide full flexibility for customers who easily want to create own connectors to underlying data layers and sources.

**Sesat** glues together information from multiple data sources and presents it uniformly to the developer, who now only need to concentrate on the presentation of the data. **Sesat** makes it very easy to develop, deploy and manage search portal applications. Components used in **Sesat** are all Open Source, and the code to **Sesat** itself is freely available to the developers.

**Sesat** will:

- reduce development complexity
- enable a high degree of flexibility for the business
- lower total cost of ownership
- deliver superior value

## What is it?

- **Sesat** is a search application toolkit
- **Sesat** is a search application framework
- **Sesat** is a search application tracking system

With the new Boomerang module it is easy to follow the users behavior on the site

## Key Points

- Users of **Sesat** value the flexibility of not being tied to any particular search engine vendor.
- **Sesat**is not tied to any particular search engine or data storage. The customer may easily provide his own search interfaces and make them available to the **Sesat** Kernel.
- **Sesat** uses unicode (UTF-8) throughout, and is as such compatible with most languages and character sets.
- **Sesat**makes it possible to create search portals and search applications fast without worrying about internals of search engine APIs or writing display code, business logic etc. The developer's focus is entirely on the portal's functionality.
- **Sesat** is a mature search application framework that has been under heavy development since autumn 2005. It has an exiting roadmap which includes personalization, session-handling, Ajax-capabilities, rules engines, statistics tools and administrative tools.
- **Sesat** is an open architecture. The customer have access to all source code, and can submit code to the project.

- **Sesat** uses Open Source applications and libraries. No commercial software needs to be installed to run **Sesat**.
- Extensibility. Plugins and libraries may be sold as products in their own right.

## What does it do?

- Handle the complex parts while giving the customer full flexibility to add own features
- Provide rapid development components not only for collecting information from various sources, but also for assembling your search portal
- Complements search applications

## Why should I care?

- ROI  
When **Sesat** is in place, you can go to negotiate with your data source deliver, since **Sesat** gives you the opportunity to replace data sources without changing the front end. Your developers can even continue to develop when you are finding out which data sources you want to use. The developers can also focus on the front end and the functionality your company wants to provide, not on integrating the search engines and other search applications.
- TCO - vanskelig å estimere, må baseres på tidsforbruk + kompetansekostnad
- TTM - time to market. eksempler med sitesearches (dra inn Magne T)  
When first **Sesat** is in place it will be very easy to continue to develop your site (or add new sites). The reason for this is that **Sesat** is also a development framework with a lot of helpful default functionality. This default functionality is easy to extend to satisfy your requirements.
- Technical resources (mindre hardcore)  
**Sesat** will give your company a GUI framework with a well documented API for the search management, so your company's developers can care about the front end functionality, and not struggle with the complexity around the different data sources API etc. **Sesat** will translate the queries on an optimal way to the different supported data sources.
- Agility

## Benefits

One great benefit with **Sesat** is that it is independent. It supports a lot of the most common data sources today, and it is simple to add new data sources. There exists a well defined API to make a connector. If you want to add a new data source you don't have to worry about the front end. It will still use the same **Sesat** API. You can even replace a data source without changing the front end.

Another great benefit with **Sesat** is that it is based and developed as open source. So even your developers can contribute, see the code and apply patches if necessary. By building **Sesat** as an open source, and get the community to work, the product in itself will live and all the customers of **Sesat** will get advantage of each others.

The business rules are easily defined and managed with an XML-file. (In the next version this will be included in the **Sesat** ADM tool)

## Components and features

**Sesat** supports many multiple different data sources, so enterprises can easily use **Sesat** in their framework to extend their functionality.

**Sesat** can be scaled to unlimited number of instances, data sources.

## Support

Norwegian companies [Conduct](#), [Comperio](#), and [TRank](#), have worked as consultants on Sesat along the way.

## Stories

See how easy it is to create a [simple search website](#).

The traditional way of creating a search portal or a search application, is to develop a full stack of components from the lowest layer communicating directly with search apis, to the templating layer on top.

In effect, **Sesat** gives you most of these components, so the developer can focus on being productive with front-end coding.

- Cuts administrative overhead - developers can focus on presentation and functionally

Overview of the **Sesat** Model: The developer focus on functionality rather than middleware and interface coding.

The main parts of Sesat, organizing all libraries, applications and tools, are:

- **Sesat** Kernel - the main application, handling the actual search analysis, content search and result presentation.
- **Sesat** API - Application Programmers Interface. **Sesat** exposes many of its functions as WebServices and XML interfaces. This is key to Ajax functionality and for client applications where the **Sesat** SFC is not an option.
- **Sesat**SFC - Search Front-end Container. This is where client applications reside, and were they utilize the functionality present in the **Sesat** Kernel.
- **Sesat** Adm - administrative plugins and applications. **Sesat** comes with a portal setup based on JBoss Portals.

Client applications reside within the Search Front-end Container, SFC. One **Sesat**-installation can handle multiple client applicatins, or "vhosts", virtual hosts. For example, one single kernel can control and support `sesam.no`, `sesam.se`, `vg.sesam.no`, `svd.sesam.se`, `sports.svd.sesam.se`...

# Sesat Whitepaper

Do you need help to [convince your boss](#) 😊

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Error formatting macro: toc: java.lang.NullPointerException

## Preface

**Sesat** - SEsam Search Application Toolkit - is a stack of software applications aiming to help efficient creation of feature-rich, stable and multi-source based search portals and search applications. Based on experience and learnings from the first installations of Sesam.no and Sesam.se, **Sesat** is now an extensive toolkit with one primary focus: reduce development complexity and dramatically improve quality and delivery time. In fact, **Sesat** lets customers create fully-functional portals in a few days rather than many months, as proved by the teams behind Sesam.no and Sesam.se, all using **Sesat** to speed up site and site search development.

In general, writing a search application from scratch given only one or more indexes providing search results as data objects or XML, the following steps are usual:

- Create an application where the user types a search query
- Create a search function for each of the data sources to be searched in, tailored to the index profile / index data model
- The application queries each of the data sources in turn
- Display the results to the user

But, this is **not at all flexible or scalable**, with code that needs to be rewritten and tailored to any change in the underlying data source models. **A much better approach would be to:**

- Define a dynamic data model for each of the indexes to be searched in
- Implement either a parallel or a sequential search function that takes the search string and queries the different data sources, collects the data and delivers it to a templating engine. For such a function to be stable, it should
  - Be able to analyse the search query to predict which indexes are worth searching in
  - Handle faulty indexes
  - Handle slow response time together with increased traffic, preventing resource starvation
  - Handle the different APIs for the different indexes
  - Have a model for unifying/normalising the search result
  - Be robust when the index model / index profile changes (there should be no need to alter the search function)
- Implement a template engine that gets data from the search function and display it to the user
- Implement a logger that can register all searches with details about the user client, search context, zero-hits, index response time etc.
- Implement some sort of rules engine that triggers on particular terms in the search query, to intelligently boost which data source should be displayed first
- Allow for the application to present search results differently depending on IP-range, user session id, personalisation settings.
- Design templates to display the result

With **Sesat**, you get all of the above by

- Set up your development environment,
- Define your data sources in a configuration file, and
- Hack the example templates that is included.



## Introduction

The Sesam Search Application Toolkit, Sesat, is the heart of the <http://sesam.no> and <http://sesam.se> search portals. These portals show the power and flexibility of a platform enabling businesses to present both structured and un-structured information from many sources simultaneously, while honoring the user's search context and choices.

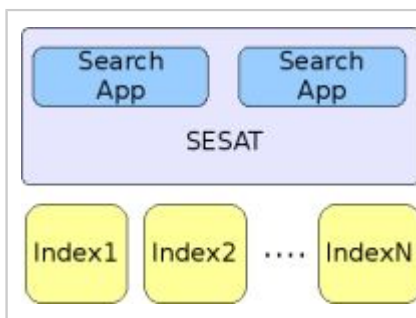
Sesat is built on experience and learnings from the first version of the sesam.no portal, and has grown both in maturity and functionality with the tasks given. It has all the time been an important goal to deliver as much flexibility and functionality to the user as possible, while keeping the "core" application stable. Sesam is today successfully leveraging the flexibility of this architecture, focusing on developing their portal rather than the underlying search technology.

## Executive Summary

Sesat includes a set of applications working together to provide a feature-rich search middleware. Sesat glues together information from underlying indexes and data sources and passes it on to the presentation layer. The toolkit has excellent support for all recent versions of the FAST search engine, as well as many other data sources. It is easy to create own connectors to underlying data layers and sources.

The **traditional** way of creating a search portal or a search application, is to develop a full stack of components from the lowest layer communicating directly with search apis, to the templating layer on top.

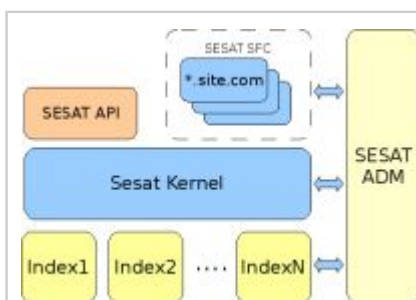
In effect, Sesat gives you most of these components, so the developer can focus on being productive with front-end coding.



Overview of the Sesat Model: The developer focus on functionality rather than middleware and interface coding.

The main parts of Sesat, organising all libraries, applications and tools, are:

- Sesat Kernel - the main application, handling the actual search analysis, content search and result presentation.
- Sesat API - Application Programmers Interface. Sesat exposes many of its functions as WebServices and XML interfaces. This is key to Ajax functionality and for client applications where the Sesat SFC is not an option.
- Sesat SFC - Search Front-end Container. This is where client applications reside, and were they utilise the functionality present in the Sesat Kernel.
- Sesat Adm - administrative plugins and applications. Sesat comes with a portal setup based on JBoss Portals.



Client applications reside within the Search Front-end Container, SFC. One Sesat-installation can handle multiple client applications, or "vhosts", virtual hosts. For example, one single kernel can control and support sesam.no, sesam.se, vg.sesam.no, svd.sesam.se, sports.svd.sesam.se...

## Key points:

- Sesat is not tied to any particular search engine or data storage. The customer may easily provide his own search interfaces and make them available to the Sesat Kernel.
- Sesat uses unicode (UTF-8) throughout, and is as such compatible with most languages and character sets.
- Sesat makes it possible to create search portals and search applications **fast** without worrying about internals of search engine APIs or writing display code, business logic etc. The developer's focus is entirely on the portal's functionality.
- Sesat is a mature search application framework that has been under heavy development since autumn 2005. It has an exiting roadmap which includes personalisation, session-handling, Ajax-capabilities, rules engines, statistics tools and administrative tools.
- Sesat is an open architecture. The customer have **access to all source code**, and can submit code to the project.
- Sesat uses Open Source applications and libraries. No commercial software needs to be installed to run Sesat.
- Extensibility. Extremely modular and pluggable architecture.

# Architecture

## Overview

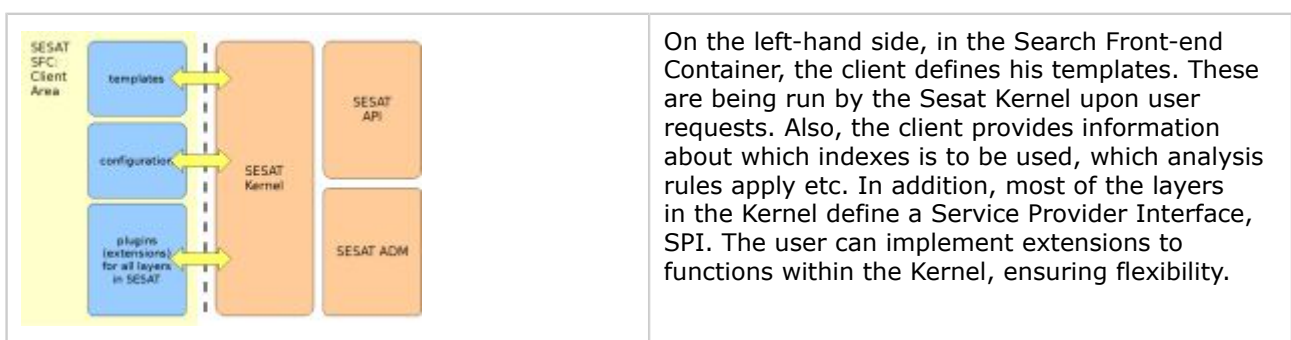
Sesat implements a search portal middleware. It lives in the layer between the application's presentation templates and one or more data sources. It is flexible enough to handle many different types of sources:

- FAST-indexes
- Lucene-indexes
- WebServices
- XML-RPC

and many more. It is very easy to extend the engine to handle other search interfaces.

The power of Sesat is its ability to search in multiple indexes at the same time, and then create a java object containing all results. This object can then be accessed either via templates (eg Velocity or JSP), or by Ajax-calls. Sesat understands user sessions, and therefore the object can be kept ready for subsequent calls and transactions.

Sesat is controlled by configuration. Some of this configuration is done by means of administrative tools - Sesat ADM. The administrative tools are implemented to run on JBoss Portals, a portal framework compliant to JSR-168, running on JBoss application servers. This framework is also home of several administrative plugins, like personalisation and statistics.



## Architecture of an example application

## Core components

A full [Product Description](#) also exists.

## Sesat Kernel

Sesat Kernel runs as a web application within a web-server. The Sesat Kernel, the core to the search front, and the generic.sesam skin (SFC) serves as a search engine's controlling and presentation framework.

Currently, Tomcat and JBoss is supported. All access to a search application or portal, is managed by this part of Sesat. The Kernel is configured to work with a number of Virtual Hosts, vhosts. When starting the service, the Kernel loads information about all active vhosts. Each of these may have their own templates, indexes and configuration. Client code for any given vhost is initialised and loaded at this stage.

A full [Kernel Feature list](#) can be found [here](#).

## Search Lifecycle

## Sesat SFC - Sesat Search Front-end Container

The SFC is where client applications run. They are deployed and directed by the Sesat Kernel.

Applications run within the same JVM as the Kernel. They are all deployed as .war-files to the same directory, by default.

The application names are the same as the vhost they implement.

Features:

- Very quick development and deployment of search application based on the kernel
- Flexible and configurable:
  - skins, vhosts, ranking, indexes, analysis rules, navigators and enrichments
- Runs in the same JVM as the kernel for speed, but **can** run on a separate JVM for security.
- Defined logfiles for developer [debugging and statistics](#).

## Sesat API

Most Kernel functionality is accessible from WebServices and the XML-interface. This is important functionality external applications that needs to communicate with Sesat. For example, mobile applications have been developed to perform searches using the XML API.

Features:

- XML RESTful API.
  - RSS / Atom feeds automatically generated from any already configured query.
- XML-RPC:
  - XML-based API with full support for all services in the kernel. Provided to tightly integrated partners.
  - Output configurable on a per-partner basis
  - Security services
- Web Services (WS)
  - WS for loosely coupled client application

Please note that XML-RPC and Web Services to Sesat are not yet implemented - We had great plans for XML-RPC and/or a Web Service API but us, and all our partners, always come back to using RSS (or custom XML) feeds. That's because at the moment the API, like most search APIs, is all RESTful so URL requests and XML (or serialised datamodel) responses gives you the full API.

## Sesat ADM

(source code to ADM not yet released)

The Sesat admin is a collection of applications and tools that run in a JBoss Portals server. The applications interact with various parts of Sesat, for example the Statistics engine.

Sesat Admin consists of portlets and applications running on JBoss Portals (server), which is a standards-compliant (JSR-168) portal. As of version 1.0 of Sesat, the following applications are available:

- User Administration Portlet (require usage of OpenLDAP). The administrator can define users, groups and roles, and ensure that access to other administrative systems or the search portal are prohibited and controlled.
- Statistics Portlet, providing simple statistics of queries and traffic through parsing of the [logfiles](#).
- FAST Lists Editor (version 1.0 of Sesat). FAST Lists are lookup-tables within the FAST engine that are used when analysing search queries.
- Rules Engine Portlet (version 1.2 of Sesat)
- Personalisation Manager (version 1.2 of Sesat)

## Sesat License

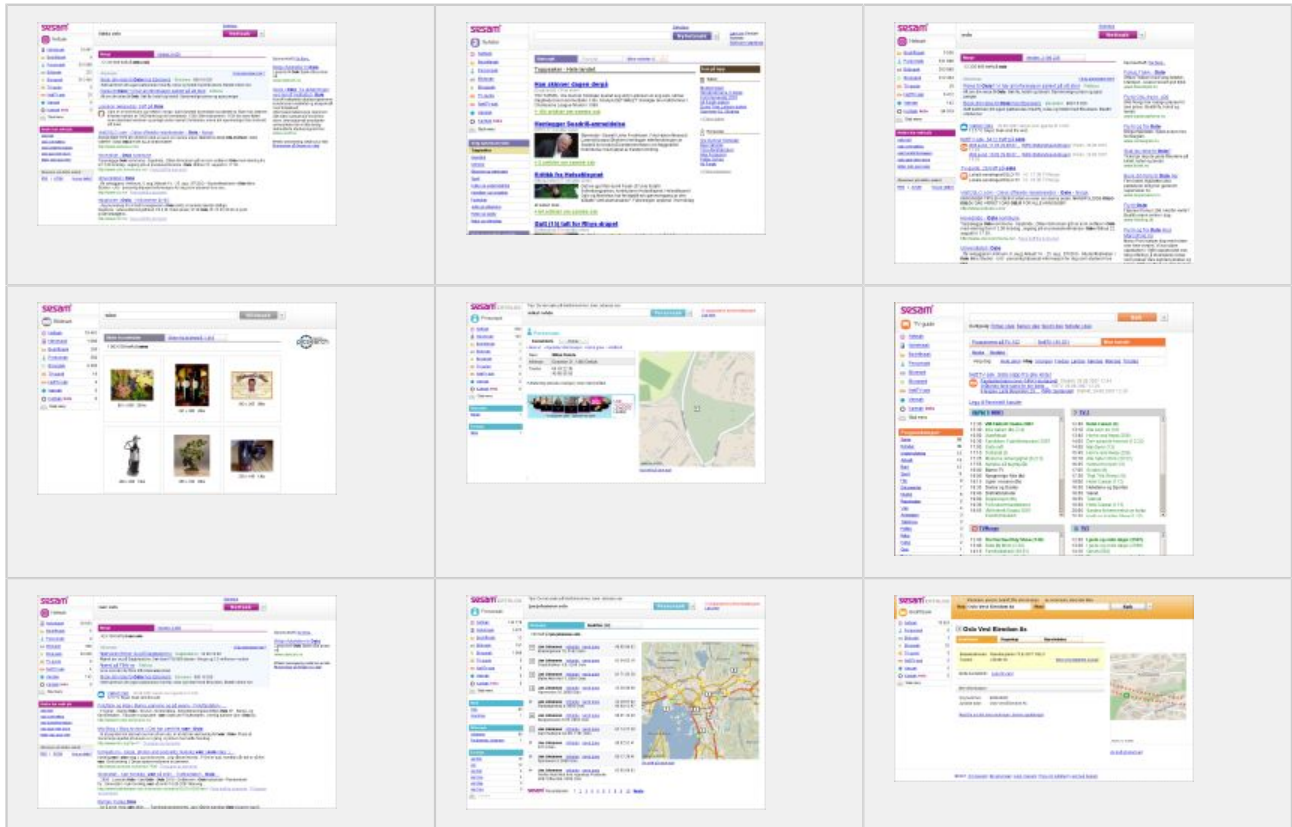
You may use Sesat under the [Affero GPLv3 license](#). This is a Free Software and Open Source license. All your source code including that belonging to derivative works must be made freely available to any user that interacts with the software locally or via any network (eg the internet).

