

# Elasticsearch Usage Statistics

Added in DSpace 3.0 is an optional statistics engine using [Elasticsearch](#), which may be enabled as an alternative to the default [SOLR Statistics](#) engine (based on [Apache SOLR](#)). The motivation for adding Elasticsearch was to find an alternative statistics processing engine that would handle the workload of a large amount of statistics data. Additionally, the Elasticsearch statistics display offers another method for creating statistical queries against your data. Elasticsearch Usage Statistics has been contributed by Peter Dietz of Ohio State University's Knowledge Bank. The data source for Elasticsearch Statistics is DSpace Usage Events, where Usage Event is a view or download of a DSpace Object (Bitstream, Item Page, Collection Page, Community Page). Elasticsearch Statistics is bundled with DSpace, and requires no additional installation of software, it just needs to be enabled. Elasticsearch is only available for use with XMLUI.

## What data is being recorded?

The default information below is what DSpace will record about a Usage Event. In DSpace 3.0 the fields of data collected is not configurable through a configuration setting.

### Information about the User Requesting the Content

- IP Address
- Time of Request
- DNS / Hostname
- User Agent
- isBot, a flag that DSpace thinks that user is a robot or not
- Geographical Information about where the user is located:
  - Continent
  - Country
  - Country Code
  - City
  - Geographical Latitude/Longitude

### Information about the DSpace Resource that was used

- DSpace Object ID
- DSpace Object Type: (Item, Bitstream, Collection, or Community)
- If it is relevant, we also store the hierarchy of where this object exists within DSpace
  - Owing Community
  - Owing Collection
  - Owing Item

## Enabling Elasticsearch Statistics

Elasticsearch Statistics is disabled by default in DSpace 3.0, the following steps will enable Elasticsearch so that you can collect data, and present statistics reports.

Modify `dspace/config/xmlui.xconf`, and uncomment the aspect, Statistics Elasticsearch.

### Enable Elastic Search Statistics in `dspace/config/xmlui.xconf`

```
<!--  
    If you prefer to use "Elasticsearch" Statistics, you can  
    uncomment the below  
    aspect and COMMENT OUT the default "Statistics" aspect above.  
    You must also enable the ElasticsearchLoggerEventListener.  
-->  
<!-- <aspect name="Statistics - Elasticsearch"  
path="resource://aspects/StatisticsElasticSearch/" /> -->
```

Modify `dspace-xmlui/src/main/webapp/WEB-INF/spring/applicationContext.xml` and uncomment the following code block for `ElasticSearchLoggerEventListener`

### Enable ElasticSearchLoggerEventListener

```
<!-- Elasticsearch -->
<!--<bean class="org.dspace.statistics.ElasticSearchLoggerEventListener">
  <property name="eventService">
    <ref bean="dspace.eventService" />
  </property>
</bean-->
```

After making these two changes, you will then need to rebuild and restart DSpace.

## Importing Legacy Data into Elasticsearch Statistics

Once Elasticsearch Statistics has been enabled, it will begin adding all new Usage Events to its data store. To import your legacy data, you will need to import the data from the `dspace.log` files. There is no tool yet that converts SOLR statistics data to Elasticsearch statistics data.

From the (Windows / Linux) terminal, you will need to use the DSpace Command Launcher to convert the `dspace.log` files to a statistics log format. Then you will need to import the statistics log format files into DSpace Statistics.

The Log Converter program converts log files from `dspace.log` into an intermediate format that can be inserted into Elasticsearch Statistics.

Command used:	<code>[dspace]/bin/dspace stats-log-converter</code>
Java class:	<code>org.dspace.statistics.util.ClassicDSpaceLogConverter</code>
Arguments short and long forms):	Description
<code>-i</code> or <code>--in</code>	Input file
<code>-o</code> or <code>--out</code>	Output file
<code>-m</code> or <code>--multiple</code>	Adds a wildcard at the end of input and output, so it would mean if <code>-i dspace.log -m</code> was specified, <code>dspace.log*</code> would be converted. (i.e. all of the following: <code>dspace.log</code> , <code>dspace.log.1</code> , <code>dspace.log.2</code> , <code>dspace.log.3</code> , etc.)
<code>-n</code> or <code>--newformat</code>	If the log files have been created with DSpace 1.6 or newer
<code>-v</code> or <code>--verbose</code>	Display verbose output (helpful for debugging)
<code>-h</code> or <code>--help</code>	Help

An example form of this command would be `[dspace]/bin/dspace stats-log-converter -i dspace.log -o statistics.log -m -n`

The Log Importer program takes the intermediate format data produced in the previous step, and imports it into Elasticsearch Statistics.

Command used:	<code>[dspace]/bin/dspace stats-log-importer-elasticsearch</code>
Java class:	<code>org.dspace.statistics.util.StatisticsImporterElasticSearch</code>

Arguments short and long forms):	Description
-i or --in	Input file
-m or --multiple	Adds a wildcard at the end of input and output, so it would mean if -i statistics.log -m was specified, statistics.log* would be imported. (i.e. all of the following: <i>statistics.log</i> , <i>statistics.log.1</i> , <i>statistics.log.2</i> , <i>statistics.log.3</i> , etc .)
-s or --skipdns	To skip the reverse DNS lookups that work out where a user is from. (The DNS lookup finds the information about the host from its IP address, such as geographical location, etc. This can be slow, and wouldn't work on a server not connected to the internet.)
-v or --verbose	Display verbose output (helpful for debugging)
-h or --help	Help

An example form of this command would be `[dspace]/bin/dspace stats-log-importer-elasticsearch -i statistics.log -m`

## Viewing Data in Elasticsearch Statistics

In XMLUI, while logged in as an administrator, the Context Panel will have an additional "View Statistics" link when you browse to a Community, Collection, or Item.

The Statistics Report includes:

- Bitstreams with Most Downloads, for all time.
- Bitstreams with Most Downloads, previous month.
- Total Number of Downloads to Bitstreams within this container, broken down by month.
- Number of hits per Country

This data is presented as either a Table or Line Graph, and requires JavaScript to draw the graphics.