If this does not suit your business needs, for example if you need to write propriety and private derivative works, then please contact us to obtain a [Propriety License](#).

## Showcases - Sesam.no

This page last changed on Apr 28, 2008 by [mick](#).

# Showcase: Sesam.no



## Technical Feature Matrix

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This page last changed on Sep 26, 2008 by [mick](#).

# Feature Matrix

We keep an up to date and detailed [Kernel Feature list here](#).

Feature	Description
<b>Installation and environment</b>	
Linux flavours	All of course, but tested on CentOS, RedHat, Ubuntu and Debian. Works well on local Windows installations (not recommended for heavy production sites)
Application Servers Supported	Tomcat 6.0+, JBoss 4.2.0+
Apache front-end proxying supported with mod_cache and mod_jk	Yes
Runs on same server as client application	No need for separate server(s). SESAT is deployed directly on the Java Application Server
Supports Java 1.6	Yes
Multiple Sites in the same JVM	Yes, with properties and templates inheritance for (sub)sites (e.g. vg.sesam.no can inherit properties and settings from sesam.no)
Easy configuration of each defined site/application	Yes, currently by XML-files, but with GUI-administration module under development.
Scalability	Scales linearly with number of servers using HW load balancing with sticky sessions.
Automated Deployment	Deployment scripts included for deployment of both SESAT and client applications.
<b>Source Code</b>	

Full access to Source Code	yes, from Subversion
Permissions to apply own patches	Yes
Special functionality built upon request	Yes, contribute it yourself or persuade the developers.
<b>Site GUI Development</b>	
Search Portal Framework	Yes. SESAT is both federating search middleware and a search application framework.
Development Environment	Anything you want. We recommend both NetBeans and Eclipse.
Development OS	Linux, Mac OS X and Windows
Client application building	Maven2-based generation of .war deployment files
Content formats supported	HTML, XHTML, XML, VCF, VML, RSS, etc.
Site inheritance	SESAT allows for sites to inherit layout and configuration from parent sites.
Example templates included	Yes, extensive stack of templates based on several real-life sites. (Velocity or JSP)
Easy development environment setup	Yes. Supports ssh-tunnels to data sources.
Search result access method	The Search Result Object is directly available from the template system.
Normalised search result	The Search Result Object presents the result in a normalised and uniform way, independent of the underlying index technology.
Templating System	Velocity and JavaServerPages are standard, support for adding any other

	Java-based templating systems.
Ajax-support	Search Result Object is connected to user sessionID to provide asynchronous information access.
Support for Java Faces	Not as standard yet, but can easily be implemented by client. Near-future versions of SESAT will have working examples of Java Faces.
Full flexibility for templating framework	Yes.
<b>Query Analysis</b>	
Configurable business logic	Yes, through the rules engine and administrative tools.
Rules-engine based Query Analysis	Yes, with rules managed by own module in SESAT ADM
Automatic search-phrase highlighting	Yes, for FAST-indexes. Highlighting independent of index type will be released in the near future.
Specification and administration of trigger-words	Yes, triggers may change ranking order of individual indexes in the search result. For example, " <b>fact</b> oslo" may boost content from a Wikipedia index before content from a global crawled web index.
Administrative back-end for rules engine	Yes, SESAT ADM Text Analysis providing automatic detection of full-names, geographical names etc.
Search term categorisation based on lookup-lists	yes
Phrase-search support	yes
Standard Search Operator support	yes, all functionality is inherited from the underlying index motor



Easter-eggs support	yes, of course!
In-built calculator	Yes, queries can be mathematically evaluated
<b>Result Handling</b>	
Result Object	Comprehensive, easily accessible object model
Simple Flat Result List	Search result represented as java object
Result persistence	Yes, attached to user SessionID, configurable duration
Handle both generic and specific index results	Yes - user configurable and extendable
<b>Enrichments Support</b>	
Enrichments ranking based on rules	yes
Easy creation and definition of enrichments	Yes, you can use any search command as an enrichment that will be displayed and ranked according to initial search analysis.
Unlimited number of enrichments	Yes
<b>Ad Systems Support</b>	
Yahoo PPC	yes
AdMomentum	yes
Google AdWords	yes
Easy to add new Ad Systems	Easy for user to implement Ad Systems by creating new, simple search commands
<b>Data Stores Support</b>	
Default Data Index Support	Default Search Command implementations for Fast-4 Simple search, Fast-4 Advanced search, Fast-5 ESP search, generic XML search, Web Services search, Blending (FAST) search, Clustering

	(FAST) search, Correcting (FAST) search, Mathematical/ Calculator search, Overture PPC search, PicSearch search, Platefood PPC search, Sensis search, Solr (Lucene) search, Stock market search, Yahoo IDP search, Yahoo Media search, and Youtube search.		
Support for external data stores	Yes, through HTTP, WebServices, JDBC. Easy to add own data sources using the SPIs.		
Roadmap Data Source/ Index Support	Lucene, Google, SharePoint, other sources we may need to search in		
Reference Search Command implementations	Blinkx Video search, Blocket search, Finn search, GeoData Map search, HittaMap search, Hitta search, HittaWeather search, Prisjakt search, Storm Weather Blinkx Video search, Tasteline search, TV-guide (FAST) search, Whitepages (FAST) search, Yellow Pages (FAST) search		
Support for Custom Search Commands	✔ Easy to develop using inbuilt SPI		
<b>Core Application Extensibility</b>			
Available SPIs (Service Provider Interfaces) for extending core functionality	Yes		
Full access to source code	Yes		
Independent release-cycles of minor kernel upgrades vs. client code	Yes		
Backwards-compability	Complete <a href="#">Upgrade Guides</a> kept up to date.		
<b>APIs</b>			

WebServices/XML support	Any search result is available through XML interfaces.		
SOA-enabled interfaces	Yes, through WebServices		
<b>Search Logging Support</b>			
Logging of requests to underlying search engines	Yes, everything can be logged with timestamp and result information (no. of hits)		
Logging of client information	Yes, user environment, browser characteristics		
Search context logging	Referer-domain, "skin" (client site from which the user is searching), navigational elements.		
User navigation tracking	Yes, using SESAT's <b>Boomerang</b> component, you can track user behaviour on your site, and also any access to external sites. Also, any asynchronous access activities can be logged by Boomerang.		
Administrative tool for reading logs	Yes, part of SESAT ADM		
Automatic anonymisation of IP-address	Yes, configurable part of the statistics parser.		
System behaviour logging	For each search, SESAT logs search execution times (on a per-index basis), zero-hitcount search results (on a per-index basis), enrichments, slow responding indexes		
<b>Monitoring/ Surveillance Logging Support</b>			
Slow index/non-responding index detection	Yes, logged to own surveillance log		
<b>Personalisation</b>			
Basic personalisation support	Yes		

Persistence storages supported	MySql currently supported, but other databases available from JDBC
Security	user session keys generated at each request
Sample code	Yes, working example of personalisation provided
User credentials storage	OpenLDAP
<b>Specific Index Functionality: FAST</b>	
Full navigator support	Yes, through Result Object and template system
Full support for rank profiles	Yes, the profile can be specified in the search command.
Full support for collections	Yes
Robust Error-handling for common FAST-errors	Yes, for example query matching failures/downtime

## Docs + Support

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This page last changed on May 12, 2008 by [mick](#).

- [Technical Feature Matrix](#) shows the main SESAT features and how works together with search technologies from <http://www.fast.no>, such as FAST ESP and FAST Unity.
- [Product Whitepaper](#)
- [Development Guidelines](#). Checking out the code and building the kernel.
- [Tutorial - Building Sesam.com](#). Tutorial running you through how to build a skin (SFC) on top of the kernel.
- [Debugging](#) Tips and tricks for debugging Sesat.
- [faq](#) Frequenty Asked Questions.

# SESAT Architecture Overview

## Overview

SESAT is composed of the following main components:

- SESAT Kernel - Main engine
- SESAT API - Application Programmers Interface
- SESAT SFC - Search Frontend Container
- SESAT ADM - Administrative Portal

## The Components

### SESAT Kernel

- Analyses queries
- Performs searches, handles timeouts
- Applies analysis and search rules
- Creates the «search result object»
- Handles personalisation

### SESAT API – work in progress

- XML-RPC:
  - XML-based API with full support for all services in the kernel.
  - Output configurable on a per-partner basis
  - Security services
- Web Services (WS)
  - QoS governance
  - WS for loosely coupled consumers

### SESAT SFC

- The Search Frontend Container allows quick deployment of search application based on the kernel
- Configurable:
  - skins, vhosts, ranking, indexes, analysis rules, navigators and enrichments
- Runs in the same JVM as the kernel for speed

### SESAT ADM – source code not released yet

- Administration of analysis and search rules
- Administration of FAST-lists (wordlists)
- User/LDAP administration
- Statistics tools (query analysis, traffic analysis)
- Portal framework (JSR-168 compliant)

## Design Proposals

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This page last changed on Jul 10, 2008 by [mick](#).

## New design proposal for SearchCommand and AbstractSearchCommand

This page last changed on Aug 21, 2008 by [mick](#).

# Design proposal for SearchCommand and AbstractSearchCommand

[Issue SKER2149: \(Divide & Conquer AbstractSearchCommand to delegates\)](#)

Error formatting macro: toc: java.lang.NullPointerException

## Current problems

- combination of various concern implementations leads to excessive subclass count or restrictive subclass implementation, eg simple or advanced filter combined with simple or advanced query gives four possible implementations with 100% duplication,
- poor parameter handling, offset, sortby, results-to-return, etc
- too many visitors, or unclear of various responsibilities involved,
- filter confusion: fielded clauses filters versus custom filters versus QueryTransformer.getFilter()
- ...

## Current API

### SearchCommand Context

ResourceContext  
DataModelContext  
SearchConfigurationContext  
TokenEvaluationEngineContext

### SearchCommand Concerns

Currently search commands have the methods:

SearchCommand	AbstractSearchCommand	AbstractXmlSearchCommand	AbstractSimpleFastSearchCommand	AbstractESPFastSearchCommand
getSearchConfiguration() call() handleCancellation() isPaginated() isUserSortable()	execute() isCancelled() performQueryTransformation() performExecution() performResultHandling() getFilter() setFilter() getAdditionalFilter() visitImpl★ visitXorClause(..) getSearchResult(..) getOffset() isPaginated() getUserSortBy() isUserSortable() getParameter(String) getSingleParameter(String) getQuery() getQueryRepresentation(Query) getTransformedTerm(Claue) getTransformedTerms() initialiseTransformedTerms()	getResultsToReturn() getXmlResult() getHttpReader()	createnavigationFilterStrings() setSearchEngineFactory(IFastSearchEngineFactory) addNavigatedTo(String) getNavigators() getResultsToReturn() getSearchEngine() getSortBy() setAdditionalParameters(Map<String, Object> parameters) collectSpellingSuggestions(IQueryResult, FastSearchResult) createSpellingSuggestion(String) collectResults(IQueryResult) createResultItem(IDocument, String) createQuery() getDynmicParams(Map<String, Object> parameters) getNavigatorsString() flattenNavigators(Collection<Navigator> Navigators) collectModifiers(IQueryResult, FastSearchResult) collectModifier(String, IQueryResult, FastSearchResult) getModifierComparator(IQueryResult) createProperNameSuggestion(String)	SearchCommandWord any(IFastSearchEngineFactory) appendFilter(String, String) getSortBy() modifyQuery(IQuery) createSearchResult(IQueryResult) getIQueryResult() isUserSortable() NavigatableESPFastSearchCommand createNavigationFilterStrings() addNavigatedTo(String) getNavigatedTo(String) getNavigatedValues() getNavigatedValue(String) getNavigatedTo() collectModifiers(IQueryResult, FastSearchResult) collectModifier(String, IQueryResult, FastSearchResult) getModifierComparator(IQueryResult) getModifierComparator(NavigatableESPFastSearchCommand)



	appendToQueryRepresentation(String) insertToQueryRepresentation(String) getQueryRepresentationLength() escapeFieldedLeaf(LeafClause) isEmptyLeaf(Clause) getFieldFilter(LeafClause) getTransformedQuery() getTransformedQuerySesamSyntax() setTransformedQuerySesamSyntax() newSesamSyntaxQueryBuilder() updateTransformedQuerySesamSyntax() getEngine() statisticInfo(String) MapVisitor FilterVisitor SesamSyntaxQueryBuilder	collectRelevantQueries(IQueryResultFastSearchResult)	addMedium(Clause) createCollapsedResults(NewsEspCommandCo addResult(NewsEspCommandCo  <b>NewsClusteringESPFastCommand</b>  createClusteringSearchResult(Cl
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A number of clear concerns can be seen:

- Execution handling `call()` `execute()` `handleCancellation()` `isCancelled()` `performQueryTransformation()` `performExecution()` `performResultHandling()`
- Parameters `getParameter(String)` `getSingleParameter(String)`
  - Result list size `getResultsToReturn()`
  - Pagination & Offset `isPaginated()` `getOffset()`
  - Sorting `isUserSortable()` `getUserSortBy()` `getSortBy()`
- Command applicable Query `getQuery()`
- Command Query construction --> internal visitor `visitImpl(*)` `getTransformedTerms()` `getTransformedTerm(Clause)` `initialiseTransformedTerms()` `appendToQueryRepresentation(String)` `insertToQueryRepresentation(String)` `getQueryRepresentationLength()` `escapeFieldedLeaf(LeafClause)` `isEmptyLeaf(Clause)` `getTransformedQuery()` `MapVisitor`
- Command XorClause handling `visitXorClause(XorClause)`
- Filter (fielded clauses) `getAdditionalFilter()` `FilterVisitor`
- Custom Filters `getFilter()` `setFilter()` `QueryTransformer.getFilter()`
- Modifiers (Domain Navigators)
- Stream handling/manipulating
- Reserved words
- Collapsing (& Clustering)
- Suggestions: Spelling, ProperName, Relevant queries
- Result Construction
- Utility (almost static methods 😊 `getSearchResult(...)`)

## Solutions

### Execution handling

Can remain as is.

This is in fact a concrete implementation of Callable's "ResultList<ResultItem> call()" method by AbstractSearchCommand, and it introduces the concepts of QueryTransformation, Execution, and Result Handling. AbstractSearchCommand express solely this, everything else it does should be moved out.

**ToDo** The SearchConfiguration classes SearchConfiguration, AbstractSearchConfiguration, and CommandConfig do not match the behaviour separation defined between SearchCommand and AbstractSearchCommand. For example, a brand new fresh SearchCommand implementation requires a SearchConfiguration with little of the properties actually defined in SearchConfiguration.

### Execution handling generics

Although the use of generics requires a review. Using generics in method signatures intended to be subclassed is something a little more complicated to design properly and IMHO was not done correctly the first time.

For example:

```

public interface SearchCommand extends Callable<ResultList<? extends ResultItem>>
public abstract ResultList<? extends ResultItem> execute()
public ResultList<? extends ResultItem> call()
protected final ResultList<? extends ResultItem> getSearchResult(String, DataModel)
protected final ResultList<? extends ResultItem> performExecution()
protected final void performResultHandling(final ResultList<? extends ResultItem> result)

```

No subclass can actually subclass these methods and provide exact generics to the signatures because each command, for example, returns a BasicResultList upon cancellation or handled internal checked exception.

## Parameters

Parameters typically have three sources, and they first found used: a url parameter, a user parameter, the command's configured parameter.

Sometimes (eg userSortBy and pagination) the configuration actually comes from the presentation layer. The command's configuration here must simply point to where in the presentation layer this configuration can be found. Strictly speaking the domain layer should be isolated from the presentation layer but here we access only the presentation layer's configuration through the datamodel.

ResultToReturn is an interesting example. It should be both overridable from url and user parameters. But the configuration exist in both the presentation layer and the domain layer. The domain layer's only responsibility is to ensure **at least** the amount of results are returned that the presentation layer wants. Up until now its just been presumed that the command's configuration is hardcoded to a value larger than any possible presentation value.

An example implementation can be viewed here: [SearchCommandParameter code example](#).

## Command applicable Query

### Command Query construction

Magnus Eklund's solution follows:

Introduce a new interface called QueryBuilder. Query Builders are used to transform the query object into a string representation.

- Remove "extends AbstractReflectionVisitor" from AbstractSearchCommand.
- New interface QueryBuilder
- Add property queryBuilder to SearchConfiguration to hold the FQN of a QueryBuilder class. This property will correspond to a <queryBuilder>-tag in modes.xml to allow for configuration of the query builder itself. (e.g. <queryBuilder class="no.sesat.search.mode.command.query.PrefixQueryBuilder" supportsAndNot="false" />)
- Create QueryBuilder implementations:
  - PrefixQueryBuilder
  - SesamQueryBuilder
  - InfixQueryBuilder.
  - Fast4QueryBuilder (if needed, should be possible to configure one of the above to produce suitable syntax)
  - Fast5QueryBuilder (if needed, should be possible to configure one of the above to produce suitable syntax)

These would still visitors over the query but transforming from the transformedMap into a string representation.

The transformedMap is the mutable state of each clause through the search command's query transformations.

QueryBuilder also needs to have an API to deal with XorClauses, ReservedWords, and supported filter clauses. The definition of these things would be supplied through the context.

**Backward Compatibility** could be helped by, when no QueryBuilder is specified, creating a proxy against the search command and using it presuming it contains all the QueryBuilder methods required. The alternative backard compatibility would be to refactor AbstractSearchCommand to DeprecatedSearchCommand, so that existing search commands work as is. Problem here is that we'd end

up with a score of `DeprecatedXyzSearchCommand` classes as many of the subclasses are rewritten to the new `AbstractSearchCommand` implementation.

Example starting implementation can be read [QueryBuilder code example](#).

## Command `XorClause` handling

This can stay how it is. It must be provided to any `QueryBuilder`'s context.

## Reserved Words

Only exists in `AbstractESPFastSearchCommand`. Should be formalised and brought down to the `SearchCommand` interface.

Since the enumeration belongs to a particular `SearchCommand` implementation the enumeration should also return how each item is to be escaped in any query.

It must be provided to any `QueryBuilder`'s context.

## Fielded clause (& Custom) filters

Where filters (included custom filters) go is a prickly trick. Some command's have the filter simply appended to the query, while others have no notion of a filter at all.

Worse yet is that some filter must go into the query and others defined as separate parameters.

Should the transformedMap state be made available to multiple `QueryBuilder` within any one request, so that a command that request filters in a separate parameter to the query could run two separate `QueryBuilders`. The query `QueryBuilder` would ignore filters, the filter `QueryBuilder` would ignore non-filter terms. Exaggerating it, commands that requested *each* filter in a separate parameter could have multiple filter `QueryBuilders` each ignoring everything but the one filter it is responsible for.

But how does this deal with custom filters that come from the configuration, not the query. Should each custom filter be deserialised into a Query tree/object and `QueryBuilders` be able to visitor multiple query trees???

## Custom filters

## Stream manipulation & Result Construction

**Stream manipulation** exists in `AbstractXmlSearchCommand`. Should be formalised. A little awkward, for example FAST commands work against a java api.

Could be defined in auxiliary interfaces, eg `RestfulSearchCommand`, `StreamReaderSearchCommand`, that could be mixed and matched.

Example implementation can be read [Stream manipulation code examples](#).

**Result Construction** is a higher level concern than stream manipulation. Likely will be the user of stream manipulation where applicable.

While the return values of such methods are easy to define, the parameters are not. Some commands parse streams, some local files, some use a webservice or local library api.

Example can be seen within the Stream manipulation example [here](#)

## Collapsing (& Clustering)

## Modifiers

Defined in an auxiliary interface, eg `NavigatableSearchCommand`.

Modifiers today are generic, built from the `Navigator` which holds the configuration, and the search command's results.

Defined behavior by an interface would result in the `FastNavigationController` becoming a `ModifierNavigationController`.

I do not see a need for delegation in the design as in most cases the parsing of the information required to construct the modifiers is specific to the search command.

Keep in mind that this is a subset to the Result Construction concern.

## **Utility behavior**

Stay as is. Actual static methods can be moved to a SearchCommandUtility class.

## QueryBuilder code example

This page last changed on Aug 21, 2008 by [mick](#).

Error formatting macro: toc: java.lang.NullPointerException

### QueryBuilder interface

```
/** QueryBuilder provides a string representation of a Query Tree against of map of "transformed
terms".
*
* It is similar in functionality to the QueryTransformer interface
* except that it does not transform terms but uses them to build the final string representation.
*/
public interface QueryBuilder extends Visitor {

    interface Context extends QueryContext, ResourceContext, SiteContext, DataModelContext{

        /**
        * Get the terms with their current transformed representations.
        * @return
        */
        Map<Clause, String> getTransformedTerms();

        /** Get the unescaped transformed term for the clause.
        *
        * @param clause
        * @return unescaped transformed term
        */
        String getTransformedTerm(Claue clause);

        /**
        * For evaluation acitions on individual (or the whole query) terms.
        * @return
        */
        TokenEvaluationEngine getTokenEvaluationEngine();

        /**
        * QueryTransformers must follow the same XorClause hints as the search command. *
        * @param visitor
        * @param clause
        */
        void visitXorClause(Visitor visitor, XorClause clause);

        /**
        * QueryTransformers needs information about supported field filters. *
        * @param clause
        * @return
        */
        String getFieldFilter(LeafClause clause);

        /** The collection of words that have special meaning/function within the query string
        *
        * @return collection of reserved words
        */
        Collection<String> getReservedWords();

        /** Escape the word.
        * The word need not be reserved or require escaping but should be escaped anyway.
        *
        * @param word
        * @return escaped version of the word
        */
        String escape(String word);
    }
}
```

```

/** The Query String built from the Query's transformed clauses
 *
 * @param query
 * @return string built from the Query's transformed clauses
 */
String getQueryString(Query query);
}

```

## Abstract QueryBuilder

```

/** Helper abstract implementation handling stringBuilder functionality behind the visitor pattern.
 **/
public abstract class AbstractQueryBuilder extends AbstractReflectionVisitor implements
QueryBuilder {

// Attributes -----

private final Context context;
private final QueryBuilderConfig config;
private final StringBuilder sb = new StringBuilder(128);

// Constructors -----

public AbstractQueryBuilder(final Context cxt, QueryBuilderConfig config) {

context = cxt;
this.config = config;
}

// Public -----

public String getQueryString() {

final Clause root = context.getQuery().getRootClause();
sb.setLength(0);
visit(root);
return sb.toString().trim();
}

// Protected -----

protected final Context getContext(){
return context;
}

protected QueryBuilderConfig getConfig(){
return config;
}

/** Gets the transformed term, escaping any reserved words.
 *
 * @param clause
 * @return
 */
protected String getEscapedTransformedTerm(final Clause clause){

return escape(context.getTransformedTerm(clause).toLowerCase());
}

/** Escapes any reserved words (including those fielded).
 * Case-insensitive.
 *
 * How to actually escape any matching words is left to the context to define via
context.escape(word)

```

```

*
* @param string
* @return possibly escaped string
*/
protected String escape(final String string){

for (String word : getWordsToEscape()) {

// Case-insensitive check against word.
// Term might already be prefixed by the TermPrefixTransformer.
if (string.toLowerCase().endsWith(': ' + word.toLowerCase()) ||
string.equalsIgnoreCase(word)) {

final Pattern p = Pattern.compile(
Matcher.quoteReplacement(word),
Pattern.UNICODE_CASE | Pattern.CASE_INSENSITIVE);

return p.matcher(word).replaceAll(context.escape(string));
}
}

return string;
}

protected Collection<String> getWordsToEscape(){
return context.getReservedWords();
}

protected final void appendToQueryRepresentation(final CharSequence addition) {
sb.append(addition);
}

protected final void appendToQueryRepresentation(final char addition) {
sb.append(addition);
}

protected final int getQueryRepresentationLength() {
return sb.length();
}

protected final void insertToQueryRepresentation(final int offset, final CharSequence addition) {
sb.insert(offset, addition);
}

protected boolean isEmptyLeaf(final Clause clause) {
return false;
}

protected boolean isEmptyLeaf(final LeafClause clause) {

final String tt = 0 == context.getTransformedTerm(clause).length()
? null
: context.getTransformedTerm(clause);

return
// no field and a valid term
null == clause.getField() && null == tt
// or, a field that is an accepted filter
|| null != clause.getField() && null != context.getFieldFilter(clause);
}

protected boolean isEmptyLeaf(final DoubleOperatorClause clause) {

return isEmptyLeaf(clause.getFirstClause()) && isEmptyLeaf(clause.getSecondClause());
}

```

```

}

protected void visitImpl(final XorClause clause) {
getContext().visitXorClause(this, clause);
}
}

```

## Infix QueryBuilder implementation

```

/**
 * Largely mimics the Query tree layout replacing OperatorClauses with the RESERVED_WORDS.
 */
public class InfixQueryBuilder extends AbstractQueryBuilder{

// Constructors -----

public InfixQueryBuilder(final Context cxt, final QueryBuilderConfig config) {
super(cxt, config);
}

// protected -----

@Override
protected InfixQueryBuilderConfig getConfig() {
return (InfixQueryBuilderConfig) super.getConfig();
}

@Override
protected Collection<String> getWordsToEscape() {

final Collection<String> words = new HashSet<String>(super.getWordsToEscape());

words.add(getConfig().getAndInfix());
words.add(getConfig().getNotPrefix());
words.add(getConfig().getOrInfix());

return words;
}

protected void visitImpl(final LeafClause clause) {

appendToQueryRepresentation(getEscapedTransformedTerm(clause));
}

protected void visitImpl(final OperationClause clause) {

clause.getFirstClause().accept(this);
}

protected void visitImpl(final AndClause clause) {

clause.getFirstClause().accept(this);
appendToQueryRepresentation(' ' + getConfig().getAndInfix() + ' ');
clause.getSecondClause().accept(this);
}

protected void visitImpl(final OrClause clause) {

clause.getFirstClause().accept(this);
appendToQueryRepresentation(' ' + getConfig().getOrInfix() + ' ');
clause.getSecondClause().accept(this);
}
}

```



```

protected void visitImpl(final DefaultOperatorClause clause) {

    clause.getFirstClause().accept(this);
    appendToQueryRepresentation(' ');
    clause.getSecondClause().accept(this);
}

protected void visitImpl(final NotClause clause) {

    final String childsTerm = getEscapedTransformedTerm(clause.getFirstClause());
    if (childsTerm != null && childsTerm.length() > 0) {
        appendToQueryRepresentation(getConfig().getNotPrefix());
        clause.getFirstClause().accept(this);
    }
}

protected void visitImpl(final AndNotClause clause) {

    final String childsTerm = getEscapedTransformedTerm(clause.getFirstClause());
    if (childsTerm != null && childsTerm.length() > 0) {
        appendToQueryRepresentation(getConfig().getNotPrefix());
        clause.getFirstClause().accept(this);
    }
}
}

```

## Prefix QueryBuilder implementation

```

/** QueryBuilder prefixing terms depending on their inclusion/exclusion.
 */
public class PrefixQueryBuilder extends AbstractQueryBuilder{

    // Attributes -----

    // third state variable. TRUE --> must have clause, FALSE --> must not have clause, null -->
    // optional clause.
    private Boolean clauseState = Boolean.TRUE;

    // Constructors -----

    public PrefixQueryBuilder(final Context cxt, final QueryBuilderConfig config) {
        super(cxt, config);
    }

    // Protected -----

    @Override
    protected PrefixQueryBuilderConfig getConfig() {
        return (PrefixQueryBuilderConfig) super.getConfig();
    }

    @Override
    protected Collection<String> getWordsToEscape() {

        final Collection<String> words = new HashSet<String>(super.getWordsToEscape());

        words.add(getConfig().getAndPrefix());
        words.add(getConfig().getNotPrefix());
        words.add(getConfig().getOrPrefix());

        return words;
    }

    protected void visitImpl(final LeafClause clause) {

```

```

insertClauseStatePrefix(clause);
super.visitImpl(clause);
}

protected void visitImpl(final PhraseClause clause) {

if (clause.getField() == null) {
insertClauseStatePrefix(clause);
appendToQueryRepresentation(getEscapedTransformedTerm(clause));
}
}

protected void visitImpl(final AndClause clause) {

clauseState = Boolean.TRUE;
clause.getFirstClause().accept(this);
appendToQueryRepresentation(' ');
clauseState = Boolean.TRUE;
clause.getSecondClause().accept(this);
}

protected void visitImpl(final OrClause clause) {

clauseState = null;
clause.getFirstClause().accept(this);
appendToQueryRepresentation(' ');
clauseState = null;
clause.getSecondClause().accept(this);
}

protected void visitImpl(final DefaultOperatorClause clause) {

clauseState = Boolean.TRUE;
clause.getFirstClause().accept(this);
appendToQueryRepresentation(' ');
clauseState = Boolean.TRUE;
clause.getSecondClause().accept(this);
}

protected void visitImpl(final NotClause clause) {

if(getConfig().getSupportsNot()){
final String childsTerm = getEscapedTransformedTerm(clause.getFirstClause());
if (childsTerm != null && childsTerm.length() > 0) {
clauseState = Boolean.FALSE;
clause.getFirstClause().accept(this);
}
}
}

protected void visitImpl(final AndNotClause clause) {

if(getConfig().getSupportsNot()){
final String childsTerm = getEscapedTransformedTerm(clause.getFirstClause());
if (childsTerm != null && childsTerm.length() > 0) {
clauseState = Boolean.FALSE;
clause.getFirstClause().accept(this);
}
}
}

private void insertClauseStatePrefix(final Clause clause){

if(!isEmptyLeaf(clause)){
if(Boolean.TRUE == clauseState){

```

```

appendToQueryRepresentation(getConfig().getAndPrefix());
}else if(Boolean.FALSE == clauseState){
appendToQueryRepresentation(getConfig().getNotPrefix());
}else{
appendToQueryRepresentation(getConfig().getOrPrefix());
}
}
}
}
}

```

## Sesam Syntax QueryBuilder implementation

```

/** Query builder for creating a query syntax similar to sesam's own.
 * Currently is basically a PrefixQueryBuilder with OrClauses wrapped in () parenthesis.
 */
public class SesamSyntaxQueryBuilder extends PrefixQueryBuilder{

// Constructors -----

public SesamSyntaxQueryBuilder(final Context cxt, final QueryBuilderConfig config) {
super(cxt, config);
}

// AbstractReflectionVisitor implementation -----

private boolean insideOr = false;

@Override
protected void visitImpl(final OrClause clause) {

boolean wasInside = insideOr;
if (!insideOr) {
appendToQueryRepresentation('(');
}
insideOr = true;
super.visitImpl(clause);
insideOr = wasInside;
if (!insideOr) {
appendToQueryRepresentation(')');
}
}

/** Overridden so to avoid visiting any FULLNAME_ON_LEFT.
 */
@Override
protected void visitImpl(final XorClause clause) {

switch (clause.getHint()) {
case FULLNAME_ON_LEFT:
clause.getSecondClause().accept(this);
break;
default:
super.visitImpl( clause);
}
}
}

```

## SearchCommandParameter code example

---

This page last changed on Aug 15, 2008 by [mick](#).

EXAMPLE implementation of a more dynamic Parameter handling for SearchCommands.

```
interface SearchCommandParameter{

enum PARAMETER_ORIGIN {REQUEST,USER,CONFIGURATION};

enum PARAMETER_TYPE {PLAIN,NAVIGATION_MAP,TAB};

String getName();

boolean isActiveParameter();

PARAMETER_ORIGIN getParametersOrigin();

String getParameter();
}

class BaseSearchCommandParameter implements SearchCommandParameter{

private final String name;
private final PARAMETER_ORIGIN[] lookupOrder;
private PARAMETER_ORIGIN origin = null;

public BaseSearchCommandParameter(
final String name,
final PARAMETER_ORIGIN[] lookupOrder){

this.name = name;
this.lookupOrder = Arrays.copyOf(lookupOrder, 0);
}

public String getName(){
return name;
}

public boolean isActiveParameter() {
return true;
}

public String getParameter() {

String result = null;
if(isActiveParameter()){

for(PARAMETER_ORIGIN origin: lookupOrder){

if(null != this.origin){
// shortcut to the origin found last time.
origin = this.origin;
}
switch(origin){

case REQUEST:
final StringDataObject sdo = context.getDataModel().getParameters().getValue(name);

if(null != sdo){
result = sdo.getString();
}
break;

case USER:
result = context.getUser().getUser().getUserPropertiesMap().get(name);
break;
```

```

case CONFIGURATION:
final PropertyDescriptor[] properties =
Introspector.getBeanInfo(getSearchConfiguration().getClass()).getPropertyDescriptors();
for(PropertyDescriptor property : properties){
if (name.equals(property.getName())){

if( null != property.getReadMethod() ){
result = (String)invoke(property.getReadMethod(), getSearchConfiguration(), new Object[0]);
break;
}
}
}
if(null != result){
this.origin = origin;
break;
}
}
return result;
}

public PARAMETER_ORIGIN getParametersOrigin() {

if(null == origin){
getParameter();
}
return origin;
}

}

class NavigationSearchCommandParameter extends BaseSearchCommandParameter{

private final String navigationMapKey;

public NavigationSearchCommandParameter(
final String name,
final String navigationMapKey,
final PARAMETER_ORIGIN[] lookupOrder){

super(name, lookupOrder);
this.navigationMapKey = navigationMapKey;
}

@Override
public boolean isActiveParameter() {

final boolean navMapExists = null != context.getDataModel().getNavigation()
&& null != context.getDataModel().getNavigation().getConfiguration();

final Nav nav = navMapExists
? context.getDataModel().getNavigation().getConfiguration().getNavMap().get(navigationMapKey)
: null;

return null != nav && getSearchConfiguration().getId().equals(nav.getCommandName());
}

}

```

## Stream manipulation code examples

This page last changed on Aug 21, 2008 by [mick](#).

Error formatting macro: toc: java.lang.NullPointerException

### Restful

This example defines an interface outside of the SearchCommand class/interface hierarchy. This approach permits delegation to occur from SearchCommand class to a Restful instance.

```
/** SearchCommands that are RESTful should implement this behaviour.
 * http://en.wikipedia.org/wiki/Representational_State_Transfer
 */
public interface Restful {

    /** A RESTful service requires a URL.
     * The resource part of the URL is usually constant to the particular command instance,
     * but each search creates a separate URL.
     *
     * @return the URL to use to the RESTful service.
     */
    String createRequestURL();

    /** Obtain a BufferedReader, in the given encoding, of the RESTful result.
     * Makes the presumption that the RESTful service returns an ascii and not binary response.
     *
     * @param encoding
     * @return
     * @throws java.io.IOException
     */
    BufferedReader getHttpReader(String encoding) throws IOException;
}
```

### XmlResultful

An extension to the Restful interface when it is known the response will be in xml format.

```
/** SearchCommands that are RESTful and return XML response.
 * http://en.wikipedia.org/wiki/Representational_State_Transfer
 *
 * It makes the presumption of working with JAXP's DOM.
 */
public interface XmlRestful extends Restful{

    Document getXmlResult() throws IOException, SAXException;
}
```

### Example abstract XmlRestful implementation

```
/**
 * Base implementation for search commands that are RESTful and have XML responses.
 *
 * The RESTful server is defined through:
 * host: AbstractXmlSearchConfiguration.getHost()
 * port: AbstractXmlSearchConfiguration.getPort()
 *
 * @version $Id: AbstractXmlSearchCommand.java 6596 2008-05-10 10:05:48Z ssmiweve $
 */
public abstract class AbstractXmlRestful implements XmlRestful{

    // Attributes -----
```

```

private final transient HTTPClient client;

// Constructors -----

/**
 * Create new xml based command.
 */
public AbstractXmlRestful(final Context cxt) {

    final AbstractXmlSearchConfiguration conf =
        (AbstractXmlSearchConfiguration)cxt.getSearchConfiguration();

    final SiteConfiguration siteConf = cxt.getDataModel().getSite().getSiteConfiguration();
    final String host = siteConf.getProperty(conf.getHost());
    final int port = Integer.parseInt(siteConf.getProperty(conf.getPort()));

    client = HTTPClient.instance(conf.getHostHeader().length() > 0 ? conf.getHostHeader() : host, port,
        host);
}

// Public -----

public final Document getXmlResult() throws IOException, SAXException {
    final String url = createRequestURL();
    return client.getXmlDocument(url);
}

public final BufferedReader getHttpReader(final String encoding) throws IOException {
    final String url = createRequestURL();
    return client.getBufferedReader(url, encoding);
}
}

```

## Example Usecase

AbstractXmlSearchCommand here is largely refactored (simplified) and now holds an Restful instance and delegates to it as needed

AbstractXmlSearchCommand also introduces the createItem behaviour requirement as it's the norm that each individual result is defined within a separate element within the xml response.

```

/**
 * Helper base implementation for search commands that are RESTful and have XML responses.
 *
 * The RESTful server is defined through:
 * host: AbstractXmlSearchConfiguration.getHost()
 * port: AbstractXmlSearchConfiguration.getPort()
 */
public abstract class AbstractXmlSearchCommand extends AbstractSearchCommand{

// Attributes -----

    private XmlRestful restful;

// Constructors -----

/**
 * Create new xml based command.
 *
 * @param cxt The context to execute in.
 */
protected AbstractXmlSearchCommand(final Context cxt) {
    super(cxt);
}
}

```

```

}

// Public -----

public final String createRequestURL() {

return restful.createRequestURL();
}

// Protected -----

/** Each individual result is usually defined within one given Element.
 *
 * @param result the w3c element
 * @return the ResultItem
 */
protected abstract ResultItem createItem(final Element result);

protected final XmlRestful getXmlRestful(){
return restful;
}

protected final void setXmlRestful(final XmlRestful restful){
this.restful = restful;
}
}

```

PicSearchCommand extends a final implementation on AbstractXmlSearchCommand displaying the delegation pattern at whole.

```

/**
 * A search command that uses the picsearch API.
 */
public class PicSearchCommand extends AbstractXmlSearchCommand {

private static final Logger LOG = Logger.getLogger(PicSearchCommand.class);
private final transient HTTPClient client;
private final int port;
private static final String REQ_URL_FMT = "/query?
ie=UTF-8&tldb={0}&filter={1}&custid={2}&version=2.6"
+ "&thumbs={3}&q={4}&start={5}&site={6}&color={7}&size={8}";

/**
 * Creates a new command in given context.
 *
 * @param cxt Context to run in.
 */
public PicSearchCommand(final Context cxt) {

super(cxt);

setXmlRestful(
new AbstractXmlRestful(cxt) {
public String createRequestURL() {

final PictureCommandConfig cfg = (PictureCommandConfig) cxt.getSearchConfiguration();

try {

final String query = URLEncoder.encode(PicSearchCommand.this.getTransformedQuery(), "utf-8");

final String color = null != PicSearchCommand.this.getParameter("color")
? PicSearchCommand.this.getParameter("color")
: "";

```



```

final String size = null != PicSearchCommand.this.getParameter("size")
? PicSearchCommand.this.getParameter("size")
: "";

final String urlBoost = PicSearchCommand.this.getFilterBuilder().getFilter("tldb")
.replace('=',':')
.replace(' ','');

if(null != cfg.getSite() && cfg.getSite().length() > 0){
PicSearchCommand.this.getFilterBuilder().addFilter("site", cfg.getSite());
}

// The boost can either be from the URL or from the configuration.
final String boost = URLEncoder.encode(urlBoost.length() > 0 ?
urlBoost : cfg.getDomainBoost(), "utf-8");

return MessageFormat.format(REQ_URL_FMT,
boost,
cfg.getFilter(),
cfg.getCustomerId(),
cfg.getResultsToReturn(),
query,
PicSearchCommand.this.getOffset()+1,
PicSearchCommand.this.getFilterBuilder().getFilter("site").replace(' ',''),
color,
size);

} catch (UnsupportedEncodingException e) {
throw new SearchCommandException(e);
}

}

});

final SiteConfiguration siteConfig = datamodel.getSite().getSiteConfiguration();
final PictureCommandConfig psConfig = (PictureCommandConfig) context.getSearchConfiguration();

final String host = siteConfig.getProperty(psConfig.getQueryServerHost());
port = Integer.parseInt(siteConfig.getProperty(psConfig.getQueryServerPort()));
client = HTTPClient.instance(host, port);

}

public ResultList<ResultItem> execute() {

final BasicResultList<ResultItem> searchResult = new BasicResultList<ResultItem>();

if (port > 0){
try {

final Document doc = getXmlRestful().getXmlResult();
if (doc != null) {
final Element resultElement = doc.getDocumentElement();
searchResult.setHitCount(Integer.parseInt(resultElement.getAttribute("hits")));
final NodeList list = resultElement.getElementsByTagName("image");
for (int i = 0; i < list.getLength(); i++) {
searchResult.addResult(createItem((Element) list.item(i)));
}
}

} catch (IOException ex) {
throw new SearchCommandException(ex);
} catch (SAXException ex) {
throw new SearchCommandException(ex);
}
}
}

```

```
}

return searchResult;

}

@Override
protected ResultItem createItem(final Element picture) {

    final BasicResultItem item = new BasicResultItem();
    for (final Map.Entry<String, String> entry :
        getSearchConfiguration().getResultFieldMap().entrySet()) {
        item.addField(entry.getValue(), picture.getAttribute(entry.getKey()));
    }
    return item;

}
}
```

# SESAT Personalization architecture

This is a document describing the design of and how the personalization architecture works in Sesam.

## Components / API

The architecture for personalization is build on three systems:

- the search front
- the user admin application
- the RMI backend, the service layer, for handling lookup and persistens of user data.

Both the RMI backend and the user admin application runs on our HA-JBoss environment using the HA-mysql database. The search front and the user admin application must share domain so they can share login cookies.

## Search Front

The search front should be as clean as possible. That's why we want to separate the user admin into it's own application. Then we don't have to handle validation and stuff like that in the search front.

The search front will contain a user filter that is used to check if there exists a known user and populate the data model with the user object and the belonging properties. The search front can also set and remove single properties for a user, to make it possible handling i.e. news cases that is implemented as drag-n-drop. And a logout method. For more advanced editing of properties and creating user accounts etc, a link will bring the user over to the admin application.

The user filter will work something like this.

### UserFilter.java

```
public void doFilter(...) {

    if (null == datamodel.getUser()) {

        // Look for login cookie

        if (null != cookie) {

            // Lookup user data by using cookie

            if (null == user) {

                // Do nothing, end filter

            }

            if (legalToken) {

                // Populate data model with user data and belonging properties
                // Update login cookie

            } else {

                // Invalidate all logins, warn user of theft

            }
        }
    }
}
```

}

## User Admin Application

The user admin application should have the following functionality:

- **Create User**  
Form for creating a new user. Submit will create a non-confirmed user object and send confirm mail to the email address that is submitted.
- **Confirm User**  
Just a direct access page for confirming a new user. This page will confirm the user in the database and redirect the user to the login page.
- **Login User**  
Page where the user can log in. After login, get links back to Sesam or update user data.
- **Edit Properties**  
Pages where the user can edit all the properties for his user.
- **Edit User**  
Page where the user can update the user info. If the user is based on an ldap user, the update will happen automatically, and give a message if an update was done.
- **Delete User**  
Users should have the possibility to delete their user object and all the belonging information.
- **Master Logout**  
This action erases all remembered logins for the user in one action.

## RMI backend

The RMI backend should contain the implementation for the EJB3 entity beans, and a service layer that is used by the different applications. The service layer should contain all needed functionality, in an easy accessible way.

The basic user service is a lightweight service class for authenticating users, and an easy way of getting/setting properties.

### BasicUserService.java

```
public interface BasicUserService {

    BasicUser authenticateByLoginKey(final String loginKey) throws InvalidTokenException;

    BasicUser authenticateByUsername(final String username, final String password);

    BasicUser findBasicUserByUsername(final String username);

    BasicUser refreshUser(final BasicUser user);

    void invalidateLogin(final String loginKey);

    void invalidateAllLogins(final String loginKey);

    void invalidateAllLogins(final BasicUser user);

    BasicUser createUser(final String email, final String firstName, final String lastName,
        final String password, final String confirmUrl) throws UserAlreadyExistsException,
        MailException;

    boolean confirmUser(final BasicUser user, final String confirmKey);

    void deleteUser(final BasicUser user);

    BasicUser setUserProperty(final BasicUser user, final PropertyKey propertyKey,
        final String propertyValue);

    BasicUser removeUserProperty(final BasicUser user, final PropertyKey propertyKey);

    boolean isLegalLoginKey(final String loginKey);
```

```
}
```

The basic user class is a lightweight value class that just wraps in the needed information, totally stripped for entity magic. Remoting and serialization is also easy since it just contains simple Java attributes.

### **BasicUser.java**

```
public interface BasicUser extends Serializable {

    Long getUserId();

    String getUsername();

    String getFirstName();

    String getLastName();

    Date getCreated();

    Date getLastLogin();

    boolean isExternal();

    Map<PropertyKey, String> getUserPropertiesMap();

    String getNextLoginKey();

    void setNextLoginKey(final String nextLoginKey);

    Date getUpdateTimestamp();

    void setUpdateTimestamp(final Date updateTimestamp);

    boolean isDirty(final Date timestamp);

}
```

## **Persistent Login Cookie**

Here is a summary of how we're handling the login cookies for Sesam.

### **Our solution is based on:**

[Persistent Login Cookie Best Practice](#)

### **With a posted improvement:**

[Improved Persistent Login Cookie Best Practice](#)

### **The summary:**

1. When the user successfully logs in with Remember Me checked, a login cookie is issued in addition to the standard session management cookie.
2. The login cookie contains the user's username and a random number (the "token" from here on) from a suitably large space. The username and token are stored as a pair in a database table.
3. When a non-logged-in user visits the site and presents a login cookie, the username and token are looked up in the database.
  - a. If the pair is present, the user is considered authenticated. The used token is removed from the database. A new token is generated, stored in database with the username, and issued to the user via a new login cookie.
  - b. If the pair is not present, the login cookie is ignored.
4. Users that are only authenticated via this mechanism are not permitted to access certain protected information or functions such as changing a password, viewing personally identifying information, or spending money. To perform those operations, the user must first successfully submit a normal username/password login form.

5. Since this approach allows the user to have multiple remembered logins from different browsers or computers, a mechanism is provided for the user to erase all remembered logins in a single operation.

### The problem:

One disadvantage, however, is that if an attacker successfully steals a victim's login cookie and uses it before the victim next accesses the site, the cookie will work and the site will issue a new valid login cookie to the attacker (this disadvantage is far from unique to Miller's design). The attacker will be able to continue accessing the site as the victim until the remembered login session expires. When the victim next accesses the site his remembered login will not work (because each token can only be used one time) but he's much more likely to think that "something broke" and just log in again than to realize that his credentials were stolen.

### The improvement:

1. When the user successfully logs in with Remember Me checked, a login cookie is issued in addition to the standard session management cookie.
2. The login cookie contains the user's username, a series identifier, and a token. The series and token are unguessable random numbers from a suitably large space. All three are stored together in a database table.
3. When a non-logged-in user visits the site and presents a login cookie, the username, series, and token are looked up in the database.
  - a. If the triplet is present, the user is considered authenticated. The used token is removed from the database. A new token is generated, stored in database with the username and the same series identifier, and a new login cookie containing all three is issued to the user.
  - b. If the username and series are present but the token does not match, a theft is assumed. The user receives a strongly worded warning and all of the user's remembered sessions are deleted.
  - c. If the username and series are not present, the login cookie is ignored.

### Comments

1. The cookie values would be on the form **userId###series###token** (specification below)  
Example: **1234###550E8400-E29B-11D4-A716-446655440000###3051a8d7-aea7-1801-e0bf-bc539dd60cf3**
2. Users can have several user cookies, so they can be logged in on different machines at the same time.
3. There should be a service that will delete and clean up old data. Login cookies not used within 3 months, and users not accessed within 1 year should be deleted? Could be implemented by a scheduled service in the backend.

## Database

Below follow the SQL for the entities we use for personalization.

### USER

```
create table USER (  
  USER_ID bigint(20) primary key auto_increment,  
  USERNAME varchar(50) not null,  
  PASSWORD_HASH varchar(50) not null,  
  PASSWORD_SALT varchar(10) not null,  
  FIRST_NAME varchar(50) not null,  
  LAST_NAME varchar(50) not null,  
  CREATED timestamp not null,  
  CONFIRMED timestamp null,  
  LAST_UPDATED timestamp not null,  
  LAST_LOGIN timestamp null,  
  EXTERNAL char(1) not null /* T or F */  
) engine=InnoDB charset=utf8;
```

```
/* The username should be a mail address for internal users, and the ldap username or email for  
external users. */
```

```
/* Passwords should not be saved in clear text, but as a hash. */
```

```

/* For ldap users, the password could be just set to i.e. "external", not hashed. */

create index USER_ID on USER(USER_ID);

create unique index USERNAME on USER(USERNAME);

create index USERNAME_PASSWORD_HASH on USER(USERNAME, PASSWORD_HASH);

create index FIRST_NAME on USER(FIRST_NAME);

create index LAST_NAME on USER(LAST_NAME);

```

## USER\_PROPERTY

```

create table USER_PROPERTY (
  USER_PROPERTY_ID bigint(20) primary key auto_increment,
  USER_ID bigint(20) not null,
  PROPERTY_KEY varchar(50) not null,
  PROPERTY_VALUE varchar(2048)
) engine=InnoDB charset=utf8;

create index USER_ID on USER_PROPERTY(USER_ID);

create index PROPERTY_KEY on USER_PROPERTY(PROPERTY_KEY);

create index USER_ID_PROPERTY_KEY on USER_PROPERTY(USER_ID, PROPERTY_KEY);

alter table USER_PROPERTY
add foreign key (USER_ID) references USER(USER_ID);

```

## USER\_COOKIE

```

create table USER_COOKIE (
  USER_COOKIE_ID bigint(20) primary key auto_increment,
  USER_ID bigint(20) not null,
  SERIES varchar(50) not null,
  TOKEN varchar(50) not null,
  CREATED timestamp not null
) engine=InnoDB charset=utf8;

create index USER_ID on USER_COOKIE(USER_ID);

create unique index SERIES on USER_COOKIE(SERIES);

create index USER_ID_SERIES on USER_COOKIE(USER_ID, SERIES);

create index CREATED on USER_COOKIE(CREATED);

alter table USER_COOKIE
add foreign key (USER_ID) references USER(USER_ID);

```

## Comments

1. Legal property keys is implemented by using a Java enum. Can also be implemented as a code value entity.
2. When creating cookie series, must check for duplicated series id's. Must be done synchronized?

## Debugging

---

This page last changed on Apr 10, 2008 by [mick](#).

- [Debugging Velocity Templates](#)



## Debugging Velocity Templates

---

This page last changed on Apr 10, 2008 by [sshafroi](#).

Example on how to set up velocity debug and local editing of files:  
(Debug can always be switched on/off by accessing <http://localhost:8080/servlet/VelocityDebug>)

Issues: Be sure to specify file.encoding: Export JAVA\_OPTS=-Dfile.encoding=utf-8

The velocity debug loader takes the following arguments:

- DVELOCITY\_DEBUG=true|false Enable velocity debug(disabling cache etc), default is false. (required)
- DVELOCITY\_DEBUG\_ON=true|false Show debug by default, default is false.
- DVELOCITY\_DEBUG\_STYLE=standard|onmouseover|silent
  - standard is full debug showing every template parsed empty or not
  - onmouseover shows templates when holding mouse over the different templates
  - silent shows only filename and editable in the div title.
- Default is standard.
- DVELOCITY\_DEVELOP\_BASEDIR=/some/local/filesystem/path/search-main/generic.sesam/war/src/main/webapp commaseparated loadpath, default is nothing

See attached files for example on how to set up CATALINA\_OPTS and screenshots.

### **catalina\_opts.sh**

```
SRC=$HOME/Source/TRUNK/minimal-search-main

# This defines the loadpath. Files residing in genericno.sesam.no will be loaded before the
generic.sesam.no

TEMPLATES="$SRC/genericno.sesam.no/war/src/main,$SRC/generic.sesam/war/src/main"
export CATALINA_OPTS="-DVELOCITY_DEBUG=true \
-DVELOCITY_DEBUG_ON=true \
-DVELOCITY_DEBUG_STYLE=standard \
-DVELOCITY_DEVELOPERBAR_HIDDEN=false \
-DVELOCITY_DEVELOP_BASEDIR=$TEMPLATES"
```

### **catalina\_opts\_minimal.sh**

```
SRC=$HOME/Source/TRUNK/minimal-search-main

# This defines the loadpath. Files residing in genericno.sesam.no will be loaded before the
generic.sesam.no

TEMPLATES="$SRC/genericno.sesam.no/war/src/main,$SRC/generic.sesam/war/src/main"
export CATALINA_OPTS="-DVELOCITY_DEBUG=true \
-DVELOCITY_DEBUG_ON=true \
-DVELOCITY_DEBUG_STYLE=onmouseover \
-DVELOCITY_DEVELOPERBAR_HIDDEN=true \
-DVELOCITY_DEVELOP_BASEDIR=$TEMPLATES"
```

# Logging

## Skin logfile, eg generic.sesam.log

There exists a logfile for each individual skin. The logging here is from the Skin's ResourceServlet. Upon initialisation of the ResourceServlet there's a series of useful WARN statements written listing exactly

- modification timestamp,
- allowed ipaddresses to restricted resources,
- what is a restricted resource by extension type,
- context path to resource type (by extension type), and
- all WEB-INF/lib jar libraries.

Default daily rotation.

## Sesat logfiles

An important part of SESAT is the logging functionality. All SESAT Kernel actions, choices, search results etc. are extensively logged for later parsing. An important part of SESAT future development is integration of statistics into the administrative portal.

Sesat's logfiles are written by Log4j and defined by sesat-kernel/war/src/main/conf/log4j.xml

The default configuration is daily rotation (sesam.access is the exception).

Two logfiles, sesam.marketing and sesam.sales, are not listed here as they are not yet in use.

SESAT produces several log files targeted to different users.

- sesam.access
- sesam.product
- sesam.analysis
- sesam.statistics
- sesam.initialisations
- sesam.dump

Default location of these logfiles is in your container's log directory.

## Types of logfiles

### sesam.access

This logfile contains the first log entry for all search requests, thus a good starting point for tracing a search request through the Search application. It partly mirrors the Apache access\_log but splits the request up in two or three stages:

1. Initial log entry. This entry contains the actual http request parameters, in the <request>-element. Such as <url>, <http-referer>, <user> and <browser>.
2. Real-url. In case a pretty URL was submitted to the Search application, a second entry is logged. This time with a <real-url>-element.
3. Final log entry. Is logged after the search request has been handled by the Search application, when a response has been returned to the caller, and basically just list the http <response code="">.

Information to look for:

- request\_id: The unique request Id that is used in all the logfiles to identify the search request.

- **time:** Timestamp for when the request was received and when it was done with.
- **skin:** Which virtual host received this request.
- **IP address:** Only used for geographical lookup, to tag searches with Geo location.
- **HTTP session Id:** Only used for counting unique users, can be used for tracking user movements.
- **http referer:** The HTTP-referer string.
- **user-agent:** The user-agent string (identifying browser and platform).
- **response\_code:** The http response code.
- **query parameters:** q (phrase), c (index; news, catalog, person etc), offset (>0 for browsing resultsets), output (rss, xml etc), newscase etc.
- **boomerang:** Boomerang-ed events are logged here (newspaper view, company view, Ajax messages).
- **site-search:** The site-search parameters (ss\_ss, ss\_lt etc) must be parsed from <real-url>.
- **mobile search:** The mobile searches (originator, ua) must be parsed from <real-url>.
- **retriever:** Ajax solution for logging paper archive clicks/reads (/search/writeLog.do?paper=...).

## sesam.product

This logfile type is logged to when the Search application is through with the query server communication and knows how many hits the search got and which enrichment types should be returned. The following information can be read out:

- request\_id
- timestamp
- mode: The tab (aka vertical aka service aka tjeneste) for which the search request was submitted, e.g. mode="p" for picture search.
- query: The search phrase.
- enrichment size: The number of enrichments returned for this search request.
- no-hits: If this appears in the log entry, it signals that no results were found for the given query and mode.
- **enrichment type:** The actual enrichment types can also be read out from the log entry, not just the number.

## sesam.analysis

Related to sesam.product but logs the underlying analysis scores for each query. Breaks the scores down to individual positive and negative hits for each predicate explicit in each analysis score.

## sesam.statistics

This logfile type contains more technical information, such as a servlet's execution time and invoked search commands. The following data can be found:

- request\_id
- timestamp
- skin
- query
- servlet execution time: How long did the servlet take in processing the search request.
- servlet output: If a special output was requested (e.g. output=rss).
- **search-command:** One or more fields, containing the type of search-command that got executed by the servlet, the number of hits it returned and the time spent in executing the command.

## sesam.initialisations

Loggers involved in core initialisation of the engine, typically SiteKeyedFactories, also log to this file. Read this log file for startup and configuration deserialisation errors. This logfile has no supported format.

## sesam.dump

Logs a summary of every outbound http request made from sesat. This includes search commands, publishing fragments, and query evaluations.

# The Sesat-Interpreter

## Basic usage

The Sesat-Interpreter is a simple interpreter that let's you add commands with some arbitrary code associated with it.

To enable the Sesat-Interpreter set/export `SESAT_INTERPRETER=true`

an example of how to add a command:

### Bar.java

```
import no.sesat.Interpreter;

static {
    Interpreter.addFunction("gc", new Function() {
        public String execute(final Context ctx) {
            System.gc();
            return "GC requested";
        }
    });
    public String describe() {
        return "Request a gc run.";
    }
}
```

When you start catelina from the commandline, and the interpreter has been enabled by setting the `SESAT_INTERPRETER` environment variable to true, then you will see the functions as they are added.

### Console output

```
..
Added function: test-arguments
Added function: help
Added function: gc
Added function: all-stacktraces
Added function: loggers
Added function: properties
Added function: save
Added function: read
Added function: macro
Added function: quit
Added function: sites
..
..
```

Now you can invoke a method by typing in it's name.

### Console output

```
help
Functions available:
all-stacktraces
Look at all stacktraces.
echo
Echo arguments.
gc
Request a gc run.
help
```

```

Print this help message
loggers
Print active loggers, and set level if specified. 'loggers [regexp] [level]'
macro
Make a macro
properties
List System.getProperties()
..
..

test-arguments 1 2 query='en fisk'
Raw argument string:
1 2 query='en fisk'
Argument array: 2
1
2
Keywords:
QUERY --> en fisk

```

Most of the functions added, like the one in Bar.java at the top, are in static blocks. This means that the function will be added when the class is loaded. So all functions might not be available at once.

## Aspectj

Some times you do not want to introduce code permanently, then you might want to use AspectJ to instrument the classes. Have a look at this aspectj class.

<http://sesat.no/svn/sesat-commons/commons-interpreter-aspectj/trunk/src/main/aspect/no/sesat/interpreter/aspectj/QueryParserInspector.aj>

If you want your aspect code to be active you need to include the interpreter-aspectj profile when building.

I use this:

```
-P include-fast,development,interpreter-aspectj
```

## Javaagent

Enable this by setting JAVA\_OPTS=-javaagent:/home/haavard/.m2/repository/sesat/commons-interpreter/2.0/commons-interpreter-2.0.jar

where home/haavard.... should be changed to wherever you have it.

## Development Guidelines

This page last changed on Jan 20, 2009 by [mick](#).

This page goes through building the Sesat-Kernel. It by itself is not enough to have a functioning search application. A [complimentary tutorial](#) exists on building the sesam.com skin.

Error formatting macro: toc: java.lang.NullPointerException

## Get Sesat source

Check out the latest version of Sesat from the Subversion repository:

```
svn co http://sesat.no/svn/sesat-kernel/trunk sesat-kernel
```

## Build Sesat

From the working copy of sesat-kernel run the Maven as follows to build the artifacts.

**Make sure you have installed all the [requirements](#).**

Read [Building with FAST](#) to enable FAST APIs within Sesat

```
mvn install
```



### java.lang.NullPointerException at com.sun.tools.javac.comp.Check.checkCompatibleConcretes(..)

When maven is building data-model-javabeen-impl it fails with the javac crash:

```
[INFO] Compilation failure
Failure executing javac, ...
java.lang.NullPointerException at
com.sun.tools.javac.comp.Check.checkCompatibleConcretes(..)
```

try checking out sesat-kernel again with a new name (eg sesat-kernel1) and building again. repeat until it works.

Or use Java7. It's a known bug [http://bugs.sun.com/bugdatabase/view\\_bug.do?bug\\_id=6218229](http://bugs.sun.com/bugdatabase/view_bug.do?bug_id=6218229) related to inodes.



### Generating schema files failed due to error: Java heap space

When maven is building generic.sesam/war it fails with:

```
[INFO] [sesat-mojo:searchModesSchemaGenerator {execution: default}]
[INFO] no.sesat.mojo.SearchModesSchemaGenerator
[INFO] Using: classpath =[snip]
Generating schema files failed due to error: Java heap space
```

Increase the heap size by adding parameters to MAVEN\_OPTS like (for example)

```
export MAVEN_OPTS="-Xms512m -Xmx1024m -XX:MaxPermSize=256m"
```



### build time

On a dual 2.2GHz machine w/ 4Gb ram & T10 connection the initial build took 6 and a half minutes 27. Subsequent full rebuilds took 1 minute.

## Deploy to Container

### Tomcat

By defining CATALINA\_BASE the maven builds automatically deploys all warfiles into CATALINA\_BASE/webapps/

# Configure Container

## Tomcat

### UTF-8 Encoding

If your machine is not natively running unicode you have to set the CATALINA\_OPTS environment variable: `export CATALINA_OPTS="-Dfile.encoding=UTF-8"`  
You also have to make a change in the server.xml file as tomcat runs by default ISO-88591.  
From:

```
<Connector port="8080" maxHttpHeaderSize="8192" maxThreads="150"
minSpareThreads="25" maxSpareThreads="75" enableLookups="false"
redirectPort="8443" acceptCount="100" connectionTimeout="20000"
disableUploadTimeout="true"/>
```

To:

```
<Connector port="8080" maxHttpHeaderSize="8192" maxThreads="150"
minSpareThreads="25" maxSpareThreads="75" enableLookups="false"
redirectPort="8443" acceptCount="100" connectionTimeout="20000"
disableUploadTimeout="true" URIEncoding="UTF-8"/>
```

`unpackWARs="true"`

This [setting](#), found in server.xml->Server->Host, cannot be set to false as Sesat requires write access into the deployed application.

### port 8080

**Note:** You need to run your development tomcat on port 8080! (Or make your own maven development profile for your setup).

## Browse

Deploy your skins to your container, start your container, and browse <http://localhost:8080>

\*\* Every skin deployed must have its name added into your hosts file pointing to 127.0.0.1

This page last changed on Sep 11, 2008 by [mick](#).

# Building with FAST libraries

The FAST libraries are proprietary and so not part of the default Sesat build and not hosted in Sesat's maven repository.

To build the version of Sesat to be used against FAST libraries use instead:

```
mvn install -Pinclude-fast
```



You need your own access to the FAST jar libraries and must deploy them to your own maven repository

The FAST libraries require a few dependencies which cannot be bundled (due to classloading issues) into Sesat. Therefore it is required that the following jar's are copied (eg from your local maven repository) to \$CATALINA\_HOME/lib:

- commons-cli-1.0,
- commons-codec-1.3,
- commons-httpclient-3.0.1,
- commons-lang-2.3,
- commons-logging-1.1,
- dsapi-2.0.70,
- esp-searchapi-5.0.14,
- jscience-3.3,
- msearch-client-4.2,
- spring-1.2.1

The following script "deploy-fast-libraries-from-local-repository.sh" can be used on \*nix:

```
#!/bin/bash
#
# Deploys the fast libraries and its dependencies into the tomcat lib directory, finding them from
# the local repository.
#

if test -z "$1" ; then
echo "Usage: deploy-fast-libraries-from-local-repository.sh <path to tomcat-home/lib>"
exit 1;
fi

find ~/.m2/repository/ -name commons-cli-1.0.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name commons-codec-1.3.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name commons-httpclient-2.3.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name commons-httpclient-3.0.1.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name commons-lang-2.3.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name commons-logging-1.1.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name dsapi-2.0.70.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name esp-searchapi-5.0.14.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name jscience-3.3.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name msearch-client-4.2.jar -exec cp {} $1/ \;
find ~/.m2/repository/ -name spring-1.2.1.jar -exec cp {} $1/ \;
```



## Kernel Operations

---

This page last changed on Nov 20, 2008 by [mick](#).

**"Feature Freeze". and creating the production branch.**

Coming up to any release the code goes into a "feature freeze".

At this point all development improvements and new features must be completed (resolved) and tested (verified),

or remaining improvements and new features be bumped up to the next version so that the feature freeze can progress.


The code is then branched, with quality assurance testing and bug fixing continuing in this branch until the release, with this branch being referred to as the "production branch", while trunk becomes the development for the next version.

This is done using the maven release plugin like:

```
cd sesat-kernel
svn up
mvn release:branch -DbranchName=<current-version-without-SNAPSHOT-suffix>
```

Accepting all default prompt values.

It's wise to initialise svnmerge at this time.

 It's typical to run the trunk code in the alpha environment (using the alpha profile), and the "feature freeze" or "production branch" in the beta environment (using the beta profile). **Accordingly please re-configure the Sesat-Kernel.productionBranch... projects in [Hudson](#) after any new production branch.**

**Updating a (alpha|nuclei|beta|electron|gamma|production) environment.**

```
cd sesat-kernel
svn up
mvn -P<environment>,include-fast clean install sesat-mojo:deploy -DserverDeployLocation=<wagon-style-remote-location> -Duser.name=<remote-location-username>
```

 **Sesat Kernel comes with seven "environment" profiles: development, alpha, nuclei, beta, electron, gamma, production.**

Development is intended for use on a developer's own machine.

Alpha is used on a server cluster for trunk testing.

Nuclei is used on a server cluster for secondary trunk testing.


Beta is used on a server cluster for production branch testing.

Electron is used on a server cluster for secondary production testing.

Gamma is used on a server cluster for tertiary production branch testing.

Production is used on a server cluster that hosts the real production.

These are only recommendations, they can be used how you wish.

 The default serverDeployLocation settings for each "environment" profile are to sesam's own server farm.

## Requirements

---

This page last changed on Feb 29, 2008 by [mick](#).

# Requirements

To build Sesat you need the following tools installed:

- Java SE Development Kit (JDK)  $\geq 1.6$  <http://java.sun.com/>
- Maven  $\geq 2.0.6$  <http://maven.apache.org/>
- Subversion  $\geq 1.4.6$  <http://subversion.tigris.org/>

To run Sesat you need a servlet container. Sesat has been tested on the following containers:

- Apache Tomcat 6.0 <http://jakarta.apache.org/tomcat/>



We do not currently support older versions than 6.0 out of the box. (SEARCH-4296)

# Development Platform Architecture

## Sesat Software Requirements

See [Software Requirements](#).

See [Hardware Requirements](#).

## Server Type Legend

Type	Description	RAM	Disk
Generic	Standard 2-CPU pizza-box	2Gb	3x72Gb disk-drives, 10krpm
FAST	Standard 2-CPU pizza-box	2Gb	Disc-cabinet with 10x72Gb disk-drives, 15krpm
DB	Standard 2-CPU pizza-box	4 Gb	3x144Gb disk-drives, 10krpm

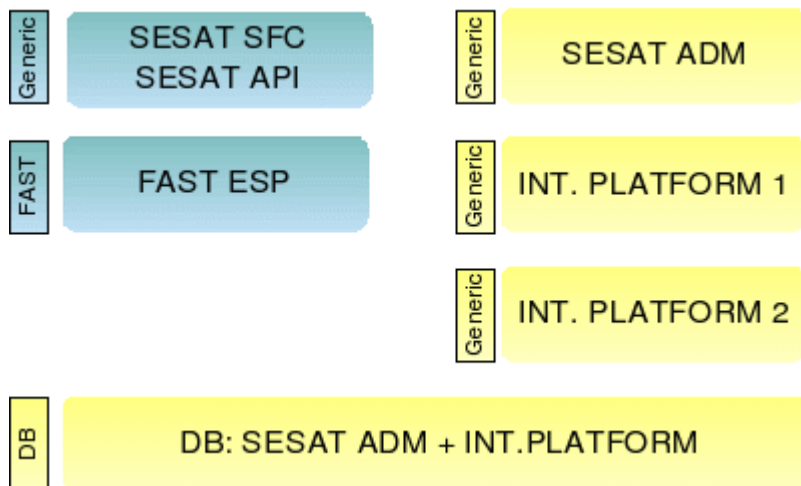
## Minimal configuration for Proof-of-Concept

The hardware platform must match the following requirements, including "external" services used by SESAT (but not part of SESAT).

Servers	Type	Description	Software	Role
1	Generic	Search portal server running the search-application part of SESAT.	OS: CentOS, RedHat, Debian or other. App-server: Tomcat 5.5. Web-server: Apache2 (not required). SESAT is deployed on Tomcat as one or more .war-files.	Required in all SESAT installations.
1	FAST	FAST Search Engine for test indices.	FAST version 4.1 or 5.0, the latter is preferred. Sufficient for 5-10 mill. documents.	Required if not using only external content.
1	DB	Database-server for storing and preparing data to be fed to FAST, and also used if installing SESAT ADM	DB: MySql 5.0 or 5.1	<b>Not required if data is fed from the filesystem</b> , for example, or if all data is gathered externally.

1	Generic	Application Server for SESAT ADM	OS: CentOS. App-server: JBoss 4.1	Required if installing SESAT ADM.
1 or 2	Generic/DB	1 server: Integration server for collecting & washing external content.	Suggestion: Mule (Open Source)	Simple and powerful integration platform. We have no experience with Mule.
		2 servers: Business Objects Data Integrator.	FAST 5.0 and BODI	Powerful, commercial integration platform, used by Sesam.no.

The following illustrates a minimal set of hardware for performing PoC-development:



The blue servers are absolutely mandatory, while the yellow servers are optional depending on your requirements.

## Single Site, Permanent Development Platform

The main difference between the "minimal" configuration and this configuration is the introduction of more FAST-servers and load-balanced servers for the search front and SESAT ADM servers. It is important to architecturally match the production platform, hence the load-balanced servers. Also, the number of FAST-servers will grow with:

- The amount of data to be indexed
- The number of different indices (for example, it is wise to have one server for Yellow and White pages data, and another server for Wikipedia indexing).

## Configuration for multiple sites (Sesam.no, Sesam.se, etc.)

(Use Sesam.no/Sesam.se as example)

- In this example, we will look at the setup used by Sesam.no/Sesam.se. This includes different components for statistics, documentation, issue-tracking etc. Many of these components are not part of SESAT, but are included for convenience.

## Hardware Requirements

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This page last changed on Jan 16, 2008 by [mick](#).

### Common hardware recommendations

- Application servers: Dual-Core Dual-64bit-CPU, 8 gigs of RAM, RAID 5 setup, 72-144 gig local disks.

## Software Requirements

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This page last changed on Jan 16, 2008 by [mick](#).

# SESAT Software Requirements

Note: SESAT supports FAST versions 4.1 and 5.0.

## Main application software

Server role	Software-type	Software	Required
Webserver	Operative system	Linux RH 4 or Linux CentOS 4	yes
Webserver	Java application server	Tomcat 5.5	yes
Webserver	Proxying webserver	Apache 2.0 or Apache 2.2	no
Webserver	Java Virtual Machine	Sun JDK 1.6	yes
Devserver	Software Management	Subversion (latest version)	yes
Devserver	Software Management	Continuum (latest version)	yes

## Software required for personalisation

Software-type	Software	Required
Directory service	OpenLDAP	yes
Persistence storage	MySql	yes

Other databases will be supported through JDBC.

This page last changed on Jan 25, 2008 by [mick](#).

# Development Using the APIs



**Coming soon**

## Development using the SFC

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This page last changed on May 12, 2008 by [mick](#).



**work in progress**

For newcomers there's a [tutorial](#) on how to build sesam.com. This may prove more useful to begin with than the following documentation.

# Development Using the SFC

Error formatting macro: toc: java.lang.NullPointerException

## General Information

The SFC - SESAT Frontend Container - is the place to create vhosts that are using the full SESAT functionality.

All sites or applications running within the SFC also runs on the same JVM as the SESAT Kernel.

All code, configuration, images etc. related to a vhost are termed **resources**. These resources may be on the same file system as SESAT Kernel (in the Tomcat deployment catalogue), **or** they can be on some other server reachable by http.

In effect, SFC is just the notion of the JVM where we deploy and run applications using SESAT Kernel.

The following text will expose the details of how to create a site within the SFC.

## Sesam examples

Documentation for starting a new sitesearch project: [SiteSearch](#)

Example documentation applicable to setting up Sesam [Setting up Sesam](#)

## Structure of an SFC application

### Catalogue hierarchy

The resources are found under the main catalogue. As for now we are using the following:

- /conf - here is the config files, with basic files as modes.xml and views.xml
- /css - the css files mainly reside in the /css/tabs folder which are default mapped from the id attribute for each tab in views.xml
- /images
- /javascript
- /templates - velocity templates and jsp files.

The hierarchy for where a sitesearch is placed is: generic.sesam.no -> genericno.sesam.no -> genericsitesearch.sesam.no -> **sitesearch**.sesam.no (vg.sesam.no)

It's important to remember that every project inherits all the template-, css-, imagefiles and so on from the level above. That's a reason why we use the generic genericsitesearch.sesam.no to keep the sitesearch spesific stuff for itself.

### Versioning

- versioning of css-templates, versioning of images etc., cache-control



## Configuration files

- detailed description of the configuration files

## HTML Templates - Velocity - JSP

While not a requirement, most users would want to use HTML to encode search results. SESAT does not pose any strict requirements on the user, but we strongly recommend following international standards.

While SESAT support any "style" of HTML-coding, we recommend using XHTML 1.0 with the TRANSITIONAL doctype.

We recommend using the STRICT doctype, but with the extensively use of javascript today it would be impossible to make it valid.

The templates are defined through a custom templating system defined via the layout element in views.xml. Using these definitions work with the search:include tag or the searchTabInclude velocity macro.

### Guidelines

We recommend the following:

- All element- and attribute names must be in lower case. All attribute values must be quoted.
- Close all elements. Example: ``, `<br />`
- Don't use deprecated elements and attributes <http://www.html-reference.com/depreciated.htm>
- Avoid using tables for layout
- Keep number of elements as low as possible (overuse of div's)
- Always add alt-attribute in `<img>` element
- Always set width and height attributes for images inline. Example: ``
- Encode ampersands in url's
- Use relative path instead of absolute where this is possible
- Make javascript unobtrusive where it's possible
- www subdomains - for example, we recommend <http://sesam.no> instead of <http://www.sesam.no>. All internal, and external links, should use the same way to link to sesam, not mixing the two. The Site class, responsible for handling the vhost always strips out any www. prefix.

### The benefits by doing this are:

- Simpler development and maintenance
- Compatibility with futures web browsers
- Faster download and rendering of pages
- Better accessibility (for screenreaders and alternative browsing)

## CSS

See [Developing using CSS](#)

## Standard Taglibs

## Navigators

See [Navigation documentation](#)

## Enrichments

Simple tutorial [Developing a quick and simple Enrichment tutorial](#)

## Developing a quick and simple Enrichment tutorial

This page last changed on Aug 30, 2007 by [mick](#).

This tutorial will give an overview on the most basic implementation of an enrichment. It will refer to the Idol enrichment implemented for sesam.no in 2007.

### The Search Command

Each enrichment is just a result list in a condensed format presented like a single result hit within the pages main result list.

Therefore the enrichment requires a result list and this must come from a search command. We could use the StaticCommand which always returns a single dummy result item in the result list, but this example will use the PropertiesCommand that performs a simple search within a specified .properties file.

### PropertiesCommand and the properties file

Configure modes.xml for the PropertiesCommand in your vertical's mode like:

```
<properties-command id="idol" properties-filename="idol"/>
```

Create a new file idol.properties, for example:

```
Idol=
Jan\ Fredrik\ Karlsen=
Benedicte\ Adrian=
Asbjørn\ Slettemark=
Mariann\ Thomassen=
```

The PropertiesCommand will return hits if any of the keys are found within the user's query.

### Triggering the execution of the search command

For the vertical/mode to include the enrichment's search command to be run it must be specified in views.xml within the corresponding vertical/tab like:

```
<enrichment base-score="1000" threshold="0" weight="6" command="idol"/>
```

This enrichment does

- not refer to a rule since there is no analysis rules-based engine to determine the display, that is a result from the search command is the only determining factor,
- specify a base score and a threshold with the base score above the threshold to ensure its inclusion,
- specify a weight to ensure top placement of the enrichment over other enrichments, and
- specify the associated command to run.



The term **mode** is used for the business definition of a vertical, and the term **tab** used for the view definition of a vertical

### Visual Design of the enrichment

Create a velocity template in the skin's template/enrichments folder giving it a name equal to the command name.

For example:

```
<div class="enrichment">
<div class="enrich_img"></div>
<div class="enrich_text">
<b>Idol 2007</b><br/>
#foreach ( $item in $datamodel.getSearch($commandName).results.results )
So you think <strong>$item.getField('key')</strong> is going to win?
#end
</div>
<div class="clearFloat">&nbsp;</div>
```

</div>

# Developing using CSS

## General information

Css files are mainly created dynamically from the <tab> element in the views.xml file. The name of the css file is taken from the id attribute, and is imported in the code in head.vm. This means that every vertical/tab can have it's own style avoiding too much unnecessary style. It's also possible to add a css file manually, besides adding it directly in the head.vm, with inserting a css attribute in the <tab> element (without the css file extension), and to omit the stylesheet to be used you can add attribute called "display-css" and set this to "false". The principle that every tab inherits from the level above also applies for css. Another thing is that a style can be overridden by the more spesific a stylesheet.

## Practical use

I will take the person-infopage as a quick example for how it works. Here it's three stylesheets, default, whitepages and whitepages-info. The default stylesheet is included in every tab and should contain styles that are in common, i.e link color, font-size, footer style and so on. (An exception for this is the individual frontpages for the tabs where the style is included directly in the vm file). Starting at the bottom level in the views.xml file we find the tab "whitepages-info". Here's the style for the role-tab which just exist for the person infopage and not the result page. As we see, this inherits data from "whitepages", where i.e the common "person things" like color and searchbar are. (this file will also contain result spesific things but you can't please all...). This tab inherits from "default-template", but here you will find the display-css attribute set to false so this file isn't included. At last this tab inherits from "default" and this file is added.

(At the time writing, the ps.css also exist, but I plan to remove this...)

## Project independant css

There's a challenge on how we got things structured and with the inheritance which follows, and how we manage the css files (and templates accordingly). The thing we want to avoid is ofcourse making a stylechange one place, making an impact in another project that's not meant to be. We've come to the conclusion that projects in different countries should be independant of each other so they don't share css at all. But sitesearchprojects for a given country inherits stylesheets from the main project. Further there is way more similarities between the sitesearches and that's the reason why we have the genericsitesearch project which serves as a common central for the sitesearches. So sitesearches have a sitesearch.css that's acts like the default.css mentioned earlier. Common styles for both the main project and sitesearches, like i.e style for advertisement, should be in default.css.

This is how we try to keep things for now, but there may of course be other and better solutions in the future.

## Guidelines

- Try to avoid inline css
- Naming css elements should be: word1Word2 (not word1:word2)
- Try minimizing style classes/id where it's practical i.e: <div id='id1'><span class='class1'>text text</span></div> Here 'class1', and really the whole <span> element is excessive. Use ' #id1 span {} ' in stylesheet instead.

...and remember to remove style when codechanges make style redundant.

This page last changed on Jun 30, 2008 by [mick](#).

# HOWTO implement a RunHandler

## POJO to hold configuration: `AbcRunHandlerConfig.java`

Create `AbcRunHandlerConfig.java` in `run-handler-config` project.  
Implement getter and setters to store configurable options.

## Controlling class: `AbcRunHandler.java`

Create `AbcRunHandler.java` in `run-handler-control` project.  
Implement the `handleRunningQuery` method.

## Configuration: `modes.xml` // `modes/mode/run-handlers`

Add the run-handler to the mode you wish it to be applicable to.  
For example:

```
<modes>
<mode>
<run-handlers>
<abc bean-property-1="someValue" bean-property-2="someValue" />
</run-handlers>
</mode>
</modes>
```

The name of the element inside `<run-handlers>` is the name of the configuration POJO minus the `RunHandlerConfig` suffix, and with CamelCase translated to typical xml format camel-case.

## TroubleShooting

1. Make sure both `run-handler-config` & `run-handler-control` jars are bundled into your skin. For example inside the war like

```
genericno.sesam.no!WEB-INF/lib/genericno.sesam.no-run-handler-config-2.18-SNAPSHOT.jar
genericno.sesam.no!WEB-INF/lib/genericno.sesam.no-run-handler-control-2.18-SNAPSHOT.jar
```

# Contents

Error formatting macro: toc: java.lang.NullPointerException

## Concepts

The navigation model is built around the object `ExtendedNavigator`. A `ExtendedNavigator` has basically four aspects viewed from the view generation side.

The core aspects of a navigators:

- **Selected:** Is this navigator selected? This is a indication if this navigator has been chosen by the user. In some cases a navigator can be chosen by default. This is controlled by configuration.
- **HitCount:** In many cases a navigator is a representation of a search. The hitcount indicates the expected number of hits you will get when you do this search. (At the time of writing this functionality only works for fast navigators)
- **Url:** The url to this navigation. To "select" this navigator, go to this url.
- **Title:** The title of this navigator. This should be used in the display text of the navigator.

Optimally all navigation on a page should be represented as `ExtendedNavigators`. If you do, you will be able to write more generic velocity code, and you don't need to worry about url generation in the view layer.

## Configuration

Navigation is configured in xml. The configuration describes how `searchResults` are used to generate the `hitCounters`, and how the URL's should be built to navigate in and out of the page.

The navigation configuration concept was written in answer to all the view code made to solve navigation in a page.

If you want to add a navigation to a mode you need to add the navigation element to that mode. An navigation may contain one or more navigation elements. And that navigation in turn must contain a nav element, to define the navigator.

A nav element can be linked to a `searchResult` (by `commandName`), contain predefined options or even a combination.

## Nav predefined options

If you want to add a pure predefined navigation, you just supply those option in the `<nav>` element. For a pure predefined navigator, `hitCount` is not set.

Example under shows how you can add a sort navigation.

```
<navigation>
<navigation>
<nav id="sort">
<option value="descending" display-name="nyest først"/>
<option value="ascending" display-name="eldst først"/>
</nav>
</navigation>
</navigation>
```

This configuration will present two navigators, on the key "sort". In velocity to access the defined navigators:

```
#set ($sort = $datamodel.navigation.getNavigation('sort'))
#foreach($sortType in $sort)
<a href="/search/?$sortType.url" >$sortType.title</a>
#end
```

Will result in the following html:

```
<a href="/search/?c=m&sort=descending" >nyest først</a>
<a href="/search/?c=m&sort=ascending" >eldst først</a>
```

The default behavior is that the "c" parameter will stick to the one active for the page you are using. You can override this by setting tab="something" in the nav and/or option.

```
...
<nav id="sort" tab="b">
<option value="descending" display-name="nyest først" default-select="true"/>
<!-- Tab on a option "overrides" the one in nav -->
<option value="ascending" tab="a" display-name="eldst først"/>
</nav>
...
```

The above velocity code will then result in the following html:

```
<a href="/search/?c=b&sort=descending" >nyest først</a>
<a href="/search/?c=a&sort=ascending" >eldst først</a>
```

Now we want to show that the default sorting is descending. So we need to set a default-select. This requires that the searchCommand actually uses descending sort if none was supplied.

```
...
<navigation>
<nav id="sort">
<option value="descending" display-name="nyest først" default-select="true"/>
<option value="ascending" display-name="eldst først"/>
</nav>
</navigation>
...
```

We change the velocity code to not make a link if a navigation is selected.

```
#set ($sort = $datamodel.navigation.getNavigation('sort'))
#foreach($sortType in $sort)
#if($sortType.selected)
<!-- Displaying the selected sort -->
$sortType.title
#else
<a href="/search/?$sortType.url" >$sortType.title</a>
#end
#end
```

Results in the following html:

```
<!-- Displaying the selected sort -->
nyest først
<a href="/search/?c=m&sort=ascending" >eldst først</a>
```

## Linking navigation to a searchCommand

In many cases you want navigation to be dynamic, depending on the search that was run. At the time of writing, only fast navigators are supported from the searchCommands.

You need to define the navigators in the search command to make the navigators able to access them.

For a typical news search you, may want to display navigators per year. A typical configuration for this could be:

```
<mode>
```

```

<navigation>
<navigation command-name="newsSearch">
<nav id="year"/>
</navigation>
</navigation>

<clustering-esp-fast-command id="newsSearch">
<navigators>
<navigator id="year" field="year" name="yearnavigator" display-name="År" sort="YEAR"/>
</navigators>
</clustering-esp-fast-command>
</mode>

```

You need to "link" the navigation element to a command by supplying the command-name in the navigation element. When generating navigators, the navigation system will use the results from this search. It will look for a navigator in the searchResult, with id equal to the id of the navigation element.

Velocity code for displaying the navigator:

```

#set ($years = $datamodel.navigation.getNavigation('year'))
#foreach($year in $years)
#if($year.selected)
<!-- Displaying the selected year -->
<p>$year.title</p>
#else
<p><a href="/search/?c=m&year=$year.url" >$year.title</a> $year.hitCount</p>
#end
#end

```

Depends on the search, but an example result could be:

```

<p><a href="/search/?c=m&year=2007&nav_year=yearnavigator" >2007</a> 583</p>
<p><a href="/search/?c=m&year=2006&nav_year=yearnavigator" >2006</a> 1786</p>
<!-- Displaying the selected year -->
<p>2005</p>

```

As you see here, when you link navigation to a fast navigator you get two parameters. The year= and the nav\_year=. If the navigators are for some reason available from the search command, and you want to suppress the nav\_year=, you can set the parameter real-navigator=false on the nav element.

```

...
<navigation command-name="newsSearch">
<nav id="year" real-navigator="false"/>
</navigation>
...

```

## Linking navigation with predefined options

In some cases it will make sense to only display chosen navigator elements with counters. This can be done if you link navigation to a Search, but supply the options that you want to display.

```

...
<navigation id="newscategory">
<nav tab="m" id="medium" command-name="newsSearchNavigator" real-navigator="false" out="true">
<option value="webnewsarticle" display-name="Norske nyheter"/>
<option value="printnewsarticle" display-name="Norske papiraviser"/>
</nav>
</navigation>
...

```

## Combining navigation and the <reset-nav> element

So, if you want to combine both a navigation on year, and want the results be be sortable you just combine the configuration from the above examples:



```

<mode>
<navigation>
<navigation>
<nav id="sort">
<option value="descending" display-name="nyest først" default-select="true"/>
<option value="ascending" display-name="eldst først"/>
</nav>
</navigation>
<navigation command-name="newsSearch">
<nav id="year"/>
</navigation>
</navigation>

<clustering-esp-fast-command id="newsSearch">
<navigators>
<navigator id="year" field="year" name="yearnavigator" display-name="År" sort="YEAR"/>
</navigators>
</clustering-esp-fast-command>
</mode>

```

If you use this, navigation will "stick" on all urls. That mean that if you click on sort, that sort whill stick on all year urls generated for the page.

In some cases you don't want all navigation to stick on certain clicks. To support this behavior you need to use the <reset-nav> element.

In the example over we want the sort, to always be descending when you display a new result. So we want sort to reset when you click year. This can be done by adding a <reset-nav> to the year navigation.

```

...
<navigation command-name="newsSearch">
<nav id="year"/>
<reset-nav id="sort"/>
</navigation>
...

```

# The Search modes schema generator

To keep the modes.xml files correct we can use different schema files, and validate against them when writing the modes.xml files. In the sesat-mojo we have introduced the searchModeSchemaGenerator which is capable of generating schema files for RelaxNG, XML Schema and DTD's.

## Generating the schema files.

The use of this is done through the build script. See an example below.

### pom.xml part-1

```
<plugin>
<groupId>sesat</groupId>
<artifactId>sesat-mojo</artifactId>
<executions>
<execution>
<configuration>
<outputDir>
src/main/conf/
</outputDir>
<classpath>
<classpath>../query-transform-config/src/main/java/</classpath>
<classpath>../search-command-config/src/main/java/</classpath>
<classpath>../result-handler-config/src/main/java/</classpath>

<classpath>../../query-transform-config-spi/src/main/java/</classpath>
<classpath>../../search-command-config-spi/src/main/java/</classpath>
<classpath>../../result-handler-config-spi/src/main/java/</classpath>
</classpath>
</configuration>
<phase>compile</phase>
<goals>
<goal>searchModesSchemaGenerator</goal>
</goals>
</execution>
</executions>
</plugin>
```

There is two ting to note in this configuration.

The first thing is where the generated files should be placed.

```
<outputDir>
src/main/conf/
</outputDir>
```

And the second thing is where the source files are located.

```
<classpath>
<classpath>../query-transform-config/src/main/java/</classpath>
....
```

## Validating during a normal build.

This is the a snippet showing how to turn validation on.

### pom.xml part-2

```
<plugin>
<groupId>org.codehaus.mojo</groupId>
<artifactId>xml-maven-plugin</artifactId>
<executions>
<execution>
<phase>test</phase>
<goals>
<goal>validate</goal>
</goals>
</execution>
</executions>
<configuration>
<validationSets>
<validationSet>
<dir>.</dir>
<includes>
<include>*/modes.xml</include>
</includes>
<excludes>
<exclude>*/target/*</exclude>
</excludes>
<validating>true</validating>
</validationSet>
</validationSets>
</configuration>
</plugin>
```

## Validating in your favorite editor.

Normally this will just work.

# Tutorial, and best practices, on using Ajax in templates

## The simple way

The RunningQueryImpl has a number of supported parameters that, in combination with using various layouts per tab (which can also be called a "vertical"), can be used to build a rich ajax client.

Each tab/vertical has a connection to one mode. In this mode there is a list of commands to run. By default all commands are run unless they are associated to enrichments from the tab, and the enrichment's rule achieved a score meeting the enrichment's threshold. Enough about enrichments, that's a [story](#) for another day.

### The *commands* parameter

This default behavior of which commands to run within the RunningQueryImpl can be explicitly, and per request, defined via the "commands" parameter.

For example, this [search](#) asks for *only* the defaultSearch command to run on [sesam.no](#) which is why you see "?" for the hit count on all the other services. The commands parameter takes a comma separate list when you want to request multiple commands within the mode to be run.

### The *waitFor* parameter

By default the RunningQueryImpl waits until all commands have been executed. This need not be the case though if you give, in modes.xml, the command the attribute *asynchronous="true"*. If a command is attributed such and you want to be guaranteed to see the results you must explicitly state that you are willing to wait for the command to finished by adding the parameter for example *waitFor=defaultSearch*.

The waitFor parameter can be used in a number of ways:

- *commands=defaultSearch&waitFor=defaultSearch* explicitly asks the command to be run, and presuming that it is attributed as an asynchronous command, and to wait until it is finished.
- *waitFor=defaultSearch* asks to wait for the command to finish. This presumes that the command is included in the default list of commands to run but is attributed as asynchronous.
- *commands=&waitFor=defaultSearch* disables all commands from running but asks to wait for the command to finish. This presumes that a previous request started the command. This demonstrates how commands are stored in the datamodel between requests and how asynchronous commands can be initiated by the original request, but not used in that request's output, and their results used via a second request, eg an ajax call, later on.

### The *layout* parameter

Finally all this can be used with alternative layouts by supplying the *layout* parameter.

Each tab contains a default layout that is in views.xml the tab without an id attribute. With the layout parameter defined a layout with a matching id is looked for and used instead. If it can't be found the default is still used.

This allows a pseudo "portals" approach to the templating system. For example the request <http://sesam.no/search/?q=sesat&commands=defaultSearch&layout=defaultSearchlayout> with the additional layout

```
<layout id="defaultSearchLayout" main="/fragments/layout/results/defaultSearch"/>
```

would render only the main results list on the page.

This above given layout doesn't have any embedded include templates. Since the result list is all rendered with just defaultSearch.vm template it can be supplied directly, in an absolute manner (see the initial / in the path), as the *main* template.

## Examples and usages

This section won't include much code, but will explain in more detail how AJAX can be used. For these examples we'll use the following configuration:

### views.xml

```
<view id="ajax-test" key="at" mode="ajax-test" inherit="default-mode">
<!-- default layout for normal requests -->
<layout main="main">
<include ...>
[... ]
</layout>

<!-- layout for the ajax request using the ajaxtest template-->
<layout id="ajax" main="ajaxtest"/>
</view>
```

### modes.xml

```
<mode id="ajax-test" inherit="default-mode">
<yahoo-web-command id="defaultSearch" inherit="default-yahoo-web-command" asynchronous="true"/>
<yet-another-search-command id="yasc" inherit="default-yasc"/>
</mode>
```

There's a few different ways AJAX/SESAT can be used to enhance a web page. What's probably most useful is the ability to fetch slow results using a second request.

**Note: This is currently broken and probably won't work as expected until SESAT 2.18.** See <http://sesat.no/scarab/issues/id/SKER4737>

The following steps will show a typical use of this:

1. The users browser makes a request to `/search/?c=at&q=sesat`
2. SESAT executes all search commands. Since `defaultSearch` is marked as asynchronous it's not waited for by SESAT, so if it's not finished by the time the other search commands are it's not included in the results returned to the browser.
3. The users browser executes javascript code that was returned in the first response and does an AJAX request to `/search/?c=at&q=sesat&commands=&waitFor=defaultSearch&layout=ajax`
4. SESAT fetches the search result for `defaultSearch` that was executed by the previous request and returns it to the browser using the templates associated with the layout with id `ajax`.
5. The users browser dynamically adds the `defaultSearch` result to the web page.

Another use would be to only fetch the results of specific search commands:

1. The users browser makes a request to a given web page
2. The users browser executes javascript code that was returned in the first response and does an AJAX request to `/search/?c=at&q=sesat&commands=yasc&layout=ajax`
3. SESAT executes only the `yasc` command and wait for it to finish before returning the result to the browser.
4. The users browser dynamically adds the `yasc` result to the web page

## The hard way

Enable DWR (the dependency and the servlet). This serialises the whole datamodel through the request so it is available in the client's javascript. This is a far more advanced approach when much more logic is required on the client side. DWR is disabled by default in Sesat as we suspect the simpler approach is well, simpler.

## Comments

---

I've been asked by Steinar to add a comment here, and after performing a lexicographical analysis (counting occurrences of the string 'ajax') it strikes me that this is probably the least ajax-centric ajax-tutorial I've read (and I've only read a few so that says close to nothing, really 😊). However, the

reference to RunningQueryImpl was quite useful. But for me who doesn't yet see the big picture (tutorial readers seldom do) it'd be useful with an explanation of how ajax actually is used to tie it all together.

Thx 😊

Posted by [smjonms](#) at May 06, 2008.

---

## Tutorial - Building Sesam.com

This page last changed on Mar 12, 2009 by [mick](#).

This tutorial will go through building a Sesat Skin from scratch to completion. It repeats the basic building of the "[sesam.com](#)" skin found at [sesat-kernel/generic.sesam/sesam.com](#)

### 6 easy steps to build your own search engine website.

Error formatting macro: toc: java.lang.NullPointerException

#### Create the project, a la the "Skin"

We will create the new skin from an existing archetype found within sesat-kernel. So we must checkout and build sesat-kernel & its skin-archetype first.

```
svn co http://sesat.no/svn/sesat-kernel/trunk sesat-kernel
cd sesat-kernel
mvn install -DskipTests=true
cd skin-archetype
mvn install -DskipTests=true
```

Now we can create our new skin:

```
cd ../../
mkdir test-skin
```

You should now have:

```
\-|
|-sesat-kernel
|-skin-archetype
|-test-skin
```

Then do (you should replace `-Dversion=2.18-SNAPSHOT` with the version you see in `sesat-kernel/pom.xml`):

```
cd test-skin
mvn archetype:generate -DarchetypeGroupId=sesat -DarchetypeArtifactId=sesat-skin-archetype \
-DarchetypeCatalog=local -DgroupId=sesat -DartifactId=pom.sesam.com \
-Dversion=<current sesat-kernel version>-SNAPSHOT -Dpackage=no.search.sesat
```

*From Author: make sure you are using maven-archetype-plugin:2.0-alpha-3 or greater. Versions before that have some confusion between archetype:generate and archetype:create goals. Take a peek in [~/m2/repository/org/apache/maven/plugins/maven-archetype-plugin/](#) if unsure. Add "-up -U" to the mvn archetype:generate command above to update to a later version.*

You should now have under test-skin a directory "pom.sesam.com" and under that the files:

```
LICENSE.txt pom.xml query-transform-config query-transform-control result result-handler-
config result-handler-control search-command-config search-command-control velocity-directives
view-config view-control war
```



#### Troubleshooting

If these directories do not exist then "mvn archetype:generate ..." didn't work properly. You can workaround this by extracting [the appropriate pom.sesam.com-X.Y.tar](#) into the test-skin directory.

You can now cd into this new maven project that has all the possible skin components set up ready to go. This tutorial will really only deal with the "war" submodule. Try building the new maven project:

```
cd pom.sesam.com; mvn install -DskipTests=true
```

Some users report that `-DskipTests=true` doesn't work, if so revert to the older and [deprecated](#) `-Dmaven.test.skip=true`.

### Create Business definition: modes.xml

We are going to use yahoo's search for our main result list. This is purely business logic so it all goes into modes.xml

Add to test-skin/pom.sesam.com/war/src/main/conf/modes.xml (inside the <modes></mode>):

```
<mode id="default-mode" analysis="false" inherit="default-magic">
<yahoo-web-command id="default-yahoo-web-command"
appid="YahooDemo"
field-filters="site"
host="yahooWebHost"
language="en"
port="yahooWebPort"
result-fields="Title AS title,Summary AS body,Url AS url,ClickUrl AS clickurl"
results-to-return="10">
<result-handlers>
<field-chooser target="title" fields="title,url"/>
<regexp field="url" target="site" regexp="http://([^\/]*)/?"/>
</result-handlers>
</yahoo-web-command>
</mode>
<mode id="international" evaluation="false" inherit="default-mode">
<yahoo-web-command id="globalSearch" inherit="default-yahoo-web-command"/>
</mode>
```

This defines two "modes". The first "default-mode" is both the template to build off and the guts of the configuration to the yahoo search command.

The second, "international", is the mode we'll actually be working with but it just inherits everything from "default-mode" for now. This layering approach is often a good idea for good house-keeping.

There are three result-handlers configured in this example. Result-handlers are used to manipulate (post-process) results once they have been fetched.

*find-file-format* adds a field to each result whose value is the mimetype guessed from the result's URL (which comes from the *clickurl* field).

*field-chooser* will assign the *title* field if it is null the value of the *url* field. A useful fallback mechanism.

*regexp* will assign the *site* field the regular expression capturing match against the *clickurl* field.

**Note:** in our repository version of generic.sesam/sesam.com/war/src/main/conf/modes.xml you'll see the yahoo-web-search elements commented out and replaced with similar yahoo-idp-search elements. The YahooIdpSearchCommand is a more powerful search interface to yahoo's indexes than their "Contextual Web Service", but you need to enter a contract with Yahoo to use it.

### Create Presentation definition: views.xml

The configuration for how these results from yahoo will appear on the page comes from views.xml.

A "tab" does not have to be a tab in UI terms, here it simply refers to a page, tab, or vertical that layers on top of one of our modes.

Add to war/src/main/conf/views.xml (inside the <views></views>):

```
<tab id="default-sesam-com" inherit="default"/> <!-- placement for a global skin css -->
<tab id="international" inherit="default-sesam-com"
key="g"
mode="international"
page-size="10"
rss-result-name="globalSearch">
<navigation>
<navigation id="offset">
<result-paging id="offset" command-name="globalSearch" page-size="10" number-of-pages="10"
hitcount-source="totalhits"/>
</navigation>
</navigation>
<layout main="sesam.com/main.jsp" front="sesam.com/index.jsp">
<include key="header-element" template="sesam.com/head.jsp"/>
<include key="header-element-extra" template=""/>
<include key="top-col-one" template="sesam.com/searchbar-top.jsp"/>
<include key="main-col-three" template="sesam.com/globalSearch.jsp"/>
```



```
<include key="bottom-col-one" template="sesam.com/offsetPager.jsp"/>
<include key="bottom-col-three" template="sesam.com/footer.jsp"/>
<include key="bottom-col-two" template="sesam.com/searchbar-bottom.jsp"/>
</layout>
</tab>
```

### Skin properties

war/src/main/conf/configuration.properties contains skin defining properties:

```
# Site attributes
site.parent=@sesam.site.parent@
site.locale.default=en
site.issitesearch=false
site.defaultTab=g
yahooWebHost=search.yahooapis.com
yahooWebPort=80
# disable fast token evaluation. HACK while we wait for SEARCH-3540 Anonymous TokenPredicates &
Token Evaluator SPI.
tokenevaluator.port=0
```

The filtered properties come from the pom.xml

There six different profiles (in addition to the default "development" profile) that can be used for server testing and production environments as you wish.

The property here *sesam.site.parent* is crucial and must match the name of the web application, as deployed, that is the parent skin.

The yahoo properties relate to the host and port attributes previously mentioned in the yahoo-web-search element in the modes.xml.

The tokenevaluator.port property is set so to disable the FAST token evaluation while SEARCH.3540 is still in progress.

These default values the archetype created can be used in this tutorial.

### Design templates

Each of the templates specified in views.xml must be created, along with the main.jsp and index.jsp. The main template's path is relevant war/src/main/webapp/pages/. The templates are all relative to war/src/main/webapp/fragments/layout.

These templates are rather self explanatory so links are given to each:

<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/pages/sesam.com/index.jsp>  
<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/pages/sesam.com/main.jsp>  
<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/fragments/layout/sesam.com/searchbar-top.jsp>  
<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/fragments/layout/sesam.com/globalSearch.jsp>  
<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/fragments/layout/sesam.com/offsetPager.jsp>  
<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/fragments/layout/sesam.com/footer.jsp>  
<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/webapp/WEB-INF/classes/fragments/layout/sesam.com/searchbar-bottom.jsp>

These templates are internationalised, the message values (from <search:text.. tags) can be found in war/src/main/conf/messages\_en.properties:

[http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/conf/messages\\_en.properties](http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/conf/messages_en.properties)

### Design css

Some of the css definitions come from the existing css in generic.sesam:

<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/war/src/main/css/tab/default.css>

Everything specific to the sesam.com skin is found in the default-sesam-com.css, which is the reason there exists the "default-sesam-com" tab in views.xml as each ancestor in the tab's ancestry imports a matching css:

<http://sesat.no/source/xref/Sesat.Kernel..trunk/generic.sesam/sesam.com/war/src/main/css/tab/default-sesam-com.css>

#### **Finished!**

Yes it's all that easy.

If you define the system environment variable CATALINA\_BASE when you build ("mvn install") the warfiles should have automatically been copied into \$CATALINA\_BASE/webapps/

So, after building, inside the webapps directory there should exist: ROOT.war, generic.sesam.war, localhost.com.war

Given that you have something like "127.0.0.1 localhost.com" in your /etc/hosts file you should now be able to fire up your container (eg tomcat) and browse <http://localhost.com:8080/>

For more documentation on skin development see [Development using the SFC](#).

# FAQ

Questions and answers on our [mailing lists](#)

Error formatting macro: toc: java.lang.NullPointerException

## License

**How to keep private code, or 'Trade Secrets', while using the [Free Software License](#)?**

Only code directly using the Sesat APIs (or SPIs) is considered derivative work. So for example code that is using an rss/xml/ajax interface to Sesat is not a covered work but be an interactive client. Skins, for example java classes within the skins, will be covered work.

Backend systems, from administration portals to databases and indexes, and any code layering on top of this of course may remain private, and can be used within the search front end in a manner similar to other propriety/private libraries that the Sesat code uses, for example the FAST java libraries.

The most practical approach to keep private code often would be to keep propriety/private code in a separate project and include it in the Sesat skin as a jar library dependency. This maintains a clean design between framework code and the underlying data and/or schema details. This is described as an aggregated work in §5 of the license.

You are also free to inquire about a [Propriety License](#), aka a contract with Schibsted Søk AS to waiver the free license. We expect bigger companies will take this approach just out of convenience (rather than any real objections to the free license).

## Documentation

**Where is the "monolithic" or "all-in-one" documentation?**

We do not provide a monolithic documentation page. The main reason we see for such a page is for searching for something when you know it is in the documentation but not what section. Since the website has a search form at the top of every page just for searching the website, and we are a search technology project, we'd rather you use that.

## Versioning

**Where is kernel version 1.0?**

Versions up to 2.15 were done under private development. Version 3.0 of the sesat-kernel can be considered the initial api-stable release as open source projects usually consider the 1.0 release to be. See <http://www.producingoss.com/en/development-cycle.html#release-number-simple-strategy>



associated to

<http://sesat.no/scarab/issues/id/SKER4952>

# Setting up Sesat's Query Evaluation with a Solr index

## Preface

Sesat comes with a query evaluation that occurs during the query parsing stage. Its purpose is to evaluate metadata against each clause (leaf and operator) within the currently constructed Query tree. The evaluation has various types.

Current implementations are clauses matching regular expressions ([RegExpTokenEvaluator](#)), mathematical expressions ([JepTokenEvaluator](#)), hits against a FAST Query Matching server ([VeryFastTokenEvaluator](#)), and hits against a Solr server ([SolrTokenEvaluator](#)).

Some examples of metadata used at [sesam.no](#) are `first_name`, `last_name`, `full_name`, `company_name`, `english_words`, `geological_province`, `geological_city`, `geological_suburb`, and `geological_street`. All of these metadata examples are stored in a Solr index as some of them are very large, eg the `full_name` list contains the national register of the norwegian population - roughly 5 million names.

After the Query tree has been constructed, and the metadata associated to each clause, this can be used to maximise the efficiency of which searches to execute and end up federating. For example there is no need for us to initiate a search against our 'white pages' (or people catalogue) if neither a `full_name`, or `first_name` + `last_name` combination, metadata exists within the query. Another example is our 'yellow pages' (or company catalogue) searches can be enhanced when we know which clauses within query are geological terms.

It can be seen why we, at [sesam.no](#), see this query evaluation as a crucial part of a federating search engine.

## Introduction

Our query evaluation against large data lists used to be via the ([VeryFastTokenEvaluator](#)) that works against a FAST Query Matching server. In a desire to move away from a proprietary closed solution that left us at the mercy of FAST consultants and towards an open solution that we fully owned and were free to share we decided to re-implement all this functionality with a Solr index. What follows is our installation and setup of a Solr index to successfully work with our ([SolrTokenEvaluator](#)) using the `english_words` metadata as the example.

## Configuration

In Sesat's base skin "generic.sesam" you'll find `war/src/main/conf/SolrEvaluators.xml` containing:

```
<solr-evaluators>
<list token="ENGLISHWORDS" list-name="common_english"/>
</solr-evaluators>
```

This declares the metadata (also referred to as a Token or TokenPredicate) `ENGLISHWORDS`, and connects it to hits in the solr index with `list_name=common_english`. This is all that is required to setup evaluation for `english_words` metadata.

We also need to configure where the Solr index can be found.

In the same skin you'll find `war/src/main/conf/configuration.properties` with the line:

```
tokenevaluator.solr.serverUrl=@tokenevaluator.solr.serverUrl@
```

The `@tokenevaluator.solr.serverUrl@` is filtered from values defined in the skin's `pom.xml` according to the current profile in action.

For the development profile this reads:

```
<tokenevaluator.solr.serverUrl>http://localhost:16000/solr</tokenevaluator.solr.serverUrl>
```

So you can either run Solr locally on port 16000 or create a ssh tunnel on your port 16000 to another Solr server.

Note: the values for the other profiles point to a host "sch-solr-test01.dev.osl.basefarm.net". This is our own Solr server and so naturally won't work for you - you'll need to override this setting.

Along with this configuration it's now presumed that you have sesat skin up and running. If you don't read [Tutorial - Building Sesam.com](#) for help on how to.

### Solr Installation

You'll need a recent version of Solr, 1.4, or latter, so that the two patches found in <https://issues.apache.org/jira/browse/LUCENE-1380> and <https://issues.apache.org/jira/browse/SOLR-763> are included.

Deploy the solr.war to your container. Before starting it you'll need to configure your Solr Home. It is fine to use the example Solr home found in example/solr but replacing schema.xml with:

```
<?xml version="1.0" encoding="UTF-8" ?>
<schema name="example" version="1.1">
<types>
<fieldType name="string" class="solr.StrField" sortMissingLast="true" omitNorms="true"/>
<fieldType name="date" class="solr.DateField" sortMissingLast="true" omitNorms="true"/>
<fieldType name="shingleString" class="solr.TextField" positionIncrementGap="100" omitNorms="true">
<analyzer type="index">
<tokenizer class="solr.KeywordTokenizerFactory"/>
</analyzer>
<analyzer type="query">
<tokenizer class="solr.WhitespaceTokenizerFactory"/>
<filter class="solr.ShingleFilterFactory" outputUnigrams="true" outputUnigramIfNoNgram="true"
maxShingleSize="99" enablePositions="false" />
</analyzer>
</fieldType>
<fieldtype name="ignored" stored="false" indexed="false" class="solr.StrField" />
</types>

<fields>
<field name="id" type="string" stored="true" required="true" />
<field name="list_name" type="string" indexed="true" stored="true"/>
<field name="list_entry" type="string" indexed="true" stored="true"/>
<field name="list_entry_shingle" type="shingleString" indexed="true" stored="true"/>
<field name="list_entry_synonym" type="string" indexed="true" stored="true"/>
<field name="timestamp" type="date" indexed="true" stored="true" default="NOW" multiValued="false"/>
>
</fields>

<uniqueKey>id</uniqueKey>
<defaultSearchField>list_entry_shingle</defaultSearchField>
<solrQueryParser defaultOperator="OR"/>
</schema>
```

Now start the container and unzip and feed in the solr xml document [add\\_english\\_words.xml.gz](#) that contains all the english words.

### Coding with the metadata: TokenPredicates

Everything should now work.

When a query is parsed [WordClauses](#) within the Query that match one of the english words with contain within the clause's knownPredicates list the [TokenPredicate ENGLISHWORDS](#). For example:

```
true == clause.containsKnownPredicate(Categories.ENGLISHWORDS)
```

### **Known and Possible Predicates?**

What is a possible predicate?

Sometimes metadata is position dependent, that is the position of the term within the query has the final say whether the metadata is really applicable. This can be used with the regular expression evaluators, but also every TokenPredicate has an "exactPeer" which is only ever true if the whole query has the metadata. We cannot assign such metadata definitely to the root clause of any query because clauses are immutable and used in a fly-weight pattern across multiple Query trees.

## Upgrade Guides

---

This page last changed on Jan 25, 2008 by [mick](#).

## 2.16 Upgrade

This page last changed on Apr 03, 2008 by [mick](#).

Error formatting macro: toc: java.lang.NullPointerException

# Compatibility changes

**Enrichment placements (14 Feb 2008)**

[SEARCH-3654 Generalized enrichment handling](#)

Removed APIs:

- SearchTab.getEnrichmentLimit()
- SearchTab.getEnrichmentOnTop()
- SearchTab.getEnrichmentOnTopScore()
- EnrichmentHint.isAlwaysVisible()

Added APIs:

- EnrichmentPlacementHint class
- EnrichmentHint.getProperties()

Changed API:

- AbstractEnrichmentDirective.placementCorrect(..)

The logic on how many enrichments to show and enrichment thresholds have been moved, from being static to a SearchTab, into the EnrichmentPlacementHint class.

The class is configured with the <enrichment-placement> element in views.xml.

Any vertical, or SearchTab, may have as many <enrichment-placement> as desired. It is intended that EnrichmentPlacementHint is used primarily by EnrichmentDirective implementation.

Both EnrichmentHint and EnrichmentPlacementHint may contain arbitrary properties. The properties for EnrichmentHint are passed into the corresponding search command result list as fields.

EnrichmentHint.isAlwaysVisible() was removed, it's /reverse/ functionality re-implemented in genericno.sesam.no/velocity-directives's EnrichmentDirective as this was the sole place where it was false, ie always-visible="false".

AbstractEnrichmentDirective.placementCorrect(..) method signature changed to take for the first parameter a DataModel instance instead of a SearchTab instance. This gave the implementation of the method more flexibility as SearchTab was easily derived from the DataModel.

**New methods for offset / SearchCommand.isPaginated() (3 Mar 2008)**

[SEARCH-3733 New methods for offset](#)

[SEARCH-4264 Nyhetssøk, nettsøkberikelsen tar i bruk offset fra URL-en](#)

Offset methods moved away from junkyard to using 'offset' navigator.

No longer any need for SearchConfiguration's isPaging() or isIgnoreOffset() methods.

Added APIs:

- boolean SearchCommand.isPaginated()
- int AbstractSearchCommand.getOffset()

Deprecated APIs:

- int AbstractSearchCommand.getCurrentOffset(int i) :: Use instead getOffset() +i

Removed APIs:

- SearchConfiguration.isPaging()
- CommandConfig.setPaging()
- NewsEspCommandConfig.isIgnoreOffset()
- NewsEspCommandConfig.setIgnoreOffset()

**AbstractSearchCommand.getParameter(..) no longer uses junkyard (5 Mar 2008)**

Removed APIs:

- AbstractSearchCommand.getParameters()  
Use AbstractSearchCommand.getParameter(parameterName) or datamodel.getParameters().getValues() instead.



# New Features

## Requirements

**Minimum Java required bumped to Java6 (28 Feb 2008)**

Sesat-kernel/sitemap-generator uses ServiceLoader to load PageProviders from skin sitemap jarfiles.

**Minimum Tomcat required bumped to Tomcat-6 (28 Feb 2008)**

META-INF/context.xml unpacking during deployment on tomcat-5.5 kills the application. See [SEARCH-4296 sesat r6123 incompatible with tomcat-5.5](#)

## 2.17 Upgrade

This page last changed on Sep 26, 2008 by [mick](#).

Error formatting macro: toc: java.lang.NullPointerException

# Compatibility changes

**Enable sesat templating system to accept JSP templates (17 Feb 2008)**

[SEARCH-4294 Enable sesat templating system to accept JSP templates](#)

Changed API:

- AbstractVelocityTemplateTag.importTemplate(..) renamed to importVelocity(..). method parameters unchanged.

**Anonymous TokenPredicates (2 April 2008)**

[SEARCH-4421 Anonymous TokenPredicates](#)

TokenPredicate is now a interface. It's inner classes provide all functionality: Categories for the existing hardcoded enumerations, Static for static-utility methods, and TokenPredicateImpl for anonymous TokenPredicates.

Changed API:

- All of TokenPredicate's existing enums have been moved into TokenPredicate.Categories
- All of TokenPredicate's static methods have been moved to TokenPredicate.Static

Added APIs:

- TokenPredicate.Static.getAnonymousTokenPredicate(String) :: finds an existing anonymous TokenPredicate
- TokenPredicate.Static.createAnonymousTokenPredicate(String, Type) :: create a anonymous TokenPredicate
- TokenPredicate.Static.getTokenPredicates(Type) :: retrieve all tokens by type

Removed APIs:

- TokenPredicate.ALWAYSTRUE :: had been deprecated for quite some time already.
- TokenPredicate.getFastTokenPredicates() :: use TokenPredicate.Static.getTokenPredicates(Type) instead

Deprecated APIs:

- TokenPredicate.getMagicTokenPredicates() :: norway specific logic
- TokenPredicate.getTriggerTokenPredicates() :: norway specific logic

**index.jsp removed**

Any root request (ie "/") is now automatically forwarded to "/search/?".

So instead of using the index.jsp -> index.vm mechanism the layout's front defined template is used.

If your front page is broken you can most likely fix it just by adding *front="index"* to that tab's layout element in views.xml

For the "/" case, where neither the c nor q paramter is defined make sure you've set site.defaultTab in configuration.properties.

**Base skin now called "generic.sesam"**

Whereas before it was "generic.sesam.no".

The same goes for the profile counter parts: generic.alpha.test.sesam, generic.nuclei.test.sesam, generic.beta.test.sesam, generic.electron.test.sesam.

It is wise now to explicitly define the port in the sesam.site.parent property in any skin extending generic.sesam, since generic.sesam isn't a valid domain and might not be successfully handled by any front end proxy, eg apache, handling the default port 80.

**Gamma profile now an almost identical copy of the Production profile**

Allows multiple tomcat instances to be run behind the one proxy front making it easy to switch between profiles. Useful for supporting multiple version of sesat-kernel under the one domain.

**ControlLevel.RUNNING\_QUERY\_RESULT\_HANDLING renamed to RUNNING\_QUERY\_HANDLING (5 Jul 2008)**

Changed API:

- ControlLevel.RUNNING\_QUERY\_RESULT\_HANDLING now  
ControlLevel.RUNNING\_QUERY\_HANDLING

**Change the syntax of XML written to the logfile sesam.access (07 Jul 2008)**

[Commit r6724](#)

Instead of using the parameter's key, as the name of the tag, we now use the fixed tag `<parameter>` for this. The key and value are added as parameters inside the parameter tag. So we have gone from this:

```
<1_wonkey_name>123</1_wonkey_name>
```

to

```
<parameter key="1_wonkey_name" value="123" />
```

Changed API:

- sesam.access logfile

## New Features

**Using JSPs in skins (16 Feb 2008)**

[SEARCH-4290 Design and code with JSPs in skins.](#)

It is now possible to use both JSPs and Velocity templates in the skin's templates/ folder. The full documentation on this feature is in the javadoc for [SiteJspLoaderFilter](#)

**AllParametersDirective added (2 Jun 2008)**

[SEARCH-4760 Replace usages of `\${request.requestURL}` in velocity templates with AllParametersDirective.](#)

Velocity templates are encouraged to be \$request free and so http-implementation independent.

So now `$request.queryString` can be replaced with `#allParameters()`

It is also an encoding safe way of writing out the current URL's query string in correct UTF-8 encoding if the original request was ISO encoded.

**SearchMode.isAutoBroadening() added (16 Sep 2008)**

By adding the attribute `auto-broadening="false"` the query will not be wrapped and re-executed when all commands return zero hits. Default value is true leaving functionality as is today.

See [SKER5004 Create option to disable the automatic rewrite of `<multi-word query>` to `\(<multi-word query>\)` when there are zero hits across all verticals](#)

**Rss mode can executed multiple commands (5 Jul 2008)**

In `views.xml/views/tab@rss-result-name` multiple commands can be entered each separated by commas. The first will be used by the `SyndicationGenerator` and will continue to be the return result from `SearchTab.getRssResultName()`. An extra method has been added `SearchTab.getRssCommands()` that returns the whole list. This method is used by `RunningQueryImpl` to ensure all specified commands are executed in rss mode.

**CopySearchRunHandler (5 Jul 2008)**

A whole `SearchDataObject` in the datamodel can be copied with a new name.

**FederatorRunHandler (5 Jul 2008)**

Easily configurable run handler to merge results from multiple search command together into one `ResultList`.

# Requirements

Renaming of news case facade (16 Sept 2008)

[SEARCH-4987 RMI doesn't work in alpha or beta](#)

Changed API in newsadmin-services:

- NewsCaseFacadeInterface renamed to NewsCaseFacade

The sesat revision r6808 requires an upgrade of newsadmin-services from [v1.4](#) to [v1.5](#) on the RMI backend server.

## 2.18 Upgrade

This page last changed on Oct 30, 2008 by [sshafroi](#).

Error formatting macro: toc: java.lang.NullPointerException

There also exists a [presentation](#) running through the new features in 2.18.

# Compatibility changes

**Sorting parameter only applicable to search command with sorting navigator (26th May)**

### [SKER4750 - Only main search should use sort order set in the URL](#)

Implemented behavior similar to `SearchCommand.isPaginated()` & `AbstractSearchCommand.getOffset()`

Added API:

- `SearchCommand.isUserSortable()` returns true for search command's that have an applicable navigator, ie `id="sort"`
- `AbstractSearchCommand.getUserSortBy()` returns the `userSortBy` parameter if `true == isUserSortable()`  
It's now mandatory that the sort navigator defines the search command applicable via the `command-name` attribute.

**SearchConfiguration subclasses must meet javabeen specification (26th June)**

### [Issue SKER4404: \(Automatically assign config settings in readSearchConfiguration where there is a setter\)](#)

Changed API:

- `no.sesat.search.query.transform.AgefilterQueryTransformerConfig`'s `config` attribute changed from `field` to `age-field`.
- `no.sesat.search.mode.config.SearchConfiguration`'s `getResultFields` changed to `getResultFieldMap`.
- `no.sesat.search.mode.config.SearchConfiguration`'s `getFieldFilters` changed to `getFieldFilterMap`.

**Token Evaluator SPI (7th July)**

### [SKER3540 - Token Evaluator SPI](#)

`TokenPredicate` exploded into more stable objects. Evaluators no longer hardcoded into kernel. Evaluators are loaded through their corresponding `AbstractEvaluatorFactory` implementation. Factories are registered via `configuration.properties`, and answer whether they are responsible for a `TokenPredicate` through `isResponsibleFor(tokenPredicate)`.

The `TokenEvaluator` is fetched through the factory as well through `getEvaluator(tokenPredicate)`. The factory encapsulates whether the one evaluator can be used for all queries, and/or for all tokens.

The skin's project for evaluator implementations is `query-evaluation`, and the kernel loads classes through `Spi.QUERY_EVALUATION`.

Added API:

- new class `AbstractEvaluatorFactory`
- factory implementations `JepEvaluatorFactory`, `FastQueryMatchingEvaluatorFactory`, and `RegexpEvaluatorFactory` added
- new class `AbstractTokenPredicate` (solid equals and hashCode overrides to satisfy interface constraint that name is unique across all implementations - allowing `exactPeer()` to be used more exactly)
- `AbstractEvaluatorFactory.Context` requires method `"String getUniqueId()"` as `datamodel.parameters.uniqueId` is not available. This contextual addition creeps back through `TokenEvaluationEngine.Context` and `AnalysisRulesFactory.Context`

Changed API:

- `TokenPredicate.Categories` moved out to own class as `Categories`
- `TokenPredicate.Type` moved out to own class as `EvaluatorType`
- `TokenPredicate.TokenPredicateImpl` moved out to own class as `TokenPredicateImpl`
- `TokenPredicate.ExactTokenPredicateImpl` moved out to own class as `ExactTokenPredicateImpl`

- TokenPredicate.EvaluationException moved out to own class as EvaluationRuntimeException (remaining an unchecked exception)
- TokenPredicate.Static moved out to own class as TokenPredicateUtility
- Categories.EXACT\_WIKI renamed to EXACT\_WIKIPEDIA (to match non-exact peer)
- Categories.EXACT\_FIRST renamed to EXACT\_FIRSTNAME (to match non-exact peer)
- VeryFastEvaluationException renamed to EvaluationException (remaining a checked exception)

#### Removed API:

- TokenPredicate.getType() [ TokenPredicate no longer references TokenEvaluator in any manner ]
- TokenPredicate.Static.getTokenPredicates(type) [ AbstractEvaluatorFactory responsible now for relationship ]
- TokenPredicate.Static.getMagicTokenPredicates() [ magic tokens a sesam.no concept, not sesat ]
- TokenPredicate.Static.getTriggerTokenPredicates() [ trigger tokens a sesam.no concept, not sesat ]

## New Features

### Selecting content type in layout element in views.xml (2nd July)

#### [SKER4919 - Configurable content types](#)

In views.xml//views/tab/layout you can now define the attribute content-type.

Example: `<layout main="main" front="index" content-type="text/xml; charset=utf-8"/>`

For further flexibility use a jsp page with `setContentTypes(..)` in scriptlet code.

#### Added API:

- SearchTab.Layout.contentType & SearchTab.Layout.getContentType()

### Sesat-ise and standardise decorators (2nd July)

#### [SKER4182 - Sesat-ise and standardise decorators](#)

The output parameter was used to select decorators like the rss, og vcard. This is a bit more configurable now. The output parameter has been renamed to layout and refers to the id attribute in the layout element in views.xml.

Example: `<layout id="opensearch" main="opensearchDecorator.jsp"/>` This will let you use `layout=opensearch`, and you get forwarded to the `opensearchDecorator`. If you put this in a views.xml early in the chain, then all pages will have this ability.

For backward compatibility `output=xyz` rewrites to `layout=xyz` (see `urlrewrite.xml`)

### Solr Search Command (15th September)

#### [SKER4949: \(Solr SearchCommand implementation\)](#)

Searching can now be configured against a Solr index. Example configuration available commented out in `generic.sesam/sesam.com/war/src/main/src/main/conf/modes.xml`

#### Added API:

- SolrCommandConfig
- SolrSearchCommand

### Solr Token Evaluation (15th September)

#### [SKER4952: \(Solr TokenEvaluator\)](#)

Query evaluation (or Query matching) can now be configured against a Solr index.

Full tutorial on setup and configing exists at [Setting up Sesat's Query Evaluation with a Solr index](#)

#### Added API:

- SolrEvaluatorFactory
- SolrTokenEvaluator

### Youtube Search Command (26th September)

#### [SKER4753: \(Promote YoutubeSearchCommand \(from Schibsted Søk AS\)\)](#)

Searching can now be configured against Youtube.

#### Added API:

- YoutubeCommandConfig
- YoutubeSearchCommand

#### Field Splitter result handler (27th September)

[SKER4752: \(Promote FieldSplitter result handler \(from Schibsted Søk AS\)\)](#)

Searching can now be configured against Youtube.

Added API:

- FieldSplitterResultHandlerConfig
- FieldSplitter

#### Clustering hit count result handler (27th September)

[SKER4781: \(Promote ClusteringHitCountResultHandler \(from Schibsted Søk AS\) \)](#)

Searching can now be configured against Youtube.

Added API:

- ClusteringHitCountResultHandlerConfig
- ClusteringHitCountResultHandler

#### An Interpreter to help debug and inspect Sesat.

See the page below for info.

[Sesat-Interpreter](#)

#### Generating XML Schema files for the modes.xml configuration files

We are now generating XML Schema files for the modes.xml files. And validating against these files during build.

See the page below for info.

[Search modes schema generator](#)

## Requirements

#### SiteMesh is no longer a requirement (2nd July)

SiteMesh was removed by work done in [SKER4182 - Sesat-ise and standardise decorators](#).

## Writing Upgrade Guide guidelines

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This page last changed on May 26, 2008 by [mick](#).

1. Prefix page with {toc:indent=5}
2. The page should contain three h1. headings: Compatibility changes, New Features, and Requirements
3. Each "change" should be a h6. heading and include a date stamp
4. Each "change" should refer to a scarab issue
5. Each "compatibility change" has it's body text quoted
6. Each "compatibility change" should list separately: Changed API, Added APIs, Removed APIs, Deprecated APIs, and equivalents for SPIs.



## About

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Version 3, 19 November 2007

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## Project

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This page last changed on May 06, 2008 by [mick](#).

# The Sesat.no Project

Sesat.no is hosted over three machines.  
The first is for the website, subversion, mailing lists.  
The second machine is dedicated to scarab + mysql.  
The third machine is dedicated to hudson and opengrok.

## Web Site

Webpages are exported from confluence using the autoexport plugin.

## Version Control

Subversion located at <http://sesat.no/svn/>  
Browsable history through Opengrok at <http://sesat.no/source/>

## Mailing Lists

Running mailman at <http://sesat.no/mailman/listinfo>  
with postfix and postgreyfilter.

## Issue Tracker

Running scarab at <http://sesat.no/scarab/>

## Propriety License

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## Sitemap














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This page last changed on Jul 09, 2008 by [mick](#).

The following is a sitemap of the wiki pages in this site. It excludes content from hudson/, mailman/, maven2/, projects/, source/, and svn/.

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## News items

Title	Author	Date Posted
 <a href="#">Lucene and Solr patches accepted</a>	<a href="#">Mck Semb Wever</a>	Jan 31, 2009
 <a href="#">Sesat 2.18 - "The acquisition of wealth is no longer the driving force in our lives."</a>	<a href="#">Mck Semb Wever</a>	Dec 03, 2008
 <a href="#">Sesat 2.18 - "The acquisition of wealth is no longer the driving force in our lives."</a>	<a href="#">Mck Semb Wever</a>	Nov 20, 2008
 <a href="#">federatedsearchblog.com - "New open source federated search middleware released"</a>	<a href="#">Mck Semb Wever</a>	Jul 09, 2008
 <a href="#">Sesat on Sourceforge</a>	<a href="#">Mck Semb Wever</a>	Apr 28, 2008
 <a href="#">Sesat on Freshmeat</a>	<a href="#">Mck Semb Wever</a>	Apr 28, 2008
 <a href="#">Sesat 2.17 - "Are we human because we gaze at the stars or do we gaze at the stars because we are human?"</a>	<a href="#">Mck Semb Wever</a>	Apr 22, 2008
 <a href="#">Sesat 2.17 - "Are we human because we gaze at the stars or do we gaze at the stars because we are human?"</a>	<a href="#">Mck Semb Wever</a>	Apr 08, 2008
 <a href="#">jaxmag.com - Search Middleware Portal Generally Available To Access Data Source</a>	<a href="#">Mck Semb Wever</a>	Apr 03, 2008
 <a href="#">Sesat, a federated search solution middleware, goes open source</a>	<a href="#">Mck Semb Wever</a>	Mar 31, 2008
 <a href="#">Cominvent - Norweigan search portal Sesam.no releases middleware as GPL</a>	<a href="#">Mck Semb Wever</a>	Mar 30, 2008
 <a href="#">DIGG - Build your own search engine with SESAT</a>	<a href="#">Mck Semb Wever</a>	Mar 30, 2008
 <a href="#">Sesambloggen - Sesam Search Application Toolkit (SESAT) available as Free Software</a>	<a href="#">Mck Semb Wever</a>	Mar 21, 2008
 <a href="#">Digi.no - Sesam deler ut kildekoden</a>	<a href="#">Mck Semb Wever</a>	Mar 21, 2008